

## DATABASES FOR LARGE LATIN AMERICAN COMPANIES\*

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Several databases now provide information on large-scale companies in Latin America. This information is being made available on a commercial basis to clients (mainly financial institutions interested in emerging markets in Latin America). The information is also available to academics, however, and promises to be a rich source that thus far has been undervalued by Latin Americanists. This research note will explore the possibilities generated by one database, *Economática* in São Paulo.<sup>1</sup>

The database in question covers some seven hundred companies in five Latin American countries (Argentina, Brazil, Chile, Mexico, and Peru). It contains a variety of data produced on a regular basis, and company balance sheets are updated every three months. Every week clients receive a diskette containing the latest information, which can be added to the database. In addition to providing information on company assets, liabilities, income, and profits, this source contains a wealth of data for each country on stock-market performance, exchange rates, interest rates, and other indicators.

Despite these advantages, *Economática* suffers from a number of limitations. The information related to a particular company is almost exclusively financial and does not cover such variables as employment, wages, and the structure of inputs. In addition, although the database ostensibly starts with 1980, the time series for many companies covers only the last few years.

A further limitation of the database is that aggregation cannot be carried out within the software employed. Only by exporting individual company data to a spreadsheet such as Lotus 1-2-3 or Excel is it possible to aggregate the data by companies across sectors or countries.

\*The authors gratefully acknowledge the assistance of *Economática* in making the database available and the help of the Social Science Research Council in providing funds for research assistance.

1. *Economática* is a firm based in São Paulo that has offices in New York.

Our extensive study of the database has made it possible to identify a number of uses to which this body of information can be put. They are all intended to test several hypotheses in financial economics. Thus the database is of interest primarily to those studying financial economics in relation to Latin America. It is not particularly helpful for economists interested in the real economy as opposed to the financial economy.

*Complementarity or Substitution between Equity Markets and Banking Systems<sup>2</sup>*

It is possible to investigate the impact of emerging stock markets on the financing patterns of Latin American corporations. One can test whether equity markets and banking systems (the main providers of debt financing in developing countries) are complements or substitutes in providing financing to corporations. This type of research requires making a cross-country study and analyzing the capital structures of firms in different stages of stock-market development. In the case of complementarity between equity and debt financing, the more developed the stock market, the higher the leverage; with substitution, the more developed the stock market, the lower the leverage.

Complementarity can be explained as follows. Assuming that borrowers prefer to diversify their financial sources, firms would choose first to diversify their risk by increasing their equity but afterward would increase their borrowing. Moreover, the superior quality of financial statements required by stock-market regulations would increase their debt capacity with the banks. But one may also expect substitution between equity finance and debt. A more developed stock market decreases the cost of equity, allowing corporations to switch from debt to equity financing.

Institutions such as the World Bank and particularly the International Finance Corporation are supporting emerging stock markets in Latin America. It is important, therefore, to investigate the complementarity-substitution relation between stock markets and banking systems because of their impact on the financing patterns of corporations. Also, one must consider possible government support for these emerging stock markets, as has been traditional with the banking system in providing rediscount facilities, "salvaging" ailing banks, and providing deposit insurance.

One way to tackle this problem is to take a sample of the top fifty

2. See Asli Demirguc-Kunt, *Developing-Country Capital Structures and Emerging Stock Markets*, IBRD Working Staff Paper no. 933 (Washington, D.C.: International Bank for Reconstruction and Development, 1993); and P. C. Kumar and George Tsetsekos, "Securities Market Development and Economic Growth," in *Business Finance in Less Developed Capital Markets*, edited by Klaus Fischer and George J. Papaioannu, 59–69 (Westport, Conn: Greenwood Press, 1992).

or so companies quoted on the stock market of each country. The variable under study would be the capital structure of the firms (the ratio of long-term debt to equity). Turnover ratio may be a good proxy for ranking stock markets because usually the greater the exchange activity, the more developed the stock market. If information is available for a sufficient number of years, a time-series study can be performed to investigate the behavior of the firms as the stock markets develop.

