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India: Asset Prices and the Macroeconomy

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Abstract

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This paper examines rising asset prices in India. For the most part, asset prices in India reflect structural factors but the risk of a correction cannot be ruled out. However, at this juncture monetary policy may not be the most effective tool to safeguard financial stability because (i) India's economy is undergoing rapid structural change making it difficult to identify price misalignments; (ii) the macroeconomic impact of an asset price correction is likely to be small; and (iii) the relationship between monetary policy and asset prices is also weak. Targeted changes in financial regulations are better tools to address potential risks.

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Contents	Page
I. Introduction.....	3
II. How Significant Are Assets Markets in India?.....	3
III. How Are Asset Prices Evolving in India?	6
IV. How Do Asset Prices Impact Macroeconomic Activity?	8
V. Should Macroeconomic Policies Adjust to Asset Price Developments?.....	14
VI. Policy Recommendations and Conclusion.....	18
References.....	20
 Box	
1. Mortgage Interest Deductibility and Real Estate Prices	18
 Figures	
1. Improved Affordability.....	4
2. Share of Mortgage.....	4
3. Comparison of Equity Market Size in Asia and Other Emerging Markets, 2005	5
4. Growth in Depth of Equity Market, 1990-2005.....	5
5. Mutual Funds Asset Under Management in 2004	5
6. Insurance Assets in 2004	5
7. Gold: Consumer Demand in Selected Countries in 2005	6
8. Emerging Asia Equity Performance, January-June 2006	7
9. Emerging Asia Equity Performance, end-June-November 2006.....	7
10. Index of House Prices	7
11. Trend in Gold Prices in India.....	8
12. Asset Prices and Macroeconomic Variables.....	11
13. Response of LN_NPC_R_CAP to Cholesky One Standard Deviation Innovations.....	13
14. Accumulated Response of LN_NPC_R_CAP to Cholesky One Standard Deviation Innovations	13
 Tables	
1. Distribution of Household Assets, 1991-2002	4
2. Price-Earnings Ratio	6
3. Household Financial Assets.....	9
4. Overall Contribution of Equity Linked Businesses and Income to Banks Value.....	10
5. Stationarity Tests	12
6. Cointegration Tests	12

I. INTRODUCTION

1. **This paper discusses the policy implications of rising asset prices in India.** This trend is generally viewed as the positive consequence of strong growth, rising incomes, increased openness, and financial deregulation. However, in international policy discussions concerns arise about the implications of rapidly rising asset prices for macroeconomic and financial stability. For example, some countries have found that a sharp turnaround in economic conditions could have adverse consequences for asset price valuations. Moreover, as financial institutions develop greater exposure to assets, sharp price swings can have a major impact on financial system balance sheets, and thus on lending and investment. As households accumulate assets, asset price volatility could also impact consumption.

2. **Policymakers in India have expressed concerns about asset prices, particularly their implications for financial sector stability.** In its March 2006 monetary policy statement, the Reserve Bank of India (RBI) raised concerns that “financial imbalances are growing in the presence of abundant liquidity, rising asset prices, and a marked increase in risk appetite (RBI, 2006a). More recently, the RBI characterized the financial system as “significantly overdrawn in terms of credit portfolios (and) banks need to recognize the reality of business and credit cycles” (RBI, 2006b). Over the course of 2005 and 2006, to counter potential inflation and financial risks from rising asset prices the RBI has gradually tightened monetary policy and has significantly raised risk weights on loans to various asset sectors (housing, commercial real estate, consumer credit, venture fund, and capital market lending) as well as increasing general provisions.

3. **This paper examines the role of asset prices in India by addressing three questions.** First, how important are asset markets, and how have asset prices evolved in India? Second, how do asset prices impact the economy; and third, what policies would minimize the potential risks as the role of asset markets in the economy grows?

