

Valuation in Emerging Markets: A Simulation Approach

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Valuation is at the center of finance theory. Many corporate decisions involve the valuation of financial and real assets, and large amounts of money are exchanged every day based on the resulting estimates of value. But even if we feel we have a good understanding of how to value assets in the developed world, it is often difficult to use standard valuation techniques in emerging markets, where many of the assumptions underlying valuation theory fail to apply. For example, emerging markets (henceforth EMs) differ from developed ones in terms of transparency, liquidity, governance, transaction costs and volatility, just to mention a few examples. But perhaps the most important difference in the case of EMs is the material probability of crisis events. During the 1990s, EMs around the globe (including Russia and those in Southeast Asia and Latin America) experienced different types of crises that triggered severe problems in the local economies. Capital markets, banks, and all kinds of business activities were seriously disrupted, affecting not only the underlying operating performance and value of local firms but, almost as important, the perception of both local and global investors. Valuation methods for emerging markets must be adjusted to reflect this reality; we cannot directly export valuation techniques that have been found to work reasonably well in the developed world and apply them without modification to EMs. Recognizing the limits of the standard approach, several academics (and practitioners) have addressed the difficulties for the valuation of real assets located in EMs, but no satisfactory solution has yet been found.² Most of the proposed attempts have followed similar paths, suggesting alternative adjustments to the discount rate designed to accommodate the special features of EMs. The rationale for these approaches depends partly on the inability to use local market data to obtain a direct estimate of the discount rate (in an attempt to capture the added risks of EMs), and partly on the lack of empirical support for the assumption of integrated markets (in which case one could directly accept the estimation based on global market data). In our view, however, the problem runs deeper than that, and the solution requires a departure from the proposed approaches—approaches that, as suggest below, effectively compromise the underlying assumptions of traditional valuation models. We identify two main shortcomings of current practice: First, the discounted cash flow (DCF) technique is based on the idea of discounting unconditional expected cash flows at a discount rate that reflects risk that is symmetric (or two-way) and cannot be hedged by holding a globally diversified portfolio—that is, global market- or economywide risk. The problem, however, is that to estimate expected cash flows that are truly unconditional, we need to consider all possible scenarios, including potential countrywide crises and the associated costs of corporate financial distress. In the developed world, the possibility of crises are generally not factored into the analysis; but given their small probability in the past (though recent events might suggest the need for a rethinking), the overestimation of value that results from ignoring the possibility of such events is generally quite small. In other words, truly unconditional expected cash flows are generally close to those actually used in valuations for developed economies. But in the case of EMs, where the probability of crisis is typically significant, the valuation errors from using expected cash flows that do not reflect crisis

scenarios—thus making them conditional expected cash flows—are likely to be substantial.³ To account for the fact that we are estimating expected cash flows that ignore the costs of default typically associated with crises, most analysts estimate discount rates that combine global data—typically computed using the global Capital Asset Pricing Model (CAPM)—with a given measure of country risk.⁴ The most popular proxy for country risk is the spread between EMs and U.S. sovereign bonds returns, which provides a unique measure that is typically added to the discount rate and used in the valuation of all potential targets within a particular country. The fundamentals behind this estimate, however, are far from what analysts really need to account for the expected impact of EMs risks on a particular business. This paper proposes going back to basics and estimating unconditional expected cash flows, which would be suitable for discounting using standard Global CAPM rates. There are two main advantages in this approach. First is that it involves the correct use of unconditional expected cash flows. To the extent that the expected effects of economy-wide crises—particularly the expected (non-symmetrical) costs of a country-wide financial distress—are not fully and reliably captured by higher levels of volatility alone, such effects can be more efficiently taken into consideration by estimating truly expected cash flows instead of incorporating “non-symmetrical” components into the discount rate. Second, the suggested procedure allows for a richer consideration of the different expected effects of country risk on different businesses. In these pages we propose accomplishing this task through the use of Montecarlo simulation techniques—techniques that are increasingly being adopted in corporate risk management applications of all kinds. To be sure, this approach will not solve all the challenges faced by practitioners trying to value real assets in EMs. For example, it does not address the limitation resulting from the basic CAPM assumption that corporate expected returns depend only on their corresponding market risk— an assumption that is likely to be especially controversial in EMs. Moreover, our method preserves the assumption—also questionable for EMs companies—that the measure of market risk can be directly based on the estimates for comparable firms in the developed world. But having acknowledged these limitations, we think that our suggestions represent an important step advance over current practice, and a better way of using standard CAPM for corporate valuation in EMs. Last, but not least, we would like to highlight a very interesting by-product that arises from the application of simulation techniques, one that goes beyond the possibility of estimating truly unconditional expected cash flows. The use of simulation is likely to change completely the outcome of the valuation approach, since what is obtained is not just one single valuation, but rather a complete distribution of net present values (NPVs). This, in turn, allows for a much richer analysis and decision criteria than what can be done by directly following the simple NPV decision rule.