### *The Determinants of a Firm's Capital Structure*<sup>3</sup>

One may also try to discover the determinants of a firm's capital-structure, assuming that decisions on capital structure cannot be detached from the corporate environment. The dependent variable is again financial leverage (short-term or long-term debt at book or market value). The independent variables may be some of the following:

*Collateral assets* / These tangible assets that creditors require as security for a loan reduce the cost of borrowing by avoiding generous discounts or high interest repayments as a prerequisite for making the loan. Hence a positive relation between leverage and collateral assets is expected.

*Non-debt tax deductions (shields)* / These mechanisms reduce the use of debt. The amount of these non-debt tax shields differs across firms, resulting in a uniquely optimal capital structure for each firm.

*Firm size* / Two possibilities exist: either large firms hold less debt due to lower transaction costs in issuing new equity, or they hold more debt due to the lower credit risk and less costly larger loans in comparison with small firms.

*Profitability* / On this subject, there are also competing hypotheses about the relationship between debt and profitability. It may be positive if debt is required for investments that yield high profits in the future. The relationship may also be negative if profitable firms prefer to use their internal finances before raising debt or equity.

*Growth opportunities* / If growth opportunities are considered as intangible and not as assets that can be exchanged for collateral, a negative relationship between debt and growth opportunities is probable.

*The firm's uniqueness* / Firms in highly specialized industries suffer greater

3. See Carl Chiarella, Toan M. Pham, Ah Boon Sim, and Madeleine M. L. Tan, "Determinants of Corporate Capital-Markets Structure: Australian Evidence," in *Pacific-Basin Capital Markets Research*, edited by S. G. Rhee and R. P. Chang, 139–58 (Amsterdam: North Holland, 1992).

losses in terms of bankruptcy in comparison with more diversified firms. The workers, for instance, are often specialists in their particular field and are less employable in the event of retrenchment. Hence these firms try to minimize their debt and to maintain a low-risk profile.

*Management's stake in the firm* / In this kind of managerial compensation scheme, the manager has a greater incentive to ensure the viability of a company and may contribute to minimize the firm's debt.

As a rule, in this kind of research, it is important to remember that inter-industry differences in capital structures make the results less generalizable.

#### *Interaction among International Stock Markets<sup>4</sup>*

One of the main benefits of international investment is the gain in diversification achieved by including foreign stocks in a portfolio. These benefits, however, may be reduced by the interaction among international stock markets. In particular, movements in a specific market may cause spillover effects in other markets.

One way to evaluate the benefits from investing in Latin American markets is to investigate the daily returns in these markets and to test their correlations with the returns of the Standard and Poor 500 Index. Their absence from that index would mean gains from diversifying into these markets. A vector-autoregression (VAR) analysis may be performed that will trace the dynamic responses of one economic variable to another in terms of the size of the stock market and also the time required for the response to take place fully.

There are other ways to gauge the interaction between stock markets. For instance, strong seasonal effects have been documented in the U.S. stock market, especially the large returns in the first five trading days in January. One can then test how integrated the Latin American stock markets are depending on how pronounced is the January effect. In this exercise, analysis of variance (ANOVA) may be used to compare mean returns of different months and thereby identify statistically whether certain months have higher returns.

#### *Impact of a Political or Economic Event in the Stock Markets<sup>5</sup>*

One can isolate an event (such as political negotiations or trade

4. The first part is based on Yih Jeng, Chan-Wung Kim, and Wan M. H. Wan-Sulaiman, "International Transmission of Stock Market Movements and Korea and Taiwan Fund Prices," in Rhee and Chang, *Pacific-Basic Research*, 209–23. The second is Young G. Kim, Kee H. Chung, and Chong S. Pyun, "Size, Price-Earnings, and Seasonal Anomalies in the Korean Stock Market," in the same collection, 303–14.

5. See Gili Yen and Philip Chang, "Reactions of the Taiwanese Stock Market to Trade Talks with the United States," in Fischer and Papaioannou, *Business Finance*, 111–20.

talks) and investigate the behavior of prices in the vicinity of that event. Reaction in the market may be concentrated either on the very day that the “good,” “bad,” or “indeterminate” news arrives, or one day following it, or perhaps even be spread across a period of several days for a full adjustment.

