The "Dilution Effect" and Emerging Equity Markets

Contrary to the conventional wisdom, rapid growth in real investment is not necessarily bullish for equities. In emerging markets, the need to finance large-scale capital formation creates a wave of initial public offerings and privatization, which in turn "dilute" the relative share of existing equities.

Over time, changes in pace of IPOs and privatization tend to alter the effect of liquidity and earnings on equity prices.

According to the conventional wisdom, the principal lure of emerging markets stems from their faster economic growth and, consequently, superior earning growth. While this view is generally correct, the implicit presumption that higher profit growth will necessarily feed into higher equity prices is not.

The reason is that the capitalization of future earnings involves not one but two processes: higher earnings affect the *number* of outstanding stocks as well as their *price*. Of course, both can – and often do – rise together. Privatization and other initial public offerings (IPOs) improve the market's liquidity, attract new investment and consequently culminate in rising equity prices. Sometimes, however, the effect is rather different and the frenzy of new issues acts as a powerful drain on the secondary market. When that happens, the result is "excess supply" of stock. Liquidity is spread thinner and equity prices fall. By the same token, a decline in the number of stocks is not necessarily bearish. Of course, when stocks disappear as a consequence of large scale bankruptcies, pessimism causes the overall market price trend to turn negative. But when companies move to re-acquire their own shares – a rather common phenomenon in the US – the effect is often to *boost* prices.

The "dilution effect" of IPOs or the "thickening effect" of stock buybacks are well recognized in the academic literature of corporate finance. However, little attention has been paid to their long-term effect on emerging markets. For most emerging markets, the "thickening effect" of stock buybacks is still some time away and the immediate concern is what happens as a result of "dilution."

IPOs: good or bad for stock prices?

Although there is no *a priori* reason to expect a rising number of stocks to depress stock prices, the data suggest that this is often the case. Chart 1 compares the performance of emerging markets as a whole to those of the US, Germany and Japan. Over the past nine years, emerging markets saw their combined market capitalization (in US$ terms) rise by 1,600% — 12 times faster than in the US, 18 times faster than in Germany and 25 times faster than in Japan (first column). The difference in share prices, however, was far less spectacular (second column). A large part of this discrepancy is due to the "dilution effect": the number of shares in emerging markets has risen by 492%, compared with 24% in Japan, 7% in Germany and a 6%

Basic dilution arithmetic

The market's overall capitalization (*MCAP*) can be thought of as future earnings (*E*) discounted by prevailing long-term interest rates (*r*):

$$(1)... MCAP = \frac{E}{r}$$

The market capitalization is a product of the number of stocks times their *average* price. Investors, however, have little interest in the average share price, which is usually fairly stable due to repeated stock splits and because new shares are commonly issued at cheaper prices. Instead, their interest is in the value of a *fixed* portfolio, such as the overall "market's price index" or similar benchmarks. Denoting this latter index as *P*, we can then write:

$$(2)... MCAP = P \cdot N$$

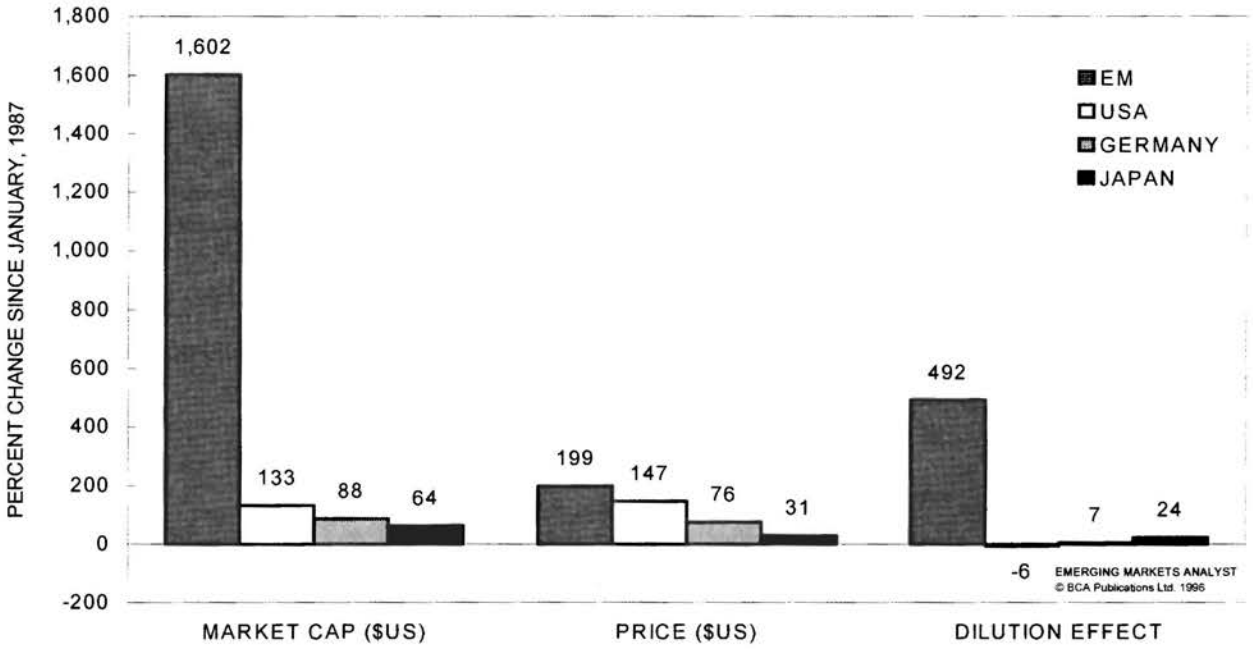
where *N* is the ratio between *MCAP* and *P*. In this equation, *N* is the number of shares *weighted* by their relative prices. In the short term, *N* will differ from the actual number of stocks. Over the longer term, however, the number of stocks tends to change far more than their relative values, so the actual number of shares and *N* should move along similar trends. In our discussion, we use these two concepts interchangeably.

Combining equations (1) and (2), we then have:

$$(3)... P = \frac{E}{N \cdot r}$$

Because of their cyclical behavior, interest rates have a significant short- and medium-term bearing on stock prices. In the long-term, however, these fluctuations are less important and stock prices are determined mainly by the *balance* between the growth of overall earnings (*E*) and changes in the number of shares (*N*).