The Estimation of the Cost of Capital: The Current Approach Corporate valuation requires the estimation of an appropriate discount rate in order to get the present value of future expected cash flows. Depending on the chosen valuation technique, one may need to compute the weighted average cost of capital (WACC), the unlevered cost of equity (K_{eu}), or the levered cost of equity (K_e). Nevertheless, the problem appears always at the same stage: the estimation of the expected return on equity, K_e , which is the basic ingredient of the WACC and the typical starting point for the estimation of K_{eu} . The CAPM suggests estimating the cost of equity capital using the following equation:⁵

$$K_e = R_f + \beta \times MRP \quad (1)$$

where R_f is the risk-free rate, β is the CAPM measure of systematic risk, and MRP is the market risk premium. To apply this formula, we need to decide how to estimate the corresponding

parameters. This task, which can be challenging in developed economies, is even more complicated when dealing with firms located in EMs. The first decision is whether to use local market (EM) or Global Market (GM) information. To estimate the cost of capital using EMs data, we need to prove that EMs information is not only available, but dependable. This would require that local capital markets be representative of the corresponding economy (hosting a broad range of sectors with high capitalization ratios), exhibit significant trading volumes and market liquidity, and have prices and returns that are established under something approximating free-market conditions. But, of course, this is not the case in many emerging economies. And in such cases, basing the cost-of-capital estimation process on local market data will generally be inappropriate. On the other hand, if we estimate the cost of capital in EMs by relying solely on GM data, to verify the relevance of such data we should carefully evaluate the extent of market integration. If the EM is reasonably integrated with developed economies—that is, in cases where global arbitrage opportunities are limited and expected returns are roughly equivalent across all markets—it would make sense to take GM data and apply them directly to the context of EMs. Yet, even though the globalization of finance is bringing markets closer to one another, the integration of emerging with developed markets is far from accomplished. The intermediate situation, wherein one finds evidence of market segmentation and deficiencies in EMs data, has led to the widespread practice of establishing the cost of capital using GM data, but with adjustments for additional sources of risk that are typically associated with emerging economies.

Suggested Adjustments to the CAPM: A Critical View As we mentioned, a large group of researchers has been working on this topic and, as a result, some have suggested different adjustments to what would be a simple application of GM data to the Global CAPM framework. Since the only source of risk contemplated within the original CAPM structure is non-diversifiable (market) risk, researchers and analysts have recognized that the direct use of such a method would leave EM investors concerned about their exposures to other sources of risk characteristic of emerging markets. With the aim of incorporating this additional source of risk, most current EM Corporate Finance practices have focused on a Country Risk measure (henceforth, CR) as attempting to capture the impact of several EM conditions (such as expropriation by local governments, unstable rule of law, and lack of transparency) on the value of business activities, and on expected returns from investment. The most popular proxy for CR has been the sovereign bond spread—that is, the spread between sovereign bonds issued by the EM government and, say, the U.S. treasury. Therefore, even though most studies have suggested a variety of different amendments to the CAPM systematic risk estimate (i.e., beta),⁶ most practitioners tend to add a CR measure to the Global CAPM formulation as follows:

$$K_e = R_f + \beta_{ind_us} \times MRP + CR \quad (2)$$

where R_f is the U.S. risk-free rate, β_{ind_us} is the beta, computed for a comparable firm or industry in the United States, MRP is the U.S. market risk premium and CR is a measure of country risk, generally calculated as the spread of sovereign bonds. Is there any problem with this approach? Analysts can easily adjust the Global CAPM formula and obtain an expression that incorporates the CR of an emerging market. The problem, however, is that there are some costs, or blind spots, associated with this popular practice. Let's examine the issue more closely. What is actually being assumed when applying this formula? Or, more generally, what are the implicit assumptions behind the use of each of these models?⁷ As we noted earlier, discounted cash flow (DCF) techniques for valuing companies or equity holdings are meant to be applied to unconditional expected cash flows and to use discount rates that properly account for the