This test requires a formula to calculate the rate of change in the stock-price index. The hypothesis is that the probability of the index going up with good news and down with bad news is greater than 0.5.

*Creation of a Stable and Efficient Stock Market and the Impact of Macroeconomic Shocks*<sup>6</sup>

In the literature on financial economics, several measures have been proposed to provide a stable and efficient stock market.

*Price limits* / It may be argued that price limits result in lower market volatility by allowing investors to gather information and reevaluate the stock. But it may be that rational speculation (buying when prices fall and selling when prices rise) would dampen rather than destabilize market fluctuations.

*Transaction taxes* / These taxes are often considered to be not only a revenue tool but a mechanism for curbing excessive short-term turnovers in stock tradings and encouraging long-term investments. Hence the volatility of prices may be lower. The opposite could also be true: the increased cost of transactions may dampen the rational speculative tradings that help to stabilize the market.

*Credit trading margins* / It can also be argued that speculative transactions and therefore market volatility may be dampened by raising margin controls. A related topic is the impact of macroeconomic conditions on the stock markets. For instance, changes in economic conditions affect interest rates and prices in the stock market. Therefore, the volatility of one is expected to be positively related to the volatility of the other.

In addition to employing multiple regression analyses to investigate the relationship between the variables, a Granger causality test could also be performed for each independent variable versus the dependent variable.

One last type of study concentrates on company response (not price response) to macroeconomic conditions. Variables such as interest rates, exchange rates, and conditions of aggregate demand affect firms through two channels. The first occurs through their incomes, and the

6. See Tai Ma, “On the Determinants of Stock Market Volatility: An Empirical Analysis of the Taiwan Stock Market,” in Rhee and Chang, *Pacific-Basin Research*, 343–58.

second by causing incentives to change the proportions in which firms hold fixed capital, inventories, financial assets, and debts—that is, to induce portfolio adjustments.

*Evaluation of the Efficiency of Stock Markets*<sup>7</sup>

The Económica database provides the information necessary to test the three hypotheses on efficient markets.

*The weakly efficient market hypothesis* / It stipulates that historical price and volume data for securities contain no information that can be used to earn a trading profit above what could be attained by using a naive buy-and-hold investment strategy.

*The semi-strong efficient market hypothesis* / This theory specifies that prices reflect all publicly available information. Consequently, only insiders with valuable information could earn above-normal profits by using a naive buy-and-hold strategy.

*The strongly efficient market hypothesis* / It claims that a naive buy-and-hold strategy does not earn less profits than any other strategy. In this case, price changes are completely independent random variables, and none of the market participants use inside information.

*Response to a Financial Crisis*<sup>8</sup>

In times of financial crisis, when declines in prices threaten widespread defaults, bankruptcy, and liquidation of exchange members, a major question is, how should a stock exchange react? In particular, it is important to decide whether the stock exchange should close (as did the Hong Kong exchange during the October 1987 crash) or remain open during those days. It is therefore necessary to evaluate whether a closing affected trading activity after the exchange reopened. The method is to compare the closing market with other similar stock exchanges that did not close in terms of prices, liquidity, volatility, and trading volume.

Arguments can be made against closing. First of all, it would signal a failure of the stock exchange in its most basic mission: to provide a marketplace wherein its customers (investors) can trade. Because assets are frozen, investors' welfare is harmed, leading them to downgrade their

7. See Cheng Few Lee, Gili Yen, and Chingfu Chang, "The Chinese New Year, Common-Stock Purchasing, and Cumulative Raw Returns: Is Taiwan's Stock Market Informationally Efficient?" In Fischer and Papaioannou, *Business Finance*, 101–9.

8. See G. N. Naidu and Michael S. Rozeff, "The Crash of 1987: An Empirical Examination of Liquidity, Volatility, and Volume across International Stock Markets," in Rhee and Chang, *Pacific-Basic Research*, 359–75.

assessments of the exchange's reliability. Such an outcome could lead to business moving toward other marketplaces, thereby harming the exchange. Second, subsequent trading behavior may also be affected. After an exchange closes, the next time customers observe prices falling, they will think it more probable that the exchange will close. Not wishing to remain in a position where they cannot trade, customers rationally will accelerate their selling. Hence the ultimate effect of an exchange closing is to exacerbate future price declines, create price volatility, and make future exchange closings more likely.

