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S. M. Schaefer

Asset Pricing: Emerging Markets

Asset pricing theory is a framework designed to identify and measure risk as well as assign rewards for risk bearing. This theory helps us understand why the expected return on a short-term government bond is a lot less than the expected return on a stock. Similarly, it helps us understand why two different stocks have different expected returns. The theory also helps us understand why expected returns change through time. The asset pricing framework usually begins with a number of premises such as: investors like higher rather than lower expected returns, investors dislike risk, and investors hold well-diversified portfolios.

These insights help us assess the 'fair' rate of return for a particular asset. Such information is critical for the investment decision facing both corporations evaluating projects, and investors forming portfolios. In the corporate setting, the theory helps us characterize the risk of a particular project or acquisition, and assign a discount rate that reflects the risk. In choosing projects that have a higher promised rate of return than what would be assumed by the risk theory, corporations create value. In the portfolio investment setting, the theory helps us identify overvalued and undervalued assets. The theory is also integral to establishing a framework to help the investor understand the risk to be faced with a particular portfolio.

The foundation work in asset pricing originated with Nobel Laureate William Sharpe (1964) and the late John Lintner (1965). While there have been many advances in asset pricing since 1964, to understand the issues that we face with asset pricing in emerging markets, it is useful to follow the framework of the first asset pricing theory, the Capital Asset Pricing Model (CAPM) of Sharpe and Lintner. The key to understanding the complexities of emerging market asset pricing lies with the assumptions of the asset pricing theory.

The CAPM suggests that investors hold well-diversified portfolios. Investors like higher expected returns and dislike variance. This is the framework pioneered by Nobel Laureate Harry Markowitz (1959).

There is an important implication of the notion of well-diversified portfolios. The risk of the well-diversified portfolio is its variance—and the risk of a particular asset is not its own variance. The logic works as follows; you care about the variance of the portfolio—not of individual assets. A particular asset might have greater or lower variance than the portfolio. However, it does not make any sense to reward the asset based on its own variance. Correlation is the missing ingredient. It is possible that a very high variance asset can reduce the overall portfolio variance because it has low or negative correlation with the portfolio returns. Indeed, one can think of this high volatility asset with low correlation as providing insurance or hedging for the overall portfolio.

Let's follow this example further. Investor's don't like variance in their portfolio returns. The particular asset with high variance and low correlation is not judged on its own variance. It is judged on how it contributes to the variance of the well-diversified portfolio. In the example, it reduces the variance of the portfolio. As a result, this asset is valuable (investors like variance reducing assets) and the expected return is low as a result. In other words, because investors value the variance reducing properties of this asset in the context of their portfolio, the price is bid up to the point that the future expected returns are low.

So, to be clear here, it is possible that a high volatility asset has a low expected return and it is also possible that the high volatility asset has a high-expected return. It is not the variance of the asset that matters—it is the contribution to the variance of the portfolio. This contribution is the covariance.

The model of Sharpe (1964) and Lintner (1965) formalize this. Expected returns on assets are different

because the assets have different covariances with a well-diversified portfolio. The model also includes a reward for covariance risk. That is, in order to translate the covariance into expected return, we need the price of covariance risk—how this risk is treated in the marketplace.

There are numerous ways to derive the CAPM and we will not go into the different ways in this article. However, some of the most important assumptions are: investors only care about mean and variance; asset returns are multivariate normally distributed (or equivalent assumptions on investor utility could be made to replace this assumption); capital markets are perfect (all information is correctly reflected in prices as in Fama (1970); there are no transaction costs, no taxes, etc.); and there are no disagreements about the returns distributions. All of these assumptions are counterfactual. However, they provide a framework to derive a simple model that has rich implications.

One serious problem in applying this model to international finance is the assumption of perfect capital markets. In an international setting, this assumption also means that markets are perfectly integrated. This means the following: the same risk asset commands the same expected return regardless of location (country). A sufficient condition for this to work is that there are no effective barriers to portfolio investment across borders. That is, local investors are free to add any stock in the world to their portfolio and international investors are free to choose any stock within a particular country.

With capital market integration, we get a world version of the Capital Asset Pricing Model. That is, assets within a particular country are rewarded in terms of their contribution to a well-diversified world portfolio. What matters is the covariance with the world portfolio. There is also a world price of covariance risk that translates the contribution into expected returns. The world price is directly linked to the weighted average risk aversion in the world. Higher risk aversion implies a higher world price of covariance risk.

