Cross-national "Laws" and Differences in Market Response

John U. Farley • Donald R. Lehmann
The Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania 19104
Columbia Business School, New York, New York 10027

International differences in general, and cultural differences in particular, exert profound influence on what people buy. In modeling market response, highly visible international differences in purchase behavior seem to lead to an assumption by management scientists that there are large parallel international differences in market response to such things as price and advertising. In an interpretive review of market response models, we do find international differences in response parameters, but we also find that parameter differences due to cross-national factors tend to be smaller than differences related to technical characteristics of the model or to product/market specifics. We suggest two new intermediate categories of generalizability between the extremes of "everything is the same" and "everything is different." We also argue that one promising approach to international generalization is through appropriate statistical adjustment of parameters from existing models.
(*Marketing; Meta-analysis; International Differences*)

The myth in international marketing is that everything is different. Managers often cling to the myth for understandable reasons; their lives are dominated by a tangle of regulatory, economic, and technical differences among countries, coupled with the obvious differences in languages, cultures, and values.

The myth of international difference seems to carry over to management science, prompted no doubt by highly visible differences in essentially arithmetic characteristics of multinational markets—for example, poor people buy less of most things than do rich people and so do poor countries. These visible differences in market size distract attention from the major thrust of most management science work on markets, which is to estimate sensitivities of demand, particularly to instruments under the control of managers working in these markets.

Being able to generalize internationally about quantities bought and factors affecting market response could be very useful for both market assessment and for designing market programs for countries or cultures with which the firm has no experience. Relatively straightforward regressions using demographic and economic variables can often predict international differences in average per capita consumption quite accurately (Armstrong 1970). If we find relatively small or predictable international differences in market response parameters, forecasting response in a new country or culture is fairly straightforward.

If interproduct differences in response are much larger than corresponding international differences, a firm's proprietary market knowledge may transfer well to a new country, at least as a first approximation. On the other hand, large and unpredictable international differences in market response represent a significant barrier to entering new countries or to the transfer of personnel skills from country to country.

Despite a growing volume of international and cross-national research, the myth that international differences are both large and unpredictable is largely unexamined. This paper attempts an interpretive examination of a set of 18 studies which make implicit or explicit international comparisons of market response. We approach the search for "laws" by attempting to determine

0025-1909/94/4001/0111$01.25

the consistencies. Where possible, we attempt to estimate or at least make judgements about the "effect size" of international differences in response parameters.

The Universality of Management Science Theories and the Complicated Realities of "Laws"

Our discussion of generalizability involves theories and models which seem to generalize fairly easily, and constants and parameters which do not generalize as easily.

Most management science theories and models are not only transnational but are virtually context free. In their abstract form expressed mathematically in Greek and Latin script (as they are even in Russian journals), the country of origin is not discernable. Objective functions of resource allocation models are shared in applications and in journals from all over the world—in rich countries and poor, in centrally planned and market economies, etc. In the present case, the general specification of market response models as a function of controllable variables (price and advertising, for example) and noncontrollables (population and income, for example) is virtually universal, as are the econometric procedures used to assess parameters.

In contrast to theories and models, there are sizeable international differences in the values of the myriad of constants and response parameters that enter the cost and response functions of management science models. The generalizability of management science models in general, and international generalization in particular, depends largely on the empirical scale of these differences. Establishing the existence of differences is not nearly as important to generalization as measuring their size and trying to explain their sources.

Discussions of international generalization seem to polarize on "everything is the same" versus "everything is different." Sameness seems associated with *Universality* of parameters, perhaps with some inconsequential random measurement error—a situation which seldom occurs in practice. Absence of Universality often seems to be interpreted as complete *Idiosyncracy*, where we can learn nothing from knowledge development in other contexts. We think that two less extreme cases prove more useful in many real situations, and they turn our attention to "laws" as tendencies to have similar response patterns or to have significant but identifiable components of difference.

- When a basic model generalizes but parameters differ systematically in different settings (e.g., in developed vs. developing countries, for consumer vs. industrial goods, etc.), we call this *Parametric Adjustability*. Parameters vary around a mean which is not equal to zero, and there are identifiable systematic components in this variability. In practice, we have rarely encountered a case in which idiosyncratic error terms are so large that some sort of generalization is hopeless—along the international dimension or any other. Parametric adjustability conceptually underlies meta-analyses in which statistical techniques are used to identify systematic components in the observed distribution of estimates of a given parameter. In a test for cross-national generalization, the null hypothesis of generalizability is that there are no systematic international differences in the parameter estimates. This can occur in presence of other systematic differences in parameters. An estimate of a parameter for a new situation can generally be constructed from the grand mean and appropriate significant terms from some sort of ANOVA decomposition of a collection of parameter estimates. An example of *international parametric adjustability* involves production functions; significant differences in labor and capital coefficients were found for developed and developing countries but there was homogeneity of both labor and capital coefficient within each of the two country groups (Farley et al. 1985).