CHART 1: EMERGING VERSUS DEVELOPED EQUITY MARKETS



decline in the US (last column). Indeed, for the developed markets, the chart shows an inverse correlation between price changes and the extent of dilution.

Similar differences are evident within the emerging markets. Chart 2 contrasts the same indicators for Latin America and Asia. Over the past seven years, the former saw its share prices (in US$ terms) rise 13 times faster than the latter. Although this was partly due to foreign portfolio inflows which were disproportionately favorable to Latin America, the effect was magnified by the far stronger "dilution effect" in Asia.

Chart 3 dissects the picture further, contrasting price changes and the "dilution effect" for 21 emerging markets, as well as the US and Japan over the 1990-1995 period. With Poland taken as an outlier, the correlation is fairly tight and clearly *negative*.

Evidently, over the longer term, market buoyancy in the sense of very active IPOs and ongoing privatization does not mean a bonanza for investors. More often than not, the consequence is excess supply, diluted earnings and depressed equity prices.

CHART 2: LATIN AMERICA AND ASIA

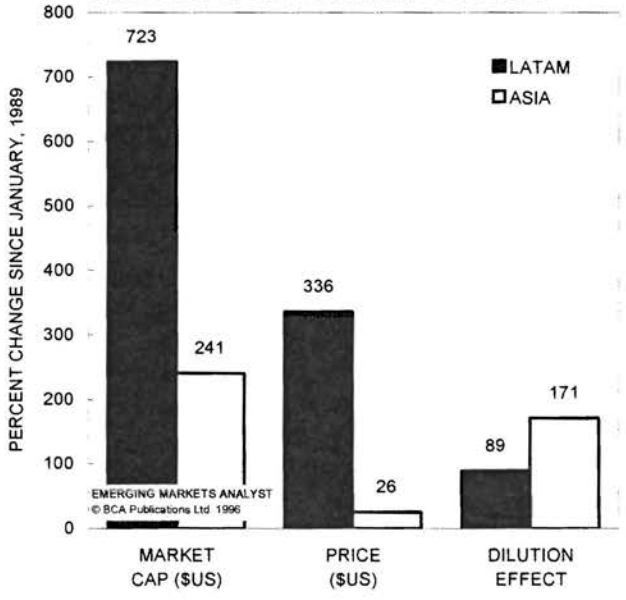
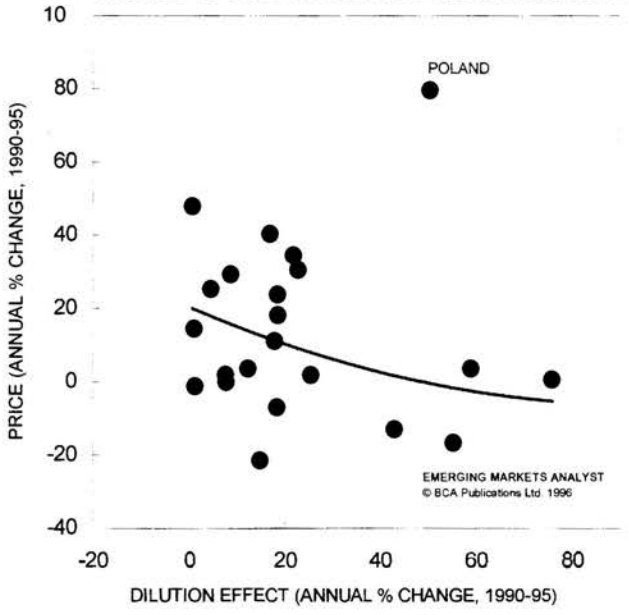


CHART 3: INDIVIDUAL EMERGING MARKETS



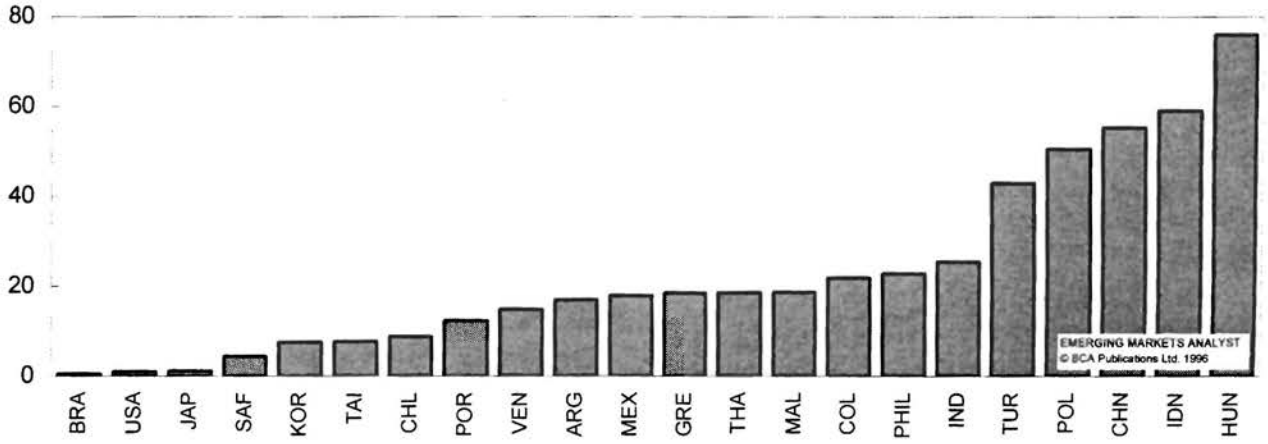
Dilution, liquidity and valuation

The most straightforward application of the "dilution effect" concerns the impact of changing liquidity on equity prices. A billion dollars of new domestic credit or foreign portfolio investment flowing into a market will have a far bigger impact on prices if the number of stocks is stationary, than would be the case when the number of stocks is rapidly rising.

Chart 4 ranks various emerging countries, as well as the US and Japan, according to their respective annual "dilution effect." Based on these data, stock prices in countries such as **Brazil**, **South Africa**, **Korea** and **Chile**, where the "dilution effect" is low, are likely to be far more sensitive to changing liquidity conditions than in countries like **Turkey**, **Poland**, **China**, **Indonesia** and **Hungary**, where the "dilution effect" is much higher.

