

Box II.4.1

Is the Bubble in Stock Markets Rational?

Prices of risky assets surged across countries to record high levels during the year on the back of unparalleled levels of monetary and fiscal stimulus, and the turn in market sentiments following positive news on the development of and access to vaccines and the end of uncertainty surrounding US election results. The widening gap between stretched asset prices relative to prospects for recovery in real economic activity, however, emerged as a global policy concern (BIS, 2020; IMF, 2020).

India's equity prices also surged to record highs, with the benchmark index (Sensex) crossing 50,000 mark on January 21, 2021 to touch a peak of 52,154 on February 15, 2021, which represents a 100.7 per cent increase from the slump just before beginning of the nationwide lockdown (i.e., since March 23, 2020) and a 68.0 per cent increase over the year 2020-21. This order of asset price inflation in the context of the estimated 8 per cent contraction in GDP in 2020-21 poses the risk of a bubble.

Literature on the subject highlights several fundamental determinants of equity prices, viz., GDP growth, inflation, and money supply (Tiryaki *et al.*, 2019; Khan and Khan, 2018). An autoregressive distributed lag (ARDL) model is estimated by regressing stock prices (Sensex) on money supply (M3, as a proxy of liquidity), the economic outlook (OECD composite lead indicator - CLI) and foreign portfolio investments in the secondary equity market for the period April 2005 to December 2020. The results suggest that the stock price index is mainly driven by money supply and FPI investments. Economic prospects also contribute to movement in the stock market, but the impact is relatively

less compared to money supply and FPI. This assessment shows that liquidity injected to support economic recovery can lead to unintended consequences in the form of inflationary asset prices and providing a reason that liquidity support cannot be expected to be unrestrained and indefinite and may require calibrated unwinding once the pandemic waves are flattened and real economy is firmly on recovery path. Even considering the above expectations earning growth of the corporates, the stock prices cannot be explained by fundamentals alone. Present valuations, as in the past, are supported by improved corporate earnings. This part of Sensex increase can be seen as rational.

$$\begin{aligned} \text{LOG(SENSEX)} = & -6.26 + 0.60^{***} \text{ LOG(M3) +} \\ & (-1.34) (4.51)^{***} \\ & 1.46 \text{ LOG(CLI) + } 0.0005^* \text{ FPI} \\ & (1.66)^* \quad (1.81)^* \end{aligned}$$

$$\text{ECM} = -0.05 (-4.57)^{***}$$

Bounds Test:

F-statistic 4.09 [Critical value at 5 per cent - I(0): 2.79; I(1): 3.67]

Bounds test rejects the null hypothesis of no level relationship at 5 per cent level.

LM Test p-value = 0.30, ARCH test p-value = 0.39

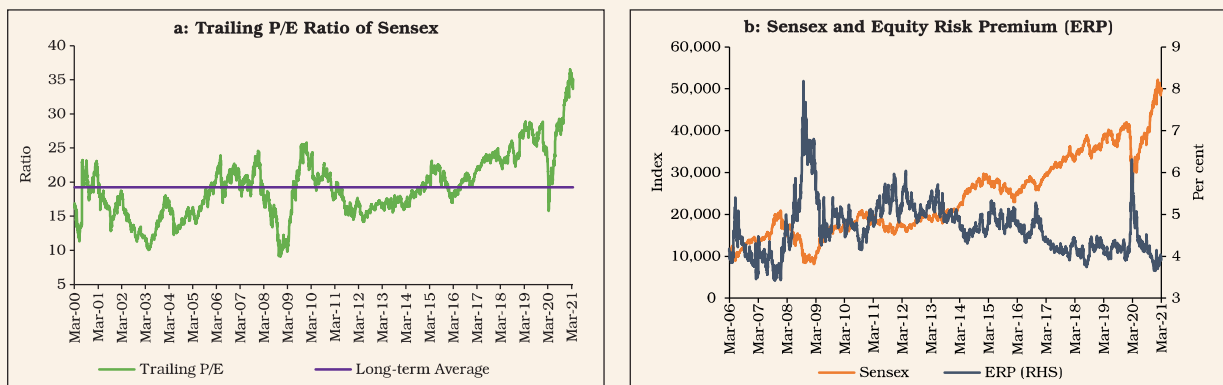
*: Significant at 10 per cent level.