- When parameters are the same up to an error term which cannot be reduced by parameter adjustment of the sort just described, we have a situation of *Stochastic Universality*. If variability of the error term is also relatively small, we are probably as close to Universality as we can get, in practice. There is no claim that *exactly* the same result occurs every time, but there is a claim that parameters are (a) nonzero, and (b) not systematically related to a laundry list of interstudy differences in research technology, measurement, setting, or problem definition. The null hypothesis is that parameters center about a nonzero mean; this has the benefit of diverting attention from the generally discredited null hypothesis of zero value underlying the individual studies that make up the body of knowledge about pa-

rameters. In some cases, the unexplained variability may be so large that generalization is not practical, but this is a case-to-case and not a general problem. Fixed response parameters may exist even in the presence of significant differences in means of such variables as consumption or knowledge of substantial measurement error. An example of Stochastic Universality arose when no systematic patterns in parameters could be found which related to differences in variable definitions, research disciplines, methods, or sampling frame in 37 published Fishbein models (Farley et al. 1981). The variability in the two model parameters is thus specific to the particular situation rather than common to study characteristics. (Unfortunately, there are no international comparisons available in these studies.) When Stochastic Universality is established, a sort of averaging of parameters from existing studies (perhaps weighted for "quality") is an appropriate value for the null hypothesis for a new study, and "new" information is added when a newly-estimated parameter differs from this value. A Bayesian procedure is available to combine existing and new information which becomes available over time (Sultan et al. 1990).

What Does International Law Mean?—Countries and Cultures

The debate on international standardization of markets and marketing (Levitt 1983, Wind and Douglas 1981) is really a debate on whether differences in consumer response patterns allow national boundaries to be used to define market segments. "International," a proxy for a complex of institutional and environmental differences that may affect behavior and/or the ability to behave in certain ways, has at least two meanings, and many discussions of the presence or absence of international differences seem to confuse them.

Differences due to crossing boundaries. We might think of these as international differences "in the small." They are due primarily to institutional factors which are truly related to the nation state, and differences in behavior resulting from differences in practices that are approximately coincident with nation-state boundaries. Most of these differences involve restrictions—particularly of the flow of information or of goods through distribution systems—that are breaking down with profound effect in many parts of the world. Examples are the absence of broadcast advertising media in Scandinavia and state-owned monopoly distribution systems of various types.

Differences due to culture. We might think of these as international differences "in the large." Differences in behavior which are culturally based would exist even if the world were not organized into nation states. They are not due to mechanical or controllable factors but rather due to life experiences of people from different cultures. The experience of "being Japanese" comes under this meaning, as does the American frontier folklore and the influence of value systems such as Islam, Confucianism, and Christianity. Culture and country are not synonymous, so cultural factors are only loosely related to the nation state, and assuming that a country variable is a suitable proxy for capturing culture specific factors can be dangerous. Few large countries are culturally homogeneous, and many are visibly or even legally multicultural—a fact which may cause systematic within-country measurement differences (Calatone et al. 1985). Models that fit to one culture may not fit well in others, although we are developing better means of operationalizing cultural variables for specification in model structures; an example is the inclusion of a Confucian scale in a customer behavior model used in Singapore where Confucianism is highly influential (Tan and Farley 1987).

Generalizing through Direct Intrastudy Intercountry Comparison

The most common approach to international generalization involves comparative studies which use the same research methodology, usually on a pair of countries. Such studies allow us to make a direct and relatively controlled international or at least binational comparison of parameter values. Many cross-country comparisons seem to start with a presumption that differences are to be expected and that similarity will be the surprise. It is easy to generate a long list of differences, including country and culture, and to conclude (usually without any particular evidence) that the available results are not applicable to a new situation. This tendency to expect to find international difference may result from a sort of "availability" bias (e.g., Tversky and Kahneman 1973) in that differences are easier to perceive than more

subtle similarities. For example, international differences in product-level advertising expenditure involving the U.S., Mexico, and Brazil turned out to be chiefly related to differences in economic output mix, with advertising/sales ratios (a common basis for setting advertising budgets; Lynch and Hooley 1990) for a given product similar in all three countries (Leff and Farley 1980). Similarly, organizational climates of large manufacturing firms in Australia and the U.S. are practically identical, despite a fairly long list of reasons why they might not be (Capon and Farley 1988).