The "dilution effect" is also significant for equity valuation. The customary growth-adjusted P/E ratio corrects the basic P/E ratio for differences in the prospective growth of corporate earnings. This, however, could be misleading. As Chart 5 illustrates, high growth countries are often those where the "dilution effect" is strongest (Hungary offers a notable exception, though this could be because the dilution data are for 1993-95 only).

CHART 4: DILUTION EFFECT (AVG. ANNUAL CHANGE 1990-1995, %)*



* 1993-5 FOR CHINA, HUNGARY AND PORTUGAL; 1994-5 FOR SOUTH AFRICA

CHART 5: ECONOMIC GROWTH AND STOCK DILUTION IN EMERGING MARKETS

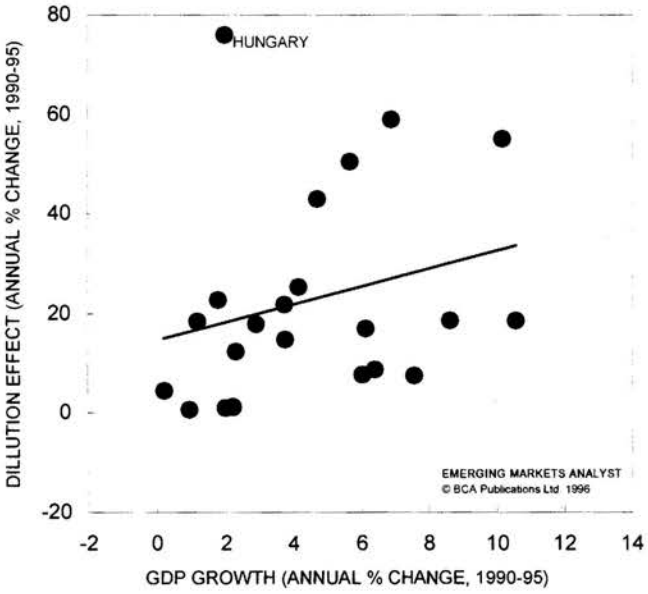
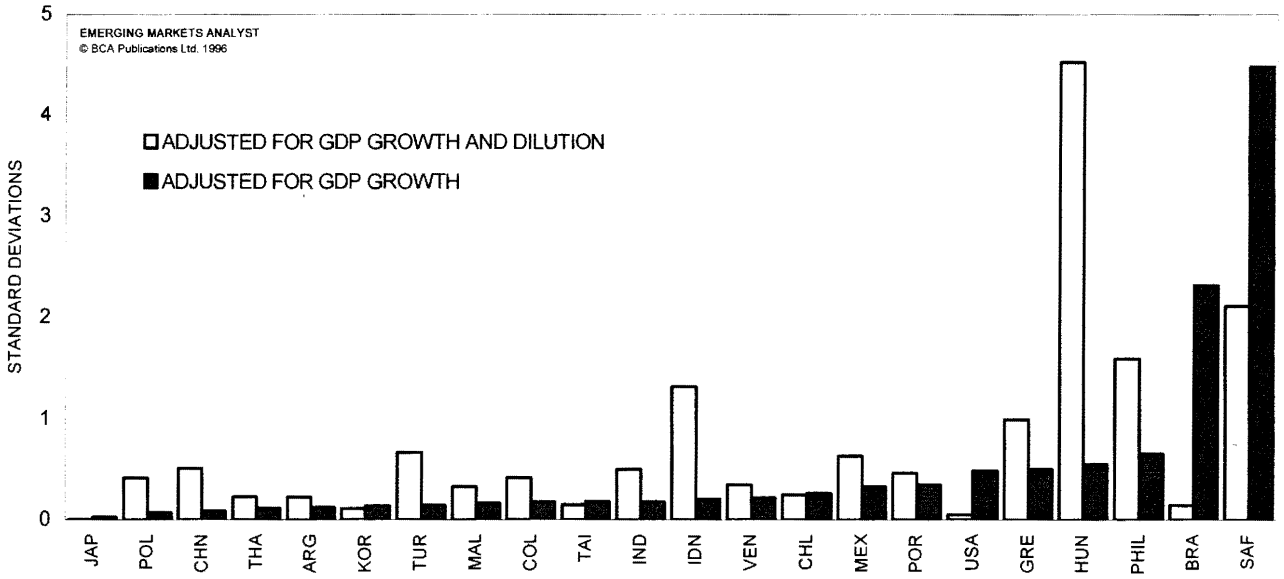


Chart 6 compares two adjusted P/E figures for the emerging markets. The first adjusts only for GDP growth by dividing the P/E by the economy's average growth over the past five years. The second adjusts for GDP growth, as well as for the "dilution effect," by multiplying the growth-adjusted P/E by the average "dilution effect" given in Chart 4. (Both indices are expressed in units of their own standard deviations.)

The comparison suggests that countries with strong potential for earnings growth also tend to "suffer" disproportionately from IPOs and privatization. Moreover, because the "dilution effect" can often be far larger than the prospective growth in earnings, the net impact on equity valuation could well be *negative.* This is apparent in **Poland**, **China**, **Turkey**, **India**, **Indonesia**, **Hungary** and the **Philippines**, where the adjustment for dilution makes the market look more than twice as expensive on a prospective basis. The reverse impact is evident in

CHART 6: ADJUSTED P/E RATIOS



the case of **Brazil**, **South Africa** and the **US**. In these markets, a low "dilution effect" implies that equities are less expensive than they look on the basis of their growth-adjusted P/E alone.