The world CAPM is a powerful model and has met with some success in being applied to developed market returns (see Harvey 1991). However, the same model fails when applied to emerging market returns (see Harvey 1995). There are many reasons why the model fails in emerging markets—but a leading and logical candidate is the lack of market integration in some emerging markets.

To understand the impact of market integration, consider a completely segmented (non-integrated) country. In this country, local investors are not allowed to own foreign securities. Foreign investors are not allowed to own local securities.

If the CAPM is held in this segmented country, then the relevant risk that investors face is the asset's contribution to variance of a diversified portfolio within the particular country—not the world. The risk that investors face is the variance of the country portfolio.

Let us make the distinction clear. In the integrated world, a country portfolio's risk is its covariance with world returns. This covariance is rewarded with a common world price, which is linked to weighted average risk aversion in the world. In the segmented world, a country portfolio's risk is it variance. The variance is rewarded with a country specific price, which is linked to a weighted average risk aversion within the particular country. These scenarios, integrated/segmented, are polar extremes. Early capital markets research on emerging markets recognized the importance of market integration and realized that it was likely that many markets were not completely integrated into world capital markets but they were not completely segmented either. For example, Errunza and Losq (1985) proposed a model of partial integration. Roughly speaking, one could think of expected returns in a partially segmented emerging market as reflecting some reward for the covariance with world returns as well as some reward for the market's own variance. One gets a hybrid CAPM that includes both variance as well as covariance with the world.

Bekaert and Harvey (1995) critique the usual implementation of the partial integration/segmentation model. The traditional model assumes that the degree of integration/segmentation is fixed over time. However, this flies in the face of substantial liberalizations of equity markets in many emerging countries in the late 1980s. That is, the traditional framework does not handle the dynamics of capital market integration. Bekaert and Harvey (1995) present an alternative framework for the valuation of emerging market assets. This framework explicitly recognizes that the integration process is gradual. Bekaert and Harvey parameterize and estimate a model that allows for a time-varying market integration. In the polar case of market integration, their model reduces to the world capital asset pricing model. In the case of market segmentation, their model reduces to a local CAPM. In the partial integration world, the expected rate of return is a weighting of world covariance times world price of covariance risk and the local volatility and the reward for the local volatility. To make the model dynamic, this weighting changes through time. The model assumes that the weighting is a function of two variables that proxy for the openness of the market: the size of the trade sector and the capitalization of the local equity market.

What happens when an emerging market liberalizes and becomes more integrated into world capital markets? This is a growing area of research that sheds much light on asset pricing in emerging markets. We will first consider what the theory suggests and second we will consider the evidence.

As previously mentioned, in the segmented capital market, variance counts. In addition, the variance of

the country portfolio is high (because it is not a truly diversified portfolio in a world context). To make matters worse, many emerging markets do not have the breadth of industrial sectors that Developed Countries have. That is, the firms come from very few industries. Further, most of the local firms' prospects are tied to the local economy. As a result, the returns of these firms tend to move in the same direction on any given day. This is another reason why variance is so high in segmented markets. Expected returns are also high. The local investors do not want to bear this extreme volatility. However, local corporations need to raise funds for investment projects. In order to get local investors to purchase local equity, the price must be low (expected rewards must be high). A subsidiary, but important point is that local corporations decline to pursue a number of seemingly profitable capital projects because the cost of equity capital is so high. For example, a project might promise a 25 percent rate of return, which is extraordinary in the context of developed markets. However, this project might be rejected because the cost of equity capital is 30 percent.

Now consider the integration process. Suppose regulations are changed such that local investors can purchase stocks outside their country and foreigners are allowed into the local market.

The most important impact will come from foreigners. They will be attracted to the emerging market for two reasons. First, at current values, the prices are cheap and the expected returns are high compared to what could be earned in developed markets. Second, because of the different industrial compositions of emerging markets relative to developed markets, the correlation of these markets' returns with world returns is lower than the correlation of developed markets' returns with world returns. This second point is important. Even though the volatility of the individual emerging market is high, the correlations are low or negative, which implies that the addition of emerging markets to a well-diversified world portfolio could reduce portfolio volatility.

When the foreign investors pour money into the market to take advantage of the low correlation/high expected return opportunities, prices rise and expected returns decrease. So, one immediate implication of capital market liberalization is that expected returns should decrease. Remember that the expected returns started out from quite a high level. There is plenty of room for the expected returns to decrease.

