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In our recent survey of University of Chicago Business School graduates, over 95% of professionals claimed to be using some type of discounted cash flow (DCF) analysis to evaluate international investments. The use of DCF, of course, requires that the cost of capital be estimated. The widespread use of DCF, along with Economic Value Added (EVA) and other valuation-based performance evaluation methods, means that cost-of-capital estimates are influencing the way today's executives run their companies and how they are compensated. This in turn suggests that estimates of international cost of capital can affect important economic decisions, and that significant corporate resources are being devoted to refining such estimates.

Based on the findings of our recent survey, we believe that *given the way in which international cost of capital is currently being estimated*, practitioners and experts alike are spending too much time, and possibly placing too much decision-making weight, on analyses that incorporate cost-of-capital estimates. Stated another way, if practitioners and experts evaluating international transactions applied discounted cash flow techniques in a more considered and rigorous fashion, the resulting analyses would be far more likely to justify the time and importance that analysts and decision makers are currently investing in DCF.

Suffice it to say, academic theory is still confronting the problems raised when evaluating the cash flows of international entities. Practitioners are thus put in the unenviable but familiar position of having to implement what is admittedly imperfect theory. In light of the number of international transactions now taking place, this raises some intriguing questions:

- How are practitioners valuing these transactions?
- What are the implications of the methods they are using?
- What frameworks or models should they use to cope with the increased complexity and uncertainty of international valuation?

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This paper attempts to answer these questions. In so doing, we argue that, as uncertainty increases, practitioners tend to become less rigorous in their analysis. Heuristics—that is, conventional "rules of thumb"—begin to replace consistently applied analytical methods. As a result, instead of saving time while maintaining accuracy, the use of heuristics may be turning DCF analysis into an exercise in futility. Managers who rely on international cost-of-capital estimates to make critical decisions are advised to revisit the fundamentals of finance and question the assumptions that underlie the way in which their organizations generate these numbers.

Consistent application of DCF analysis is a difficult and time-consuming process. We all take some shortcuts either to meet business deadlines or compensate for lack of information. But shortcuts involve trade-offs; and if we aren't clear about the trade-offs we are implicitly making, we may be allocating managerial time and assigning decision-making weight to DCF analyses that are out of all proportion to their likely accuracy. Without a clear framework for both generating and interpreting the results, we may be making decisions based on flawed or inappropriate inputs.

World capital markets are increasingly integrated. This means that, setting aside currency issues, managers should measure the cost of capital in the same way as in an integrated market. The most reasonable model for adherents of the Capital Asset Pricing Model[1] (or CAPM for short) is thus the Global CAPM[2]—and not only in international applications, but in evaluating domestic investments as well. In those international markets that remain relatively "segmented," however, analysts may still be justified in using a local version of the CAPM. We offer a framework in which the recommended asset pricing model varies with the degree of integration of the market in question.

The remainder of the paper is organized in three main sections. The first provides an overview of our recent survey that attempts to identify the methods practitioners and experts use when doing international valuations.[3] The second section examines some implications of practices uncovered in the survey and encourages managers to identify clearly the purpose of performing a DCF analysis. In the third section, we explore the reasons why professionals may employ international valuation techniques that are different from domestic techniques. We also illustrate the differences between the global CAPM and the local CAPM, and offer a framework designed to help practitioners understand when each is more appropriate.

SURVEY RESULTS

It has been our experience that both experts and practitioners rarely agree on the best methodologies or approaches for valuing foreign assets. For example, even those experts who agree that the CAPM is the best asset-pricing model available differ in the way they apply it to international valuations. Perhaps it is this lack of consensus that has led to what we perceive as a gap between the current state-of-the-art of academic research on international valuation and its actual application by practitioners. Our aim was to find out whether this perceived gap truly exists, understand why it exists, and then determine what elements of academic theory can be applied in practice but are not (perhaps because they may not be fully understood). In order to better define this gap and understand its causes, we sent out a survey to approximately 2,700 University of Chicago GSB alumni. The survey questions were directed at three major issues:[4]

1. Capital Market Integration. To get a broad sense of how people perceive the degree of international capital market integration, we asked participants to evaluate the relative degree of integration/segmentation of four proxy markets: the United States, the United Kingdom, Mexico, and Sri Lanka.

2. Valuation Methodologies. We presented three standard methods—DCF, public company multiples,

1. Where CAPM refers to the Sharpe-Lintner-Black single-factor asset pricing model.

2. As we discuss later, the global CAPM is essentially the traditional CAPM, but uses a global market proxy instead of a local market index to estimate an asset's beta. For a discussion of the global CAPM, see René Stulz,"Globalization of Capital Markets and the Cost of Capital: The Case of Nestlé," *Journal of Applied Corporate Finance*, Vol. 8 No. 3 (Fall 1995).

3. We also tried to gather data to help answer some of the questions posed above. We are not aware of any recent surveys that explore these questions. We reviewed surveys by Stonehill and Nathanson (1968) and Oblak and Helm (1980). Both surveys concentrated on Fortune 500 companies. Sample sizes and questions for these surveys were similar to ours, although they did not address capital market integration. (See A. Stonehill and L. Nathanson, "Capital Budgeting and the Multinational Corporation," *California Management Review* (Summer 1968), 39-54; and D.J. Oblak and R.J. Helm, Jr., "Survey and Analysis of Capital Budgeting Methods Used by Multinationals," *Financial Management* (Winter 1980), 37-41.

4. A copy of the actual survey will be gladly provided upon request.

and comparable transactions—along with a catch-all "other" category, and then asked respondents what weights they gave each method when valuing an asset located in each of our proxy markets.

3. Discount Rate Determination. We posed a series of questions ranging from the preferred asset pricing model, to the source of risk-free rate, to an assessment of factors that might be considered important in an international valuation.

Sample Demographics

The survey was mailed to approximately 2,700 GSB alumni. One hundred and thirty-one alumni responded in whole or in part. The 5.2% response rate was above our expectations. In their comments and letters, many respondents expressed concern about the lack of guidance in this area.

While nine home countries were represented in the survey, the bulk of the respondents were based in the U.S. Thus, in addition to a potential GSB sample bias, the results may also reflect a "U.S.-centric" view. We do not believe these potential biases materially affect our results.

Most respondents had significant international experience. Ninety-two percent had evaluated investments in the U.S., 72% in the U.K., 60% in Mexico. Only 6% had evaluated an investment in Sri Lanka, our proxy for an accessible but relatively segmented market. Respondents were fairly well distributed across "type" of deal experience, with 42% of our respondents reporting experience in securities; 59% in transactions involving business units; and 55% in acquisitions. Over 55% of respondents had experience in multiple types of transactions. Most of the respondents (73%) had less than ten years of international transaction experience. This can be interpreted as a sign of the relative novelty of international investing on a wide scale (or, perhaps just as likely, that recent graduates are more receptive to alma mater-generated requests).[5]

Finally, over half of the respondents are coded as "experts" (see Table 1). We have defined an "expert" as someone who provides professional advice on this subject. Almost 12% are defined as "center of expertise" practitioners, meaning that while they do not provide professional advice on the subject, they are the in-house experts for their firm (for example, as a member of a corporate or strategic development group). Surprisingly, approximately 33% of the responses came from practitioners located outside designated valuation groups. We interpret this as a strong indication that valuation issues are permeating organizations as businesses become increasingly global. This diffusion of analysis and responsibility heightens the need for clear and consistent valuation approaches within organizations.

TABLE 1 ■ PROFESSIONAL OCCUPATION OF RESPONDENTS

"Non-center of expertise" practitioners	33%
Center of expertise practitioners	12%
Experts	55%

Survey Results

Four major points emerge from the survey results. First, respondents claim to be fairly comfortable both with their valuation approaches and with the sufficiency and completeness of information available (although there is also some evidence that this may be the result of overconfidence). Second, there is significant variation in the weights respondents give to different valuation methods in different proxy markets, but the variation betrays no consistent trend. Third, as complexity and uncertainty increase, respondents tend to rely more on heuristics, and are less rigorous (in our opinion) in their application of DCF methodologies. Fourth, most respondents are *de facto* multi-factor adherents in international valuations. In addition to market factor proxies, they often adjust discount rates for factors such as political, sovereign, or currency risk.

