
Is there a “Nasdaq effect” in emerging equity markets?

The Nasdaq Composite has come to symbolise the new economy. As an index of technology stocks, its movements have reflected perceptions of changes in productivity growth brought about by new technology and the internet. The extraordinary rise and equally spectacular decline of the index both drew widespread attention. The Nasdaq’s peak in March 2000 marked the high point of the euphoria about the new economy, just as the subsequent shedding of 60% of its value indicated that previous valuations had been based on overly optimistic projections of a new growth era. Along with these developments, one fact that also attracted attention in the financial press and in the policy community was the close co-movement of emerging economy equity markets with the Nasdaq.¹⁰

The strong positive relationship observed between the Nasdaq and emerging market equities has been less evident between the Nasdaq and broader equity indices in industrial economies. This difference in co-movement might simply reflect differences in the composition of these indices. In particular, equity indices for economies with large technology sectors should be highly correlated with the technology-heavy Nasdaq. Indeed, it has been argued elsewhere that sectoral effects now play a larger role in driving the behaviour of equity indices across the world than in the past.¹¹ However, the relatively higher correlations of emerging market equities with the Nasdaq may reflect other factors as well, such as a perception that these assets have common risk attributes or attract a similar class of investors.

This special feature investigates whether there is a “Nasdaq effect” in the sense that changes in this index drive the movements in headline emerging market equity indices even after accounting for common global and sectoral components. The analysis suggests that changes in the Nasdaq have little additional explanatory power beyond these components, except in a few cases.

¹⁰ For instance, see The Economist (2000), The Wall Street Journal (2001), International Monetary Fund (2000, 2001) and, for the euro area, Tsatsaronis (2001).

¹¹ See Brooks and Catão (2000), Baca et al (2000) and Sinha et al (2001).

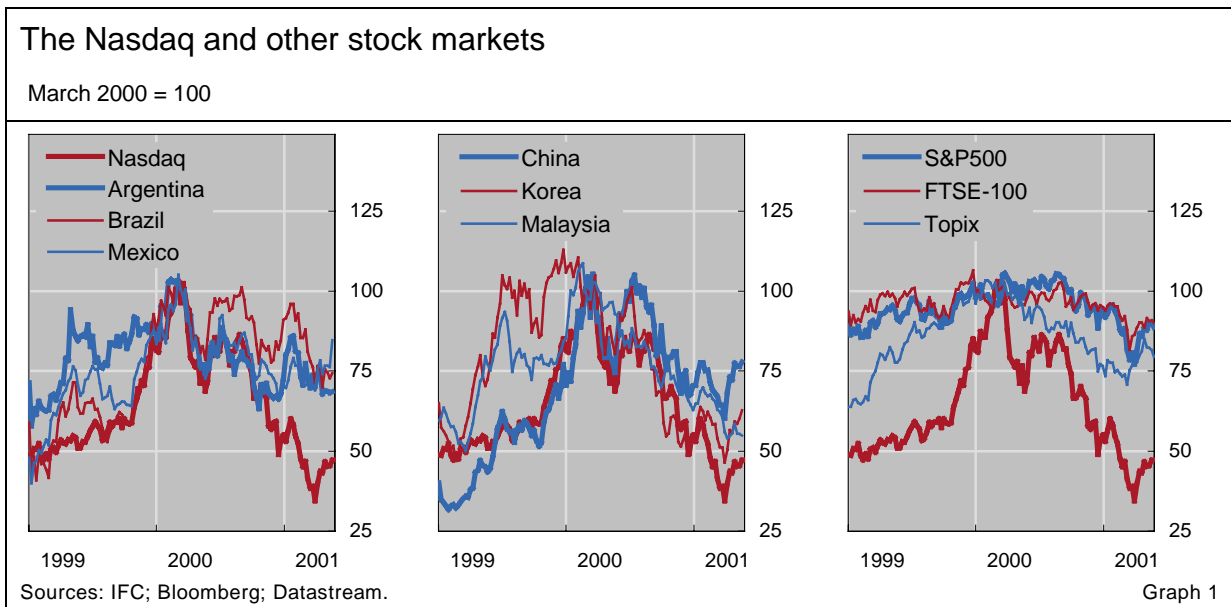
However, the analysis also points to the possibility of instability in the examined relationships, particularly during 2000.