Bekaert and Harvey (2000) and Henry (2000) document this phenomenon. Bekaert and Harvey propose a set of dates that reflect capital market liberalization. They find that the expected returns decrease after liberalizations.

There are powerful implications to the decrease in expected returns. An immediate implication is that the cost of equity capital decreases. For local firms, this means that the investment projects that in the past were rejected because of expensive equity financing—are now profitable. We would expect to see an increase in capital investment as a proportion to GDP with a decrease in the cost of capital. We would also expect to see high GDP growth.

The evidence in Bekaert et al. (2000) provides convincing evidence in favor of these implications. In a cross-country study of the determinants of GDP growth, Bekaert et al. find that liberalization of capital market leads to a 1.5 percent increase in real GDP growth.

There are other potential implications of capital market liberalization. Policy makers, in particular, are often concerned with the volatility of capital market returns. Is it the case that liberalization or the move to more integrated capital markets increases local equity volatility?

In the case of volatility, there are many possible theories. It might be that capital market integration brings new trading volume and many new analysts watching emerging market stocks thereby increasing the informational efficiency. As a result, these stocks react faster to relevant information and we may see a natural increase in volatility. Volatility might also increase as so-called 'hot' foreign portfolio investment is withdrawn from a particular country on the hint of economic/financial/political unrest. Volatility may also increase as local firms specialize their product line to focus on the goods that they have a demonstrable competitive advantage in producing.

There are reasons for volatility to decrease too. Financial integration is often accompanied or preceded by economic integration. As firms trade their goods and services in world markets, they become less susceptible to shocks or economic fluctuations from the local economy. That is, world trade provides a natural economic hedge. Less sensitivity to the local economy can reasonably be translated into lower volatility of equity returns.

The evidence presented in Bekaert and Harvey (1997, 2000) suggests that there is no significant impact on volatility. Market integration sometimes leads to higher volatility and sometimes leads to lower volatility—it depends on the country. This ambiguous result is consistent with the different theories of volatility.

What about correlation with world returns? Historically, many researchers have looked at increases in correlation as evidence of capital market integration. However, this approach is potentially flawed. Two countries may be completely integrated and, at the same time, their equity returns are uncorrelated. The low correlation could simply reflect the different industrial mixes in the two countries.

The argument articulated in the previous paragraph that local companies might find more of their business in world product markets, is a powerful reason why correlations may increase. In an integrated world, the same type of world shocks that companies in developed markets experience will influence local com-

panies. For example, if the US falls into recession, this is bad news for many stocks in Developed Countries because the US is a major consumer of their goods. While segmented, the local economy may have been largely shielded from such fluctuations. However, as both the economic and financial integration processes are initiated, local companies could be very much affected by, for example, a US recession. Correlations should increase as a result.

The evidence in Bekaert and Harvey (2000) suggests that correlations increase after financial liberalizations. Note that one of the important reasons for foreign investors to enter these emerging markets and purchase securities is the low correlation. Importantly, the evidence in Bekaert and Harvey does not suggest that the diversification potential be eliminated. Even the new higher level of correlation provides substantial benefits to international diversification and is well below the threshold level set by developed markets.

For asset pricing theory, it is critical to know when and if an emerging market has effectively liberalized. Notice the use of the word 'effective.' Bekaert and Harvey (1995) argue that a country might be liberalized to the letter of the law but effectively segmented. That is, new laws might be passed that make it easier for foreigners to access the local capital markets—but it is possible that no foreigners bother to enter the market. This might happen if the liberalization was not credible—or if there was a threat of future policy makers reversing the liberalizations.

Conversely, it is possible, by the letter of the law that a country appears completely segmented but it effectively integrated Indeed, the growth of country closed-end funds as well as American Depository Receipts (ADRs) has made it possible for foreign investors to access local securities without directly purchasing the securities on the local market (where they might not be allowed to transact).

So, it is potentially problematic to judge the degree of integration by looking at particular regulations. The analysis in Bekaert and Harvey (2000) considers a number of different dating schemes: regulatory, introduction of first ADR, introduction of country fund, and a composite indicator of the first sign of liberalization (first date of regulatory, ADR, and country fund). Bekaert and Harvey also examine US portfolio flows. Indeed, if the market were truly open, then supporting evidence of integration would be a dramatic pickup in foreign portfolio flows to the emerging market.

The idea of portfolio flows as a proxy for market integration is analyzed in Bekaert et al. (2000a). Using the econometrics of break point analysis, they examine the interrelationship between capital flows and expected returns in emerging markets.

