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Mutually supportive or trade-offs: An analysis of competitive priorities in the emerging economy of India

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ABSTRACT

To refine the theories of operations strategy, we need research from all different situational contexts, including different countries—both developing and developed. There have been many studies, including some replications, done in various parts of the world to further the debate on whether competitive priorities are mutually supportive or if they present potential trade-offs, but hardly any from a rapidly growing economy, such as India. This study is a significant attempt in that direction. After a thorough review of the literature, a set of hypotheses is introduced to test whether Indian manufacturers view competitive priorities as mutually supportive or trade-offs. The data from over 150 high-ranking individuals from over 75 manufacturers in India is used to test the hypotheses by way of cluster analysis and ANOVA. The resultant taxonomy reveals patterns that uniquely represent Indian manufacturers' view of the competitive priorities, namely quality, flexibility, delivery and price. The study findings have significant managerial implications, both for India and other developing as well as developed economies. The taxonomy will serve to gauge India's manufacturers' role in the world. From a researcher's perspective, this study makes a significant contribution to theory development, furthers our understanding of the strategic role of operations, moves forward the ongoing debate on the topic of trade-offs or complementarity, and paves the way for future studies in this topical area.

1. Introduction

Researchers and practitioners alike continue to ponder whether competitive priorities are pursued at the cost of one another or in consonance. The *trade-offs* perspective suggests that superior performance along one dimension can be achieved only by sacrificing performance along another dimension (Skinner, 1969). Hence, according to this perspective, a company could not simultaneously perform well on all competitive dimensions (Hayes and Wheelwright, 1984). Many studies have mustered support for this notion (cf., Pagell, Melnyk, and Handfield, 2000; Safizadeh, Ritzman and Mallick, 2000; Silveria and Slack, 2001; and Boyer and Lewis, 2002) through survey-based research as well as case-based research.

On the other side, there is equally strong support, if not more, in favor of the virtually opposite notion that manufacturers can simultaneously improve on multiple capabilities (cf., Amoako-Gyampah and Meredith, 2007; Narasimhan and Schoenherr, 2013; Singh, Weingarten, Nand and Betts, 2014). Hence, they can simultaneously place equally high importance on multiple competitive priorities. According to this perspective, manufacturers view competitive priorities and capabilities as potentially supportive of one

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another (cf., Nakane, 1986; Ferdows and De Meyer, 1990; Noble, 1995).

The studies that test the mutually supportive notion of competitive priorities, also known as cumulative competence building, often use the configurational approach. Configurations are quite revealing as they tend to form groups based on certain defining characteristics that speak to the internal fit or their fit with the environment. A high degree of fit invariably leads to higher organizational effectiveness, which reflects in higher performance. Configurations are built on the notion of 'equifinality', which implies that organizations can achieve the fit in multiple yet equally effective ways (Bozarth and McDermott, 1998; Cai, 2017).

The above referenced configurations are of two types, typologies and taxonomies. A taxonomy empirically derives mutually exclusive groups or configurations, whereas a typology generates conceptual grouping. A typology represents the ideal types whereas a taxonomy categorizes an observable phenomenon into distinct configurations, which, in the field of operations strategy, are also called 'strategic groups.'

A taxonomy aids theory building by providing a parsimonious portrayal of strategic groups. However, the taxonomic research in operations strategy is not so prevalent, though some consider it is on the rise (cf., Chatha and Butt, 2015). Further, whatever research exists in this area is primarily based on the data collected from North America or Europe. For example, two early taxonomies—Miller and Roth 1994, and Kathuria 200—that defy trade-offs are based on the views and practices of manufacturing managers in USA. These studies use competitive priorities, measured in terms of delivery, quality, price/cost, and flexibility, or the manufacturing task to characterize manufacturers.

The replication attempts of the two seminal taxonomies in operations management have also been made mostly in the Americas and Europe (cf., Frohlich and Dixon 2001; Christiansen, Berry, Bruun and Ward, 2003; Grant, Cadden, McIvor, Humphreys, 2013), with some in the industrialized economies of Asia-Pacific (cf., Sum, Low and Chen, 2004; Zhao, Sum, Qi, Zhang, and Lee, 2006). Their findings raise an important question whether the strategic groups identified are unique to a country or region, or if these configurations will also appear in rest of the world.

When studies were replicated in the same country after several years, for example in Spain (cf., Avella-Camarero, Fernandez-Sanchez, and Vazquez-Ordas, 1999; Martin-Pena and Diaz-Garrido, 2008a), researchers observed a declining trend in the number of clusters from three to two. Hence, one may surmise that strategic groupings change due to the influence of time, even within the same country. Cagliano, Acur and Boer (2005) conducted a longitudinal study to observe patterns of change in strategic configurations over time. Due to the longitudinal nature of the study, their sample was quite small, and they observed minimal change over time in the four configurations, namely market-based, product-based, capability-based and price-based. They, however, noted that companies in their sample did change their strategies over time.