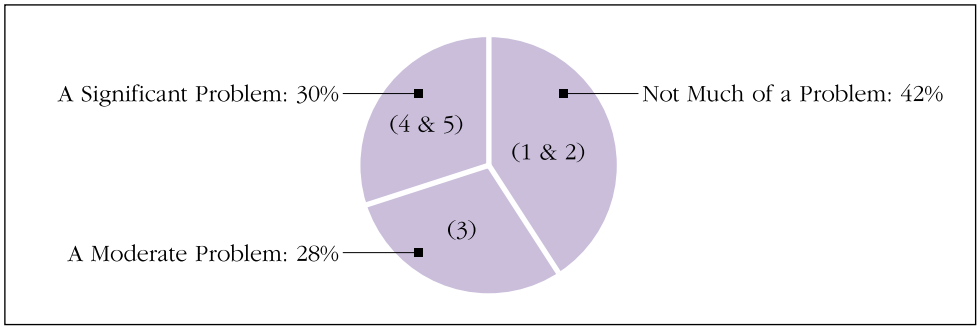
Comfort with Approaches and Information

Confidence in Approach to International Valuation. Most of the respondents indicated that they were reasonably comfortable with the valuation methodologies they employed. The majority (60%) selected the attractively worded option: "best method available, but have reservations." Only 17% were "not very comfortable" with the methodologies they employed. An

5. This could also mean that more seasoned professionals are not directly concerned about estimating the cost of capital. This may be because they aren't the ones crunching the numbers, or because they trust the resident knowledge within their company. Given the level of concern in the professionals who presumably are crunching the numbers (our respondents), the more senior experts and practitioners definitely should care.

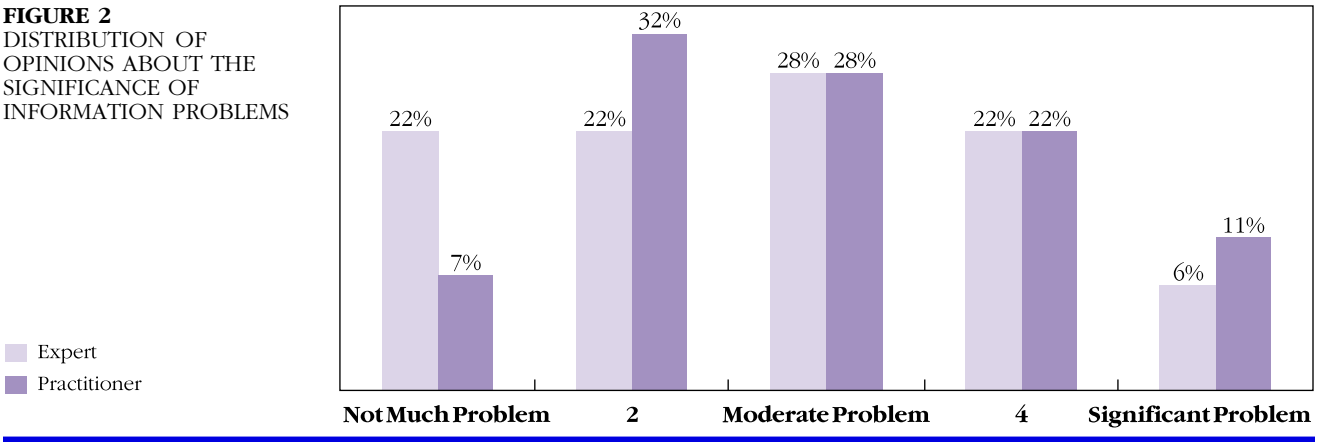
Approximately 33% of the responses came from practitioners outside designated valuation groups. We interpret this as a strong indication that valuation issues are permeating organizations as they become increasingly global. This diffusion of responsibility heightens the need for clear and consistent valuation approaches.

FIGURE 1
DIFFICULTY OF FINDING INFORMATION*



*Response codes are in parentheses.

FIGURE 2
DISTRIBUTION OF OPINIONS ABOUT THE SIGNIFICANCE OF INFORMATION PROBLEMS



additional 22% were relatively comfortable with their methods (though only 1% claimed to be "very comfortable"). There were no material differences between the responses of "experts" and "practitioners."

Given the disagreement among academics and the lack of clear and readily available literature on valuing international assets, we found these results somewhat surprising. We expected to find a larger proportion of people to be "not very comfortable" with the methods they employed. It's not clear, however, whether people are overconfident, or just making the best of a difficult situation. In light of respondents' tendency to emphasize methodologies differently in the face of both increased uncertainty and segmentation (discussed later), we tend to believe that these data show signs of overconfidence.

Comfort with Information Availability. We asked survey participants to what extent the difficulty in getting information in an international setting affected their responses. To our surprise, the median response was a three (on a scale of one to five), indicating that on average people agree that information is an issue, but they do not believe it is a serious issue (see Figure 1). Even more surprisingly, 42% of the respondents did not feel information was much of a problem at all. It may also reflect the fact that the majority of overseas business is transacted among developed countries, where information is less of a problem. Alternatively, it may reflect improvements in the availability of information—or overconfidence.

The median level of comfort with the available information set was a three for both experts and practitioners. However, the modal response was a two for practitioners while it was a three for experts (see Figure 2), implying that practitioners as a group felt more comfortable with the available information set than the experts. Perhaps experts are more aware of the problems caused by lack of information. Alternatively, practitioners may not use information-intensive methods, thus making availability less of an issue. Or it may be the case that practitioners are relying on experts, thereby "avoiding" the information availability issue.

TABLE 2
WORLD CAPITAL MARKET INTEGRATION RESPONSES (PERCENT)

"To what degree do you believe the following countries are integrated into world capital markets?

	Segmented	2	3	4	Integrated	Median
World	3.1	10.8	**34.6**	**46.2**	5.4	4
US	1.5	1.5	6.9	**39.2**	**50.8**	5
UK	1.6	0.8	10.2	**44.5**	**43.0**	4
Mexico	3.9	**29.9**	**42.5**	**18.1**	5.5	3
Sri Lanka	**47.3**	**37.5**	11.6	2.7	0.9	1

TABLE 3
MEXICAN TRADE AND CAPITAL FLOWS VERSUS THOSE OF SELECTED COUNTRIES

	UK	Japan	US	Italy	Mexico*
GDP (US$ billions)	1,159	4,600	7,576	1,214	**287**
(Imports + Exports)/GDP	59%	19%	24%	44%	**59%**
Total Inv. Flows (US$ billions)**	2,713	5,459	5,133	214	**31**
Total Inv. Flows % GDP**	234%	119%	68%	18%	**11%**

Source: International Financial Statistics
*1995 figures, all other data are for 1996
**Does not include Government or Monetary Authority figures

Valuation Method Weightings Vary by Country with No Apparent Pattern

Market Integration. We asked respondents to assess the level of capital market integration both for the world and for four proxy countries, on a scale of one to five (see Table 2). The respondents considered the U.S. and the U.K. to be "highly integrated" into the world capital markets. Mexico was considered "slightly less integrated"; Sri Lanka "relatively segmented." Overall, they considered world capital markets to be reasonably integrated.

We found it interesting that the median respondent considered Mexico to be "only moderately integrated" into world capital markets, even though over 60% had had some transaction experience in that country (a level that is not much different from the 72% of respondents who had had transaction experience in the "highly integrated" U.K.). According to *The Economist*, the stock of inward FDI for Mexico was US$70 billion, or 21% of 1996 GDP.[6] Table 3 illustrates some statistics on Mexican trade and capital flows relative to some selected countries. These data seem to indicate that Mexico is not much less integrated than Italy from a capital-flow perspective, and is equally integrated with major markets from a trade perspective.

This raises several issues. Do perceptions reflect reality, or is the world integrating faster than we can adjust? What factors influence the evaluation of relative segmentation? Can a market go from being integrated to being segmented? Is familiarity and similarity to one's home market more important than the actual ability to transact across borders? If a large number of foreigners are involved in some fashion or another in an "emerging market," at what stage does it become integrated, and why?

We believe this is more than a semantic discussion for two reasons. First, as we discuss immediately below, many people seem to adjust their valuation method based on perceived levels of segmentation. Second, opportunities to exploit perceived inefficiencies due to market segmentation may be overestimated.

Valuation Method Weightings. One particular goal of this survey was to determine what methods people use to perform valuations and how they alter the relative weight attached to those methods in various markets. One of our original hypotheses was that relative weightings would change along with the assessed level of integration. We hypothesized that information availability and uncertainty would drive a change, but we were unsure as to the direction.

