Journal of Business and Economics, ISSN 2155-7950, USA
June 2013, Volume 4, No. 6, pp. 490-494

http://www.academicstar.us

Comparison of the Local and Global CAPM Estimates for Mexican Companies

Cuauhtemoc Villarreal Celestino
(Universidad de Monterrey, Mexico)

Abstract: Given that Mexican companies holding foreign currency debt are extremely exposed to the volatility in currency exchange rates, we ask if the required returns determined by the Local CAPM model and those determined by the Global CAPM model are significantly different. In our study, which was conducted between 2006 and 2010, we found the two models projected significantly different estimated capital costs. We tracked 19 companies that trade on the Mexican Stock Market and found that the average of the Local CAPM is 13.83% while that of the Global CAPM is 20.38%. Our discovery that the estimated cost of capital for the Mexican firms in the global capital market is significantly higher than in the local — reaching 1000basis points in some cases — suggests the need for further studies to investigate the statistical and economic significance of this difference.

Key words: finance; cost of capital; emerging markets
JEL Codes: G12, G15, G32

1. Introduction

A study by Bruner et al. (1998), found that 87% of the 27 best administered companies use the CAPM model to estimate capital cost. A further study by Graham and Harvey (2001) reported that 73% of the 392 companies that replied to their survey use the CAPM model to estimate capital cost. Thus the CAPM model appears to be widely employed by companies to estimate capital cost. Stulz (1995a, 1995b, 1999) has argued that the global market index should replace local market indexes in CAPM calculation for companies whose stock trade on global financial markets. As Stulz showed with the example of Nestlé, many companies will show different betas in relation to global markets than they show in relation to their local market, which will affect their estimates of capital cost. However, the Local CAPM projections in Stulz's analysis were based on the Swiss market index, so one can question whether his findings are relevant to a sample of Mexican stocks. The key question is whether average estimates made with Local and Global CAPM models are substantially significant in general.

The stock of a global company might be more closely correlated with a global market index than with the local capital market, while a company whose activities occur predominately in the local market should have a higher correlation with the local market index than with the global market index. Therefore, the estimated capital costs based on the Local and Global CAPM might be significantly different for individual companies even if the average difference across all companies is not. For this reason, we established the absolute average between the estimated capital cost of individual companies using the two models.

Cuauhtemoc Villarreal Celestino, Ph.D., Accounting and Finance Department, University of Monterrey; research areas: corporate finance, dividend policy, cost of capital. E-mail: cvillarreal@udem.edu.mx.

If, in our analysis, we find that the differences in the absolute average between the estimated capital cost in the Local and Global CAPM are small, we can accept that Stulz's argument might be theoretically correct, even if empirically insignificant. It is not our object to test the financial valuing models, nor to generate universally correct estimates of capital cost for the selected companies. Rather, we will try to establish whether the different CAPM models differ significantly in their results.

2. A Review of the Literature

The traditional CAPM model establishes that the cost of capital can be estimated based on the risk-free interest rate plus an adjustment for risk, which is equal to the Beta of the company multiplied by the market premium. This well know relation is shown in equation (1) for a local (or domestic) market.

$$E(Ri) = Rf\ L + \beta iL(E(RmL)-RfL) \quad (1)$$

E(Ri) is the expect return on the capital asset;

RfL is the local risk-free rate of interest;

RmL is the expected return of the local market;

BiL is the Beta of company (i) calculated in relation to the local market,

Stulz (1995a, b, 1999) argues that equation (1) applies to a local market index only if the stock of the company is traded in a closed financial market. The (E(Rm)-Rf) term is often called the market premium, which represents the advantage expected over the risk-free rate of return on the local index. Here RfL is the historical average of expected risk-free returns in the local country.

Risk-free rate of return, in the case on Mexico, is the interest rate on Federal Government Treasury Bonds (CETES). These bonds are sold by the Mexican government and offer an essentially risk-free interest rate.

Market rate of return (IPC) is the rate of returns expected of the local market. In the case of Mexico, we use the primary index of the Mexican Stock Market (the Índice de Precios y Cotizaciones or IPC) to set this rate. It show the returns and fluctuations in Mexican stocks by measuring the daily variations in the value of their capitalization. The IPC is calculated by measuring the price variations on a representative selection of the Mexican stocks (36) traded on the Mexican Stock Market (Bolsa Mexicana De Valores, 2012).