To account for shifts in competitive paradigms and other environmental initiatives, a regular verification and replication of taxonomies is required for theory building. The applicability of these taxonomies to a rapidly developing economic environment, such as India, has not been studied and hence remains unclear. India has steadily attracted Foreign Direct Investments (FDI) since it opened up its economy in 1991. During a recent three and one-half year period, from April 2014 to December 2017, the FDI inflow in India reached over 200 billion US dollars (www.ibef.org). According to the same source, India's manufacturing sector's output is expected to reach one trillion US dollars. Yet, so little is known about India's manufacturing strategy.

India was a closed economy up until 1991, when it began to privatize state-owned enterprises and reduce control on foreign trade and investment. Industrial deregulation and economic liberalization of the nineties paved the way for India's rising economic prosperity on account of technological adaptation and innovation. India is now poised to become a more outwardly focused nation that will deepen its ties with the rest of the world (2017 Global Shakeup by the BMI Research Group) for which India needs globally-minded managers as opposed to ones with a domestic focus. However, India's manufacturing strategies are relatively unknown, especially whether its manufacturers view their competitive priorities as potential trade-offs or as potentially supportive of one another.

A taxonomy of competitive priorities will aid our understanding of India's role in global manufacturing and its relative position in the world market. India's transition from a closed economy to a more open economy offers unique challenges as well as opportunities in the manufacturing sector. It also makes India a potent setting for conducting academic research and gleaning practical advice. A taxonomy of Indian manufacturers' competitive priorities shall augment the manufacturing strategy body of knowledge, which primarily rests upon North American and European studies.

We have set forth the following objectives for this study:

1. to elicit Indian manufacturers view of the competitive priorities by way of identifying a taxonomy;
2. to compare the taxonomy derived from this study with Kathuria's (2000) taxonomy;
3. to study the connection between strategic groups and performance.

To accomplish aforesaid research objectives, the present study is modeled after the above mentioned seminal studies in this area. The authors of the two seminal studies, and of their replications as well, have encouraged future researchers to consider different settings and time to test the taxonomy.

2. Literature review and research hypotheses

In the operations strategy literature involving taxonomies and typologies, 75% of the studies seem to propose new taxonomies (Martin-Pena and Diaz-Garrido, 2008b). The remaining 25% that replicate a taxonomy also reported differences from the original taxonomy. Further, these studies identify the need for future research and encourage the use of configurational research methods for

the examination of changes in operations strategy and its subsequent development and implementation (Martin-Pena and Diaz-Garrido, 2008b). With the changes in global competitive landscape, the ever-changing nature of competitive priorities, and with India and China rising as major players in global manufacturing, there is impetus to examine how manufacturers are clustered across competitive priorities in these emerging economies. There has been one such taxonomical study done in China, but none for India yet.

In China, Zhao et al. (2006) derived a taxonomy of strategies for manufacturers in that country and found it to be dissimilar from the strategic groups in Miller and Roth (1994). Frohlich and Dixon (2001) noted limited support for Miller and Roth's (1994) taxonomy by utilizing a new set of global and U.S. data. The *Marketeers* of Miller and Roth were swapped with a newly discovered strategic type, the *Designers*. From the global data, they branded new strategic categories called *Idlers*, *Servers* and *Mass Customizers*. Frohlich and Dixon concluded with a call for validation and replication of their global findings.

Christiansen et al. (2003) found four groups in Danish manufacturers with one very different from those in the Kathuria (2000) and Miller and Roth (1994) taxonomies, and they called it *Aesthetic Designers*. That finding prompted them to call for more configurational studies to identify such unique, country-specific strategic groups, since each country presents a different setting and has a unique competitive advantage (Porter, 1991).

Using data from a newly industrialized nation Ireland, Grant et al. (2013) replicated the taxonomy of Miller and Roth. While there was some consistency in the two studies that both had three clusters, there was a distinct correlation with only one cluster. They concluded that the Miller and Roth's model of *Marketeers*, *Caretakers* and *Innovators* did not muster support in Ireland, and hence it is perhaps not a globally relevant model. Their conclusion is also supported based on a much larger and rapidly developing, or rather nearly developed, industrial economy, China, as Zhao et al. (2006) reported the dimensions underlying their clusters were unlike those in Miller and Roth.

From the above findings, researchers infer that the focus of operations strategy and competitive priorities need to be at the country level instead of at the global level with one leading model. Martin-Pena and Diaz-Garrido (2008a) observed a declining trend in the number of clusters from three to two in Spain over ten years. This finding underscores the need for replication studies over time, even in the same country.