6. "Emerging Market Indicators," *The Economist*, 4 October 1997, 116.

As complexity and uncertainty increase, respondents tend to rely more on heuristics, and are less rigorous in their application of DCF methodologies.

TABLE 4
COMPARISON OF DCF WEIGHTINGS IN UK AND MEXICO

Response to increased segmentation	Percent of respondents	United Kingdom		Mexico	
		Mean DCF weight (%)	Median Level of Integration	Mean DCF weight (%)	Median Level of Integration
Increase weighting	33	57	4	78	3
Decrease weighting	29	49	4	29	3
No change	38	57	4	57	3

Our results are interesting on several fronts. Consistent with the finding of prior studies, most people assign significant weight to the DCF methodology in all markets.[7] In this study, 97.6% assigned some weight to DCF in the U.S. market; 96.3% in the U.K.; 91.2% in Mexico; and 82.4% in Sri Lanka. Contrary to our original hypothesis, mean DCF weighting did not vary significantly with assessed levels of integration.

However, a deeper look into the data reveals a pattern of divergence in weightings as markets become more segmented. In order to evaluate more closely how people react to increased segmentation, we compared the weighting placed on DCF in the U.K. with the weighting placed on DCF in Mexico (see Table 4). In this manner, we were able to compare variation in DCF weightings between countries of varying levels of perceived integration (for example, the U.K. had a median level of assessed integration equal to "4" while Mexico's median level of assessed integration was "3"). Of the 93 people responding for both markets, one third increased their reliance on DCF methodology as the markets became more segmented, about one-third decreased their reliance, and the remainder did not change their weighting. Unfortunately, we were not able to find any clear explanatory variables for this divergence among the data we collected.

The motivation for increasing DCF weighting in response to greater segmentation may be explained by thin markets, and the lack of observable public company multiples and comparable transactions. Yet a similar rationale might explain why others decrease their reliance on the DCF methodology. Cash flow estimates are more difficult to generate for non-insiders; and even harder to adjust to reflect increased uncertainty. Use of DCF also brings the issue of discount rate determination to the fore. How does one develop a discount rate in the relative absence of statistically reliable information? Respondents might conclude that this array of new complexities is better left untouched and thus decrease their DCF weighting.

Increasing Complexity Leads to Use of Heuristics

Cost of Capital by Project Type. We asked respondents to indicate how they prefer to estimate the cost of capital when evaluating: a publicly traded company, a private company, a new venture, and a research and development (R&D) project (see Figure 3). No explicit mention was given that these projects were international. We provided four alternatives for determining discount rates in addition to the ubiquitous "other" category.

As Figure 3 clearly shows, survey participants respond to increased project uncertainty by relying on "alternative" methods. While a few respondents specifically indicated a switch to option pricing techniques for evaluating R&D projects, we assume that most of the "rule of thumb" category reflects judgment or heuristics like comparative internal rates of return. This is a bit surprising since 50% of the respondents to the R&D question fall into the "experts" category. As we will see below, however, this result is not unique. The move from integrated to segmented markets is also a move from relative certainty and familiarity to relative uncertainty, and we found a similar trend there.

Selecting a Risk-Free Rate. In the U.S., it seems everyone chooses the U.S. risk-free rate (recall that 87% of the respondents were U.S.-based). In the U.K., only 60% switch to a local currency risk-free rate, while approximately 35% select their home country rate (presumably the U.S. risk-free rate for most respondents). Opinions diverge again in the segmented markets. Almost half of the respondents

7. Stonehill and Nathanson (1968), and Oblak and Helm (1980). Oblak and Helm also refer to several intervening studies which find the same result.

FIGURE 3
PREFERRED METHOD OF ESTIMATING COST OF CAPITAL FOR DIFFERENT TYPES OF PROJECTS

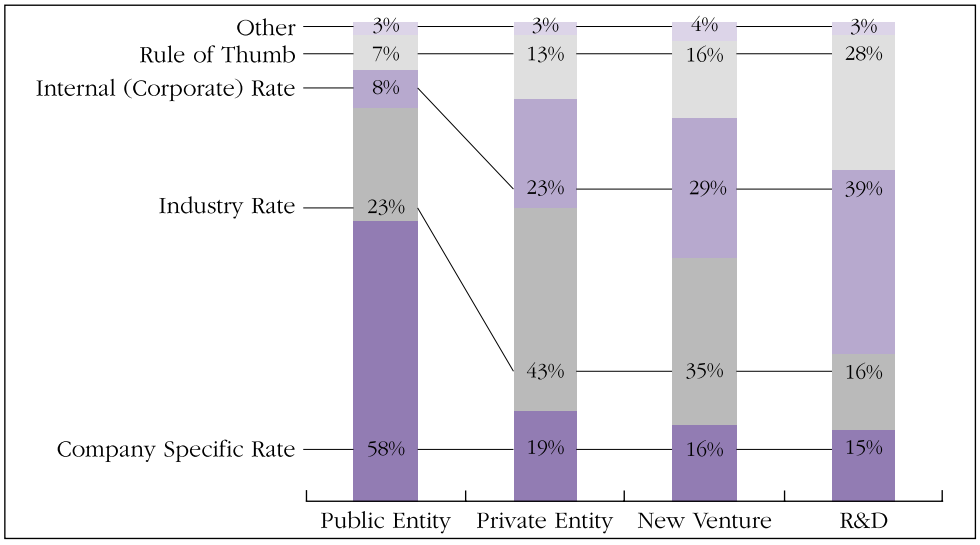


TABLE 5
RISK-FREE RATE SELECTION (PERCENT)

	US	UK	Mexico	Sri Lanka
Local Treasuries	80.8	60.9	39.4	38.0
Home Currency Treasuries	16.7	34.5	49.0	47.9
Synthetic or Other rate	2.5	3.6	11.5	14.1

reverted back to their home currency rate, over a third chose the local rate, and slightly over 10% appear to adjust for sovereign risk by using a synthetic or blended rate. Yet again, as segmentation increases, the choice of risk-free rate, and presumably the choice of currency, becomes increasingly difficult (See Table 5).[8]

Most Respondents Are *De Facto* Multi-factor Adherents

Model Specification by Country. Our respondents' answers to questions about the models and methods they use to determine international discount rates highlighted several inconsistencies. For example, only a small group of respondents explicitly indicated the use of multi-factor models to generate discount rates in the international setting. Yet our evidence seems to indicate that, in practice, it is common for our respondents to incorporate more factors in the discount rate as perceived segmentation increases. This leads them to implement the DCF in a way that is not consistent with its theoretical foundations. As the data will show, most respondents adjust for political risk and sovereign risk in the discount rate rather than in the cash flow. This only makes sense if one believes these factors are non-diversifiable "state variables," a view unlikely to be held by the 86% of the respondents who said they were using either CAPM or some other, presumably single-factor, model.

In the first of the series of questions, we asked respondents to indicate whether, conditional on using DCF, they used a single-factor model, multi-factor model (or APT), or some other model when estimating the cost of capital outside their home country. Approximately 42% of respondents indicated use of a single-factor model, 14% use of a multi-factor model while a significant number of professionals (44%) make use of model specifications other than a pure single or multi-factor model. What could they be using?

It seems likely they are doing one of two things. One possible explanation is that they are using corporate policy-based rates. However, this presumably doesn't apply to everyone since the majority of

8. Currency issues, which are inexorably linked to risk-free rate selection, are not addressed in this paper—not because they are unimportant, but because we do not have the space to do them justice here. Our survey results may suggest that respondents are probably using a home country rate while deriving a value in a foreign currency. For purposes of this paper, we assume respondents match the currency in which the valuation is performed with its respective risk-free rate.

Our evidence seems to indicate that, in practice, it is common for our respondents to incorporate more factors in the discount rate as perceived segmentation increases. This leads them to implement the DCF in a way that is not consistent with its theoretical foundations.