Basic facts

The co-movement between the Nasdaq and equity prices in a number of emerging market economies is evident in Graph 1.¹² Not only did stock prices in most of these economies tend to rise with the Nasdaq during 1999 and the early part of 2000; they also fell in close step during most of last year. In contrast, the relationship with broader equity indices in the United States and other industrial economies appears to be much weaker (right-hand panel).

Table 1 provides a more precise measure of the degree of co-movement of emerging equity market indices with the Nasdaq and its intensification over the last few years. The first column shows the correlation of weekly returns over the period from January 1996 to March 2001, while the remaining columns report correlations over 12-month sub-periods corresponding to calendar years.¹³ Most of these correlations are positive, and tend to be highest for Latin American economies. Moreover, there is roughly an upward trend in their values over the five-year period. The majority of the 20 indices moved more closely with the Nasdaq in the year 2000 than they did on average over the

Large, positive gross correlations



¹² Note that the indices have been rebased to equal 100 in March 2000. Most of the equity markets examined peaked during the course of that month.

¹³ All returns refer to the main (headline) index of the economy. Returns on the Nasdaq and indices in Latin America are calculated using Wednesday closing prices; for all other economies, Thursday closing prices. They are expressed in US dollar terms; thus, issues related to the relationship between equity markets and currency movements are not considered (see Bernard and Galati (2000)).

Correlation between emerging market equities and the Nasdaq						
	1996-2001	1996	1997	1998	1999	2000
Asia						
China	0.236	0.094	0.105	0.229	0.318	0.553
Hong Kong	0.406	0.415	0.329	0.414	0.463	0.588
India	0.189	0.043	0.094	0.321	0.192	0.479
Indonesia	0.112	0.272	0.294	0.034	0.116	0.059
Korea	0.227	0.295	0.122	0.155	0.404	0.521
Malaysia	0.219	0.200	0.232	0.167	0.397	0.103
Philippines	0.260	0.246	0.260	0.295	0.309	0.106
Singapore	0.268	0.212	0.342	0.225	0.328	0.531
Taiwan, China	0.211	0.130	0.266	0.247	0.191	0.408
Thailand	0.263	0.411	0.170	0.265	0.285	0.273
Eastern Europe						
Czech Republic	0.176	- 0.075	0.086	0.394	0.08	0.341
Poland	0.414	0.192	0.381	0.509	0.510	0.292
Russia	0.247	..	0.427	0.317	0.150	0.309
Turkey	0.263	0.260	0.228	0.424	0.117	- 0.002
Latin America						
Argentina	0.435	0.377	0.47	0.585	0.215	0.507
Brazil	0.484	0.123	0.472	0.527	0.515	0.558
Chile	0.367	0.102	0.409	0.456	0.274	0.360
Mexico	0.537	0.417	0.483	0.597	0.532	0.464
Venezuela	0.232	0.202	0.408	0.305	0.127	0.130
South Africa	0.246	0.242	0.337	0.238	0.248	0.391
Average	0.290	0.219	0.296	0.335	0.289	0.346

Sources: IFC; Bloomberg; BIS calculations. Table 1

whole period from 1996, and the average correlation with the Nasdaq across economies was highest in 2000 as well. That year represents the peak period of correlation for eight out of the 20 emerging economies considered here.

The closeness of movement with the Nasdaq is somewhat surprising in view of the differences in the composition of the indices across economies. For instance, based on the sector shares (in terms of market capitalisation) in the FTSE indices for emerging market economies in June 2000, few had an important technology sector, which is the dominant component of the Nasdaq index.¹⁴ Moreover, there is broad dispersion in the sectoral make-up of these markets, indicating that economic structure is unlikely to account for the intensity of their co-movement.

Differences in composition

¹⁴ There are 10 industrial sectors in the FTSE classification: resources, basic industries, general industrial, cyclical goods, non-cyclical goods, cyclical services, non-cyclical services, utilities, financials and information technology. The share of the IT sector ranged from, for example, 1.4% in Korea to 64.9% in Taiwan, while it was not identified as even existing in several other countries.

Methodology for computing the Nasdaq effect¹⁵

In order to determine whether a Nasdaq effect existed in the second half of the 1990s, it is necessary to go beyond the simple return correlations of Table 1. This section describes the methods used to assess whether changes in the Nasdaq help explain changes in emerging market indices, above and beyond what can be explained by a global equity trend and similarities in industrial composition. The starting point of the analysis is to obtain measures of returns in emerging market countries and on the Nasdaq that are stripped of the influence of these factors. Using these “stripped returns”, the marginal influence of the Nasdaq on emerging market indices can then be assessed.