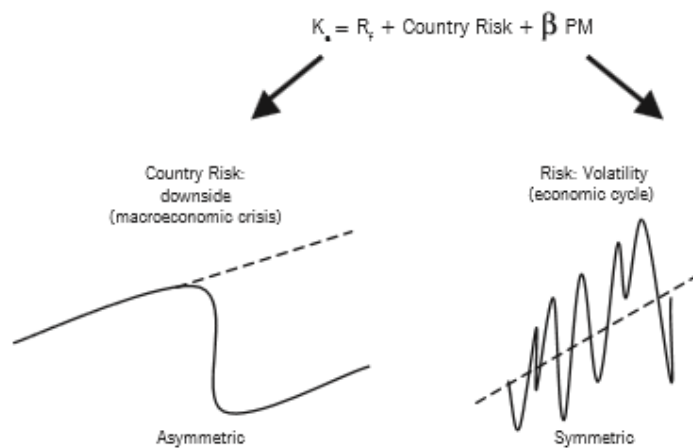
corresponding risk associated with those cash flows. Using the CAPM framework and assuming perpetual cash flows, this can be summarized as follows:

$$\text{Value} = \frac{\text{ExpectedCashFlow}}{R_f + \beta \times \text{MRP}} \quad (3)$$

This is the standard practice when valuing companies in developed markets.⁸ But, in the context of emerging economies, this approach is no longer relevant because the calculation of the cash flows fails to account for the probable impact of an economy-wide crisis. Such an impact cannot be captured by increasing expected volatility, but only by reducing the expected cash flows to reflect the costs of financial distress that are expected to accompany a crisis.⁹ And for this reason, the standard practice of raising discount rates to capture the country risk of EMs violates the theoretical framework. It implies replacing Equation (3) by the following procedure:

$$\text{Value} = \frac{\text{ExpectedCash Flow} | \text{No CrisisEvents}}{R_f + \beta \times \text{MRP} + \text{CR}} \quad (4)$$

That is, instead of discounting an unconditional expected cash flow using a discount rate that accounts for the (nondiversifiable, symmetric) volatility, common practice in EMs is to discount what are really conditional expected cash flows—cash flows that are expected under only the noncrisis scenario. Because conditional expected cash flows do not account for the material probability of an EM crisis (and associated costs), a new component—usually a measure of CR, computed as a spread—is added to the discount rate, thus altering the foundations of the CAPM. Another potential problem with this procedure is that introducing a measure of CR effectively assumes that the impact of that factor—at least to start with—is the same for all businesses, regardless of differences in degree of connectedness to foreign markets, exposure to commodity prices, and the extent of regulation. The clear reality is that an EM company's exposure to specific risk factors is likely to vary considerably between, for example, firms whose trading activity is directed exclusively toward the domestic economy and those selling a large share to international markets. But before presenting an alternative procedure, let's start by summarizing the important differences between investments in developed economies and those in EMs that call for a different approach. First, as already noted, investors contemplating projects in emerging markets perceive higher risks than those associated with a comparable opportunity in the developed world. On top of the standard volatility risk, they face the potential impact of political, legal, social and economic issues that tend to arise in EMs. Second, because of these additional risks, analysts cannot directly apply the same methods and estimations used in developed countries. To adapt those methods to an EM setting, the most common



practice is to add a new factor to the discount rate that is assumed to capture the exposure to CR. Third, all methods that introduce this extra component tend to oversimplify the problem, assuming that the impact of country risk will be (1) the same for all industries or companies within a given economy and (2) represented accurately by the sovereign bond spread. In what follows, we suggest a novel approach that attempts to deal with all these limitations of the standard approach.

The Country Risk Adjustment The traditional DCF method, as stated earlier, values equity by discounting expected cash flows with a discount rate that takes into account the associated risk. In the context of the widely used CAPM, the discount rate includes only non diversifiable market risk, which is understood to be symmetric (and, more specifically, normally distributed). The volatility risk signifies that cash flows are likely to be higher or lower than projected values, and it is assumed to reflect the sensitivity of a company's profitability and value to broad market movements. This kind of risk is present in all markets, whether developed or not. Country risk, on the other hand, is asymmetric, or one-sided, since it reflects potential cash flow shortages attributable to economic, politic, social or legal problems that often arise in emerging economies. And because of the one-sided, firm-specific nature of country risk, the attempt to capture its effects in the discount rate amounts to an oversimplification of the problem. As summarized in Figure 1, this approach violates the foundations of the basic model by (1) combining components of different nature (symmetrical and non-symmetrical) into the discount rate and (2) estimating