International Differences in 18 Comparative Studies

For examples of comparative studies, we surveyed six journals from 1985 to 1991 for cross-national market research: *Journal of Consumer Research*, *Journal of Marketing*, *Journal of Marketing Research*, *Marketing Science*, *Management Science*, and the *Journal of International Business Studies*. We found only 12 articles which had obvious cross-national marketing focus—an indication that pairwise country comparisons in small numbers will yield only limited quantitative generalization. We also include six earlier articles which considered international differences (Lindberg 1982, Lilien and Weinstein 1984, Lehmann and O'Shaugnessey 1974, Assmus, Farley, and Lehmann 1984, Farley, Lehmann, and Ryan 1982, and Farley and Sexton 1982). An interpretive summary of these appears in Table 1. The 18 papers in Table 1 break down as follows:

- Twelve deal with response parameters either directly or indirectly (papers 2, 3, 5, 6, 7, 9, 11, 12, 13, 15, 16 and 17). Four of these are meta-analyses (papers 2, 5, 15 and 17).
- Ten of these report intercountry differences (papers 2, 3, 6, 7, 9, 11, 13, 15, 16, 17). In all likelihood there is publication bias in favor of differences and against the null hypothesis of sameness.
- Four of ten studies reporting international differences attempt to explain the sources of the differences as well (papers 2, 6, 7 and 15) and three (papers 2, 7 and 15) succeed at least partially.
- The international differences give the appearances of being relatively small, but only four of the 12 response parameter studies provide a basis to calibrate them. The four meta-analyses also provide a basis for computing the relative sizes of the international differences; these are discussed in detail in the next section.

Examining the 14 studies which are not formal meta-analyses leads to several conclusions. First, there has been remarkably little original work done which explicitly sets out to compare market response across countries. As we observed earlier, most authors seem to expect or at least hope to find differences rather than commonalities as is indicated by discussions of differences in environment explicitly or implicitly related to hypotheses of anticipated behavior difference. Unsurprisingly, several of the published comparisons deal with mean levels rather than response sensitivities (e.g., Anderson and Coughlan 1988, Gilly 1988, Mansfield 1988, Desphande et al. 1986); even if differences in mean consumption are large, differences in response parameters may be relatively small or nonexistent. Only one study (Farley and Sexton 1982) explicitly set out to make a multicountry study of a representative sample, albeit of developing countries, and it found more cross-country similarities in parameters than differences. (This also appears to be the only study in the set that was formally corroborated elsewhere (Black and Farley 1977, Farley and Reddy 1980).

When differences due to country arise, and when they can be compared within study to other effects, they are relatively small in relation to other determinants. For example, Lilien and Weinstein (1984), using the ADVISOR data, found differences in spending levels but no differences in the relation between strategic variables and advertising spending between the U.S. and Europe. Lindberg (1982) found models predicting consumer durable spending calibrated in the U.S. performed well in Europe. Even stereotyping based on country of origin seems limited (Johansson et al. 1985).

Moreover, across-country differences are often explainable in terms of variables other than country. Takada and Jain (1991), for example, demonstrate that apparent differences due to country in imitation rates for durables adoption may be explained by the fact that the higher Pacific Rim country coefficients were estimated in a later time period. Thus the products had actually been on the market in other countries, making

Table 1 A Sample of Past International Comparisons

Study	Domain	Method/Data	Finding
1. Anderson and Couglan (1988)	Choice of channels in foreign markets	Survey data; logistic regression (U.S. firms in semiconductors)	More likely to be via integrated channels in Europe than in Japan or Southeast Asia
2. Assmus, Farley, and Lehmann (1984)	Advertising response	Meta-analysis of econometric models	Advertising elasticities higher in Europe than in U.S.
3. Campbell, Graham, Jolibert, and Messner (1988)	Buyer-seller negotiations in France, Germany, U.K., and U.S.	Laboratory simulation; Correlations	"Marketing negotiations proceed somewhat differently." • U.S. driven by profits • France affected by similarity and attractiveness of other party • Germans do best when using a distributive approach. Similarity reduces seller's profits • Status of role important in U.K. negotiations (buyers do better)
4. Desphande, Hoyer, and Donthu (1986)	Hispanic consumption patterns	Survey of Hispanic and non-Hispanic residents in Texas	Mean differences among Anglo, weak Hispanic, and strong Hispanic identifiers on education, income, household size, brand loyalty, and prestige product purchase; considerable differences between weak and strong identifiers
5. Farley, Lehmann, and Ryan (1982)	Buyer behavior	Meta-analysis of regression models	No significant differences in response coefficients over countries
6. Farley and Sexton (1982)	Buyer behavior in family planning based on knowledge, attitude, and practice	Six-equation regression model fit to survey data from 8 countries	Model generalizes qualitatively over countries, but differences not related to socio-demographics. • 9 of 25 coefficients significant in 6 or more countries • 42 of 48 lagged behavior coefficiencies significant • All coefficients between 0 and 1, most on smaller side • Larger coefficient differences between variables than between countries
7. Gatignon, Eliashberg, and Robertson (1989)	Diffusion patterns	Comparison of Bass model parameters for 6 product categories in 14 European countries	Differences across countries explainable based on cosmopolitanism, women in labor force, mobility
8. Gilly (1988)	Sex roles in TV advertising in Australia, Mexico, and U.S.	Content analyses of ads	"Australian advertisements show somewhat fewer sex role differences and Mexican advertisements show slightly more sex role differences than U.S. advertisements"
9. Glisman and Horn (1988)	Invention performance in France, Italy, Japan, U.K., U.S.S.R., West Germany, and U.S.	Patent analysis 1963–1983 for 41 industries; Regression model of impacts on rate	Difference due to "catching up" process, not to government intervention

