

International Production Operations Management Research

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This article was originally conceived of as an “update” on a handful of multi-country, multi-researcher, Production and Operations Management (P/OM) research projects. However, the course of the article changed as it became apparent that a broader perspective would better serve the interests of those interested in international P/OM research. This “course-change” was motivated by several factors. First, international P/OM research is being conducted and published on a much wider scale, and by a far broader range of participants, than many would suspect. Second, the combination of the terms “international” and “operations research” or “production/operations management” research has many different meanings. These factors suggested the following questions, each of which will be addressed in this article.

1. First, what is international P/OM research?
2. Next, what is the current state of international P/OM research and what agenda is suggested for international P/OM research?
3. Finally, what issues should be considered, what resources are available, and are there any suggestions to facilitate international P/OM research?

What is International Operations Management Research?

During the process of gathering information on this topic, the most frequent question that arose was, “What is international Productions/Operations Management research?” The question is rooted in determining what is international, since there is a reasonable understanding in the literature as to what topic areas are included in the study of P/OM. Chakravarty, Ferdows, and Singhal (1997) suggested that Operations Management (OM) research could be considered “international,” if it had to do with operating (producing, procuring, and/or distributing) internationally—presumably, across national boundaries. In addition, they indicated that research which involves the “comparison of production and operations in different countries” could also be considered “international.” Prasad and Babbar (2000) suggested that international P/OM research would necessitate the inclusion of at least some internationally oriented variable: economic, cultural, legal, or political. This seems generally consistent with both of the dimensions of Chakravarty et al.

Table 1 shows how the two dimensions of Chakravarty et al. (2000) can be considered separately (as they presented them), or together, to delineate the boundaries of international P/OM research. International P/OM research must include explicit con-



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		Scale of Operational Activity	
		Within Country	Across Countries
Comparison of POM Activity	Within Country	A	B
	Across Countries	C	D

Table 1: Boundaries of international P/OM research.

sideration of the challenges of operating across borders—for example, managing the operations of MNC's (cells B or D in the table), or it must involve a comparison of operational issues across borders—such as a comparison of JIT implementation in the US and Japan (cells C or D). However, international P/OM research could include a combination of scale and activity—for example, how an MNC operating solely within one international trading bloc differs (or is similar to) an MNC operating solely within a different trading bloc (cell D). Finally, the table indicates that which would not be considered to be international P/OM research (cell A).

The State of and an Agenda for International P/OM Research

Previously published research has provided a number of suggestions for topics and types of international P/OM research that will move the body of knowledge forward. Most topic areas have been studied to some degree in developed nations but neglected, for the most part, in less developed countries. However, there are exceptions in some topic areas. Differing degrees of research on specific international P/OM topics indicate that the topic areas are maturing at different rates. Thus, different approaches are necessary for effective and efficient knowledge creation. Table 2 indicates some of those areas, and suggests approaches that could facilitate developing the existing body of knowledge. For areas that have already received sizable attention in the literature, it may be time to review (or even re-review) the literature within a developed topic area. Meta-analysis of existing research could also prove useful in consolidating findings and making generalizations, as well as identifying area in need of further inquiry. Other topic areas have received less attention, and many may require more research before generalized understanding of the particular topic is possible.

An almost exclusive focus on the study of P/OM in developed nations raises the question of whether the existing body of knowledge is generalizable to less-developed countries. Less developed nations may face very different political, resource, infrastructure, cultural, economic, and le-

gal situations. With the scant amount of research to date on these variables (for virtually all international P/OM topic areas), we have very little idea on how they may or may not affect P/OM choices and actions in these countries. This certainly is a research opportunity—one that may also pose a significant challenge to scholars.

Situations that have received little research attention (e.g. neglected topic areas, less developed countries, or a combination of both) raise some important questions. Before embarking upon a study, one must consider why so little work has been done. Is it because research for the situation is potentially difficult and others have picked easier areas? Is it because a particular topic area is "out of favor" and is not getting the attention it should? Is it because it does not make sense (there is no theoretical or practical reason) to study a particular topic area from an "international" point of view? Perhaps there are other reasons a particular topic areas has been overlooked. Careful evaluation of a particular situation or topic area should provide answers to these questions and likely suggest whether work should and/or could be initiated in a particular area by a given researcher or team of researchers.

Issues to Consider, Resources, and Suggestions

A number of issues present themselves to the international P/OM scholar, some perhaps obvious, others may not be so obvious. A few will be raised and addressed here, although this is neither a complete nor a comprehensive listing. First, I will address the question of "what to study." Table 2 has provided some ideas of topic areas that might be considered; however, other P/OM topics might be considered as well. Because international P/OM research is published in so many different outlets, conducting a comprehensive literature search to determine the degree to which a particular international P/OM research question has been investigated can become a daunting task. At this stage of research, the scholar might consider consulting both Prasad and Babbar (2000), and Roth, Gray, Singhal, and Singhal (1987). These two references provide fairly comprehensive listings of research as of the date of publication. In addition, they sort the research by topic area, and then further, into level of indus-

trialization and degree of globalization in a study.