II. HOW SIGNIFICANT ARE ASSETS MARKETS IN INDIA?

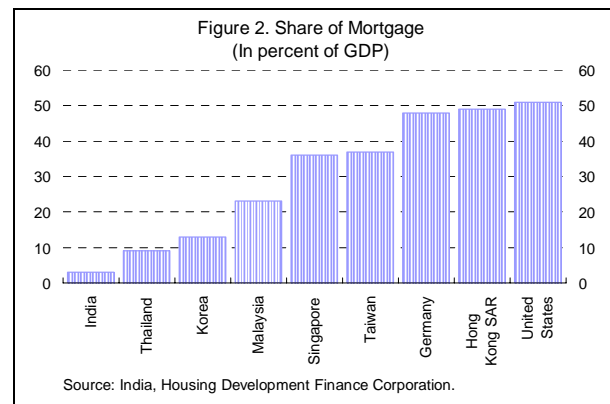
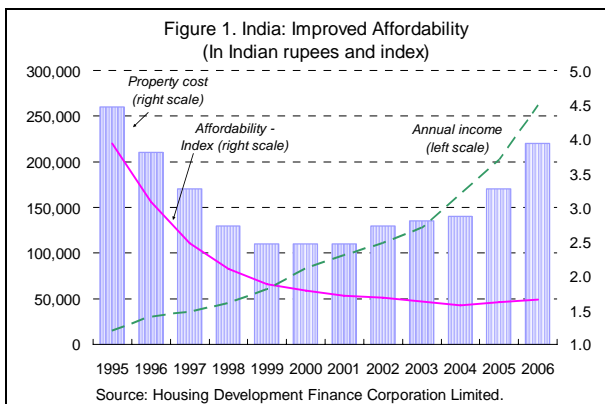
4. **Asset markets in India have been growing rapidly, reflecting structural factors, namely rising incomes and financial deregulation.** The real estate market dominates but the stock market is gaining greater prominence. Traditionally, gold has been an important asset to store wealth particularly in rural areas.

5. **Real estate is the most important asset class in India.** Households' investment in real estate far exceeds their holdings of financial and nonfinancial assets contributing to a rising stock of real estate. Households' savings comprise about 28 percent of disposable income in India. In 2004–05, about 53 percent of the annual flow of savings was invested in physical assets. The National Sample Survey data shows that the value of the stock of property holdings more than tripled over the past decade to over 200 percent of GDP (Table 1). This expansion reflects growing population, increasing affluence (household incomes and savings have almost doubled in real terms over the past decade) and increasing affordability on account of the declining cost of housing as interest rates and land use restrictions were deregulated (Figure 1). The development of the retail mortgage lending market has also spurred development (Figure 2). This asset market is likely to expand even further in coming years. According to official and market estimates, another 31 million housing units are needed to meet pent-up demand, while a further 2.7 million additional units per annum are needed to meet the needs of the growing population (Deutsche Bank, 2006).

Table 1. India: Distribution of Household Assets, 1991–2002

	Rural		Urban		Total	
	1991	2001	1991	2001	1991	2001
(In trillions of Indian rupees)						
Total asset value	10.4	32.9	7.9	23.2	18.3	56.1
Land	6.7	20.8	2.8	8.9	9.5	29.8
Buildings	2.2	7.7	3.1	8.8	5.3	16.5
Livestock	0.4	0.7	0.0	0.0	0.4	0.7
Machinery/equipment	0.4	1.2	0.4	1.3	0.8	2.5
Household durables	0.6	1.7	0.9	1.9	1.5	3.6
Financial assets	0.1	0.7	0.6	2.2	0.8	2.9
Receivables	0.0	0.0	0.0	0.1	0.0	0.1
(In percent of GDP)						
Total asset value	157.4	144.4	119.9	101.5	277.3	245.9
Land	101.0	91.3	42.6	39.1	143.6	130.4
Buildings	33.7	34.0	47.2	38.4	80.8	72.3
Livestock	5.3	3.0	0.5	0.2	5.8	3.2
Machinery/equipment	6.0	5.3	5.8	5.6	11.7	10.9
Household durables	9.3	7.4	13.9	8.5	23.2	15.9
Financial assets	2.0	3.2	9.5	9.4	11.5	12.6
Receivables	0.2	0.1	0.5	0.3	0.6	0.4

Source: National Sample Survey Organization, *Household Assets and Liabilities in India*, 2005 and 1998.