Dilution and the "Maturation Curve"

Given these considerations, the determinants of "dilution" or "thickening" are of significant interest to investors. At the level of the individual firm, the decision to float new shares is related to:

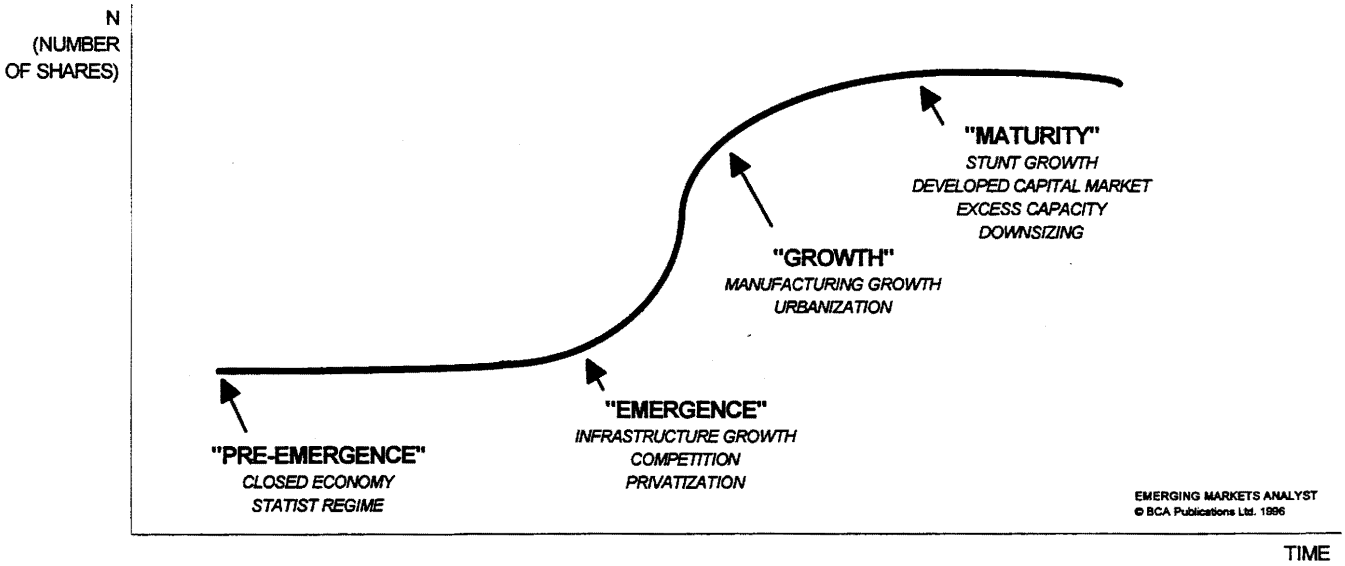
- available investment opportunities
- the cost of equity relative to that of bonds or loans
- the risk of relinquishing control.

At the macroeconomic level there are added factors related principally to the country's stage of development. These include:

- the pace of capital formation relative to the overall market capitalization
- the maturity of capital markets
- the availability of alternative finance such as FDI
- the degree of corporate concentration
- the extent of merger and acquisition activity
- privatization.

Most generally, equity markets seem to go through a life cycle comprising four principal stages affecting

CHART 7: DILUTION AND THE MARKET "MATURATION CURVE"



the pattern of stock "dilution." These stages are schematically illustrated by the "maturation curve" in Chart 7 on page 15.[1]

The first, "pre-emergence" stage is commonly associated with a closed economy, import substitution policies and a statist political regime. Growth is often stagnant, and when it is not, the government is typically the main provider (or intermediary) of project and development finance. In this context, there is only limited demand for new private funds, earning growth is erratic and risk is high; IPOs are minimal and privatization has not yet started.

The second stage is that of "emergence." Economic growth picks up and the appetite for investment finance is rising. Large companies, which previously enjoyed monopolistic positions, find that they need additional equity in order to compete with venture capital and foreign investment. Significant chunks of the state sector are privatized. If the opening of the market is also accompanied by an equity bull run, entrepreneurs find it easy to milk uninformed investors of their extra cash. This stage is commonly associated with a very rapid rise in the number of outstanding stocks.

[1] Market "maturity" is often approximated by the ratio of market capitalization to GDP. However, this measure is affected by the price of shares which does not depend on the stage of development, as well as the number of shares which does.

The third, "growth" stage consists of a continued, albeit slower rise in the number of shares. Most of the large privatizations are over. The market bubble of the earlier "emergence" stage has probably burst, and the retail investor is less willing to buy new script from unknown companies. However, growth is spreading and the agricultural population flows into the cities. There is a constant need to finance new infrastructure projects and a growing manufacturing sector.

The final, "maturity" stage begins as growth starts to falter. Investment as a share of GDP begins to decline and new projects could easily be financed from retained earnings. Debt markets are fully developed and the level of intermediation is high. Companies are increasingly preoccupied with the threat of excess capacity, so that downsizing is highly rewarded. Instead of issuing new stocks, firms increasingly move to re-purchase their own shares. "Stock thickening" substitutes for the "dilution effect" and the overall number of outstanding shares stabilizes or even begins to decline.

The stylized pattern of the "maturation curve" manifests itself in the comparative experience of different markets illustrated in Chart 8. The series in the chart represent the quantity of stocks in each market, as measured by our *N* variable. Because the series have different starting dates, we have rebased them to January 1996=100. *Our interest is in the respective slopes of the series*, with steeper slopes representing a faster rise in the number of shares.

CHART 8: STOCK QUANTITY INDICES (JANUARY 1996 = 100.0)