The above-mentioned studies further fuel the question whether the differences are due to a paradigm shift or can they be ascribed to environmental changes, regional specificity, or time. More studies from various environments and regions are needed to address the questions whether strategic configurations based on competitive priorities are country-specific or not. In other words, are they unique to each country or are they context-specific? For example, would similar types of countries with equivalent economic conditions have a similar taxonomy?

Researchers have continued to develop theory in operations strategy, specifically related to competitive priorities and resultant strategic configurations by gathering evidence from different countries and contexts. To the best of our knowledge, however, competitive priorities of Indian manufacturers have neither been examined from a configurational perspective nor to support one of the two prevalent perspectives in the literature—trade-offs or cumulative. Further, it is worth investigating if the patterns detected among manufacturers in the two seminal studies—Miller and Roth (1994) as well as Kathuria (2000)—would be prevalent across the globe in a different cultural and economic setting, such as India.

Manufacturers are categorized into three groups in Miller and Roth's (1994) classification: *Caretakers*, *Marketeers*, and *Innovators*. These groups emphasized different improvement programs, such as zero defects, new product introductions, etc., as well as different performance measures, such as outgoing quality, etc. Kathuria's (2000) taxonomy is based on the degree of emphasis that the U.S. manufacturers place on four generic competitive priorities—price, quality, flexibility and delivery. He categorized them as: *Starters, Speedy Conformers, Efficient Conformers,* and *Do All*. These four types of manufacturers seemed to excel on those measures that were consistent with their competitive orientation—their emphasis on certain competitive priorities. Both studies implicitly supported the notion of Nakane's (1986)*Cumulative model* or the Ferdows and DeMeyer's (1990)*Sandcone model* in how manufacturing progresses through various competitive priorities or core capabilities. It is noteworthy that these researchers challenged the earlier notion of *trade-offs*. Other studies of competitive priorities of Indian manufacturers (cf. Dangayach and Deshmukh 2005, and Kathuria et al. 2010) have shown that the managers in India place varying degrees of importance on the generic competitive priorities that comprise quality, price, delivery and flexibility. Indian managers are seemingly aware of the global competitive trends (Kathuria et al., 2010) and are considered properly trained and “westernized” (Vachani 2008).

This study replicates Kathuria (2000), in particular. Replication is necessary to establish or refute a theory. Though not so common in operations management, replication is widely accepted as researchers continue to challenge and extend the ideas put forth by renowned scholars in various disciplines, such as Einstein in physics, Freud in psychology, Darwin in biology and Keynes in economics (Frohlich and Dixon 2001). To build theory in any field, researchers require multiple rounds of validation and extension (Flynn et al., 1990). As a new theory is proposed, replication is first done on purpose and subsequently it follows as a routine (Lindsay and Ehrenberg, 1993) to support and substantiate the theory (Madden et al., 1995). Both a failure to support the theory as well as a successful duplication help advance the theory building in any field. On the other hand, unreplicated ideas even in management disciplines have raised concerns (cf., Hubbard et al., 1998). To attain maturity in operations management, replication research is needed to abandon weak models and refine the surviving ones (Kathuria 2000, Frohlich and Dixon 2001). In that spirit, we conducted this study after Kathuria (2000) in a geographic setting across the globe and in a developing economy that has been rarely studied—India. Without replication, we will also not be able to settle the issue of trade-offs versus cumulative competence building.

To seize the complexities of organizational reality, configuration research is an accepted and widely used methodology (Dess, Newport and Rasheed, 1993; Ketchen and Shook, 1996). Strategic configurations are clusters of similar organizations that have some common underlying characteristics captured by the study variables (Bozarth and McDermott, 1998). Taxonomies, a form of strategic configurations, are especially useful before subjecting a dataset to serious analyses (Ketchen, Thomas and Snow, 1993).

As noted above, Kathuria (2000) identified four strategic categories—*Starters, Efficient Conformers, Speedy Conformers* and *Do All*—based upon a sample of U.S. manufacturers, and urged the researchers to test the configuration for stability over a period of time as well as in other geographic regions. Heeding the advice, and to contribute to the theory building efforts of operations strategy researchers, we test that framework in a geographic setting that is on the other side of the world. Accordingly, we have formulated the following hypotheses:

H1. India manufacturers will cluster the same way as in Kathuria's (2000) analysis of U.S. manufacturers: *Starters, Efficient Conformers, Speedy Conformers* and *Do All*.

H2. The clusters for India manufacturers—*Starters, Efficient Conformers, Speedy Conformers* and *Do All*—will mirror the same competitive priority standings that groups of U.S. manufacturers did.

H3. The clusters of India manufacturers will excel on the performance measures that are compatible with their competitive orientation, as did the U.S. manufacturers.