Beta (β) is the coefficient of sensitivity of a portfolio. It is used to measure systematic risk and thus reflects the sensibility of a company to market conditions (Price Water House Coopers, 2002).

Beta is calculated by using regression analysis against an index that represents market value. It is the covariance of the expected returns of the company and the expected returns on a representative portfolio. The covariance is then divided by the market variation (Damodaran, 1996).

The dependent variable is considered representative of the systematic market risk that cannot be eliminated through portfolio diversification (Páscale, 1999).

In CAPM models, Beta is multiply by the risk premium. The premium is earned by accepting the increased risk involved with investing in a company rather than government debt instruments (Price Water House Coopers, 2002).

Damodaran (1994) established that this premium is usually calculated from historical data and is defined as the difference between average market returns and rate risk-free return (2006).Therefore, if purchasing power parity (PPP) is maintained, Stulz's (1995 a, b, 1999) international stock valuation theory can be simplified to the global CAPM of a single factor, as represented in equation (2).

$$GCAPM = RfL + (RmG - RfL)*\beta Global \quad (2)$$

RfL is the expected return on government debt in the local country.

RmGis the expected return on a global market portfolio.

βGlobal, is the company's Beta measure against the global market index.

(RmG−RfL)is called the global risk premium, represented as the return in excess of the local risk-free rate.Here (RfL) is the historic average of the expected return in the local country.

This formula represents the cost of capital given the integration of local and global capital markets.

3. Methodology and Models

Our sample includes 19 Mexican companies that meet the primary requirement of the Global COPM model: they trade on global financial markets.

We have estimated the parameters of capital risk, in pesos, with the two CAPM models over a five year period based on monthly yield. Our data sample begins in January of 2006 and concludes in December of 2010. The information was obtained from various sources, including Bloomberg, the data base of the Mexican Central Bank. Mexican financial companies were excluded from the study because they must employ distinct methods for the presentation of financial information from non-financial companies.

The Índice de Precios y Cotizaciones (IPC) of the Mexican Stock Exchange is used as the nation (local) index. The Morgan Stanley Capital International (MSCI) World Index is used as the global index. The monthly yields in Mexican pesos where retrieved from www.mscidata.com. The yield on Mexican Government Bonds (CETES) is taken as an approximate risk-free rate of return. The monthly rate of bond returns are subtracted from the yield on the global index to establish the parameters of risk. The historical monthly rates of return on CETES was obtained from the Bank of Mexico.

Given that companies with greater exposure to debt in foreign currencies are more affected by the cost of global capital than by that of local capital, how seriously do currency exchange rates impacted the CAPM of Mexican companies? We attempt to identify any differences in the cost of capital for Mexican companies exposed to exchange rate fluctuations. The companies in our study that trade according to the ADR are shown on the following table:

Table 1 Mexican Companies that Trade According to the ADR System

Company	ADR	Exchange
Alfa, S.A.B. de C.V.	ALFFF.PK	OTC
América Móvil, S.A.B. de C.V.	AMOV	NYSE
Axtel, S.A.B. de C.V.	AXTLY	OTC
CEMEX, S.A.B. de C.V.	CX	NYSE
Coca-Cola FEMSA, S.A.B. de C.V.	KOF	NYSE
Gruma, S.A.B. de C.V.	GMK	NYSE
Grupo Bimbo, S.A.B. de C.V.	GRBMF.PK	OTC
Grupo Carso, S.A.B. de C.V.	GPOVY.PK	OTC
Grupo Famsa, S.A.B. de C.V.	GUFAF.PK	OTC
Grupo Industrial Saltillo, S.A.B. de C.V.	GISXY	OTC
Grupo México, S.A.B. de C.V.	GMBXF.PK	OTC
Grupo Modelo, S.A.B. de C.V.	GPMCY.PK	OTC
Grupo Televisa, S.A.B.	TV	NYSE
Mexichem, S.A.B. de C.V.	MXCHY.PK	OTC
Grupo Simec S.A.B. de C.V.	SIM	NYSE
Vitro, S.A.B. de C.V.	VITOF.PK	NYSE
Wal-Mart de México, S.A.B. de C.V.	WMMVY.PK	OTC

Source: author's compilation from data obtained from the Mexican Stock Market (Bolsa Mexicana de Valores) (2011).

The 28 day yield on CETES (6.39%) was used to calculate the risk-free rate for both CAPM models.