Table 1 *Continued*

Study	Domain	Method/Data	Finding
10. Johansson, Douglas, and Nonaka (1985)	Impact of country of origin on product evaluations	Simultaneous equation model of 15 attributes from Japan, U.S., German cars plus overall rating data from U.S. and Japan.	"The results also provide little evidence of stereotyping based on country of origin." There is some slight impact on specific beliefs.
11. Lehmann and O'Shaughnessy (1974)	Purchasing agents in U.S. and U.K.	Comparisons of importance of 17 attributes on 4 purchasing situations of increasing complexity	Larger difference in attributes and their importances over purchase situations than over countries
12. Lilien and Weinstein (1984)	Determinants of marketing and advertising budgets: U.S. vs. Europe	ADVISOR data; regression model	"The overall relationship between the strategic variables and advertising spending levels is not different between the U.S. and Europe" (based on Chow test). Small spending differences exist as the result of difference in levels of determinants.
13. Lindberg (1982)	Demand for new consumer durables in U.S., Denmark, Finland, France, Norway, Sweden, West Germany	Regressed demand as percent of consumption expenditures vs. 3rd degree polynomial of past penetration.	Forecast based on U.S. fits other countries fairly well. Pooled data from European countries does better.
14. Mansfield (1988)	Speed and cost of industrial innovation	Sample of 200 firms in Japan and U.S.; percent of cost devoted to different tasks.	Japan has manufacturing advantage in some industries (e.g., machinery), none in others (e.g., chemicals). In general bigger between-industry than between-country differences.
15. Sultan, Farley and Lehmann (1990)	Diffusion	Meta-analysis of diffusion models	Differences found in coefficients of innovation between Europe and the U.S.
16. Takada and Jain (1991)	Diffusion of durables in U.S., Japan, South Korea, and Taiwan	Bass model estimated on 8 consumer durables	Average coefficient of imitation greater in Pacific Rim countries, which are similar, than in U.S. (but time periods differ so product less new in Pacific Rim countries).
17. Tellis (1988)	Price elasticity	Meta-analysis of 367 elasticities from 220 brands/markets	Elasticities: from Australia more negative; from Europe less negative. Larger impacts for product category, model specification, and data type.
18. Weinberger and Spotts (1989)	International content in TV advertising in U.S. and U.K.	Content analysis	U.S. somewhat more information than U.K. in 1985, but larger difference in U.S. from 1977 to 1985; more significant impacts for involvement and thinking vs. feeling type products than for country.

them both better known and understood and less risky. Similarly, apparent differences in diffusion parameters across countries can be explained based on demographic differences (Gatignon et al. 1989). Differences in the impacts of factors on invention rate among France, Italy, Japan, U.K., U.S.S.R., West Germany, and the U.S. can

be explained as a "catching up" process rather than country or its governmental policies (Glisman and Horn 1988). Finally, there is some evidence of substantial within-country differences (e.g., due to subculture in Desphande et al. 1986 or time period in Weinberger and Spotts 1989), which may be larger than some true international differences. Taken together, these results suggest that the impact of country on response parameters is in fact relatively small.

Generalizing Internationally Across Quite Different Studies

A statistical approach to meta-analysis (Farley and Lehmann 1986) allows us to calibrate the magnitude of cross-national variability in model parameters and compare it to variability traceable to other sources such as the research technology used or the product or market studied. This approach has the advantage of not requiring that each individual study in the meta-analysis to involve an explicit international comparison, but only that multiple countries are involved in the set of studies. There are four such meta-analyses in Table 1.

Meta-analysis itself is controversial (Wachter 1988). For example, meta-analysis may mix with equal weighting results from research of different quality, although experiments with quality weighting (Sultan et al. 1990) have not produced major quantitative changes in results. Further, "publication bias" may be caused by unwillingness to publish papers accepting null hypotheses (Rust et al. 1990). However, viewed broadly, meta-analysis has particular potential for assessing international generalizability as an imperfect substitute for large, controlled international studies. Even in those rare circumstances when the resources are available, such comparisons are hard to control strictly, and cultural differences (not the least of which is language) make strict replication difficult internationally.

Meta-analysis approaches generalization with the presumption of Parametric Adjustability—that is that there are identifiable patterns of differences in parameters from a broad range of models. Meta-analysis of response parameters uses individual estimates from individual models which share a key output variable but are highly disparate in terms of model specification and research technology. We decompose these parameter estimates from individual models using ANOVAs of the following general form:

$$X = f(B, C, E) \quad \text{where} \qquad (1)$$

X represents outcome variables from the individual studies—for example, measures of response sensitivities normalized into scaleless elasticities to produce comparable units of measure.

B represents behavioral variables describing the explanatory endogenous or exogenous factors related by the parameters in X (e.g., attitudes, price, purchase) and their operationalizations (e.g., weighted summative form or direct measure).