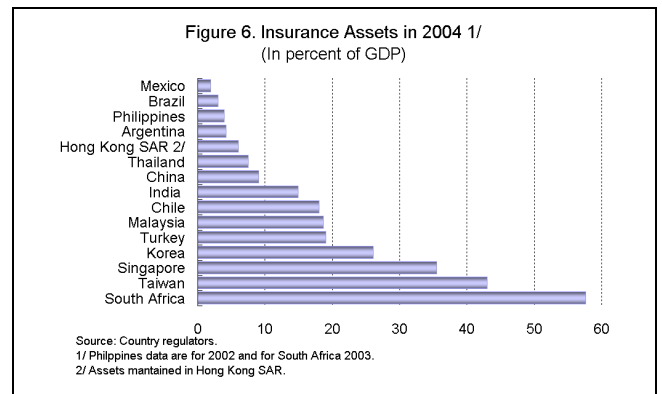
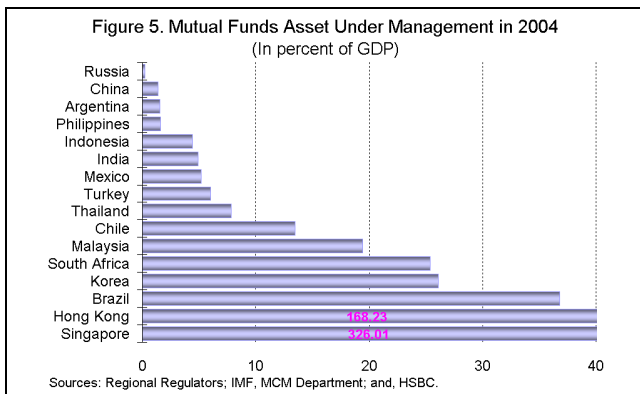
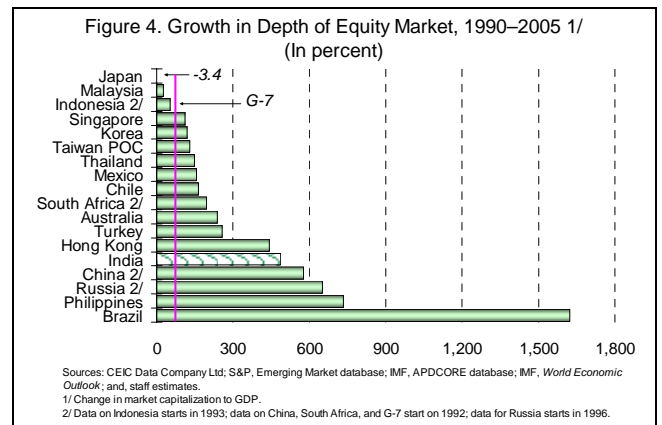
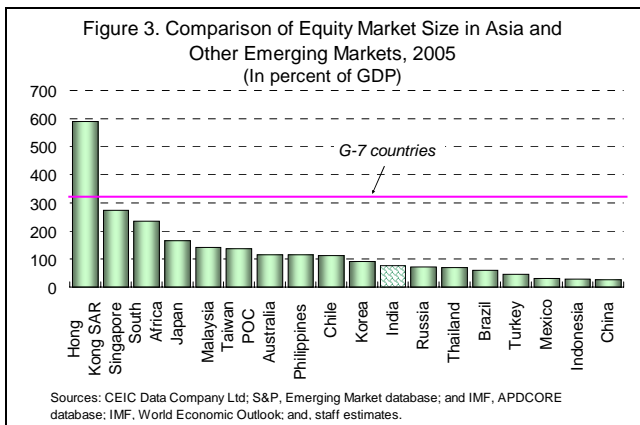


6. **The commercial real estate sector in India is also very large.** Deutsche Bank (2006) puts the value of India's commercial real estate stock at \$300 billion (35 percent of GDP), making it the fourth largest commercial real estate market in Asia, after Japan, China, and Korea. The sector has benefited from the rapid development of the services, and more lately the manufacturing sector, combined with the opening of the sector to FDI.¹

¹ In 2005, the government further liberalized investment norms in real estate, allowing 100 percent FDI in real estate development of over 50,000 square meters, IT parks and Special Economic Zones (SEZs) and, hotels and
(continued...)