4. Conclusions

As opposed to Stulz (1995), who only used a single Swiss company, we analyzed a sample of 19 Mexican companies which trade on the MSCI WORLD INDEX. We have detailed the results we obtained applying the two models for each company, which makes our study unique.

The estimated capital cost using the Global CAPM model and the Local CAPM model differs, on average, by 655 basis points.

The interpretation of the economic significance of the difference in the estimated capital cost projected by the two models is the prerogative of those who use the models. However, or judgment is that the two models make substantially different estimates of capital cost, on average. Of course, these results were obtained on a specific date: May, 2011. Perhaps further estimates from other dates will show even greater differences.

References:

Adler M. and B. Dumas (1983). "International portfolio choice and corporation finance: A synthesis", *Journal of Finance*, June, pp. 925-984.

Bodnar G. and Wong F. (2000). "Estimating exchange rate exposures: Some 'weighty' issues", *Working Paper*, NBER.

Bruner R., Eades K., Harris R. and Higgins R. (1998). "Best practices in estimating the cost of capital: Survey and synthesis", *Financial Practice and Education*, Spring/Summer, pp. 13-28.

De Santis G. and Gérard B. (1998). "How big is the premium for currency risk?", *Journal of Financial Economics*, September, pp. 375-412.

Dumas B. (1994). "Partial vs. general equilibrium models of the international capital market", in: Frederick van der Ploeg (Ed.), *The Handbook of International Macroeconomics*, Basil Blackwell, London.

Dumas B. and Solnik B. (1995). "The world price of foreign exchange risk", *Journal of Finance*, June, pp. 445-479.

Elton E., Gruber M. and Mei J. (1994). "Cost of capital using arbitrage pricing theory: A case study of nine New York utilities", *Financial Markets, Institutions & Instruments*, August, pp. 46-73.

Fama E. and French K. (1997). "Industry costs of equity", *Journal of Financial Economics*, February, pp. 153-193.

Fama E. and French K. (2000). "The equity premium", Working Paper, CRSP/SSRN.

Ferson W. and Harvey C. (1999). "Economic, financial and fundamental global risk in and out of the EMU", *Working Paper*, NBER/SSRN.

Graham J. and Harvey C. (2001). "The theory and practice of corporate finance: Evidence from the field", *Journal of Financial Economics*, forthcoming.

Grauer F., Litzenberger R. and Stehle R. (1976). "Sharing rules and equilibrium in an international capital market under uncertainty", *Journal of Financial Economics*, June, pp. 233-256.

Harvey C. (1995). "Predictable risk and returns in emerging markets", *Review of Financial Studies*, Fall, pp. 773-816.

Koedijk K., Kool C., Schotman P., Van Dijk M. and Nissen F. (1999). "The cost of capital in international financial markets: Local versus global beta", *Working Paper*, SSRN.

Korajczyk R. and Viallet C. (1989). "An empirical investigation of international asset pricing", *Review of Financial Studies*, No. 4, pp. 553-585.

O'Brien T. (1999a). "The US dollar global CAPM and a firm's cost of capital in different currencies", *Working Paper*, SSRN.

O'Brien T. (999b). "The global CAPM and a firm's cost of capital in different currencies", *Journal of Applied Corporate Finance*, Fall, pp. 73-79.

O'Brien T. and Dolde W. (2000). "A currency index global capital asset pricing model", *European Financial Management*, March, pp. 7-18.

Ross S. and Walsh M. (1983). "A simple approach to the pricing of risky assets with uncertain exchange rates", in: R. Hawkins et al. (Eds.), *Research in International Business and Finance*, 3 (JAI Press, Greenwich, CT), pp. 39-54.

Sercu P. (1980). "A generalization of the international asset pricing model", *Working Paper*, Katholieke Universiteit Leuven.

Solnik B. (1997). "The world price of foreign exchange risk: Some synthetic comments", *European Financial Management*, March, pp. 9-22.

Solnik B. (1974). "An equilibrium model of the international capital market", *Journal of Economic Theory*, August, pp. 500-524.

Stulz R. (1995a). "The cost of capital in internationally integrated markets: The case of Nestlé", *European Financial Management*, No. 1, March, pp. 11-22.

Stulz R. (1995b). "Globalization of capital markets and the cost of capital: The case of Nestlé", *Journal of Applied Corporate Finance*, Fall, pp. 30-38.

Stulz R. (1999). "Globalization, corporate finance, and the cost of capital", *Journal of Applied Corporate Finance*, Fall, pp. 8-25.