C represents technical characteristics of the study (such as estimation technique used) and model specification (such as whether a carry-over term is included in an advertising model or an imitation effect in a diffusion model).

E represents characteristics of the research environment, e.g., type of sample, method of data collection used, type of market studied, and, most importantly for this paper, country or type of country in which the research was done. While our discussion focuses on country, it is important to recognize that these other factors are important explainers of interstudy parameter differences.

Significant differences related to elements of B, C, or E produce the situation we call Parametric Adjustability. When there are no identifiable patterns relative to elements of B, C, or E, we have a situation of Stochastic Universality. Only if the grand mean is also zero can we conclude that parameters do not generalize at all, and that we have a real case of Idiosyncracy.

In this spirit, we reinterpret results of ANOVAS from four meta-analyses in Table 1 which represent collections of response models which happen to include applications from different nations. The international comparisons do not form any systematic research program, and there is only one explicit within-study international comparison of the sort discussed in the four sets of studies:

- A study of 128 econometric advertising models (Assmus et al. 1984) which differ in many important ways, but which contain two common response param-

eters—a short-term advertising elasticity and (in many cases) a carry-over effect. These are primarily aggregate time series models. While most used data from the U.S. market, a number of the studies used data from other industrial countries, primarily the U.K. and Australia.

- A study of response parameters in four system models of buyer behavior published in the 1970s and summarized by Farley et al. (1982). The response parameters are converted into comparable elasticities for this paper. These underlying models are fit to cross-sections of individual respondents. Included are four studies of product introductions: a subcompact car in the U.S. (Farley et al. 1976), a new contraceptive in Kenya (Black and Farley 1977), a new soap category in Argentina (Farley et al. 1974), and a new food product in the U.S. (Farley and Ring 1970). Parameter values were not significantly different over either countries or product in these four studies.
- A study of two parameters—coefficients of imitation and innovation—of 213 diffusion models (Sultan et al. 1990). These are also aggregate time series models. Again, while many of the studies used data from the U.S. market, a number of studies used European data.
- A study of 337 price elasticities (Tellis 1988) which included estimates from the U.S., Europe, and Australia.

The various meta-analyses explain between three-tenths and two-thirds of the variability (Table 2) in the model parameters—in all cases a significant amount—and indicating that Parametric Adjustability may be a useful approach to international generalizability in this case. The grand means from the ANOVAs represent the conditional estimates of values for a new modeling exercise, and the individual ANOVA coefficients provide the basis for adjustment of this mean to correspond more closely to the specifics of the new situation.

Relative Effect Sizes of International Differences in the Meta-Analyses

The key question for international generalization is whether the significant international effects are relatively "large," which we interpret to mean as large as or larger than other suspected or established sources of variability. For comparison, we have devised a measure of "effect size" for a particular factor on a particular parameter as

$$\text{Effect size for factor } i \text{ on parameter } j = \frac{\text{Range of significant ANOVA coefficients related to levels of factor } i \text{ for parameter } j}{\text{Grand mean estimate of parameter } j \text{ from the meta-analysis ANOVA}}. \quad (2)$$

We have compared the relative effect sizes of international differences in parameters with those of four other key differences, which constituted the bases for design of the ANOVAs as described in Farley and Lehmann (1986). These are the types of product or market under study, technical aspects of measurement, and estimation and specification characteristics (Table 2). When a factor is not significant in the ANOVA, we assume the effect is absent—that is, that the effect size is zero.

The international differences are small relative to other effects such as model specification. In two of the six cases (buyer behavior model coefficients and carry-over coefficients in advertising models), there was no significant international effect. In two cases (price elasticities and coefficients of imitation), international was the smallest significant effect. In one other case (short-term advertising elasticities), the international effect was larger only than the estimation method, and it was much smaller than systematic differences due to model specification or the "obvious" effect of differences related to the products being studied. In fact, only in the case of the coefficient of innovation was the European value an order of magnitude larger than in the U.S.—and this was on a base grand mean value of only 0.02, so the small denominator in the ratio in (2) may tend to make the ratio in the effect size unstable.

It is clearly worrisome that technical matters—particularly the tremendous variation in model specification, and estimation methods that we observe—should have such large effects on parameter estimates. Multi-method within-study comparison is a low-cost way to help us gain deeper insights on these technical issues and should be encouraged.