The main argument in favor of closing is to avoid collapses of member firms and the subsequent problem among customers. A secondary argument is to stop overreaction by investors, giving them time to evaluate other options rather than selling.

Analysis of this problem should consider the pre-crash levels of liquidity, volatility, and trading volume in the stock markets; the alteration of these trading characteristics during the immediate crash period; and post-crash behavior in terms of liquidity, volatility, and trading volume. It is important to evaluate whether these indicators return to normal levels, and how long this process takes.

#### *Predictions of a Firm's Sickness<sup>9</sup>*

It is possible to investigate whether a reasonable connection exists between particular ratios and the firm's future health and survival. The purpose may be to identify potentially sick firms or simply to rank firms according to their financial health. This financial ratio analysis should be conducted on homogeneous industry groups.

Earnings are the most sensitive financial indicators. Company failure is almost always preceded by a period of impairment in earnings. As soon as earnings decrease, the supply of funds dries up, hurting both working capital for current operations and long-term capital for growth.

It is crucial to determine whether a firm is marginal or submarginal in its respective industry. The latter type manage to survive when the economic environment is favorable but are the first to suffer the effects of an approaching recession. The same happens when the credit supply becomes scarce. The idea is to test different profitability ratios for their predictive accuracy. The smaller a ratio's classification error in the "pre-sickness years," the higher the predictive power of that ratio.

A similar kind of study using ratios derived from balance sheets may not be too helpful, however. It suffers from two fundamental weaknesses from the standpoint of predictive power. First, the historical values reflected in a balance sheet may be completely out of line with market

9. See L. C. Gupta, *Financial Ratios for Monitoring Corporate Sickness: A More Systematic Approach* (Delhi: Oxford University Press, 1983).

prices, particularly in long-established companies. Second, balance sheets are an easier place than profit-and-loss accounts for managers to perform “window dressing.”

#### *Ratio Analysis to Differentiate Industries*<sup>10</sup>

Ratio differences can highlight the economic characteristics and strategies of firms in the same industry, the same firm over time, and firms in different industries. The return on assets ratio (ROA) can be disaggregated as follows: ROA equals (total asset turnover) times (return on sales), which equals (sales over assets) times (EBIT over sales).<sup>11</sup> Firms (and industries) may be differentiated according to whether they employ a strategy of high turnover with a low margin or one of low turnover with a high margin to generate profits. In the first instance, firms sell large volumes by charging low prices. Such firms must ensure that profit margins do not fall too low by controlling costs and investments carefully. In the second approach, firms compete on a basis of product differentiation. They have certain controls on the firm’s prices, and consequently cost controls are less important as they can be passed on to the customer through higher prices.

#### *Ratio Analyses to Determine the Stages of the Product Life Cycle*<sup>12</sup>

The marketing concept of a product life cycle—consisting of start-up, growth, maturity, and decline—can be used to understand and forecast changes over time in a firm’s financial performance as it passes through any of the four stages in the cycle. The impact of financial performance is reflected in the balance sheets, in the income statement, and therefore in financial ratios. Despite this concept’s useful insights, it should not be overrated because it is primarily applied to products. Firms build a portfolio of products, and consequently defining the firm’s “stage” depends on the stage at which the majority of its products are found.

This research note has identified a number of hypotheses in financial economics that can be tested against data on Latin American corporations by using the databases now available. All the information required to test these hypotheses is available on the databases, although there is no guarantee that significant results will be achieved. This list of hypotheses that can be tested is not meant to be exhaustive. Interested readers will need to familiarize themselves with the particular database and also to immerse themselves in the literature of financial economics.

10. See Gerald White, Ashwinpaul Sondhi, and Dov Fried, *The Analysis and Use of Financial Statements* (New York: Wiley and Sons, 1994).

11. EBIT refers to earnings before interest and taxation.

12. See White, Sondhi, and Fried, *Analysis and Use of Financial Statements*.

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