3. Methodology

3.1. Data collection

Indian manufactures comprised of the SIC codes 20–39 formed the sampling frame for this study. We surveyed two levels of managers at each manufacturer. The first survey was given to managers of manufacturing function, with titles ranging from Manufacturing Manager, Operations Manager, and Director of Operations. Their immediate supervisors, commonly known as General Managers, completed the second survey.[1]

The cover letters requesting participation in the study and subsequent follow-up correspondence was signed by both groups of researchers—from India and USA. Surveys were collected by the researchers based in India. The response rate was close to 30%. The responses came from a national sample of 78 manufacturing units from across India.

3.2. Measures

Since the competitive priorities are inherently multi-dimensional, we used multiple items to gauge a manufacturing manager's importance to each competitive priority. We used five-point Likert type scales for manufacturing manager's survey, where 1 was 'not at all important' and 5 being 'extremely important'. These items were randomly arranged in the survey. In order to conduct a true replication study, the measures used for operationalizing competitive priorities as well as manufacturing performance were taken from Kathuria (2000).

To ascertain manufacturing performance, we asked senior executives—the supervisors of manufacturing managers—to assess their accuracy, quantity, and quality of work, operating efficiency, customer satisfaction, productivity of the group, and timeliness in keeping delivery commitments. These measures were chosen as they were deemed generic enough for applicability to units following dissimilar strategies, and different industries. We used a seven-point scale, where 1 is 'Unsatisfactory' and 7 is 'Excellent.'

3.3. Reliability and validity of scales

The content validity is supported as the study measures are based in the operations strategy body of knowledge. We used Cronbach's alpha coefficients to check internal reliability of scales, which ranged from 0.64–0.77, with the exception of the cost scale that was 0.55. The scale for quality-of-design was dropped as it had a low alpha. Since quality-of-conformance was retained, it is hereafter, referred to as quality. The value of each measure was calculated as the average of the scores for the corresponding scales.

The discriminant validity was checked through dissimilarity of constructs. Significant correlations between competitive priority constructs were expected because we anticipate companies to pursue multiple competitive priorities. All significant but moderate (< 0.7) correlations support discriminant validity, which means the scales represent diverse constructs.

After Kathuria (2000), we deployed the Harman (1967) test to assess the problem of common methods variance (CMV) that might have occurred as this study used perceptual measures. We, however, do not think CMV is a problem in this study for the following reasons. First, multiple factors with eigenvalues exceeding 1 were extracted through factor analysis. Secondly, several factors had the highest factor loadings. Further, we substantially mitigated concerns of CMV by capturing data from high-ranking managers as such officials are considered reliable sources of information (Kathuria, 2000). The study also did not have the potential of mono-respondent bias since the data were collected on the two constructs from two different levels of managers.

The lack of variability is another potential criticism of Likert type scale measures used in the study. Some researchers (cf., Boyer and Pagell, 2000) contend that respondents may not want to admit even if they don't emphasize certain priorities. Hence, they would exaggerate their emphases. In this study, however, responses corresponding to the competitive priorities ranged between 1 and 5.

[1] The surveys are available from the corresponding author on request.

Table 1
Competitive priorities pursued by clusters.

	Starters $n = 8$ Cluster #1	On-the-Move $n = 37$ Cluster #2	Do All $n = 29$ Cluster #4	F = Value (p = probability)
Cost				
Cluster Mean	3.00 (2, 3)	4.05 (1, 3)	4.54 (1, 2)	F = 30.4
Std. error	0.17	0.07	0.07	$p < .0001$
Rank	4	2	3	
Delivery				
Cluster Mean	3.22 (2, 3)	3.84 (1, 3)	4.67 (1, 2)	F = 31.48
Std. error	0.18	0.08	0.10	$p < .0001$
Rank	2	3	2	
Flexibility				
Cluster Mean	3.17 (3)	3.42 (3)	4.29 (1, 2)	F = 29.80
Std. error	0.17	0.07	0.10	$p < .0001$
Rank	3	4	4	
Quality				
Cluster Mean	3.50 (2,3)	4.44 (1)	4.68 (2)	F = 14.12
Std. error	0.19	0.08	0.11	$p < .0001$
Rank	1	2	1	

Note: The numbers in parentheses are the cluster numbers that the given cluster is different from at $p \leq 0.05$.

3.4. Data analysis

This study deployed the Ward's method with squared Euclidean distance measure, and used SPSS to cluster analyze data. As done in similar studies, the appropriate number of clusters was selected by striking an equilibrium between stinginess (less clusters) and accuracy. To check the steadiness of our solution, we performed four iterations of the Ward's method. The count of clusters in these iterations was increased by one in each iteration, from two, to three, to four, and to five. When we compared the four solutions, we observed that cluster membership remained stable across various solutions, and splitting apart larger clusters was the only means to form new clusters.

We used ANOVA to assess differences among clusters, if any. The emphases on the competitive priorities were evaluated to ascertain differences among clusters. Next, we performed Scheffe's pairwise comparisons to assess differences among pairs.