There are also some model-specific patterns of interest:

For the advertising models: Estimated short-term advertising elasticities are 0.039 greater in Europe than

Table 2 Relative Effect Sizes of ANOVA Estimates of Parameters in Four Types of Models

Types of Models and Parameters Studied	Adjusted Grand Mean	Relative Effect Size Measured as Range of ANOVA Coefficient(s) Associated with that Effect Divided by Estimated Grand Mean					Explanatory Power of Meta-Analysis (R^2)
		Country or International	Product Type under Study	Estimation Method	Other Variables Specified in Basic Model	Model Specific Parameters[a] Specified	
Diffusion Model Coefficients of							
Innovation	0.02	2.0	0.2	0.1	0.1	NA	0.32
Imitation	0.35	0.1	0.8	0.2	1.8	1.8	0.42
Buyer Behavior Model Coefficients	0.29	NS	NS	0.8	4.8[c]	NA	0.39
Advertising Model Coefficients							
Short-Term Elasticities	0.27	0.3	0.5	0.1	0.6	1.0	0.50
Carry-over	0.39	NS	0.3	0.1	0.4	NA	0.60
Price Elasticities[b]	−1.76	0.3	0.7	0.7	0.7	NA	0.29

a—Model Specific Parameters are, respectively, a coefficient of innovation in the diffusion models and a carry-over coefficient in the econometric advertising models.

NS—Effect is not significant in the original meta-analysis.

NA—Not applicable because the model contains no such model-specific parameter.

b—Based on Table 2 of Tellis (1988) to assure negative elasticities; coefficient of determination from Table 3.

c—Includes range negative price elasticities and large positive distribution elasticities; removing these controllable exogenous variables reduces this effect size to 12.

the grand mean of 0.27, but average 0.057 smaller than the grand mean in the U.S. These intercontinental differences may be due to a number of factors—media differences or restrictions, copy differences, or cultural preferences about advertising.

For diffusion models: The coefficient of innovation is fairly stable under a wide variety of conditions. However, models fit to data from European countries have significantly larger coefficients of innovation than the U.S. models. While this represents the largest relative effect of any of the parameters studied, it may be due to the very small average parameter. This effect may also be due to some factor such as relatively dense populations and/or communication systems rather than international institutions. Also, the innovations were in most cases introduced in the U.S. first, and this may make imitation in the later European introductions appear in the models as innovation.

For buyer behavior models: Elasticities computed for a wide range of endogenous variables in these four applications do not vary systematically over countries. This is even more important because this particular set of models involves two countries outside North America and Europe—one clearly a developing country.

For price elasticities: There are significant over-all differences related to product category, national setting, data characteristics, and estimation method. Specifications including quality and distribution produce significantly different price elasticities, indicating difficulties in studying one independent variable at a time.

Implications for advertising budgeting: We can combine the significant cross-national advertising and price sensitivity results to generate advertising budgets for an "average" product in Europe and the U.S.; this analysis

	Average price elasticity from Tellis (1988)	Average advertising elasticity from Assmus et al. (1984)	Implied advertising to sales ratio
Europe	−1.62	0.31	0.19
U.S.	−1.96	0.21	0.11
All Countries	−1.76	0.27	0.15

also allows us to examine the degree of precision that may be available. The analysis uses the Dorfman-Steiner (1954) equilibrium condition that

$$\text{Price elasticity} = (1/\text{Ratio of advertising to sales}) \times (\text{advertising elasticity}).$$

The combination of higher European advertising elasticity and lower price elasticity implies that European budgets should be higher than U.S. budgets in terms of fraction of expected sales budgets for advertising. Small numeric differences in inputs to optimization procedures (e.g., the Dorfman-Steiner conditions) can produce noticeable differences in optimal solutions, so these results should be treated with caution. Still these results provide a starting point for estimating optimal advertising, though it should be modified based on specifics under study.

Conclusion

There is no doubt that parameters of the market response models discussed here have significant components specifically related to country location, as well as to market characteristics and to some specific technical factors. We call this "parametric adjustability," with international differences combining with other factors to explain about half of the interstudy variability in parameter estimates. We conclude, however, that international differences are not systematically larger than differences due to market environments studied or due to technical characteristics of the models. In several important cases, the international differences are not even significant, even though some other contextual factors are.

Are North America and Europe Good Laboratories for the World?

Our conclusions are mixed on this issue although the number of data points is small and more comparisons are needed. We have found some relatively small but still significant differences between the U.S. and Europe in values of price and advertising elasticities and in parameters of diffusion models. We also found significant differences in labor and capital coefficients of production functions for the developed and developing worlds, but homogeneity within each country group (Farley et al. 1985), so we are not yet ready to claim that the industrial world is an adequate laboratory. On the other hand, parameters from a disaggregate buyer behavior model do not differ over three countries ranging from the U.S. to a developing country, even though average values of endogenous and exogenous variables range widely across these countries.

How Should We Approach Generalizability?

In areas in which we have a reasonable base of knowledge, like those discussed here, we should abandon the null hypothesis of no effect which is long discredited in most situations, and make comparisons with some sort of historical average or weighted average where a body of results exists. For example, advertising elasticities are usually positive and generally between 0 and 1; in practice, they average about 0.25, and sizable deviations from that value may be important. Similarly carry-over coefficients in distributed lag models average around 0.4 (Assumus et al. 1984). Price elasticities are, in practice, negative and generally less than unity, while elasticities involving distribution are generally positive and greater than unity. Behavioral response coefficients in consumer choice models (such as those linking attitude and behavior, for example) range generally between 0 and 1, meaning that such models tend to converge to a new equilibrium after a disturbance; further, elasticities tend to be in the 0.1 to 0.3 range, meaning that the models are fairly insensitive to change and that convergence is rather rapid. These first-cut grand mean values can be adjusted for a particular situation using more specific information from ANOVAS (Table 2) which correspond more closely to the market under study.

