Investigating New Product Diffusion Across Products and Countries

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Abstract
As firms jockey to position themselves in emerging markets, firms need to evaluate the relative attractiveness of market expansion in different countries. Since the attractiveness of a market is a function of the eventual market potential and the speed at which the product diffuses through the market, a better understanding of the determinants of market potential and diffusion speed across different countries is of particular relevance to firms deliberating their market expansion strategies. Despite a recent spurt in research on multinational diffusion, there exist significant gaps in the literature. First, existing studies tend to limit their analysis to industrialized countries, thus reducing the ability to generalize the insights to many emerging markets. Second, these studies tend to focus on the coefficients of external and internal influence in the Bass diffusion model but do not analyze the determinants of market potential. Third, the choice of variables that affect the parameters of the Bass diffusion model has been rather limited.

In this paper, we seek to address these gaps in the literature. To address the scope issue, we assembled a novel dataset that captures the diffusion of 6 products in 31 developed and developing countries from Europe, Asia, and North and South America. The set of countries in our dataset encompasses 60% of the world population and includes such emerging economies as China, India, Brazil, and Thailand. This should provide us with a stronger basis to make empirical generalizations about the diffusion process.

For firms seeking to expand into emerging international markets, our findings about penetration potential have considerable significance. For example, we find that for the set of products that we analyze the average penetration potential for developing countries is about one-third (0.17 versus 0.52) of that for developed countries. We also find that it takes developing countries on average 17.9% (19.25 versus 16.33 years) longer to achieve peak sales. Thus, despite the well-known positive effect of product introduction delays on diffusion speed, we find that developing countries still continue to experience a slower adoption rate, compared to that of developed countries.

Our study also investigated the impact of several new macroenvironmental variables on penetration potential and speed. For example, our findings indicate that a 1% change in international trade or urbanization level can potentially change the penetration potential by about 0.5% and 0.2% respectively. These are some of the key variables projected to change significantly over the coming years for developing countries. While business managers have relatively little influence on such variables, our findings can still serve as a valuable empirical guide for the variables that they should consider in evaluating diverse international markets and in performing sensitivity analysis with respect to their projected trends.

Finally, our study also holds implications for managers seeking to combine information about past diffusion patterns across products and countries for better prediction. We pool information efficiently across multiple products and countries using a Hierarchical Bayes estimation methodology. By sharing information across countries and products in a single, coherent framework, we find that this pooling approach leads to substantial improvements in prediction accuracy. Our technique is particularly superior in predicting sales and BDM parameter values in the early years of a new product introduction in a new country, when forecast estimates are managerially most useful. We also decompose the variance in the BDM model parameters into product, country, and product-country components. These results give guidelines to managers about which market experience they should weigh more to arrive at forecasts of market potential and diffusion speed. We find that while past experiences of other products in a country (country effects) are relatively more useful to explain penetration level (cumulative sales), past experiences in other countries where a product was earlier introduced (product effects) are more useful to explain the coefficients of external and internal influence (and thus the speed with which the product will attain peak sales).

(Diffusion; International Marketing; Hierarchical Bayes; Forecasting)