

The important role of meta-analysis in international research in marketing

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A current major thrust in marketing has been the attempt to create global products, brands, and strategies. Resistance typically arises from local managers who argue that important differences exist which make their situation unique. The key to "think global, act local", then, is to standardize those elements of a product strategy which can be standardized without significant harm (or, better yet, with efficiency benefits) and let the elements which really do have different effects in different countries or cultures vary.

Deciding which elements have similar effects and which are significantly different conceptually requires meta-analysis of each of the elements. For example, the marginal impact of advertising dollar spending (advertising elasticity) or price (price elasticity) might be similar across all countries in the EU. If so, these elements of the plan could be set across Europe rather than locally, since differences in estimated elasticities might reflect noise rather than real differences and hence lead to non-optimal budgeting decisions. On the other hand, certain ad copy strategies (e.g. informational vs. image advertising) might differ significantly in their effectiveness across countries. Were this revealed in a meta-analysis, decisions could be made on a more local basis (e.g. country or region such as northern vs. southern Europe). The point here is that the search for average effects and significant contingencies is both the objective of meta-analysis and the appropriate basis for decisions across country borders. The purposes of this paper are to examine international aspects of meta-analysis in marketing over the past two decades and to suggest how meta-analysis can be more useful in international marketing in the future.

Past use of meta-analysis

Meta-analysis has been and continues to be applied in a broad number of arenas. Probably the most interesting and important use of meta-analysis has been in the field of medicine. Given the strong tradition of clinical trials using controlled experiments as the basis for high-risk decisions involving drug therapy, the introduction of meta-analysis was understandably controversial (Mann and Plummer, 1991). In spite of this, it has gained a wide following and produced impressive results (Mann, 1990, 1994), spearheaded by the work of Richard Peto on the impact of aspirin on heart attacks (Landler, 1994). The concept has now gained wide acceptance, as perusal of medical journals such as the *New England Journal of Medicine* attests. The main issue is no

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COLUMBIA BUSINESS SCHOOL

longer whether meta-analysis is useful (Iyengar, 1991); the issue is how to generate enough appropriate studies to apply it to topics of interest in the international arena.

In marketing, in addition to a continued focus on topics such as advertising effectiveness (e.g. Lodish et al., 1995a, b; Vakratsas and Ambler, 1999; Batra et al., 1995), meta-analyses have appeared on methodological issues such as sampling (Richardson et al., 1994), market orientation (Deshpande and Farley, 1996; Appiah-Adu and Ranchhod, 1998), and the impact of demographic variables (Anderson and Leaper, 1998; Tongren, 1988). The use of meta-analysis in international contexts has increased. For example, the Assmus et al. (1984) meta-analysis of advertising response contrasts US and European advertising elasticities. Work has also addressed issues such as innovation champions (Shane, 1995) and social indicators (Saris et al., 1998). Some work has explicitly focused on international comparisons for example - Deshpande and Farley (1996) on market orientation and Gatignon et al. (1989) on new product diffusion. Use of meta-analysis with an international component is also increasing in the management area (Maghrabi and Pettingell, 1994; Boeker and Huo, 1998; Boyd, 1991), finance (Coggin and Hunter, 1993), and in public policy (Mann, 1994; Elliot, 1993).

During the past two decades, marketing meta-analysis has largely focused on distilling two things from a collection of studies on a common topic:

- (1) A "grand mean" or overall average effect. This average can serve as a replacement for the theoretically and empirically discredited statistical null hypothesis of a zero value for a parameter. For example, brand price elasticities would generally be expected to be less than one on the basis of theory, and a meta-analysis (Tellis, 1988) found an adjusted mean value of -1.76 that serves as a benchmark for further work.
- (2) Components which account for systematic differences in the meta-analyzed parameters. The core of contemporary meta-analysis in marketing is a "natural" experimental design made up of factors systematically related to differences in study outcomes. These differences fall into four general categories (Farley and Lehmann, 1986):
 - Research environment - type of product, stage in the life cycle, and, importantly in this context, countries of study. International differences offer great potential for building environmental variability into the experimental design which will make the design more efficient.
 - Model specification - individual parameters serving as the dependent variable in a meta-analysis, advertising elasticities, for example, often come from differently specified econometric models. For example, the presence of a carry-over effect in a model substantially lowers the estimate of short-term advertising elasticity.
 - Data collection - type of interviews, length of measurement period involved, etc.