Indeed, it is possible that the market integration process fundamentally impacts a number of financial and economic variables. Bekaert et al. (2000b) presents the first multivariate tests that try to date the integration of world capital markets. The idea of this paper is to let the data speak for itself. They simultaneously examine a number of important aggregates and use endogenous break point analysis to reveal the common break point. They link this break point to capital market liberalization. For example, we expect to see a decrease in the cost of capital and an increase in foreign portfolio flows. The technology in this paper uses the information in many different economic aggregate series to come up with a composite break point.

The analysis in Bekaert and Harvey (2000) as well as Bekaert et al. (2000a, 2000b) suggests that many emerging markets have successfully liberalized their capital markets. There was a clustering of liberalizations in the late 1980s and early 1990s. This suggests that it is more likely that some version of the world capital asset pricing model holds more today than 10 years ago in 1990 for emerging markets. This is consistent with the results presented in Harvey (2000) who studies the ability of a world version of the CAPM to explain expected returns in 20 developed markets and 27 emerging markets.

There is one additional important issue. Traditional asset pricing theory operates in a world of mean and variance. The assumption of multivariate normality is often invoked. However, the evidence in Bekaert and Harvey (1997) strongly suggests that emerging market returns are highly non-normal. There is also evidence that the returns in many Developed Countries are non-normal. In addition, there is considerable discussion of the 'downside risks' of investing in emerging markets. That is, emerging markets are known to suffer from sharp crises. Two recent memories are the Mexican crisis of December 1994 and the Asian crisis of July 1997.

The analysis of downside can be handled within the traditional asset pricing frameworks. For example, Rubinstein (1973) and Kraus and Litzenberger (1976) developed an asset-pricing framework that explicitly considers the skewness of portfolio returns. Harvey and Siddique (2000) present tests of an asset-pricing model with a dynamic measure of skewness.

The logic of these models is much like that of the CAPM—indeed, it is a straightforward extension of the CAPM. Investors like expected returns, dislike variance, and dislike negative skewness (but like positive skewness). Investors' preference for positive skewness is evidenced by the unusually high price that they will pay for a lottery ticket (which has an expected return of –50 percent). We also see evidence in the options markets where 'put' options on the S and P indexes have very high prices. Investors are using these 'put' options to protect against extreme downside moves in the equity market. These options reduce negative skewness in an investor's portfolio. As a result, they are valuable (high price).

Like variance, it is not the skewness of the particular asset that matters—it is the contribution of that asset to the portfolio's skewness. This is called the coskew-

ness. If the coskewness is negative, it means that the asset is contributing negative skewness to the portfolio. In order to get people to purchase an asset with such an undesirable property, the price must be low (expected returns high). If the asset offers to increase the portfolio skewness (which is desirable), the price will be bid upwards (expected returns will be low).

Harvey and Siddique (2000) present tests of an asset-pricing model that incorporates skewness. They find some success in explaining the cross-section of US equity returns with this framework.

Harvey (2000) looks at a model with skewness for 47 international stock markets. His analysis is broken into three groups: Developed Countries, emerging markets, and all countries. He only considers data from 1988 which marks the beginning of an intense period of capital market reforms in emerging markets.

If markets were completely segmented, then what counts is the country's variance and total skewness. If markets are completely integrated, what counts is the covariance and coskewness. Harvey presents evidence that developed markets are not impacted by variance and total skewness, which is consistent with them being integrated. Evidence is also presented that covariance and coskewness also do a reasonable job in emerging markets—suggesting that many of these markets have successfully integrated into world capital markets. However, his evidence suggests that these emerging markets be not completely integrated. In some of his tests, both variance and total skewness provide an incremental ability to explain the cross-section of expected returns in emerging markets. The evidence suggests that it is unwise to assume that emerging markets are fully integrated into world capital markets.

There are a host of additional issues that we face in investing in emerging markets. Transaction costs (execution fees, bid-ask spread, and market impact) are higher than developed markets. Acute information asymmetries can exist (local investors may have better information than foreign investors may). Regulations, such as insider trading laws, may not exist or even if they exist, are not enforced. Many securities suffer from chronic infrequent trading making the price data unreliable. There is also the general issue as to how to handle foreign currency risk within asset pricing theory (see Dumas and Solnik 1995 as well as the early work of Solnik 1974 and Stulz 1981).

Each of these additional issues increases the probability that standard asset pricing models will fail when applied to emerging markets.