4. Results and discussion

We found the three-cluster solution to be a robust solution. ANOVA results enabled us to reject, at the 0.0001 level of significance, the null hypothesis of no differences across defining variables of the three clusters. Table 1 contains cluster statistics, relative ranking of a priority within the cluster, and whether a cluster is significantly different at $p < .005$ from other clusters. All of the F-statistics are significant at $p < 0.0001$ which reject the null hypotheses of no differences across clusters.

The three clusters are named: Starters(Cluster1), On-the-Move(Cluster 2); and Do All(Cluster3). We interpret the clusters or strategic groups based on (a) differences among clusters in the relative pursuance of competitive priorities, and (b) the difference from other defining variables within a cluster, which is assessed through paired-sample t-statistics and presented in Table 2. Each row in Table 2 pertains to a cluster and shows the differences among competitive priorities at $p \leq .05$.

Cluster 1: Starters. Compared to the other two clusters, this cluster of eight manufacturers places *lesser* emphasis on delivery, quality and cost. Flexibility is appraised significantly *below* that in the manufacturers of cluster 3, but not of cluster 2. We call this group "Starters" for this group's low appraisal of all four competitive priorities that ranges between 3.00 and 3.50. Table 2 indicates that quality ranks #1, and all other competitive priorities—flexibility, cost and delivery—are rated below quality. This group stresses

Table 2
Pairwise *t*-tests for differences within a group.

	Cost (C)	Delivery (D)	Flexibility (F)	Quality (Q)
Starters				
Cluster Mean	3.00 (D, Q)	3.22 (C, Q)	3.17 (Q)	3.50 (C, D, F)
Std. error	0.17	0.18	0.17	0.19
On-the-Move				
Cluster Mean	4.05 (F, Q)	3.84 (F, Q)	3.42 (C, D, Q)	4.44 (C, D, F)
Std. error	0.07	0.08	0.07	0.08
Do All				4.68 (F)
Cluster Mean	4.54 (F)	4.67 (F)	4.29 (C, D, Q)	0.11
Std. error	0.07	0.10	0.10	4.68 (F)

Note: The letters in parentheses are the initials of the competitive priority(ies) that the focal priority differs from at $p \leq 0.05$.

quality as an 'order qualifier'. The Starters are the smallest cluster comprised of 11% of the sample.

Cluster 2: On-the-Move. This group of thirty-seven manufacturing units assigns a significantly greater importance to delivery, quality and cost relative to those in cluster 1. Hence, it is named On-the-Move. The topmost priority within this cluster is quality with an emphasis of 4.44 (out of 5) followed by an almost equal (no statistically significant difference) emphasis on cost (4.05) and delivery (3.84). Within cluster analysis indicates that importance given to cost, delivery and quality is significantly more than to flexibility. This is the largest group and represents about 50% of the cases.

Cluster 3: Do All. This cluster of twenty-nine units represents about 39% of the cases in all three groups. All four competitive priorities receive simultaneously high emphasis, ranging between 4.29 and 4.68, from units within this cluster. A key distinguishing factor from this group is that, except for quality, this group's emphasis is significantly higher on the remaining three priorities, whereas in the other two groups it is not. Within group analysis (Table 2) further demonstrates that the only significant difference is the emphasis on flexibility, which is lower than the other three, implying that the group provides equal emphasis to the remaining three priorities—quality, delivery, and cost. Given that all four competitive priorities are highly emphasized in this group and the emphasis is significantly higher on flexibility, delivery, and cost, relative to the other two clusters, this cluster was aptly named Do All.

These results establish support for our core thesis that companies pursue different combinations of competitive priorities that seem to mirror their orientation suited for the demands of their respective target audience. The analysis also discovered a group, about 40% of manufacturers in the sample, who demonstrate simultaneous pursuit of all competitive priorities. The result supports the notion of competitive priorities being mutually supportive rather than being treated as potential 'trade-offs'. How the results support individual hypotheses, or not, is discussed below.

Hypothesis 1. Number and characteristics of clusters.

On a first look, the three-cluster solution does not seem to support Hypothesis 1 that predicted four clusters. On a closer cluster-by-cluster comparison, however, the three clusters in the India taxonomy are very similar to the four clusters in Kathuria's USA taxonomy. The first cluster of Starters in the India taxonomy is the same as the *Starters* cluster in Kathuria's USA taxonomy. The third cluster, Do All, is the same as Kathuria's *Do All*. The second cluster of this study, On-the-Move, is a combination of Kathuria's *Efficient Conformers* and *Speedy Conformers*.