***: Significant at 1 per cent level.

Note: Figures in parentheses are t-statistics.

Another approach to assess stock market valuation is to compare the price-to-earnings (P/E) ratio with its historical

Chart 1: Sensex and P/E Ratio



Source: Bloomberg and RBI staff calculations.

(contd.)

trend. The deviation of the actual P/E from its long-run trend shows that the ratio is overvalued (Chart 1a). Measures of dividend yield also signal that markets are getting overpriced. A decomposition of changes in equity prices indicate that the rise in equity prices during 2016 to early 2020 was mainly supported by a decrease in interest rates and Equity Risk Premium (ERP), with increase in forward earnings expectations contributing to a lesser extent (Chart 1b). Thereafter, a spike in ERP on COVID-19 concerns initially contributed to equity prices declining sharply to compensate for increased risks. However, equity prices registered an impressive recovery, subsequently, aided by easing of ERP. Currently, dividend yields have fallen below their long-term trends. As such, two-way price movements are possible going forward.

References:

1. International Monetary Fund (2020), 'Global Financial Stability Report: Bridge to Recovery', October.
2. Khan, J., & Khan, I. (2018), 'The Impact of Macroeconomic Variables on Stock Prices: A Case Study of Karachi Stock Exchange', *Journal of Economics and Sustainable Development*, 9 (13), 15-25.
3. Bank for International Settlements (2020), *Annual Economic Report*, BIS.
4. Tiryaki, A., Ceylan, R., and Erdoğan, L. (2019), 'Asymmetric Effects of Industrial Production, Money Supply and Exchange Rate Changes on Stock Returns in Turkey', *Applied Economics*, 51(20), 2143-2154.

Furthermore, the run-up in domestic equities was sustained by the government's approval of the ₹1.5 lakh crore production-linked incentive (PLI) scheme for 10 manufacturing sectors and record high FPI inflows. Market sentiment remained exuberant during December 2020 on better than expected GDP data for Q2:2020-21 and upward revision in India's GDP forecast for 2020-21 by the Reserve Bank and various global agencies. The benchmark indices hit record high levels during the month on upbeat IIP data for October 2020 and hopes of a faster global economic recovery after the passage of the US stimulus package and the Brexit trade deal. Markets wilted, however, under reports of a new strain of coronavirus in several countries, leading to imposition of fresh lockdowns and travel restrictions.

II.4.26 Domestic markets remained largely volatile in January 2021 as investors weighed the roll-out of coronavirus vaccines in the country and upbeat corporate results for Q3:2020-21 against the persistent rise in COVID-19 cases across the globe. The benchmark hit 50,000 mark in intra-day trade for the first time in history on January 21, 2021 before paring all the gains on concerns over reports of a fresh face-off between

India and China at the border, weak global cues over the stretched valuations in US equities and cautious trading ahead of the Union Budget. Reversing the weak momentum towards the end of January 2021, the benchmark achieved a fresh high of 52,154 on February 15, 2021 buoyed by budgetary proposals, optimistic outlook on revival of GDP growth by the Reserve Bank and positive cues from global markets. However, markets declined towards the end of the month following a surge in the US treasury yields, rise in crude oil prices and fresh spikes in COVID-19 cases in certain Indian states. Markets commenced on an optimistic note in March 2021 buoyed by release of positive Q3:2020-21 GDP data and encouraging reports for February 2021 on auto sales, GST collections, manufacturing and services PMI. Market ebullience, however, sobered reflecting concerns over inflation and imposition of fresh COVID-induced restrictions in some parts of the country.

II.4.27 The total market capitalisation of BSE listed companies scaled to record level of ₹204.3 lakh crore at end-March 2021 registering an increase of 80 per cent over that of ₹113.5 lakh crore at end-March 2020. The market capitalisation to

GDP ratio crossed 100 per cent in January 2021 for the first time in over a decade. There has been a

surge in IPOs during 2020-21 as also the number currently in the pipeline (Box II.4.2).