FIGURE 4
PERCENT OF RESPONDENTS THAT INDICATE USE OF A SINGLE-FACTOR MODEL OR OTHER MODEL BUT ACTUALLY USE MULTIPLE FACTORS IN DEVELOPING INTERNATIONAL COST OF CAPITAL

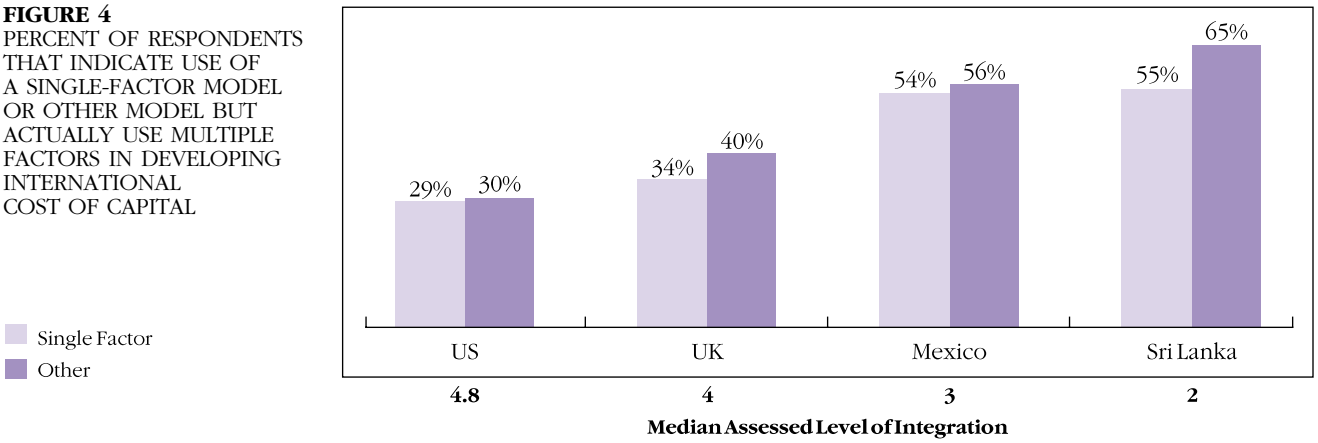
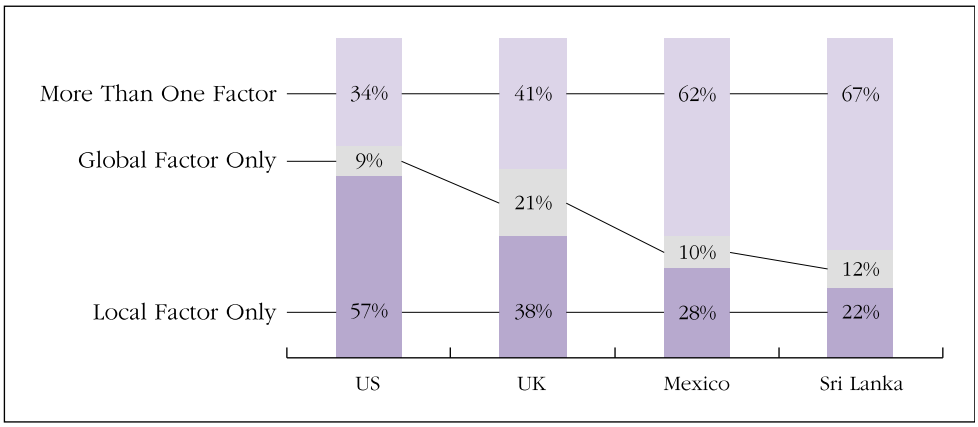


FIGURE 5
TENDENCY OF RESPONDENTS TO USE GLOBAL, LOCAL OR MULTIPLE FACTOR PROXIES IN DIFFERENT MARKETS



respondents to this question (approximately 60%) were experts. As we discussed earlier, it is possible that experts are relying more on their judgment or rules of thumb as the complexity of the project increases and as the availability of information decreases. Somewhat surprisingly, however, the median comfort level of all respondents who rely on "other" methods to develop costs of capital was 3.0, exactly the same as the total sample. Maybe these respondents are relatively comfortable with information because they don't use it! In any case, this is another example of how the complexity of a project or investment environment increases the likelihood that respondents rely on heuristics.

Once the respondents classified themselves as single-factor, multi-factor, or "other" model users, we asked them to identify what they use as proxies for systematic risk factors. It was here that some of the contradictions began to emerge. By definition, a single-factor model user should only be using one proxy. Yet, even when valuing assets in the U.S. and the U.K. markets, over 25% of the respondents who claim to use a single-factor model or the CAPM indicated that they use more than one factor proxy (see Figure 4). In Mexico and Sri Lanka, more than 50% of the single-factor users used more than one risk factor proxy. The same pattern holds for "other" model users. These results are consistent with the rest of the data below.

Figure 5 also shows how methodologies shift as investors' perceptions change. As the assessed level of integration decreases, and the implied complexity and uncertainty of analysis increases, reliance on the local market as the sole risk factor proxy also decreases. This might be a reasonable response if investors were concerned about the information available on the local market. If this were the case, however, we would expect them to use a global market proxy rather than adding more risk factors. We also note that there is a greater use of a global

TABLE 6
MEDIAN RESPONSES TO VARIABLE IMPORTANCE ASSESSMENT

	Unexpected Inflation	Tax Differentials	Political Risk (e.g. expropriation)	Sovereign Risk (Gov't default etc.)	Currency Risk
US	1	2	1	1	1
UK	2	3	1	1	2
Mexico	4	4	4	4	5
Sri Lanka	4	3	5	5	5

TABLE 7
METHOD OF ACCOUNTING FOR RISK FACTORS (IN PERCENT)

	Unexpected Inflation	Tax Differentials	Political Risk (e.g. expropriation)	Sovereign Risk (Gov't default etc.)	Currency Risk
Cash Flow	24	71	19	13	36
Discount Rate	55	14	65	66	42
Indifferent	3	8	4	7	8
No Adjustment	18	7	12	14	13

market proxy for the U.K. than for the U.S. But this makes sense only if the U.K. is "more" integrated into world capital markets (or if the U.S. market is assumed to be a reliable proxy for global market).[9] Recall, however, the median assessed level of integration for the U.S. was greater than the U.K. Is this another type of home country bias?

Once respondents tackle Mexico and Sri Lanka, single-factor usage of either a local or global market proxy is increasingly rare. Yet again increasing segmentation seems to drive the use of additional factors.

Identifying Risk Factors Incorporated into the Cost of Capital. These results lead to the following question: If people are using multi-factor models in segmented countries, are these additional factors actually proxies for state variables?

The next step was to ask people specifically what risks were important to adjust for in the international setting. We asked the respondents to rank five variables exclusive of each other on a scale from one to five. A one was coded as "not important" and a five as "very important."

The results (see Table 6) are relatively self-explanatory. Unexpected inflation was not deemed to be a very important issue in either the U.S. or the U.K. The same applies for currency risk, which is reassuring since the two variables are closely related. Conversely, both unexpected inflation and currency risk were considered to be important in Mexico and Sri Lanka. Tax differentials were an issue across all four countries. As would be expected, both political and sovereign risk were considered important issues in Mexico and Sri Lanka.

These data help clarify a point made earlier. Even though most of our respondents had valuation experience in Mexico, they considered the country only moderately integrated. This may be explained by the (probably valid) perception that country-specific risks are higher in Mexico. This raises a series of questions: How does risk relate to integration, or integration to risk? Is it a matter of perception, or of economics? If a risk can be reduced through diversification, rational asset pricing models tell us it should not be accounted for in the discount rate.

This leads to the next survey question. For the same variables listed above, we asked respondents whether they accounted for them by adjusting their cash flow estimates or their discount rate. Respondents could also indicate indifference between either of the options, or they could indicate that they made no adjustment at all.

The majority of respondents adjust for inflation, political, and sovereign risk by adjusting the discount rate (see Table 7). Since only 14% of respondents said they were using a multi-factor model, we assume that most are making some type of ad-hoc adjustment for the factors above. These data also reaffirm the analysis of the earlier data on factor proxies. Even if respondents claim to be single-factor adherents, they are making some additional adjustments in the discount rate.

Granted, the 55% who are adjusting the discount rate for inflation risk, and the 42% who adjust for

9. See René Stulz, "The Cost of Capital in Internationally integrated markets: The Case of Nestlé," *European Financial Management* Vol. 1 No. 1 (1995): 11-22.

Just as a pilot flying through the Andes Mountains would chart his course with greater precision, we would expect an investor in the relatively rugged terrain of international investing to increase the time and rigor applied to the valuation process.