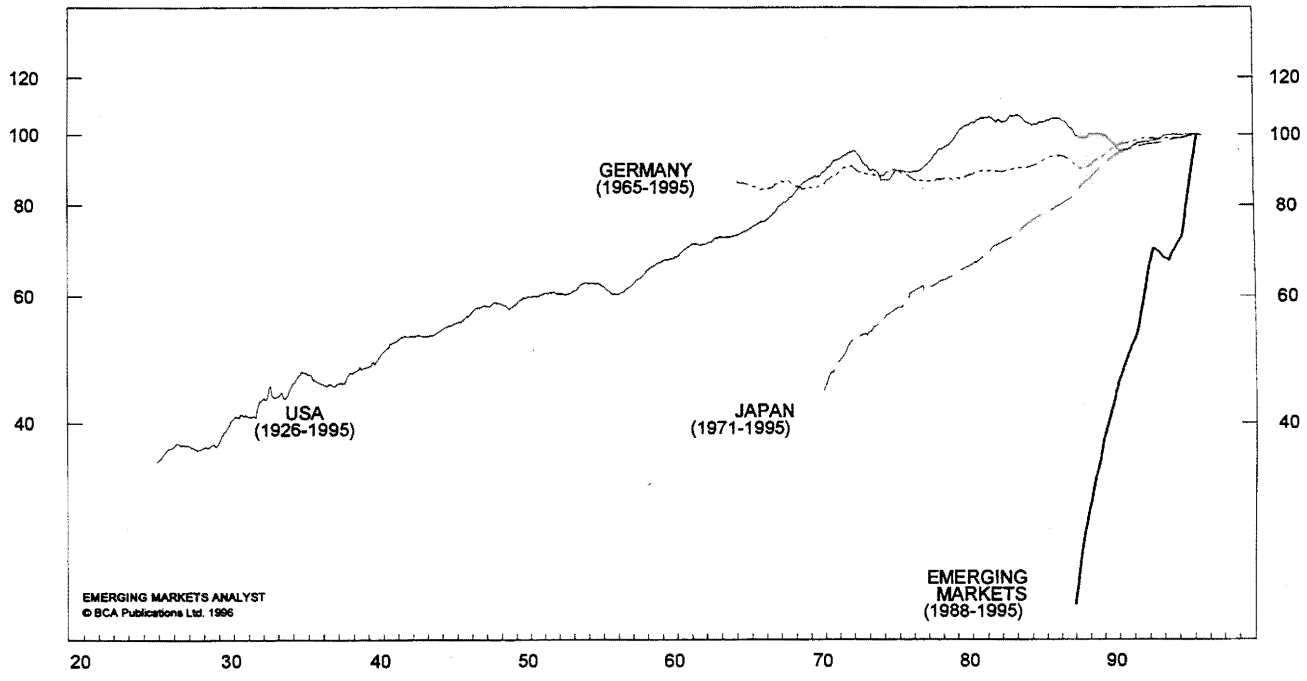
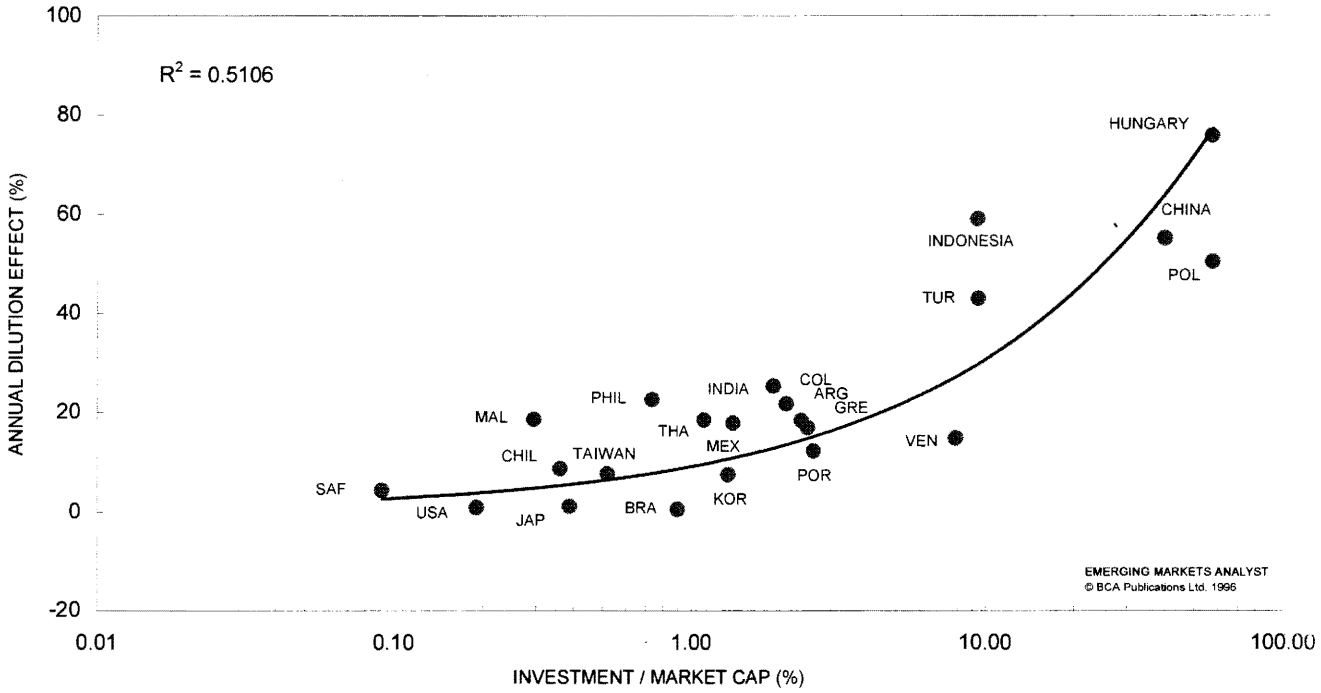


CHART 9: INTERNATIONAL COMPARISON



In the US, the period between the late 1920s and the late 1960s corresponds roughly to the "growth" stage in Chart 7. From the 1970s onward, the US seems to have entered the maturity period, with the number of stocks stabilizing and then, since the 1980s, even falling. The data for Germany suggest that it is also approaching the "maturity" stage with the number of stocks growing fairly slowly. Japan was until very recently in a "growth" stage. Since the late 1980s, it too appears to be entering its "maturity" stage.

Finally, and as their name suggests, emerging markets as a whole are still in the second stage of the "maturation curve" – with their position perhaps comparable to that of the US during the latter part of the 19th century.

With the overall number of emerging-markets stocks rising almost vertically, it is no wonder that price gains have remained moderate despite the explosive growth of overall earnings.

Capital formation and the "Dilution Effect"

For equity investors, the significance of the "maturation curve" is that *the "dilution effect" tends to change over time.* When that happens, a given infusion of liquidity or a given growth in overall earnings will have a *changing* effect on stock prices. Specifically, prices will become *decreasingly* sensitive to changes in liquidity and earnings when the "dilution effect" is *rising*, and *increasingly* sensitive when the "dilution effect" is *falling.*