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- Estimation - procedures used in the original study from which the meta-analyzed parameter was drawn (e.g. OLS, GOLS, Gibbs sampling).

As a general matter, meta-analyses in marketing have detected significant differences related to only a minority of potential "design" variables, with research environment (of which country is a part) contributing the largest differences.

Results from meta-analyses which explicitly incorporate international elements (usually country) show a mixture of substantive results. For example, advertising elasticities are somewhat higher in Europe than in the USA (Assmus et al., 1984), probably because of broadcast media restrictions in Europe. Unfortunately there are few studies available outside the USA and Europe, and almost none available for industrializing economies where advertising may be relatively effective at this point of development (Leff and Farley, 1980; Deshpande and Farley, 1999).

On the other hand, meta-analysis does not always find international differences. For example, there are no clear cross-national differences in parameters of buyer behavior models (Farley et al., 1982), or in carry-over coefficients of econometric advertising models (Assmus et al., 1984). Also, the magnitudes of cross-national differences in parameters of various response measures (diffusion model parameters, buyer behavior model parameters, advertising and price elasticities) are generally less than the magnitudes of differences due to the other sources (Farley et al., 1995).

In other words, while international differences exist, they are often both relatively modest in size and consistent, meaning that their differences are quantifiable. Of course, most of the so-called international studies compare the USA, European countries, and occasionally Japan - all northern-hemisphere developed economies. We conjecture that results not yet subjected to meta-analysis are available in local journals (which do not appear in computer databases) and/or in books or journals in languages which have not been accessible to meta-analyzers in the past. This means that potential exists for more internationally diverse meta-analyses by researchers with access to these literatures.

Studies constructed for international generalization: the "designed" meta-analysis

Most marketing meta-analyses discussed so far have been ex-post - that is they have been based on available parameter values from a set of studies without access to the raw data used to estimate those parameters. It is possible and desirable, however, to build analyses of parameter differences into the analysis in the first place - that is in collecting the raw data. Market response measures like advertising and price elasticities across markets will generally be less variable than average country per capita consumption, and these elasticities govern the long-term fraction of sales revenues which should be spent on advertising. (The average per capita consumption, of course, governs the total revenue, but differences in mean per capita consumption and/or revenue are materially easier than elasticities to calibrate and track.)

COLUMBIA BUSINESS SCHOOL

Examples of "designed" meta-analysis generally involve building into the meta-analysis international differentials in intercepts and slopes which connect explanatory variables to the dependent variable. These differential parameters are especially useful in international settings, where different populations and sub-populations are included in the data. For example, response of firm performance to various available measures of firm market orientation is the same for US- and European-based firms (Deshpande and Farley, 1998). Similarly, in a model of supplier selection and usage of foreign exchange services, only 20 of 132 country-specific coefficients were significant, while 29 of 39 basic structural coefficients were significant in a general non-country-specific model (Bowman et al., 1999). Most of the significant country-specific differences in coefficients were related to institutional rather than behavioral differences. A study of five industrial countries also found no country-specific differentials in the relationship of performance to market orientation, innovativeness, or corporate culture (Deshpande et al., 1997).

The ability to combine data on the same variables from different sources without changing results is often useful in international research. In a market-focused study of performance of large Vietnamese firms, one sample drawn from a population of firms and another drawn from managers in a senior management executive program were no different in terms of responses or estimated sensitivity of performance to those responses (Deshpande and Farley, 1999). This meant that it was appropriate to combine data from the "representative" sample of firms with those from a more selective sample.