Finally, there is one overriding issue that impacts the study of asset pricing in emerging markets—as well as a more general study of asset pricing. It is not clear that the standard models are adequate to capture the complexities of security valuation in developed markets, let alone in emerging markets. Recently, in a number of studies of US equity returns, the traditional CAPM has come under attack. Indeed, most view the US market as one of the most efficient markets in the world, which would maximize the chance that the CAPM would work.

However, the international evidence is more generous to the traditional framework. It is paramount to explicitly allow for the role of capital market integration. After doing so, the traditional frameworks, perhaps augmented with measures of coskewness, are able to do a reasonable job in explaining the cross-section of expected returns.

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C. R. Harvey

Assimilation of Immigrants

Immigration is a transformative force, producing profound and unanticipated social changes in both sending and receiving societies, in intergroup relations within receiving societies, and among the immigrants themselves and their descendants. Immigration begets ethnicity—collectivities that perceive themselves and are perceived by others to differ in language, religion, race, national origin or ancestral homeland, cultural heritage, and memories of a shared historical past. Their modes of incorporation across generations may take a variety of forms—some leading to greater homogenization and cultural solidarity within the society (or within segments of the society), others to greater ethnic differentiation and heterogeneity. Assimilation is a multidimensional process of boundary reduction that blurs an ethnic or racial distinction and the social and cultural differences and identities associated with it. At its end point, formerly distinguishable ethnocultural groups become effectively blended into one. At the group level, assimilation may involve the absorption of one or more minority groups into the majority, or the merging of minority groups. At the individual level, assimilation denotes the cumulative changes that make individuals of one ethnic group more acculturated, integrated, and identified with the members of another. Ideologically, the term has been used to justify selective state-imposed policies aimed at the eradication of minority cultures. But in the social scientific study of immigration and intergroup relations, it remains an indispensable concept (Alba and Nee 1997, Yinger 1981).

1. Evolution of the Concept of Social Assimilation in American Social Science

A May 15, 1880, editorial in *The New York Times* reflected the popular usage of the concept on the eve of a new era of mass immigration:

> There is a limit to our powers of assimilation and when it is exceeded the country suffers from something very like indigestion … We know how stubbornly conservative of his dirt and ignorance is the average immigrant who settles in New York … these wretched beings change their abode, but not their habits in coming to New York.

But in Chicago a generation later, with immigration unabated and the large majority of the city's residents already consisting of first- and second-generation immigrants, Robert Park, the leading sociologist on the subject, could write (in Park and Burgess 1924, pp. 757–8):

> In America it has become proverbial that a Pole, Lithuanian, or Norwegian cannot be distinguished, in the second generation, from an American born of native parents … As a matter of fact, the ease and rapidity with which aliens, under existing conditions in the United States, have been able to assimilate themselves to the customs and manners of American life have enabled this country to swallow and digest every sort of normal human difference, except the purely external ones, like color of the skin.

What had become proverbial in America would become canonical in American sociology.

Ironically, Park is best known for the formulaic notion that assimilation is the final stage of a natural, progressive, inevitable and irreversible 'race relations cycle.' But in a prolific career, Park wrote about a 'race relations cycle' only twice: first in a sentence near the end of a 1926 article, 'Our racial frontier in the Pacific;' then a decade later (Park 1937) in a brief introduction to a book on interracial marriage in Hawaii written by one of his former students. In the first instance he was arguing against the likelihood that a 'racial barrier'—which the passage of exclusionary laws sought to establish by barring Asian migration to the USA—could be much of a match against global economic, political, and cultural forces that have brought about 'an existing interpenetration of peoples … so vast and irresistible that the resulting changes assume the character of a cosmic process' (Park 1926, p. 141). And in his 1937 introduction, he explicitly rebutted any notion of a predictable assimilative outcome to race conflict and change ('what are popularly referred to as race relations'), arguing instead that when stabilization is finally achieved, race relations would assume one of three configurations (Park 1937, p. xii):

> They will take the form of a caste system, as in India; they will terminate in complete assimilation, as in China; or the unassimilated race will constitute a permanent racial minority within the limits of a national state, as in the case of the Jews in Europe … All three types of change are involved … in what we may describe as the 'race relations cycle.

Park and Burgess gave the concept of assimilation its classic formulation: 'a process of interpenetration and fusion in which persons and groups acquire the memories, sentiments, and attitudes of other persons and groups, and, by sharing their experience and

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