Constructs and Measurement Issues. When studying different cultures, it is not always possible to transport constructs from one to another. For example, the meaning of family, duty, and even attitude varies, and serious problems exist in translating constructs across languages. Structured scales prevalent in research in developed countries (e.g., 5-point Likert scales, 100-point constant sum scales) may not be appropriate in other societies. As a consequence, international generalizations probably need to rely on a common construct rather than a particular measurement method.

Response Level vs. Response Sensitivity Generalization. Clear differences exist in average consumption (e.g., between richer and poorer nations or between meat-eating and vegetarian societies), and they are relatively easy to both estimate and observe. These differences should not dominate our search for response generalizability, which appears to vary much less than does consumption.

Nation and Omitted Variable Bias. Just because national boundaries are easy to identify does not make them an appropriate variable for segmenting behavior. Somehow longitude and latitude seem less important than climate, culture, the economy, regulations, needs, and possibly even genetics in determining behavior. There may be more profound differences in response between the French Quarter in New Orleans and Chinatown in New York City, or even between pairs of boroughs within New York City than between, say, Austria and Germany. Country may be a sometimes useful proxy for the "true" causes of differential response, but it is not the theoretically most appropriate variable. While this paper focuses on country as a potential source for systematic difference, future research should explore those other, more basic causes.

Implications

While there is still a paucity of data points involving explicit international comparison, those available indicate that market response patterns do to a surprising extent generalize across countries—more so, for example, than industry-specific knowledge generalizes across industries. Country boundaries do not necessarily imply barriers to understanding buyer response. This suggests that both managers and researchers should use results from countries where analysis is available as first-cut estimates of response (perhaps in a Bayesian framework) in other countries. By combining identifiable differences in response parameters in a framework like Dorfman-Steiner equilibrium analysis, we can make at least initial decisions about such matters as relative prices and relative advertising budgets.[1]

[1] The authors are indebted to Doug Bowman, Jamie Kalamarides and Wilfried Vonhonacker for helpful comments on earlier drafts.

References

Anderson, Erin and Anne T. Coughlan, "International Market Entry and Expansion via Independent or Integrated Channels of Distribution," *J. Marketing*, 51 (January 1988), 71–82.

Armstrong, J. Scott, "An Application of Econometric Models to International Marketing," *J. Marketing Research*, 7 (May 1970), 190–198.

Assmus, Gert, John U. Farley and Donald R. Lehmann, "How Advertising Effects Sales: A Meta-Analysis of Econometric Results," *J. Marketing Research*, 21, 1 (February 1984), 65–74.

Black, Timothy R. L. and John U. Farley, "Responses to Advertising Contraceptives," *J. Advertising Research*, 17, 5 (October 1977), 49–56.

Calatone, Roger, Michael Morris and Jotinder Johar, "A Cross-Cultural Benefit Segmentation Analysis to Evaluate the Traditional Assimilation Model," *International J. Research in Marketing*, 2, 3 (1985), 207–217.

Campbell, Nigel C. G., John L. Graham, Alan Jolibert and Hans G. Messner, "Marketing Negotiations in France, Germany, the United Kingdom, and the United States," *J. Marketing*, 52 (April 1988), 49–62.

Capon, Noel and John U. Farley, "Comparing Organizational Climates of Large U.S. and Australian Manufacturers," Working Paper, Columbia University, New York, 1988.

——, John U. Farley and Scott Hoenig, "Determinants of Corporate Performance: A Meta-Analysis," *Management Sci.*, 36 (October 1990), 1143–1149.

Desphande, Robert, W. D. Hoyer and N. Donthu, "The Intensity of Ethnic Affilication: A Study of the Sociology of Hispanic Consumption," *J. Consumer Research*, 13 (September, 1986), 214–220.

Dorfman, Robert and Peter O. Steiner, "Optimal Advertising and Optional Quality," *American Economic Review*, 44 (December 1954), 826–836.

Farley, John U., J. A. Howard, D. R. Lehmann and T. V. O'Brien, "Some Empirical Contributions to Buyer Behavior Theory," *J. Consumer Research*, 1, 3 (December 1974), 43–55.

——, John A. Howard and Donald R. Lehmann, "A Working Version Car Buyer-Behavior Model," *Management Sci.*, 23 (November 1976), 235–247.

—— and Donald R. Lehmann, *Generalizing about Market Response Models: Meta-Analysis in Marketing*, Lexington Books, Lexington, MA, 1986.

——, —— and J. Katz, "Impact of Different Sets of Comparison Brands on Evaluation of a New Brand of Sub-Compact Car," *J. Consumer Research*, 5, 2 (September 1978), 138–143.