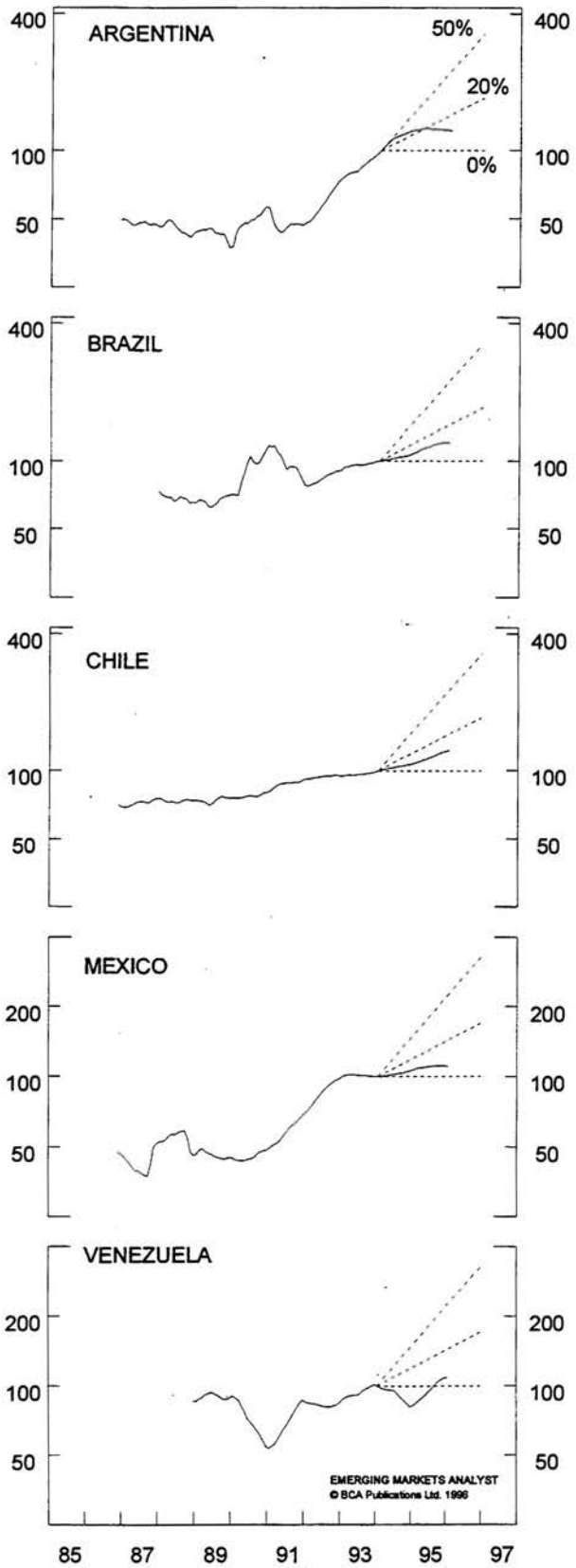
The principal factors affecting the pace of dilution are investment and market capitalization. Capital formation needs to be financed either by retained earnings, new equity or debt. Although the relative weights of these components change cyclically and are also subject to long term shifts, all tend to be correlated positively with changes in capital spending. Moreover, in the emerging countries, where companies are only beginning to build their retained earnings and debt markets are nascent, the issuance of new equity is the principal method of new investment. Now, with the number of newly issued shares being proportionate to the pace of capital formation, the *rate* at which this number is growing – that is, the "dilution effect" – will tend to diminish with the progressive growth in market capitalization.

These influences are evident in Chart 9, which shows a strong positive correlation between the "dilution effect" and the ratio of investment to market capitalization.

Long-term changes in the "dilution effect" are associated with movements of the country's "natural" position along the fitted curve, as well as with deviations from this position.

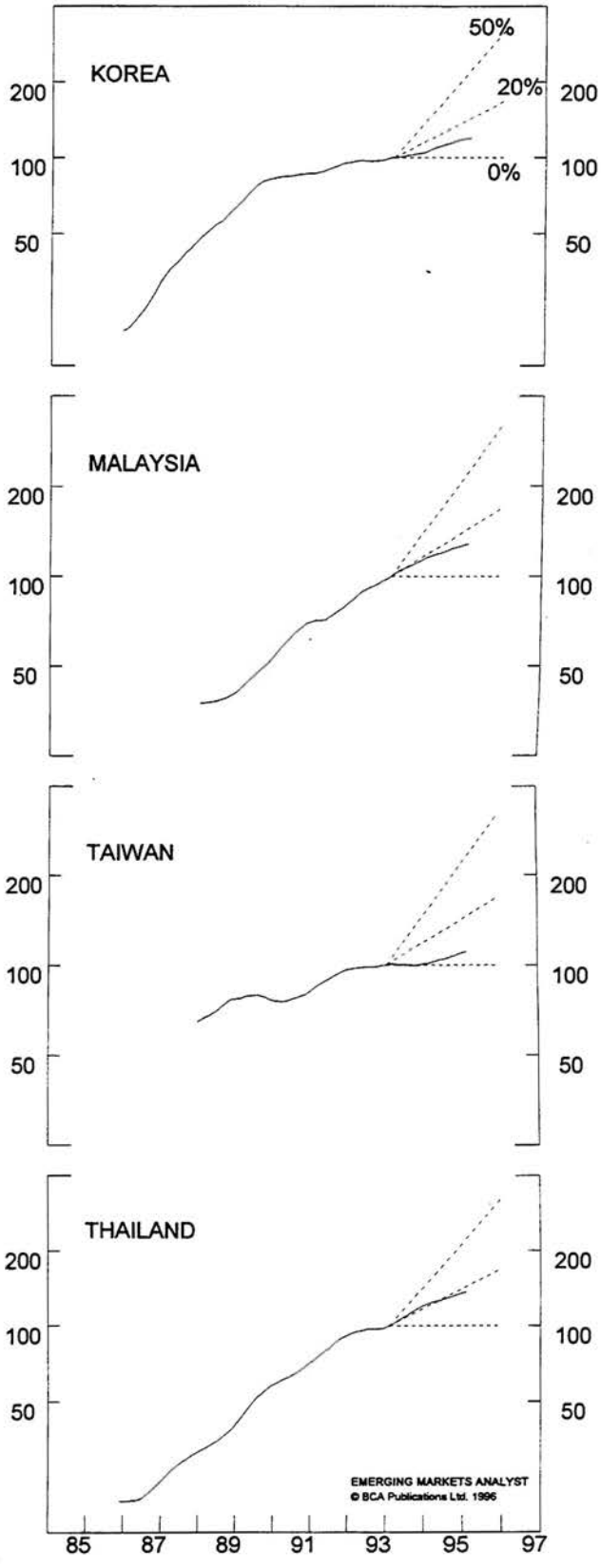
Movements along the curve are determined by changes in the investment/market capitalization ratio. Markets in which investment is set to rise against a still-limited market capitalization will move *up* toward the top right part the curve. Their "dilution effect" will