TABLE 8
TENDENCY OF TYPES OF RESPONDENTS TO MAKE ADJUSTMENTS FOR ADDITIONAL RISK FACTORS

	Inflation	Tax	Political	Sovereign	Currency
CAPM Non-Purists (27)	48.1%	14.8%	81.5%	81.5%	44.4%
CAPM Purists (23)	60.9%	17.4%	52.2%	52.2%	39.1%
Multi-factor Proponents (16)	62.5%	25.0%	75.0%	81.3%	56.3%
"Other" Factor Proponents (52)	44.2%	9.6%	51.9%	51.9%	34.6%

currency risk, may be implementing a model consistent with recent theoretical extensions of the CAPM to the international arena.[10] However, in general, it seems that our respondents are making adjustments for factors which, when pressed, they would agree are not necessarily non-diversifiable state variables.

Is respondents' behavior what we would expect if they believed that political risk and sovereign risk were non-diversifiable state variables? We classified those respondents who make adjustments to the discount rate into four categories based on their answers to an earlier question.

- "CAPM Purists" were defined as those who stated their reliance on single-factor models and only selected a one-factor proxy in the related question. Given this behavior, we would not expect these respondents to make adjustments in the discount rate for political or sovereign risk, let alone taxes.
- "CAPM Non-Purists" were defined as those who stated their reliance on single-factor models but when asked selected more than a one-factor proxy. Given their stated model preference, they should also not be adjusting for political, sovereign, or tax risks in the discount rate. However, since they took up the offer of multiple-factor proxies, they may have a higher propensity to deviate.
- "Multi-factor Proponents" and "Other Factor Proponents" can be expected to show a higher propensity to make adjustments in the discount rate. Presumably the multi-factor adherents are using these factors as proxies for state variables. It is not clear the same can be said for "Other Factor Proponents."

In short the answer to the above question is "Yes." As the data in Table 8 show, the moral of the story is that observed behavior is inconsistent with CAPM theory but is consistent with treating political and sovereign risk as state variables. Thus, the outstanding question remains: Are political and sovereign risks state variables? We remain skeptical.

Survey Conclusion

We acknowledge that the survey methodology could be improved by removing the Chicago GSB and U.S. biases, as well as by improving some of the survey wording. However, we strongly suspect that a more precisely worded survey administered to a more representative sample would still raise broadly similar questions, to wit:

- What is the relationship between risk and the degree of market segmentation? Do assets in segmented markets expose investors to additional, non-diversifiable risks that positively contribute to the overall risk of a domestic portfolio? Or do they reduce the overall risk profile of a portfolio because their returns are relatively uncorrelated with the rest of the global market?
- Are experts and practitioners implementing multi-factor models in a theoretically sound, systematic fashion? Our survey suggests that practitioners and experts alike adjust the discount rate for "bogeys" that they perceive in foreign markets but are unable to quantify analytically.
- Do ad-hoc adjustments based on "gut instinct" undermine the benefits of performing a DCF analysis and create inherent contradictions in the valuation process? The reliance on heuristics we observed implies that as perceived risk increases, people tend to become less consistent, less systematic, and less rigorous in the methods they use to measure and evaluate that risk: an ill-advised recipe. One respondent characterized what we suspect is a widely held opinion: "[International] investing is more about guts and commitment. You can make the numbers support any conclusion. Been there....done that."

Many of our respondents would no doubt protest that it is ultimately too difficult to adjust for political, sovereign, or other "diversifiable" risk in the cash flows. This may be the case. But, if so, then

10. For work that extends the CAPM to account for a world market portfolio and deviations from purchasing power parity, see M. Adler and B. Dumas, "International Portfolio Choice and Corporation Finance: A Synthesis," *Journal of Finance* Vol. 38 No. 3 (June 1983): 925-84; B.Solnik, *International Investments*, 3rd ed. (Reading, Massachusetts: Addison-Wesley Publishing Company, 1996); and C. Harvey, "The World Price of Covariance Risk," *Journal of Finance*, Vol. 46 (1991): 111-159.

why isn't information a problem, why are people relatively comfortable with their methods, and why are they placing such relatively heavy reliance on DCF in the first place? Perhaps the experts, who are aware of the information problems, are not relying heavily on DCF in these markets. In that case, practitioners are analyzing investments without a real sense of the limitations of the tools they are using. We find this trend disconcerting, especially in a group of Chicago GSB graduates. Heuristics are most useful as time-saving devices. Consequently, they are best employed in familiar, repetitive processes, and always with an eye toward the inherent time/accuracy trade-off. Applying a rule of thumb to a new, unfamiliar, or rapidly changing environment greatly increases the risk of application errors. Just as a pilot flying through the Andes Mountains would chart his course with greater precision, we would expect an investor in the relatively rugged terrain of international investing to increase the time and rigor applied to the valuation process.

Of course, one may conclude that the results of any valuation process may be too imprecise to be useful in an international context, ergo the recourse to gut instincts. Eugene Fama voices doubt about the efficiency of the DCF approach. In his paper "Discounting Under Uncertainty,"[11] Fama ponders: "Given the massive uncertainties in project valuation, does a discounting rule lead to value estimates that have less measurement error than an alternative, less complicated rule-of-thumb?" Perhaps the rule-of-thumb is the best approach in an international setting.[12] However, if this is the case, it seems silly to feign a DCF analysis to maintain appearances, or convince yourself that your analysis has an accuracy or rigor which it does not. In the best case, the time would be much better spent collecting the type of information that can effectively inform the gut; anything else is just a distraction. In the worst case, the DCF results could inhibit effective decision-making.

IMPLICATIONS

To understand the impact cost-of-capital errors may have on your company, it is necessary to revisit some fundamental tenets of valuation. In general, there are three reasons to perform a DCF analysis:

1. To determine the value of an asset: "intrinsic" value.
2. To determine the price an asset will fetch in the marketplace: "extrinsic" value.
3. To rigorously test the valuation assumptions.

The distinction between (1) and (2) is important because the assumptions made in determining a discount rate (i.e. cost of capital) in the course of a DCF analysis determine whether an estimate of intrinsic or extrinsic value is generated. Why does this matter? In a perfectly integrated globally efficient market it should not; the two results would be the same. Thus, in a deep and highly efficient market like the U.S., we can comfortably use DCF, multiples, and comparative transaction valuations interchangeably. The old trick of "ratcheting" the discount rate to make the DCF conform with the observed market price is a reasonable estimation methodology.

If markets are segmented, however, the intrinsic value of an asset to a foreign investor can diverge from the price in the local market. It is in this case that DCF can be a highly useful tool. Multiples and comps can only be used to generate an extrinsic value, while DCF can generate both. An investor with accurate intrinsic and extrinsic valuations is well positioned to exploit international market investment opportunities. When doing this, the investor should ask two rhetorical questions: How comfortable am I that the model used to generate the discount rate is a good approximation of the "theoretically correct" asset pricing model? Am I willing to put my money where my spreadsheet is, and bet on my DCF valuation when it diverges from observable market values? Affirmative answers to both questions require a high degree of comfort with the assumptions that underlie the models.

These questions may strike the reader as a bit of "form over substance." However, there are ways to increase the relative level of confidence one has in the DCF analysis, even in an international setting. For example, one can develop an extrinsic DCF model by calibrating public market prices in the target market. Once the calibrated discount rate is obtained, it can be compared with the discount

11. Eugene F. Fama, "Discounting Under Uncertainty," *Journal of Business*, 69 (October 1996), 415-428.

12. We would counter this argument by noting that Kaplan and Ruback (1995) show that, at least for a particular sub-set of firms in the U.S. market, discounted cash flow techniques have significant explanatory power and perform at least as well as valuation methods using transactions and comparable company multiples.

If markets are segmented, the intrinsic value of an asset to a foreign investor can diverge from the price in the local market. It is in this case that DCF can be a highly useful tool. Multiples and comps can only be used to generate an extrinsic value, while DCF can generate both.

rate generated by the "true" asset pricing model (whatever that may be). A detailed comparison will yield insights as to the assumptions used to develop both the implicit value discount rate and the extrinsic value discount rate. These assumption insights will in turn allow the prospective investor to assess the reasonableness of the two assumption sets, ultimately affording the investor the ability to make an informed decision as to the proper price to pay for an asset and whether or not to invest in a particular market.