——, —— and Terrence A. Oliva, "Are There Laws in Production? Cobb-Douglas Revisited," Working paper, Columbia University, New York, 1985.

——, —— and Michael J. Ryan, "Generalizing from Imperfect Replication," *J. Business*, 54 (October 1981), 597–610.

——, —— and ——, "Patterns in Parameters of Buyer Behavior Models: Generalization from Sparse Replication," *Marketing Sci.*, 1 (Spring 1982), 181–204.

Farley, John U. and Srinivas Reddy, "Joint 'Social Marketing' of a Weaning Food and a Contraceptive in Sri Lanka," *J. International Business Studies*, II (Winter 1980), 73–80.

—— and L. Winston Ring, "An Empirical Test of the Howard-Sheth Model of Buyer Behavior," *J. Marketing Research*, 7 (November, 1970), 427–438.

—— and Donald E. Sexton, "A Process Model of the Family Planning Decision," *TIMS Studies in Management Science*, Vol. 18, 1982, 209–239.

Gatignon, Hubert, Jehoshua Eliashberg and Thomas Robertson, "Modeling Multinational Diffusion Patterns: An Efficient Methodology," *Marketing Sci.*, 8 (Summer 1989), 231–246.

Gilly, M. C., "Sex Roles in Advertising: A Comparison of Television Advertisements in Australia, Mexico, and the United States," *J. Marketing*, 52 (April 1988), 75–85.

Glisman, H. H. and E. Horn, "Comparative Invention Performance of Major Industrial Countries: Patterns and Explanations," *Management Sci.*, 34 (October 1988), 1169–1187.

Johansson, Johny K., Susan B. Douglas and I. Nonaka, "Assessing the Impact of Country of Origin on Product Evaluations: A New Methodological Perspective," *J. Marketing Research*, 25 (November 1985), 388–396.

—— and Hans B. Thorelli, "International Product Positioning," *J. International Business Studies*, 16 (Fall 1987), 57–75.

Leff, Nathaniel and John U. Farley, "Advertising and Development," *J. International Business Studies*, II (Fall 1980), 65–79.

Lehmann, Donald R. and John O'Shaughnessy, "Difference in Attribute Importance for Different Industrial Products," *J. Marketing*, 38, 2 (1974), 36–42.

Levitt, Theodore, "The Globalization of Markets," *Harvard Business Review*, May–June (1983), 92–102.

Lilien, Gary L. and David Weinstein, "An International Comparison of the Determinants of Industrial Marketing Expenditures," *J. Marketing*, 48 (Winter 1984), 46–53.

Lindberg, B. C., "International Comparison of Growth in Demand for a New Durable Consumer Product," *J. Marketing Research*, 19 (August 1982), 364–371.

Lynch, James E. and Graham J. Hooley, "Increasing Sophistication in Advertising Budget Setting," *J. Advance Research*, 30 (1990), February, 67–75.

Mansfield, Edwin, "The Speed and Cost of Industrial Innovation in Japan and the United States: External vs. Internal Technology," *Management Sci.*, 34 (October 1988), 1157–1168.

Parameswaren, Ravi and Attila Yaprak, "A Cross-National Comparison of Consumer Research Practices," *J. International Business Studies*, 18, 1 (Spring 1987), 35–49.

Rust, Roland T., Donald R. Lehmann and John U. Farley, "Estimating Publication Bias in Meta-Analysis," *J. Marketing Research*, 27 (May 1990), 220–227.

Sultan, Fareena, John U. Farley and Donald R. Lehmann, "Meta-analysis of Application of Diffusion Models," *J. Marketing Research*, 27 (1990), 70–77.

Takada, H. and D. Jain, "Cross-National Analysis of Diffusion of Consumer Durable Goods in Pacific Rim Countries," *J. Marketing*, 55 (April 1991), 48–54.

Tan, Chin Tiong and John U. Farley, "The Impact of Cultural Patterns on Cognition and Intention in Singapore," *J. Consumer Research*, 13 (March 1987), 540–544.

Tellis, Gerald J., "The Price Elasticity of Selective Demand: A Meta-Analysis of Econometric Models of Sales," *J. Marketing Research*, 25 (November 1988), 331–342.

Tversky, Amos and Daniel Kahneman, "Availability a Heuristic for Judging Frequency and Probability," *Cognitive Psychology*, 5 (1973), 207–232.

Wachter, Kenneth W., "Disturbed by Meta-Analysis?", *Science*, 241 (September 16, 1988), 1407–1408.

Weinberger, M. G. and H. E. Spotts, "A Situational View of Information Content in TV Advertising in the U.S. and U.K.," *J. Marketing*, 53 (January 1989), 89–94.

Wind, Yoram and Susan P. Douglas, "International Portfolio Analysis and Strategy: The Challenge of the '80's," *J. International Business Studies*, (Fall 1981), 69–82.

Accepted by Yair Aharoni and Richard M. Burton, acting as Special Editors. This paper was received June 1991; *revision received November* 10, 1992.