CHART 10:
SLOW DILUTION IN LATIN AMERICA



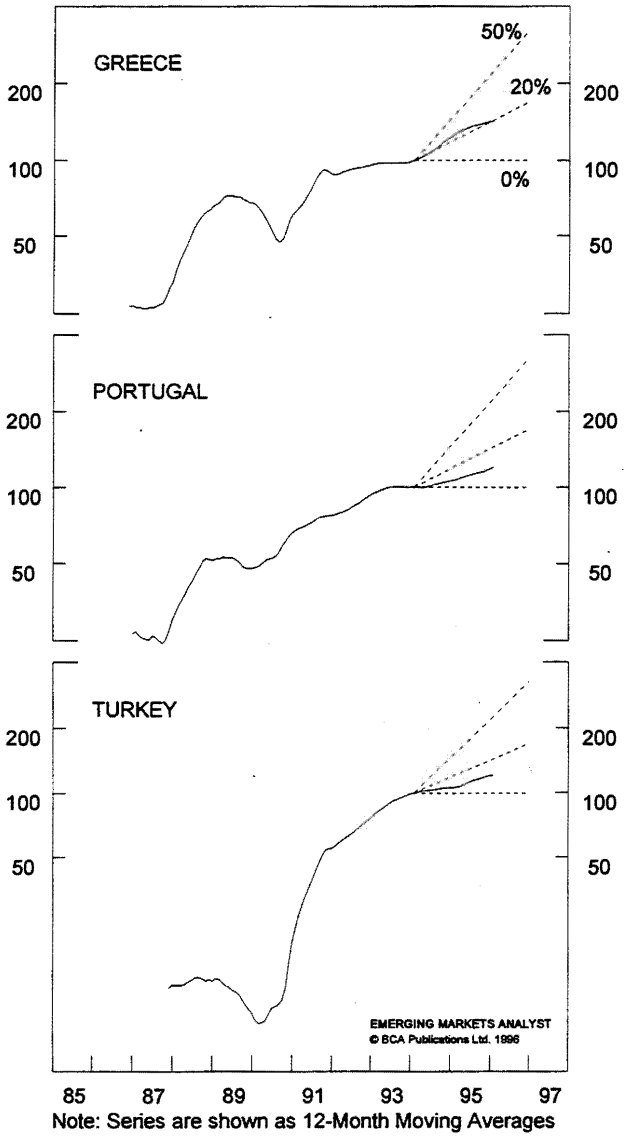
Note: Series are shown as 12-Month Moving Averages

CHART 11:
SLOW DILUTION IN ASIA



Note: Series are shown as 12-Month Moving Averages

CHART 12:
SLOW DILUTION IN EUROPE



Note: Series are shown as 12-Month Moving Averages

be intensifying. Examples of markets where this is likely to happen are **China**, **Hungary, India**, **Philippines** and **Poland**. On the other hand, markets where investment is already very high and market capitalization has grown considerably are likely to move *down*, toward the bottom left of the fitted curve. Potential candidates are **Chile**, **Indonesia**, **Korea**, **Malaysia** and **Thailand**.

The "dilution effect" is also sensitive to the market's vertical deviation from the fitted curve. Thus, countries which lie significantly *above* the curve – for instance, **Malaysia**, **Philippines**, **India**, **Turkey** and **Indonesia** – have in some sense issued *too many* shares relative to their current investment needs. If their investment does not rise significantly, these markets are the most likely to compensate for "over issuance" and move down toward the fitted curve. On the other hand, in markets such as **China**, **Venezuela** and **Poland**, where the growth in IPO has been limited relative to their high investment needs, the "dilution effect" is most likely to correct upward.

*The two types of movements are likely to converge in several markets. **China** and **Poland** are set to move up and to the right: their "dilution effect" will rise and stocks prices will suffer. **Indonesia** and **Malaysia**, on the other hand, are likely to move down and to the left: their "dilution effect" should fall and equity prices will benefit.*

Another angle

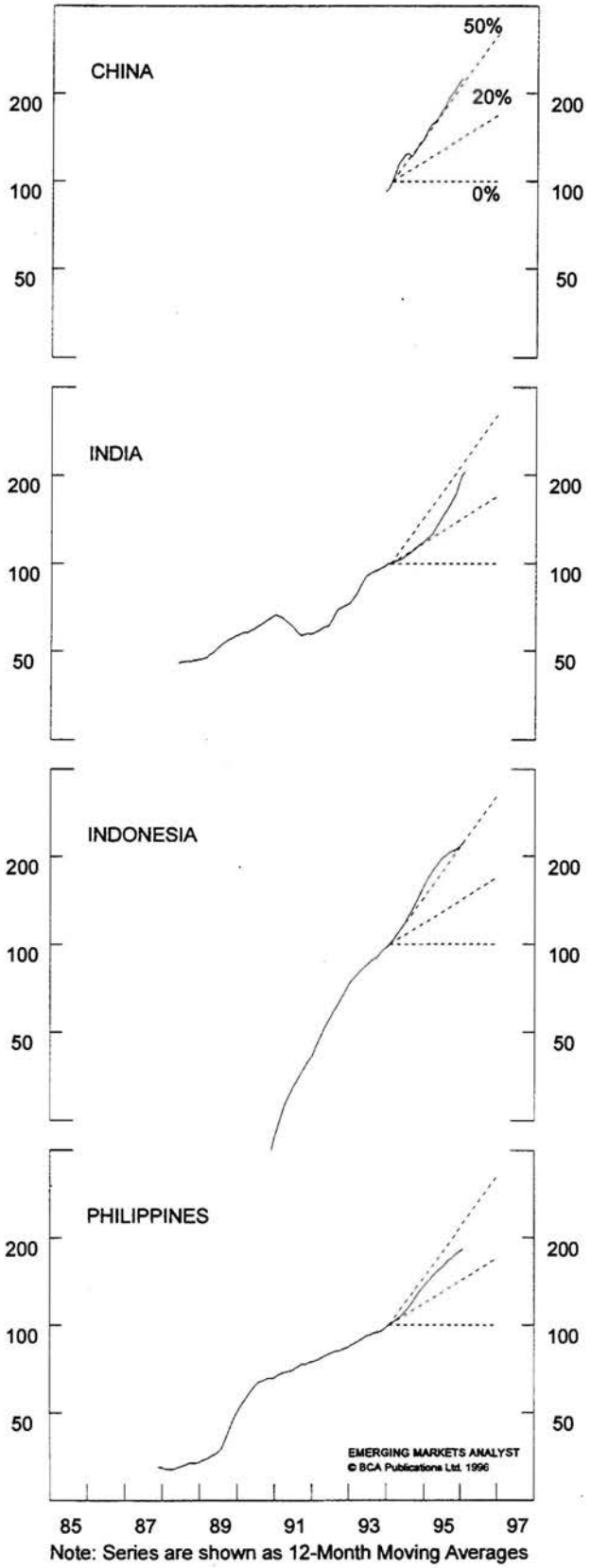
The "dilution" data in Chart 9 are averages based on the past five years. The panels in Charts 10-14 describe the evolution of the "dilution effect" over time. The series denote the *N* index for each market (with January 1994=100). The dashed lines give trajectories for slow dilution (0-20% a year), medium dilution (20-50%) and rapid dilution (over 50%).