Of course, not all readers are in the business of placing bets on the difference between intrinsic and extrinsic values. DCF analysis instead is used as another data point in a larger process of estimating market value. Sometimes it is used as a sanity check of comparable firms and multiples valuation. Other times, when good comparable data is not available, it can serve as a primary estimate of market value. In any case, there is inherent noise involved in applying a DCF analysis to either an individual company or even a portfolio. In their paper, "Industry Costs of Capital," Fama and French write, "Unfortunately, imprecise risk loadings are only half the cost of equity (CE) estimation problem. Even if we knew the true risk loadings, CE estimates would be imprecise... CE's are obtained by plugging estimates of risk loadings and risk premiums into expected return equations... CE estimates are unavoidably imprecise."[13]

Nevertheless, we argue that *DCF analysis is valuable because it forces the user to be explicit about the assumptions* that are implicitly incorporated into the valuation process. At the end of the day all valuations are based on assumptions. The DCF method is highly powerful because it allows the user to test the valuation assumptions more rigorously than can be done using other methods. Moreover, since generating cash flow scenarios is a relatively more important component of the DCF exercise than generating a discount rate estimate, a good discount rate model should add as little noise and bias as possible. And this implies that asset-specific risks should be modeled in the cash flows, not in the discount rate.

These are obvious points, particularly in the domestic setting. Yet for some reason, as the survey data shows, when people venture further afield they tend to lose touch with the obvious. Instead of making the extra effort to distinguish between systematic and non-systematic risks, ensuring that the latter are modeled in the cash flows, there is a tendency to rely on ad-hoc adjustments. Our results indicate that it is common practice to insert a premium into the discount rate to account for additional "political" risk without necessarily having a firm theoretical, or even practical, rationale for that insertion. In our view, this is akin to a pilot's flying through the Andes and estimating the plane's altitude by looking out the window while ignoring the altimeter.

What if your company is using value-based metrics to measure performance? Not only can cost-of-capital errors cause you to misallocate financial capital, it may also prejudice your assessment and use of human capital. Some country managers may be unfairly saddled with a cost of capital that is too high simply because your company employs a heuristic to derive a discount rate for a country perceived as riskier. Because metrics such as EVA and MVA measure intrinsic value creation, you must be able to explain why the added risk in a market is not diversifiable before you can justify using a higher discount rate.

If the companies represented by our survey respondents were using EVA to evaluate their operations, for instance, it is possible that they may be systematically underestimating the value created by their Mexican operations. Recall the assessed level of Mexican integration, the evidence of Mexican capital market integration, and our respondents' tendency to incorporate additional risks in the discount rate.

COMPLICATIONS

One needs to understand the role market segmentation plays in international asset pricing to determine if and how a discount rate model should be altered when investing abroad. While empirical evidence on this subject matter is lacking, we offer a framework that may help the practitioner consider such issues in a logical manner.

If all markets were perfectly integrated and PPP held perfectly, there would be no reason to believe that different models would be necessary to explain the "cross-section" of expected returns in different

13. Eugene F. Fama and Kenneth R. French, "Industry Costs of Capital," *Journal of Financial Economics*, 43 (1997), 153-193.

international markets.[14] Most foreign asset valuations, however, take place in the gray area of "quasi-segmented" markets. Only 5% of the respondents to our survey believed that world markets were highly integrated. The ad-hoc adjustments employed by the respondents appear to be an attempt to capture or reflect the effects of this partial segmentation. This gives rise to several questions: What are the factors that lead to market segmentation? How might market segmentation cause differences in asset pricing across markets? Are ad-hoc adjustments the best way to account for these differences?

The starting point for analyzing these questions is in the definition of segmentation. A perfectly segmented market is one in which foreigners may not invest, and from which local investors cannot remove their wealth. In other words, foreign capital cannot come into the market, and local capital may not leave. This market, though perfect in its segmentation, is of little interest to a foreign investor, since by definition he cannot invest there. In such a case, the model of market equilibrium would likely be unique to each segmented market.[15]

René Stulz also provides a succinct definition of the other side of the continuum: "Asset markets are said to be perfectly integrated internationally if two assets (existing or hypothetical) which have perfectly correlated returns *in a given currency* but belong to different countries have identical expected returns *in that currency.*"(our emphasis).[16] In other words, this means that markets are perfectly integrated when the *price of risk* (excluding currency risk) is the same in both markets. The price of risk can be thought of as the amount of excess return (i.e. in excess of the risk-free rate) per unit of systematic risk.[17]

In contrast to the case of perfectly segmented markets, if markets are perfectly integrated, market participants should use the same model to generate a discount rate in all markets. Since the world seems to be moving toward greater global market integration, we should also observe a convergence toward a single model of market equilibrium. We recommend that, before developing a discount rate model for a foreign market, a practitioner should first ask himself how he would model a foreign market that is globally integrated. The answer then becomes the base line model against which all country- or market-specific modifications should be evaluated.

In order to justify employing a different model in a foreign market, one must first believe that that market is not completely integrated in the world market. Bruno Solnik cites six common factors which can lead to market segmentation: legal restrictions, transactions costs, discriminatory taxation, political risk, psychological barriers and exchange risks.[18] If these or similar factors are present, the next question is: how does this segmentation affect the way assets are priced in the market under consideration?

For a market to be considered not well integrated into the world capital market, it is not enough to observe that some of the factors cited above are present. While these factors may make a market "riskier," they do not necessarily warrant the use of a multi-factor or "unique" asset pricing model. One or both of the two following additional conditions must hold: the same risk must be priced differently or different risks must be priced. Note, moreover, that only the latter condition justifies employing a *different* asset pricing model.

These last statements hold the key for understanding the implications of market segmentation for asset pricing. Accordingly, we will explore each "condition" in greater detail.

Same Risks Priced Differently

To understand what we mean when we say "the same risk priced differently," let us assume that PPP holds perfectly at all times and the real risk-free rate is the same in both the domestic and foreign markets.

14. Integrating international capital markets implies convergence of models of market equilibrium. In the limit of perfectly integrated and efficient global capital markets, one model of market equilibrium would be sufficient to explain the cross-section of expected returns globally.

15. In the subsequent discussion, when we refer to a "model" we are referring both to a formulation (e.g. CAPM) and the factor proxy or proxies which fit into that formulation (e.g. S&P 500). In this context changing a factor proxy is synonymous with changing a model.

16. René Stulz, "A Model of International Asset Pricing" *Journal of Financial Economics* (Dec. 1981): 383-406.

17. The term "systematic risk" refers to the component of an asset's return for which the marginal investor can not diversify and requires compensation. Our description of "the price of risk" is essentially that offered by Sharpe's ratio, adjusted for currency fluctuations.

The exclusion of currency risk requires that we assume PPP holds at exactly at every instant in time. While there is ample evidence to suggest that this is not the case, we will allow ourselves the luxury of assuming PPP throughout the remainder of this paper in order to better discuss some other fundamental issues. For a more detailed discussion on the importance of PPP in international finance, see Adler and Dumas, "International Portfolio Choice and Corporation Finance: A Synthesis."

18. B.Solnik, *International Investments*, 3rd ed. (Reading, Massachusetts: Addison-Wesley Publishing Company, 1996).

For simplicity, we will also assume that a global CAPM is an accurate model of how securities are priced in the world capital market. These assumptions then imply that expected real risk premium on the global market portfolio is the same for all investors and is independent of domicile.

Now, imagine there are two firms which make the same product and have identical expected cash flows and capital structure from now to eternity. One firm, HOME, is in your home country, which is well integrated into the world capital market. The other firm, AWAY, is in a foreign country whose market is not well integrated into the world capital market. In this scenario, the appropriate cost of capital for HOME and AWAY can be estimated by equations 1 and 2.

$$E(r_H) = r_f + b_{HG}\,[E(r_G) - r_f] \qquad (1),$$

where $E(r_H)$ is the expected return on HOME; r_f is the nominal risk-free rate; b_{HG} is the slope of the regression line of the returns on HOME against the returns on the global market portfolio G; and $E(r_G)$ is the expected return on the global market portfolio.

$$E(r_A) = r_f + b_{AG}\,[E(r_G) - r_f] \qquad (2),$$

where $E(r_A)$ is the expected return on AWAY; and b_{AG} is the slope of the regression line of the returns on AWAY against the returns on the global market portfolio G.

In theory, these two firms should offer the same expected return because they have identical expected risk and return trade-offs. However, since AWAY's market is not well integrated into the world capital market, the firm in this market may face a different price of risk such that $E(r_A)$ is not equal to $E(r_H)$. This is true despite the fact that the two companies are identical in every respect except for domicile.