While there are similarities in this taxonomy and that of Kathuria (2000), there are distinct differences as well that may be unique to the two geographic settings. One such difference is the percent of manufacturers in each cluster in the two taxonomies. The Starters are mere 11% in this India taxonomy compared to 33% in Kathuria (2000)—that is, one-third of what Kathuria found in USA. This is a strange finding as one would expect more Starters in a developing economy as compared to a developed economy. A plausible explanation for this may be the time factor. When the USA data was collected in 1996, the operations strategy concept was relatively new and hence the manufacturers were still working on improving the quality of their product offerings. As time has gone by, quality has become more of an order-qualifier as compared to an order-winner.

The number of *Do All* type are different too in the two taxonomies, but in the direction that one would not expect—39% in India compared to 15% in USA. Again, one would expect more *Do All* in a developed economy, but here the result is just the opposite. As stated above, this may also be a function of the time factor. Another plausible explanation for this scenario is that in the nineties, a lot of the US manufacturing was being outsourced because of loss of competitive edge. The small and medium sized companies that comprised majority of Kathuria's (2000) sample were the ones most impacted by foreign competition and many were either being shuttered or off-shored. Hence, it is not surprising that only 15% of the sample was in this category, par excellence. Whereas for India, which is an up and coming economy focused on competing internationally, its manufacturers have to strive to be world-class and hence 39% give significantly high importance to all competitive priorities.

The number of manufacturers in the third cluster, On-the-Move, are 50% compared to a combined 52% (41% *Speedy Conformers* and 11% *Efficient Conformers*) in the Kathuria's USA taxonomy. The focus of this cluster is simultaneously high emphasis on quality, delivery and cost, with an aim to move to the top in due course. In Kathuria (2000) there were two separate groups, one focusing on delivery and quality (41%), called *Speedy Conformers*, and the other (11%) on cost and quality, called *Efficient Conformers*. The latter group was an unexpected finding for Kathuria (2000), but for the former, based on the underlying theory of the *Sandcone* model, one would expect them to be moving up the ladder by enhancing their emphasis on the remaining competitive priorities.

Hypothesis 2. Ranking of competitive priorities within clusters.

Hypothesis 2 predicted the same ranking of competitive priorities in the India replication as in the original Kathuria (2000). Overall, there are more similarities than differences in the rankings of two taxonomies.

As for the similarities, in both taxonomies Quality is ranked #1 in the Starters and Do All groups. It ranked #2 for On-the-Move cluster, as it did for *Efficient Conformers* in Kathuria (2000). These results indicate that the Quality rankings are very similar. Similarly, Flexibility ranked #3 for Starters and #4 for Do All and On-the-Move, in this India replication. For Kathuria (2000), it also ranked either #3 or #4 for all of its clusters—which shows more similarity than difference. On a deeper analysis, however, minor differences were observed. In Kathuria (2000), Flexibility ranked #4 for *Starters* whereas it was #3 in this India replication, and the ranks were reversed for the *Do All* clusters, that is #3 in Kathuria (2000) and #4 in India replication. The smaller of the *Conformers* group (*Efficient*) in Kathuria (2000) had Flexibility ranked #3 and the bigger *Conformers* group (*Speedy*) had it ranked as #4, compared to #4 for the On-the-Move group in India Replication. That again is more similar than different because *Speedy Conformers* were about 40% of the sample and *Efficient Conformers* only 11%.

Delivery ranked #2 for Starters in both studies, so that is exactly the same. For On-the-Move, it ranked #3 and in Kathuria (2000)

Table 3
Manufacturing performance by clusters.

	Starters n = 8 Cluster #1	On-the-Move *n* = 37 Cluster #2	Do All *n* = 29 Cluster #3
Accuracy			
Cluster Mean	5.00(3)	5.31	5.40(1)
Std. error	0.37	0.16	0.16
Rank	3	4	4
Customer Satisfaction			
Cluster Mean	5.20	5.31	5.40
Std. error	0.43	0.19	0.19
Rank	2	4	4
Efficiency			
Cluster Mean	5.00(3)	5.04(3)	5.40(1, 2)
Std. error	0.34	0.15	0.15
Rank	3	6	4
Productivity			
Cluster Mean	5.60(2, 3)	5.23(1)	5.24(1)
Std. error	0.38	0.17	0.17
Rank	1	5	5
Timeliness			
Cluster Mean	4.60(2, 3)	5.35(1)	5.48(1)
Std. error	0.40	0.17	0.18
Rank	4	3	2
Quality			
Cluster Mean	5.20 (3)	5.39	5.44
Std. error	0.38	0.17	0.17
Rank	2	2	3
Quantity			
Cluster Mean	5.00(2, 3)	5.42(1)	5.64(1)
Std. error	0.40	0.18	0.18
Rank	3	1	1

Note: The parentheses designate the cluster number(s) that the focal cluster differs from at $p < 0.05$.

the average rank of Delivery was also #3 for the two *Conformers*. So that is quite similar. For the Do All, however, it was #2 in this study (the score was almost as good as #1) whereas for Kathuria (2000) it was clearly at the bottom for the *Do All* group. That is a huge difference and may be ascribed to the geographical setting.