Taking account of common global factors ...

... to obtain “stripped” returns...

Ideally, estimates of the stripped returns would be computed by decomposing sectoral-level data across both industrial and emerging market economies, for each week, into four sets of factors using a regression technique developed by Heston and Rouwenhorst (1994): the global mean in equity returns; the excess returns (over the global mean) attributable to sectors; the excess returns attributable to economies; and an idiosyncratic shock term. The sequence of estimates of the economy-specific factors for each emerging market economy would provide a weekly time series of stripped returns. The residuals from a regression of the gross Nasdaq returns on the estimated global equity trend and sectoral factors would provide a measure of stripped Nasdaq returns. Estimates of the Nasdaq effect could then be obtained by looking at the relationship between the stripped Nasdaq and emerging market returns (eg non-zero correlations would indicate the presence of a Nasdaq effect).

... to measure the Nasdaq effect

Lack of sectoral-level data for emerging markets

Because sectoral-level data on emerging equity market indices are not readily available for the entire 1996–2001 period, the analysis here employs a slightly different procedure. In the first step, the methodology is applied to construct measures of the global trend factor and industrial sector factors by using sectoral-level data from a number of industrial economies only.¹⁶ In the second step, the influence of sector returns in emerging markets can be isolated by a time series regression of the weekly returns of the headline index, in excess of the global trend factor, on the set of excess returns to the 10 sector factors that were estimated in the first step. Furthermore, including the excess return on the Nasdaq (over the global trend factor) in this regression provides a measure of its marginal impact on emerging market equities beyond what can be explained by the global trend factor and industrial composition.¹⁷

¹⁵ The reader interested only in the findings of this article, rather than in the technicalities of the methodology, can skip to the next section.

¹⁶ Ten sector factors are estimated corresponding to the FTSE classification mentioned in footnote 14. The estimated factors have the interpretation of the price of a portfolio that has an exposure to the specific sector but is fully diversified across all other sectors and countries, expressed in terms of its return in excess of the global trend factor.

¹⁷ This regression is akin to the style-analysis methodology first proposed by Sharpe (1992), who used a similar regression to infer portfolio allocation strategies for managed portfolios from information on their returns.

By comparison with the first procedure described above, the approach taken here amounts to assuming that the estimates of the global trend factor and sector factors, which are based on industrial economy data alone, are valid proxies for those that would be obtained using both industrial and emerging market data. Under this alternative method, notice that, by first subtracting the global trend factor from both the emerging market and Nasdaq returns, and then including the excess returns to the sectors in the second-step regression, stripped returns are effectively obtained. These stripped returns are the equivalent of the country factors that would be estimated from the regression on sectoral-level data.

Finally, it has been argued that changes in correlation do not necessarily reflect changes in the underlying links between variables in cases in which the economic environment has become more volatile; higher correlations might simply be a statistical artefact of the increase in volatility. In order to assess whether variations in the strength of the Nasdaq effect observed across subperiods are the result of structural changes in the link with the Nasdaq, a test suggested by Loretan and English (2000) is constructed.¹⁸

Testing for changes
in behaviour

Evidence of a Nasdaq effect

The gross correlations shown in Table 1 reflect all of the risk factors driving stock indices. The measures of the Nasdaq effect presented in this section are obtained as the coefficient in a regression of emerging market returns on Nasdaq returns, after controlling for the correlation that would be expected to derive from their co-movements with global market returns and sector-specific factors. Coefficient estimates for the entire period January 1996–March 2001, as well as for five subperiods corresponding to calendar years, are presented in Table 2. Entries with an asterisk are statistically significant.

Generally, the Nasdaq effect does not appear to be present. Over the full period, a significant relationship holds in Argentina, Mexico and Turkey only. However, in those cases where the coefficient is significant, it is positive. The results display two other interesting features.

First, they point to a lack of sharp geographical differences. Even though the Nasdaq effect is not found to exist at all in Asia over the entire sample period, it is present in only a few economies in the rest of the world. Moreover, the results in individual years are mixed across the regions. Thus, it can be concluded that the positive correlations reported in Table 1 mostly reflect a link with the Nasdaq that can be explained by industrial composition effects or the global trend in equity market returns.

Lack of clear
geographical ...