How can this happen? Intuitively, it is easy to think that $b_{AG} = b_{HG}$ because the two firms are identical. However, this need not be the case. In an integrated capital market, risk that is residual with respect to the local capital market is also likely to be residual to the global capital market because the global investor can diversify the risk just as easily as the local investor. In this case, equation (1) expands to the following:

$$E(r_A) = r_f + (b_{HL} \times b_{LhG})[E(r_G) - r_f\,] \qquad (3),$$

where b_{HL} is the slope of the regression line of the returns on HOME against the returns on the HOME's local market portfolio L; and b_{LhG} is the slope of the regression line of the returns on HOME's local market portfolio against the returns on the global market portfolio G.

Likewise, if AWAY market is integrated into the world capital markets, then equation (2) becomes:

$$E(r_A) = r_f + (b_{AL} \times b_{LaG})[E(r_G) - r_f] \qquad (4),$$

where b_{AL} is the slope of the regression line of the returns on AWAY against the returns on the AWAY's local market portfolio L; and b_{LaG} is the slope of the regression line of the returns on AWAY's local market portfolio against the returns on the global market portfolio G.

If both markets were identically integrated into the world capital market, the two firms would be identical in the sense that $(b_{HL} \times b_{LhG})$ would be equal to $(b_{AL} \times b_{LaG})$ and b_{HG} would equal b_{AG}. This holds true even when b_{LhG} is not equal to b_{LaG}, but implies that for two identical securities in integrated capital markets to have the exact same beta relative to the global market portfolio, b_{HL} must be equal to the ratio $(b_{AL} \times b_{LaG}/b_{LhG})$ and b_{AL} must equal the ratio $(b_{HL} \times b_{LhG}/b_{LaG})$.

The complication arises when AWAY's market is not integrated in the world capital market. Thus, in the example we have described above, it is conceivable if not indeed likely that b_{HG} will not equal b_{AG} in equations 1 and 2. In such a case, the appropriate cost of capital for AWAY may be described as follows:

$$E(r_A) = r_f + (b_{AL} \times b_{LaG} + b_a)[E(r_G) - r_f] \qquad (5),$$

where b_a is the incremental risk (positive or negative) associated with the portion of AWAY's assets return that does not have covariance locally but does have covariance globally.[19]

19. The reader may note that b_a looks an awful lot like an ad-hoc adjustment. There is one exception, however: it is not identical for all companies. It varies with respect to the degree of local market segmentation. In fact, Stulz shows that $b_a = \mathrm{Cov}(e_{AL},R_G)/\mathrm{Var}(R_G)$, where e_{AL} equals the portion of AWAY's return which is uncorrelated with the its local market portfolio (but has covariance with the global market portfolio). Thus, one of the major problems with using an ad-hoc adjustment is the assumption that all assets in a market are affected identically, without exception, by a constant factor. That's hard to swallow.

TABLE 9
QUASI-SEGMENTED MARKET FRAMEWORK

I'm an international investor who . . .	Political risk for the marginal investor is . . .	The Marginal Investor is . . . International	Local
Can diversify local political risk	Diversifiable	1	1
	Non-diversifiable	—	2
Cannot diversify local political risk	Diversifiable	—	3
	Non-diversifiable	4	4

From equation 5 it is clear that $E(r_A) = E(r_H)$ only when $b_a = 0$. If the two markets were perfectly integrated, b_a would be "arbitraged" or diversified away, such that $E(r_A) = E(r_H)$ vis-à-vis $b_{HL}\, b_{LhG} = b_{AL}\, b_{LaG}$. But because AWAY's market is not integrated, the non-local investor can not diversify AWAY's residual local market risk. Thus, AWAY's risk is priced differently from a non-local perspective. If a non-local investor is the marginal investor in the foreign market then risk gets priced, and AWAY gets saddled with a higher (or conceivably lower) local expected risk premium; thereby creating a potential risk arbitrage opportunity for the non-marginal investor.

The risk arbitrage opportunity is the result of cost-of-capital or expected return differentials between local and non-local investors. In order to exploit a differential in the pricing of risk, an investor must be able to do two things. First the investor must be able to identify the opportunity. Then the investor must be able to buy (or sell) the asset at its market price. Markets are often segmented because the latter is difficult to do. Notwithstanding, identifying an investment opportunity that arises from differential risk pricing in non-globally integrated markets requires an "intrinsic" pricing model. The foreign investor must determine what risks must be compensated, and how much compensation is required to bear them.

In short, a DCF analysis must be performed. Transaction multiples and comparable public company multiples will yield only estimates of the current market price. They will not identify the risk arbitrage opportunity. Even a DCF analysis will not be complete if the discount rate is not based on a "true" model of market equilibrium.

Different Risks Priced Abroad

As mentioned in the introduction to this section, there is another potential reason why $E(r_A)$ might not equal $E(r_H)$. Suppose there are other risk factors the marginal investor in the foreign country wants to hedge against. If this were the case, then AWAY's cost of capital would be given by:

$$E(r_A) = r_f + b_{AG}\,[E(r_G) - r_f] + b_{AX1}\,[E(r_{X1}) - r_f] + \ldots + b_{AXn}\,[E(r_{Xn}) - r_f] \quad (6),$$

where $E(r_{X1} \ldots r_{Xn})$ is the expected return on the portfolios that proxy for the *n* risk-factor X's, and b_{AX1}–b_{AXn} represent the slopes of the regression of AWAY's returns on the returns of the X_n risk factor mimicking portfolios. In this case, HOME's cost of capital will still be modeled by equation (1).[20]

$$E(r_H) = r_f + b_{HG}\,[E(r_G) - r_f] \quad (1)$$

Obviously, then, this is a situation where segmentation means that a different type of risk is priced in the foreign market.[21] We can make three observations about this situation:

1. The risk-factor X must be a risk that cannot be diversified away by the marginal investor in the foreign market;
2. The marginal investor must demand compensation for bearing risk-factor X; and
3. In identifying the different type of risks that investors believe to be priced in the foreign market, the investor has made the leap from a single-factor global CAPM to a multi-factor global asset pricing model. However, the investor must be able to explain why these risks are not priced elsewhere.

Again, an example is helpful for developing this scenario. Assume that AWAY's country has some appetite for foreign capital, but for political and fiscal reasons has put restrictions on the kind of investing in which foreigners can engage. In addition, AWAY's government won't let local investors invest internationally.

20. In this case either n number of b_{HX} are zero, or HOME investors are able to diversify away the risks X_1–X_n or b_{X2}–b_{Xn} are subsumed by b_{HG}.

21. We admit that the distinction between b_a and a state variable may be somewhat arbitrary. Indeed, b_a may subsume the X_n risk factor mimicking portfolios.

Not only can cost-of-capital errors cause you to misallocate financial capital, it may also prejudice your assessment and use of human capital. Some country managers may be unfairly saddled with a cost of capital that is too high simply because your company employs a heuristic to derive a discount rate for a country perceived as riskier.

As shown in Table 9, depending on who the marginal investor is, the asset pricing model can provide very different value estimates (e.g. expected returns). To understand this, consider the logic behind Stulz's recommendation for using the global CAPM in quasi-segmented markets. Stulz argues that the global CAPM should be used to develop expected returns because in most markets the cost of capital is being determined globally not locally (that is, integrated global investors whether located domestically or abroad are the "marginal" investor).[22] While we agree that this is likely, Table 9, which shows the four possible pricing scenarios, given different investors' abilities to diversify the aforementioned political risk, allows for other possibilities in order to make the framework more complete. Table 9 implies that, in any of four scenarios, the global CAPM provides a closer estimate of an asset's intrinsic value to an international investor than does a strictly local CAPM.

In scenario 1, it doesn't particularly matter who the marginal investor is, because either one can diversify away the political risk in question—perhaps it is industry- or firm-specific. In this case the risk should not be priced in the discount rate, but should be estimated in the cash flows. We also note that in this case it appears that, despite capital restrictions, international capital flows are significant enough to eliminate any risk price differential, and the markets are essentially integrated by Stulz's criterion. In scenario 4, it doesn't matter who the marginal investor is, because neither one can diversify the political risk.[23] In this scenario, you would want to price this risk in the discount rate instead of the cash flows.