Cost ranked a notch lower for both Starters (#4 compared to #3 in Kathuria) and Do All (#3 compared to #2 in Kathuria). The differences, though not much, may be attributed to the geographical setting. For On-the-Move, Cost ranked #2, which was the average of the two *Conformer* groups in Kathuria, and hence it appears to be quite similar in both studies.

We further validated our results above by comparing the average rank of a priority across groups. If we average the rank of each priority across groups, then Quality in this study averages 1.33 as compared to 1.25 in Kathuria (2000), Flexibility averages 3.67 compared to 3.5, Delivery averages 2.33 compared to 3.0, and Cost 3.0 compared to 2.25. Hence, on average, Quality and Flexibility rank about the same in the two taxonomies, but the ranks of Delivery and Cost are swapped.

Hypothesis 3. Strategic groups and operational performance.

The cluster statistics for manufacturing performance on seven measures and their rankings within a cluster are in Table 3. It also shows the results based on the within-cluster paired-sample T-statistics.

The rank represents the order of a performance measure inside a cluster.

Managers of the Do All group are viewed by senior executives as performing significantly better on accuracy, timeliness, efficiency and the quantity of work than managers in the Starters group. On the efficiency frontier, they are viewed better than even the On-the-Move group. Within the Do All group, the highest rating (5.64 on a scale of 1–7) of manufacturing performance is received by the quantity of work performed, followed by timeliness (5.48), and quality of work (5.44). Very close to quality is the equally good performance on accuracy, efficiency and customer satisfaction, all at 5.40. Thus, the Do All seem to be doing it all and doing it well too.

Manufacturing managers of the On-the-Move group are also considered as performing better than the Starters on the quantity of work and timeliness. The Starters seem to be doing their best on productivity, even better than the other two groups. They, however, trail behind the other two clusters on the remaining six performance measures, which is consistent with their strategic posture.

Hypothesis 3 is supported as per these results, which establish the existence of differences both across and within clusters. The performance appears to be superior on the measures compatible with competitive priorities of the group. For example, the Do All type of manufacturers seems to do well on accuracy—a measure of quality-of-conformance, on efficiency and quantity of work—the measures supporting the competitive priority of price or low cost, and timeliness—a measure supporting delivery speed and delivery reliability. Researchers have advised of such compatibility between performance measures and competitive focus (cf., Jitpaiboon

et al., 2016) and our results support this notion as manufacturers in this study demonstrate better performance on measures that are compatible with their strategic direction. Thus, there is a fit between a strategic group's competitive orientation and its operational performance.

These operational performance results for various strategic groups are mostly compatible with those in Kathuria (2000), who also found different clusters performing well on compatible performance measures. There is, however, something unique about this taxonomy of India manufacturers. The Starters' top performance rating on productivity (5.60) is the second highest of all groups on any of the seven performance measures. The Starters' second highest performance rating of 5.20 is on both quality and customer satisfaction. Though the drop from 5.60 to 5.20 is significant, yet their high performance on customer satisfaction is noteworthy. It may at first seem that the group hasn't quite figured out which competitive priorities to focus on after quality, but a deeper look indicates that their emphasis on delivery is the second highest followed by flexibility, a close third rank. Hence, consistent with their competitive orientation, they are performing well on productivity, quality, and customer satisfaction—their top three ratings on performance measures.

Another noteworthy difference in performance ratings between this study and Kathuria (2000) is the lower ratings by Indian superiors, in general. For example, for the Do All group, five of the seven ratings on a scale of 1–7 are between 5.40 and 5.48, with the lowest being 5.24 and highest 5.64. In the Kathuria (2000) study, the American superiors rated their manufacturing managers between 5.06 and 6.07, with four of the seven ratings being above the highest rating of 5.64 for the Indian manufacturing managers. There are two plausible interpretations of this pattern. First, the US manufacturers are perhaps better performers compared to their Indian counterparts. Second, superiors in India, compared to their US counterparts, are more conservative when evaluating performance of subordinate managers. A similar observation can be made about the subordinate manufacturing managers in the two countries who rated the emphasis on competitive priorities.

5. Conclusion and implications

This study established a taxonomy of manufacturers in an emerging economy, India, with three groups—Starters, On-the-Move, and Do All—based on their competitive orientation. In general, the three clusters are selective about which competitive priorities to emphasize and how to attain a higher level of performance on certain criteria that are compatible with their competitive orientation.