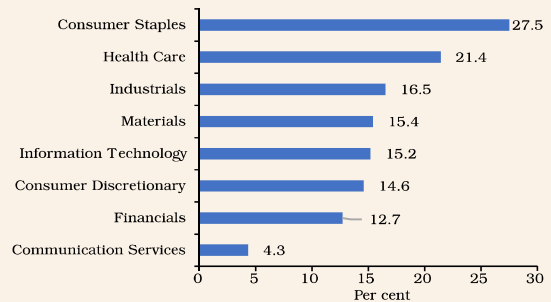
Box II.4.2 The Phenomena of Listing Returns in India: Some Exploration

Equity markets experienced a roller-coaster ride, rebounding steeply from their March 2020 downturn. The exuberance witnessed in the secondary market gripped the primary market, with the year 2020-21 turning out to be an extraordinary one for initial public offers (IPOs) by Indian companies, as 21 out of 29 IPOs have generated positive returns for investors on listing (Chart 1). A sector-wise analysis of 201 IPOs over the last 10 years (2011-12 to 2020-21) indicates that IPOs from consumer staples and healthcare sectors generated the highest listing gains in India (Chart 2).

The underpricing of IPO is one of the most commonly studied puzzles in the field of corporate finance. Underpricing of an IPO is said to have taken place when the stock generates higher prices on the first day of listing, called the listing returns. In the literature, information asymmetry is regarded as the root cause of underpricing (Rock, 1986) - a winner's curse model is at work wherein the issuer deliberately underprices its IPO to attract uninformed investors. Other reasons are providing compensation to investors by the issuers for undertaking *ex-ante* uncertainty risk.

An attempt has been made to examine the factors underlying the underpricing in IPOs in the Indian context using three sets of variables: market specific variables such as oversubscription, lagged market return and lagged volatility; firm characteristics such as age, leverage, growth, profitability and valuation indicators; and IPO specific variables such as IPO size. The data relate to the mainboard

Chart 2: Main board IPO Average Listing Returns in Last 10 Years (Sector-Wise)



Note: Only those sectors with at least five IPOs during last 10-year period are considered.

Source: Bloomberg and RBI staff calculations.

IPOs that were listed on the BSE and the NSE during 2011-12 to 2020-21. The following regression model has been estimated to determine the influence of each characteristic on the adjusted IPO returns, which are calculated as the raw IPO returns minus the BSE Sensex returns on the IPO listing day (adjusted returns are preferred over raw returns to control for the effect of general market on IPO performance).

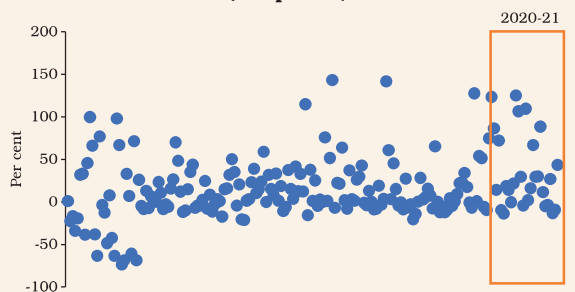
$$\begin{aligned} \text{Adjusted_Rtn}_i = & \beta_0 + \beta_1 \text{Oversubscription}_i + \beta_2 \text{Sensex_lag2mreturn}_i \\ & + \beta_3 \text{VIX_lag2mavg}_i + \beta_4 \ln_Age_i + \beta_5 \text{DER}_i + \beta_6 \text{ROE}_i \\ & + \beta_7 \text{Pat2ygrowth}_i + \beta_8 \text{PE}_i + \beta_9 \ln_IPOsize_i \\ & + \text{Sector}_i \end{aligned}$$

Where,

Adjusted_Rtn = Adjusted IPO returns; Oversubscription = Number of application of shares/ number of shares issued by the company; Sensex_lag2mreturn = absolute Sensex returns in two months preceding the IPO; VIX_lag2mavg = average VIX in two months preceding the IPO; Ln_Age = log of the difference between date of incorporation and IPO listing date; DER = debt to equity ratio; ROE = return on equity; Pat2ygrowth = compounded annual growth rate of profit after tax in the last 2 years; PE = price-earnings ratio; and Ln_IPOsize = log of size of IPO proceeds. The model also controls for sector specific dummies.

The coefficient of oversubscription rate is found to be positive and highly significant in explaining the IPO's initial

Chart 1: Main board IPO Listing Returns in Last 10 Years (Scrip-Wise)



Source: Bloomberg and RBI staff calculations.

(Contd.)