¹⁸ Bootstrapped confidence intervals are computed for the unconditional correlations of the stripped excess returns on the emerging market indices and the Nasdaq (ie net of sector effects) for each calendar year. Drawing random samples equal in length to one year from the 63-month history of the set of stripped excess returns, the confidence intervals are calculated by conditioning on the variance of the Nasdaq in each random sample falling within 10 basis points of the observed volatility of the Nasdaq in the corresponding calendar year. The interested reader is referred to Loretan and English (2000) for further details.

... and temporal differences

Second, there are no discernible temporal patterns in these results. Aside from the finding that the Nasdaq effect was completely absent in 1997, none of the other years studied looks special. If anything, the link with the Nasdaq was statistically stronger in more economies in 1999 than in 2000. One surprising conclusion from this analysis is that the Nasdaq does not appear to have had a positive independent influence on Asian stock prices during 2000.¹⁹

The Nasdaq experienced marked changes in volatility during the period under investigation. As mentioned in the previous section, when volatility fluctuates, changes in correlations may simply be statistical artefacts rather than reflecting changes in underlying behaviour. Using the simple correlations between the stripped returns (as opposed to the regression coefficients presented in Table 2), a test was undertaken to see if the underlying relationship with the Nasdaq was stable throughout the period

The estimated importance of the Nasdaq effect						
	1996-2001	1996	1997	1998	1999	2000
Asia						
China	0.042	0.296	0.271	0.392	-0.111	-0.154
Hong Kong	0.104	0.379 ¹	- 1.023	0.632	0.042	0.023
India	0.270	-0.518	- 0.284	0.099	0.873 ¹	-0.008
Indonesia	-0.098	0.259	0.258	-0.077	0.260	-0.527
Korea	-0.136	-0.121	0.763	-0.536	0.936	0.487
Malaysia	0.439	-0.130	1.461	-0.533	1.173 ¹	0.540
Philippines	0.120	-0.090	0.601	0.424	0.273	-0.429
Singapore	0.281	-0.063	0.326	0.463	0.733 ¹	-0.104
Taiwan, China	0.034	-0.148	- 0.165	0.204	0.314	0.016
Thailand	0.464	0.020	- 0.208	1.109	0.644	-0.414
Eastern Europe						
Czech Republic	0.147	-0.521	0.883	0.650	-0.607	0.760 ¹
Poland	0.273	-0.764	0.757	0.390	0.243	0.428
Russia	0.563	..	0.342	-0.469	2.357 ¹	0.065
Turkey	0.856 ¹	0.420	1.992	0.993	0.249	-0.171
Latin America						
Argentina	0.820 ¹	1.065 ¹	- 0.108	1.079 ¹	0.162	0.546 ¹
Brazil	0.218	0.129	- 0.047	0.742	-0.499	-0.012
Chile	0.270	-0.089	0.202	0.882 ¹	-0.262	0.293
Mexico	0.361 ¹	0.536	0.008	0.586	0.012	0.241
Venezuela	0.497	0.646	0.750	0.408	0.103	0.594
South Africa	0.262	0.675 ¹	0.179	0.64	-0.091	0.536 ¹
Average	0.289	0.104	0.348	0.404	0.340	0.136

¹ indicates significance at the 90% confidence level.

Sources: IFC; Bloomberg; BIS calculations. Table 2

¹⁹ To investigate whether a Nasdaq effect exists in industrial economies, the same procedure used to produce Table 2 was also applied to broad-based equity indices in a selection of economies. Over the full sample period, the results show that the Nasdaq had a marginal influence in only a few economies. In these cases, the coefficients are negative, suggesting that the Nasdaq attracted funds at the expense of equity markets in these economies.

under consideration.²⁰ The results of the test are reported in Table 3. Entries with asterisks correspond to those that, conditional on the observed volatility of the Nasdaq during that year, are different than would have been expected if no change in the underlying link with the Nasdaq had occurred.

The correlations paint a slightly different picture than the previous results in Table 2. The correlations in Table 3 point to changes in underlying behaviour in eight of the 11 cases in Table 2 in which coefficients were found to be significant in subperiods. Furthermore, there is some evidence that 2000 differed from other years, although for reasons that run contrary to widely held beliefs. In the Philippines, Singapore and Thailand, for example, the correlation between stripped returns was negative and unusually large (in absolute value). However, large, positive coefficients are obtained in some other countries, implying that the direction of Nasdaq influence overall was mixed during 2000.