In scenario 2, the foreign investor can diversify this risk while the local investor is the marginal investor and cannot. In this case, the market price of the asset will include compensation for political risk. This means that the intrinsic price (the price the foreign investor is willing to pay) will be greater than the extrinsic or market price. This represents a potential risk arbitrage buying opportunity. In this case, the valuation analysis should include the estimate of market value as well as intrinsic value. If you were to use a CAPM with the local market proxy or were to insert an ad-hoc increase to your domestic cost of capital, you might not pick up this buying opportunity because you would overestimate the riskiness of the investment and underprice the asset.

In scenario 3 the converse is true. The political risk will not be priced in the market, although it is an additional risk for which the international investor will require compensation. In this case the market price is greater than the foreign investor's intrinsic value; if the international investor used a local CAPM or the domestic cost of capital, he might wind up making a negative net present value investment—or it may lead to a potential risk arbitrage short-selling opportunity. Even if the international investor makes an ad-hoc increase to his global (or even the domestic) cost of capital, it may not be sufficient to compensate for the political risk! A word of caution, however: It is extremely difficult to conceive of a risk, political or otherwise, that the local investor will be able to diversify and that the international investor will have to bear. An international investor may be saddled with political risk in a market that insulates local investors, but that political risk won't affect the rest of the international investor's portfolio—which means it is probably diversifiable and should be accounted for in the cash flows.

This framework is also useful for demonstrating how changing the cost of capital by country can affect the use of EVA to evaluate business units in multiple markets. If the business units are homogeneous and operate in integrated markets, then their relative rankings will be accurate as long as the same cost of capital is used to evaluate each. In order for a business unit's cost of capital to be different from the global cost of capital, different risks must be priced; that is, you must be bearing risks in that market which you cannot diversify locally or internationally. For example, if you have a wholly owned

22. At this point we should make notice of a subtle difference between what we have written and what has been written by other authors such as René Stulz. Stulz argues that since markets are becoming increasingly global, the cost of capital is being determined globally not locally. As such, he would argue, the Global CAPM is the appropriate model for estimating expected returns. He then shows the conditions under which the valuator encounters cost of capital estimate errors by using the local CAPM. In this manner he shows an attractive way of summarizing "cost of capital mistakes." These cost of capital mistakes are in a sense equivalent to what we have termed "the same risks priced differently". In slight contrast, we state that if the local investor is the marginal investor and demands compensation for bearing a risk which the foreign investor can diversify but the local investor can not, that this leads to a potential "risk arbitrage opportunity" for the foreign investor because his cost of capital is lower. Stulz does not suggest, however, whether these "cost of capital errors" lead to different intrinsic values depending on where the potential investor is located. Presumably he leaves that for the reader to ponder. In our writings, we assume that these "cost of capital errors" may infiltrate local pricing and create the potential for intrinsic valuation differences depending on where the potential investor is located.

23. Unfortunately, we can offer few ideas as to what political risk may be non-diversifiable.

subsidiary in scenario 2, then you should still use the global cost of capital to measure the EVA of that business unit, because you or your investors can diversify away the additional risks in that market. If your local subsidiary were a joint venture, or you had listed a portion of its shares on a local exchange, then the cost of capital for the entire business unit would indeed be different, because the local investors bear additional, non-diversifiable risks. Your investment in the unit, however, would still be measured against the global cost of capital because it is still the best estimate of your opportunity cost for making that investment. In such a case, the non-local subsidiary or JV is would be punished by being subjected to unreasonable return expectations.

Similarly, if you are investing in a (segmented) market where you have the same risks, but they are differently priced, you still have to measure your investment against the global cost of capital, because it estimates the intrinsic value of the investment to you, which is what EVA is all about. You could reasonably use a different cost of capital for a unit that was in scenarios 3 or 4, which are examples of the existence of additional, non-diversifiable risk. But, as we have already mentioned, it is very difficult to conceive of a risk set that would result in either scenario. The bottom line is that the cost of capital you use to measure your business units should be estimated using an intrinsic value model.

Our examples have shown how country-specific risks, whether real or perceived, can lead to market segmentation and pricing differentials. As we have discussed, segmentation does not automatically mean higher risk. It could mean the same types of risk priced differently (higher or lower), or it could mean additional types of risk.[24] While it is tempting to adjust for these international market differentials by tweaking the discount rate, this only dilutes any analytical rigor that was put into the cash flow estimates in the first place. For example, if one is attempting to use the DCF analysis to search for evidence that would either confirm or cast doubt on other valuation estimates, allowing adjustments of the discount rate completely undermines the discipline of the method and provides no feedback on the reasonableness of the other valuation methodologies employed. It gives analysts greater flexibility to reject positive-NPV projects and accept negative-NPV projects.

The framework in Table 9 is useful for more than just political risk. Identifying the marginal investor in a foreign market will assist one in determining the level of segmentation of that market; then, for any additional factor put into the discount rate, one must explain why the marginal investor must be paid to bear that risk. If PPP holds and the foreign market is integrated with your home market, then the marginal investor faces the exact same risk factors you face at home. There would be no need to add any other factors to the discount rate. Conversely, if the foreign market is not well integrated into the world capital market, the same risk factors may be priced differently, or there may be some risk that is priced in the foreign market but not at home.

CONCLUSIONS

Most professionals seem to use a different cost-of-capital model when investing internationally than the one they use to evaluate domestic projects. They do so because their intuition tells them that the risks abroad are different in some way from the risks at home. Respondents to our survey demonstrated this propensity by making ad-hoc adjustments and adding risk factors to their models when investing abroad, suggesting that foreign markets have different *types* of risk, rather than simply different *levels*. We argue that, while partly segmented markets may in fact have some different types of risk, the primary driver of cost-of-capital differences is likely to be "risk-price differentials": the same risk priced differently.

How important are country-specific risks, anyway? By taking a sample of 50 pension fund portfolios and dividing the funds' assets two ways, by industry and by country, a 1988 study produced evidence that country factors are far less important as a component of risk contribution than are industry factors;[25] and other studies have reached the same conclusion. In other words, given PPP, finding a state-variable that varies across international rather than industry or other boundaries seems unlikely. This makes ad-hoc discount rate adjustments based on country risks even more difficult to justify.

24. In fact, Stulz points out that for the market as a whole, the local CAPM does not systematically under- or over-predict the appropriate cost of capital. However, he points out that local pricing more often than not yields the wrong cost of capital estimate for individual securities as a result of home country securities differing in the extent to which their return is correlated with the global market portfolio.

25. Hagigi (1988). Other authors have come to similar conclusions.

If one is attempting to use the DCF analysis to search for evidence that would either confirm or cast doubt on other valuation estimates, allowing adjustments of the discount rate completely undermines the discipline of the method and provides no feedback on the reasonableness of the other valuation methodologies employed.

Explaining why a factor is a state-variable is not the only problem. In most lesser developed markets, there is a real lack of reliable historical data to use in estimating factor "loadings." Assuming that one finds a proxy for an arguably non-diversifiable risk factor, you would then have to compile at least 25-40 years of market data to get only a somewhat reliable estimate of the importance of that factor. Although such data are becoming more available for more markets, the pace of market integration is such that by the time enough data have been compiled, that market will likely have become integrated (or changed in some other fundamental way) such that the risk-factor would no longer be priced. Thus, both factor loadings and market premia may change over time.[26]

Our survey results offer many questions and few answers. We have attempted to address a few of these questions. Specifically, our discussion of the reasons for using DCF analysis are in some respects a step back to the basics. However, going back to basics often provides a partial if not a complete remedy for many ills. It seems that getting back to the basics when considering an international investment is an appropriate prescription for a significant portion of our survey respondents. We suspect this recipe would be advisable to many others outside our sample as well.

The answers we offer are straightforward. Since capital markets are increasingly integrated, asset pricing models that incorporate market proxies, such as the CAPM, need to use a global market proxy in any integrated capital market. Additionally, there are markets that you may think of as segmented (such as Mexico) which are arguably integrated. Thus, for any segmented market, you must be able to explain why that market has a different price of risk: either the same risks are priced differently, or additional risks are priced. The framework in Table 9 can be used as an aid in setting out the logic that leads to either of these determinations. Once satisfied that a market is segmented, the appropriate asset pricing model will suggest itself, depending on what kind of value is being estimated. For an estimate of intrinsic value, it is probably still best to use an asset pricing model that incorporates a global market proxy. For an estimate of extrinsic value, we recommend use of a local market proxy.

26. There is plenty of evidence to suggest time variation in factor loadings is a significant issue in the US much less overseas. See Fama and French (1994) and Harvey (1991).

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