The use of country as a variable in international meta-analysis

The terms "international" or "global" imply results and decisions which extend beyond country borders. Frequently, however, international research is operationally defined as studies which use country (or group of countries) as an independent variable (e.g. as a determinant of advertising effectiveness). While differences across countries do exist, variation in behavior within country is often much larger than variation among countries. Thus relying on country as a determinant masks the variables which really cause differences. These variables include geographic characteristics (e.g. temperature, humidity), demographics (e.g. age, income), and social and cultural factors (e.g. collectivism, religion, restrictions on number of children). Just as consumer behavior analysis benefits from considering the difference between high and low involvement products rather than automobiles and paper towels per se, so international research should focus on culture and climate rather than country.

There are two different philosophies regarding the use of country in international studies. One, popular among many researchers, is that country differences exist due to unique characteristics within political boundaries. The other, consistent with the philosophy of meta-analysis, is that response parameters tend to be similar across countries and that differences related to country are the result of underlying differences in the means of key variables such as income. We support the latter view and suggest that country be used as a variable only in cases where theoretically sound variables fail to capture variance due to country. In other words, country variables should be added only when they significantly improve explanation in a nested model test where variables like culture, geography and

COLUMBIA BUSINESS SCHOOL

income are already accounted for. In essence, we argue that country effect correlations result from under-specification (omitting variables) rather than being the direct (or indirect) cause of differences.

Consider a hypothetical example where the response to Internet advertising depends on the percent of the population under 30 and whether individuals are individualistic or collective in cultural orientation:

Ad response = $0.10 + 0.20(\% \text{ population under } 30) + 0.10(\% \text{ population with collective orientation})$

Now consider two countries A and B (see Table I).

Ad response in the two countries would be $0.10 + 0.13 + 0.09 = 0.32$ and $0.10 + 0.07 + 0.01 = 0.18$ respectively and differ significantly. The difference, however, is due to these (omitted) variables and not to anything permanently associated with the countries (i.e. if country A's population aged and became more individualistic, as often happens when economies improve, then its ad response would drop toward that of country B).

As an example, new products have diffused faster in individual countries in Europe than in the USA (Sultan et al., 1990). While one could attribute this to differences in inherent innovativeness across countries, closer examination reveals some important covariates. For example, individual European countries are smaller geographically and more homogeneous culturally than the USA and the products introduced in European countries had often first been introduced in other countries (historically the USA), making them less "new." Failure to push beyond a country level analysis would obscure these important distinctions.

Where should internationally-oriented research go? A look to the next millennium

Globalization of markets makes the ability to generalize substantive knowledge about markets and about marketing increasingly valuable. One way to develop these international generalizations is through meta-analysis of existing studies which include work in a number of countries and/or a number of cultures. Several trends point toward the increased use of meta-analysis in international marketing:

- Rapid accumulation of information. Enabled by information technology, the increasing amount of information available provides both sufficient basis on which to conduct meta-analyses and the impetus to find efficient means for processing and interpreting data. Scanners, now commonplace throughout much of the world, capture huge amounts of raw information. Summarization and extrapolation of data have lagged behind the accumulation of (often unused) information.
- Globalization of information. In addition to the power of TV, movies, and music to cross borders, the Internet/Web makes it as easy to communicate across continents as next door. Efficient use of information from both home and foreign markets has the

COLUMBIA BUSINESS SCHOOL

potential to produce competitive advantage. Put simply, since global strategy and branding are often promoted, global information integration should be also.

- International travel and commerce. Diffusion of products and concepts across borders and trading blocs (e.g. NAFTA, Common Market) has led fast food franchises, fashion goods, and many packaged goods brands to become "global" brands. Some producers of these products have implemented systems requiring managers to share information and to systematically consider information from other markets.