An overview of these charts suggest the "dilution effect" in Asian markets is generally much more stable, and hence more predictable, than in Latin America and in Europe. Projections based on these data are likely to prove more accurate for the former than for the latter.

The table below classifies countries according to their current pace of dilution, as well as their likely direction in the medium term.

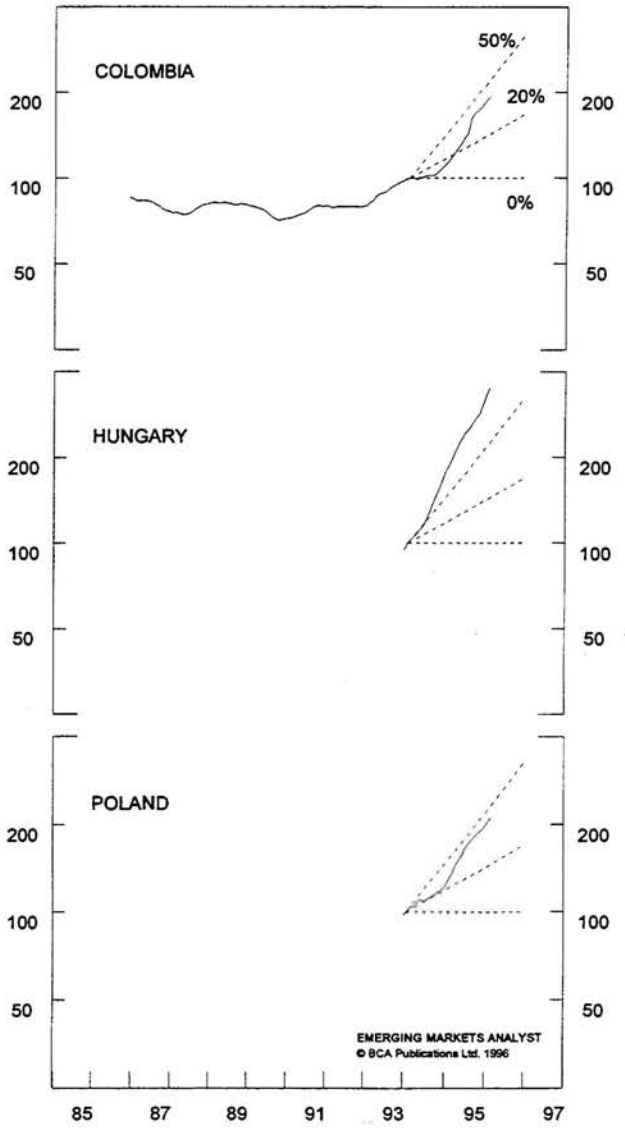
"Dilution Effect"	**Slow (0-20%)**	**Medium (20-50%)**	**Rapid (over 50%)**
Decelerating	Argentina Mexico Korea Turkey		Indonesia
Stable	Brazil Venezuela Malaysia Taiwan Thailand Portugal	Greece	China
Accelerating	Chile	India Philippines Colombia Poland	Hungary

CHART 13:
FAST DILUTION IN ASIA



Note: Series are shown as 12-Month Moving Averages

CHART 14:
FAST DILUTION IN EUROPE & LATIN AMERICA



Note: Series are shown as 12-Month Moving Averages

Considering the effect of dilution on prospective valuation, the "best" markets are those for which dilution is relatively slow and *falling* (top left cell in the table). In countries such as **Argentina**, **Mexico**, **Korea**, **Malaysia**, **Thailand** and **Turkey**, IPOs are slowing, so higher earning growth will be more fully reflected in equity prices. According to this same criterion, the "worst" markets are those where the pace of dilution is medium or rapid and is *further accelerating* (bottom middle and right cells). In countries like **India**, **Philippines**, **Colombia**, **Poland** and **Hungary** (as well as **China** where dilution is stable but should accelerate as the market recovers) prices will remain capped by an avalanche of new issues.

Investment conclusions

• Market buoyancy – as reflected by IPOs and privatization – raises liquidity and optimism, but is not necessarily bullish for equities. The "dilution effect" of excess supply can often ***depress*** prices in the secondary markets.

• Because of their investment needs and relatively small market capitalization, emerging markets are generally more vulnerable to the "dilution effect" than markets in the industrialized countries. Within the emerging-market universe, **Asian** markets and those of the **transition economies** of Europe are subject to faster and more stable "dilution" than **Latin American** markets.

• A higher "dilution effect" makes stocks ***more expensive*** on a prospective basis. Rapid economic growth raises the growth of corporate earnings but also the number of new shares. When P/E ratios are adjusted for both GDP growth and the "dilution effect", the most "expensive" markets are currently **Hungary**, **South Africa**, **Philippines** and **Indonesia**. The "cheapest" are **Brazil**, **Taiwan** and **Korea**.

• Markets with a high "dilution effect", such as **Poland**, **China, Indonesia** and **Hungary**, are less sensitive to changing liquidity than markets like **South Africa**, **Brazil** and **Korea**, where the "dilution effect" is low.

• The "dilution effect" changes as the market progresses along its "maturation curve." The markets where the "dilution effect" is most likely to grow are **China** and **Poland**, so their equities could continue to suffer despite apparently attractive valuations. **Indonesia** and **Malaysia** will likely see their "dilution effect" falling, which will benefit equities by more than is warranted by current valuations.