The middle group, called On-the-Move, is the biggest group with 50% constituents, who place a reasonably good emphasis on cost, quality, and delivery. These manufacturers are yet to master flexibility, but they strive to provide highest quality products that are delivered when the customer demands and at a competitive price. This group appears to have emerged through a combination of the two middle clusters in Kathuria (2000) called Speedy Conformers (emphasizing delivery and quality) and Efficient Conformers (emphasizing cost and quality).

Martín-Peña and Díaz-Garrido (2008a,b) also found a similar group, comprised of nearly 48% of their sample, that emphasized quality and delivery most, and then cost. Other studies have found similar groups of manufacturers that are labeled in a variety of ways. For example, in Miller and Roth (1994) they were called *Marketers* or *commercial manufacturers*, in Ward et al. (1996) they were *market differentiators*, in Sweeney and Szwejczewlski (2000) they were identified as *variant producers*, and in (Avella et al., 1999) they were addressed as *delivery-focused manufacturers*.

The Do All are the second largest group, with about 40% representation, and they highly emphasize all competitive priorities – price or cost, quality, flexibility, and delivery. This group is exactly the same as Kathuria's (2000) '*Do All.*' It is also similar to the *Lean competitor* group of Ward et al. (1996) and *Mass server* of Zhao et al. (2006). Researchers in Spain found a similar group of manufacturers in their sample that they called '*manufacturers pursuing excellence*' (Martín-Peña and Díaz-Garrido, 2008a,b). Similarly, Pooya and Faezirad (2017) had one in their study of Iran manufacturers that they termed as *Industry Leaders*. The existence of such a group in the above studies defies the notion of trade-offs and lends further support to the mutually supportive view of competitive priorities and the cumulative competence building model.

This result also supports the notion that a group of India manufacturers can compete effectively on multiple priorities simultaneously. Thus, it can be inferred that manufacturers in India don't view these competitive priorities as trade-offs, but rather mutually supportive of one another. They seem to go after excellence through the pursuit of these competitive priorities. This result demonstrates that India manufacturers are ready for competing in the worldwide market that faces a dynamic and intricate environment. This also indicates India has globally-minded managers and is now poised to become a more outwardly focused nation, as is expected for India to become a manufacturing giant as per the 2017 Global Shakeup report of the BMI Research Group.

There are a few Starters, about 10%, who are rightly focusing on quality first, in comparison to the other competitive priorities. However, compared to other groups, this emphasis is the lowest. Additionally, they don't surpass any other group on any of the four competitive priorities. This configuration is consistent with Kathuria's, even though his was derived from the data collected in a developed economy, the United States of America.

This study further supports the notion that it is possible for manufacturers to simultaneously pursue all competitive priorities and also be able to excel on multiple performance measures simultaneously. This finding, similar to that observed in the taxonomy of Kathuria (2000), challenges the belief of some researchers in the trade-offs camp, who would posit that the Do All companies could not demonstrate good performance, and that too on multiple measures. The findings regarding strategic groups' competitive orientation and operational performance are in line with other studies (cf., Cua, McKone and Schroeder, 2001).

Finally, manufacturers seem to excel on those measures that are compatible with the competitive orientation. This finding was, however, not as widely supported as in the taxonomy of Kathuria (2000) based on the US manufacturers. Further, the manufacturers in India, regardless of their cluster membership—Starters or Do All—seem to focus more on the performance measures that help

reduce cost and pursue low price as a competitive priority. For example, the highest perceived performance on productivity is that of the Starters group, but even the Do All focus on the quantity of work the most. Further, their perceived performance on efficiency is as good as on customer satisfaction.

The managerial implications of this study are significant for India and other developing as well as developed economies. Strategic group membership may serve as a useful tool for comprehending the choices manufacturers make about the competitive priorities to pursue. Compared to the proportion of Starters in the US, based on earlier studies, Indian managers have very few in that category. Most manufacturers in India seem to be on a fast track as though with an eye to reach the top of the *sandcone*.

From a researcher's perspective, the study contributes significantly to the ongoing debate on the topic and paves way for future studies in this topical area in other developing as well as developed economies. This paper has enhanced our understanding of configurations in operations strategy research by validating some groups that were identified in previous studies, even though in a different geographic setting, as well as identifying a unique and the largest group called On-the-Move. The orientation of this group is indicative of the overall state of India's economy, which is developing and on the move. This finding supports the belief that different countries may have cluster of companies with competitive orientation unique to their country (Porter 1991; Christiansen et al., 2003).

As stated earlier, this study replicated the taxonomy of competitive priorities by Kathuria (2000), which was mostly supported by the findings of this study. While the type and competitive orientation of clusters in Kathuria's (2000) taxonomy from a developed economy apply to a developing economy of the present study, there are differences in the proportions of clusters, as we noticed the proportion of Do All and Starters were reversed in the two countries. We acknowledge and underscore the need to further replicate these studies across geographic settings and over time to fine tune the theory of cumulative competence building and progression of competitive priorities.

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