- Faster-paced decision making. Shortening product life cycles have compressed the time to make marketing decisions, as ability to do specialized studies decreases. Of necessity general rules for response are needed, as is efficient summarization (Farley, 1998).

Meta-analysis has contributed considerably to knowledge of differences in response measures in cross-national markets. Quantitatively, we can conclude that international differences in parameters, which exist and are often important, are not as large as other sources of variability. In most cases, the magnitude of response parameters does not vary internationally - a fact which leads us to repeat that the null case for international research is that parameters are the same for different countries, not that they are different. As we move into the next millennium, however, there are some ways to make research on international markets and marketing generalize more productively:

- Choice of countries. The countries involved in most existing international studies are chosen by accident. Sometimes the researchers are involved with particular countries - either as citizens or as visitors. Sometimes the choices are based on where data happen to be available. It may be a bit harsh, but the reality is that most are based on some sort of convenience sampling of countries, a method which would be frowned on in the choice of observations within country. Choice of countries with some sort of experimental approach would be helpful - that is by trying to choose countries which have relatively large variability in the explanatory variables. Some randomization is, of course, desirable when possible.

- Nature of "International". International research is usually implicitly or explicitly based on the assumption that culture matters. Moreover, demographics such as average age and income differ substantially across countries and these variables may determine response parameters rather than country per se. It is important to remember that boundaries of countries and boundaries of culture do not necessarily coincide, and few countries are genuinely single-cultured. Even demographics may be highly variable, as they are in the so-called "dual" economies characterizing many industrializing countries. Segments exist across political boundaries (e.g. harried parents will testify that teenagers are remarkably similar in many parts of the world), and countries consequently differ in degree, not kind. The challenge, then, is to uncover the relevant variables that constitute country and culture. In the past, we have tended to analyze the form:(see equation 1)where Z = a series of dummy variables representing countries. We argue that a better model is:(see equation 2)where X = a series of "functional" variables which may vary by and even within a country (e.g. culture, demographics, economic policy). In this way, country will

COLUMBIA BUSINESS SCHOOL

be recognized as a collection of relevant factors rather than as the de facto determinant of results. By focusing purely on country we have lower predictive power, confound the fundamental variables, and obscure the true causes of differences. An even better approach would be to blend equations (1) and (2):(see equation 3) Given that X and Z are usually correlated (i.e. the "natural" experimental design underlying a meta-analysis is seldom orthogonal), the goal would be to explain as much of Y based on X variables as possible (i.e. in a nested model approach where the Zs are included only if they add predictive power to the Xs). Our strong conjecture is that there will be relatively little systematic difference that is explainable only by country in variables such as marketing mix elasticities. Finally, sooner or later, means must be developed to explicitly incorporate aspects of culture into the models. The Hofstede (1980) dimensions have led the way, but they are highly controversial and unacceptable to many reviewers.

- Discontinuities. In the past decade, important changes have occurred in marketing in a number of countries. Probably most important is the transition of many countries - some very large and very important - from centrally-planned, command economies to systems more driven by market forces. These represent natural "big bang" experiments on the effectiveness of marketing and should be treated as such.

Conclusion

It is important to establish both commonalities and differences that occur across international settings. Moreover, while country is a common unit of analysis, real knowledge gains will come from investigating the underlying factors which can lead to differences (e.g. cultural, economic, and geographic). Especially in an era of international unions such as the EU and international communication via the Internet, traditional country boundaries are increasingly less relevant. The key issue is whether and how the response to marketing activities (e.g. the four Ps) differs substantially across different situations and to what extent (international) generalizations exist. In essence meta-analysis is the analytical embodiment of "think global, act local" with its focus on commonalities and key contingencies. Hopefully the future will see more studies designed either individually or collectively to allow a better delineation of what we know and how it differs depending on where we are.

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[Illustration]

Caption: Table I.; A hypothetical example of application of meta-analysis; (see equation 1); (see equation 2); (see equation 3)