Another question that arises is how to study a particular question or, more appropriately, what research methods to apply. While there will likely be differences by topic area and by the level of maturity of knowledge in a particular area, past research suggests that case studies, descriptive empirical studies, hypothesis testing studies, various modeling approaches, as well as other methods may be applicable. The same considerations should be applied to international P/OM research as to non-international P/OM research in guiding the researcher as to which methods are most appropriate for a given study.

While a handful of well-known international P/OM research groups have received attention at academic conferences and in the press, the larger (and growing) portion of published international P/OM research has and is being conducted by small groups of scholars. Individuals from industry are often important partners in international P/OM research. It appears, in many instances, that research teams, whether small or large, are strategically constructed—with each member contributing differently in terms of language, cultural background, access to industry, and academic experience. The development of an appropriately diverse, but focused, team seems to be a common characteristic of much of the international P/OM research that is reported in the literature.

International P/OM research has a diverse set of publication outlets. Scholars are publishing in a very wide array of journals. In addition, some books have been published, and others are currently in development or in press. Many academic conferences are also publishing proceedings of international P/OM research. As with virtually all topics and issues, some outlets appear more or less receptive to international P/OM research. Prasad, Babbar, and Calis (2000) broach this issue in their review of international P/OM publications.

It is crucial that international P/OM research be conducted from a sound theoretical basis. Otherwise, a large amount of international P/OM research could be generated without adding much to the knowledge base. It is not enough to say that the theory was developed in country (or culture) X and so we must test it in country

(or culture) Y. “International” variables that differ from X to Y and that may be relevant to the theory must be identified in order to form a basis for evaluation. Thus, conducting theory-based international P/OM research requires an understanding of a theory and an understanding of how “international” variables may come into play within the context of the theory. In some instances, the addition of an “international” variable to the mix of variables and relationships described by a theory increases the complexity of a model but does not modify the relationships in the theoretical model. In this circumstance, the addition

of the “international” context makes the problem larger, but the theory remains sound from one context to another. In other instances, the introduction of an “international” variable may be expected to modify the way that existing variables in the theoretical model relate one to another. In this situation, the inclusion of an “international” context helps to broaden or constrain the application of a theory to specific contexts.

A related issue that poses a challenge and an opportunity is conducting research which is truly generalizable across national or cultural boundaries. Empirical studies in particular need to be careful in their at-

tempts to generalize across boundaries. When conducting and reporting empirically based international P/OM research, scholars should strive to maintain and demonstrate reasonable levels of validity and reliability of measures, particularly those that are based in opinion or perception. A substantial literature exists concerning this, outside, and to a lesser degree, inside the international P/OM research stream. A related but separate issue for the international P/OM researcher who is attempting to make generalizations across countries or cultures using empirical data is the examination of the covariance structure of the

	Roth, Gray, Singhal, Singhal (1997)	Prasad, Babbar (2000)	Suggested Research Approach *
Aggregate Planning		Mentioned	RO
Capacity		Mentioned	RO
Distribution		Mentioned	AR or MA
Flexibility		Mentioned	RO
Forecasting		Mentioned	RO
HRM issues in P/OM	Mentioned		RO
Information Systems in P/OM	Mentioned		RO
Inventory		Mentioned	RO
Just-in-Time (JIT)		Mentioned	AR or MA
Layout		Mentioned	RO
Location	Mentioned	Mentioned	AR or MA
Manufacturing Operations	Mentioned		RO
Product & Process Development & Technology Transfer	Mentioned	“technology” Mentioned	AR or MA
Productivity	Mentioned	Mentioned	RO
Project Management		Mentioned	RO
Purchasing		Mentioned	AR or MA
Quality		Mentioned	AR or MA
Reliability & Maintenance		Mentioned	RO
Scheduling		Mentioned	RO
Service Operations	Mentioned	Mentioned	RO
Strategic Issues	Mentioned	Mentioned	AR or MA
Supply Chain	Mentioned		RO
Work Measurement		Mentioned	RO

*A literature review of the topic area (AR) or a meta-analysis (MA) of existing research may help identify generalizable knowledge, gaps in understanding, and situations where context may be an important factor. Also, large-scale studies that attempt generalization may be appropriate.
 Research Opportunities (RO) may abound due to lack of existing published research; however, some areas may not be particularly suited to “international” P/OM, either for practical, theoretical, or other reasons. Smaller scale studies, perhaps, may be more appropriate.

Table 2: Topic areas in international P/OM and suggested research approaches.

data. For generalization (of tested or observed relationships among variables in an empirical study) across countries to be valid, the covariance structures of the data should be approximately equivalent across countries.

Conclusion

There exists substantial need and opportunity for informed, thoughtful, theory-based international P/OM research. While substantial research has been reported in some topic areas of international P/OM, most, if not all, P/OM topic areas could benefit from additional research. However, appropriate approaches and methods may vary from one topic to another. Additionally, most P/OM topics have been under-researched or ignored in less developed countries. Numerous suggestions for further study on specific international P/OM topics are given

in Prasad and Babbar (2000), and in Roth, Gray, Singhal, Singhal (1997), as well as in review of specific international P/OM topic areas. Furthermore, substantial resources have been developed to aid the international P/OM research in identifying relevant prior research. Finally, journals, academic conferences, and other potential outlets can facilitate the development of international P/OM knowledge base by encouraging international P/OM research.

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