Correlation between emerging market equities and the Nasdaq net of sector effects						
	1996-2001	1996	1997	1998	1999	2000
Asia						
China	0.004	-0.046	0.046	0.065	0.037	-0.101
Hong Kong	0.029	0.225 ¹	- 0.128	0.125	0.085	-0.071
India	0.087	0.020	- 0.035	0.087	0.241 ¹	-0.031
Indonesia	- 0.016	0.16	0.052	-0.054	0.070	-0.246
Korea	- 0.033	-0.061	- 0.014	-0.113	0.200 ¹	0.093
Malaysia	0.084	0.027	0.140	-0.031	0.302	0.191
Philippines	0.031	0.067	0.085	0.055	0.130	-0.275 ¹
Singapore	0.096	-0.086	0.126	0.093	0.273	-0.116 ¹
Taiwan, China	0.012	-0.074	- 0.105	0.037	0.127	0.026
Thailand	0.079	0.189	- 0.031	0.133	0.186	-0.208 ¹
Eastern Europe						
Czech Republic	0.047	-0.159	0.189	0.159	- 0.16	0.295 ¹
Poland	0.063	-0.170	0.215	0.116	0.003	0.088
Russia	0.058	..	0.010	-0.066	0.286 ¹	0.028
Turkey	0.114	0.118	0.199	0.138	0.038	-0.057
Latin America						
Argentina	0.235	0.423 ¹	- 0.056	0.345 ¹	0.097	0.147
Brazil	0.032	-0.007	- 0.019	0.213 ¹	-0.132	-0.169 ¹
Chile	0.010	-0.129	0.121	0.256	-0.039	0.124 ¹
Mexico	0.108	0.182	- 0.011	0.226	0.004	0.015
Venezuela	0.092	0.136	0.155	0.036	0.088	0.161
South Africa	0.079	0.203 ¹	0.063	0.106 ¹	-0.044	0.168 ¹
Average	0.065	0.054	0.050	0.096	0.090	0.003
¹ indicates significance at the 90% confidence level.						
Sources: IFC; Bloomberg; BIS calculations.						Table 3

²⁰ The test used was the one suggested by Loretan and English (2000), as described in the previous section. Notice that the standard deviations of weekly stripped Nasdaq returns were 1.2% (1996), 0.94% (1997), 1.27% (1998), 1.26% (1999) and 1.77% (2000).

Conclusions

This article has found that, after accounting for industrial composition effects, the correlation between returns on the Nasdaq and headline equity indices in emerging market economies was generally weak in the second half of the 1990s. This suggests that, in a few cases only, an alternative common risk factor has affected the pricing of Nasdaq stocks and equities in these markets.

In economies where the Nasdaq effect was found (Argentina, Mexico and Turkey), the evidence presented here is sufficient to identify the existence of an effect, but not to characterise it. One possible explanation is that equities in the Nasdaq and these economies lie close to each other in the spectrum of asset classes from the point of view of international investors. However, this view is difficult to reconcile with the evidence against the existence of a Nasdaq effect in most emerging market economies. Presumably, stocks in many of these economies share a similar risk profile.

Nasdaq effect could be underestimated

It is important to realise that the methods used here attempt to capture what is possibly only one part of a larger total influence of the Nasdaq on other equity indices. To the extent that returns on the Nasdaq are themselves a main force driving the global trend factor, the estimates of the Nasdaq effect provided here would be biased downwards. This is because the Nasdaq effect as defined here captures co-movements once the global trend and sectoral factors, assumed to be exogenous to the Nasdaq, are already accounted for. If, instead, the Nasdaq is used as a benchmark for pricing all global equities, then the average return on global equities itself will be subject to a Nasdaq effect as well. Likewise, if excess returns in the global IT sector are cued off changes in the Nasdaq, then the methodology employed here will miss this effect too. Unfortunately, there is no simple way to separately identify the independent influence of the Nasdaq through these two channels. Moreover, the Nasdaq effect may be stronger at a different frequency. For instance, stripped daily returns might exhibit higher correlations than the weekly returns used here.

Implications for portfolio diversification and contagion

The result that a common risk factor does not appear to affect Nasdaq stocks and emerging market equities suggests that there is still scope for international diversification along geographical lines. In addition, the hypothesis that the Nasdaq might be a new channel through which global financial contagion could spread is not supported by the results. However, there could be implications for portfolio diversification and contagion if, as discussed, the Nasdaq is indeed used as a benchmark pricing index in a way not captured here.

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