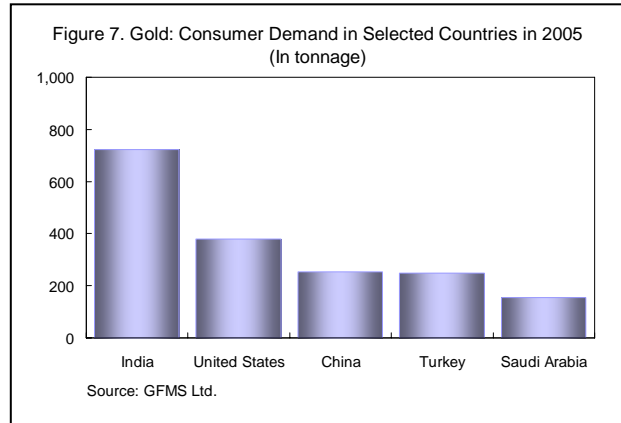
Nonetheless, it remains relatively undeveloped by international standards. Market analysts conclude that it has the potential to grow by \$66 billion in the next five years Deutsche Bank (2006).

7. **Equity markets are also sizable** (Figures 3 and 4). Between 2000–2005, stock market capitalization rose to over 77 percent of GDP, reflecting the easing of controls on foreign inflows, the emergence of dedicated emerging market funds, rising capital flows, and a growing domestic investor base (Purfield and others, 2006). Net portfolio inflows totaled about \$10 million in 2005, with foreign investors hold about 10 percent of GDP in equity assets (Lane and Milesi-Ferretti, 2006) and accounting for up to one third of stock market turnover. The domestic institutional investor base has also expanded. Insurance, pension, and mutual funds' assets amount to almost 15 percent of GDP, with significant portions invested in equity (Figures 5 and 6).



service apartments. It also allowed the repatriation of investments after three years. However, foreign investors are not permitted to sell or trade in undeveloped land.

8. **Gold represents India's third major asset market.** India is the world's largest consumer of gold, accounting for about 20 percent of annual global gold purchases (Figure 7). With annual gold purchases tripling since 1990, households' gold holdings are estimated to be worth 28–42 percent of GDP in 2002 (Bhattacharya, 2002), or \$204–307 billion. This matches the total savings by individuals in the Indian Banking sector (Agarwal, 2004).



III. HOW ARE ASSET PRICES EVOLVING IN INDIA?

9. **Stock market prices have risen sharply particularly relative to other emerging markets** (Figures 8 and 9). After underperforming regional indices in the 2000–02 periods, the SENSEX increased at a compound annual rate of 17 percent since 2003. This run-up reflects large inflows of foreign capital (some \$26½ billion in 2003–2005) as low U.S. interest rates and promising growth prospects increased the attractiveness of India. Markets in turn have become more integrated with regional and world markets as illustrated by a rising correlation and beta.² The growing base of domestic intuitional investors has kept stock prices buoyant.³ The price-earnings ratio on the SENSEX now exceeds 20, with ratios in the mid-cap, and technology markets closer to 30. These valuations appear high by recent historical and emerging market standards (Table 2).

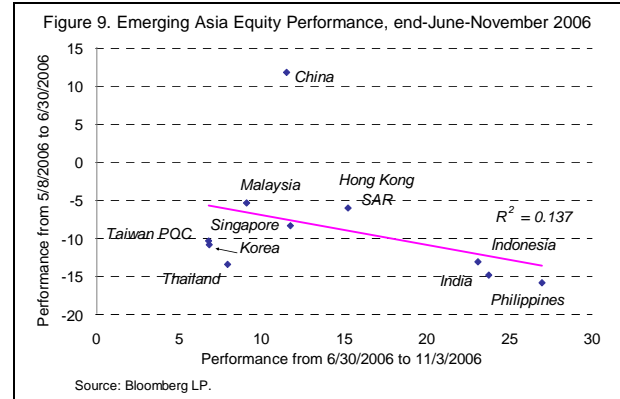
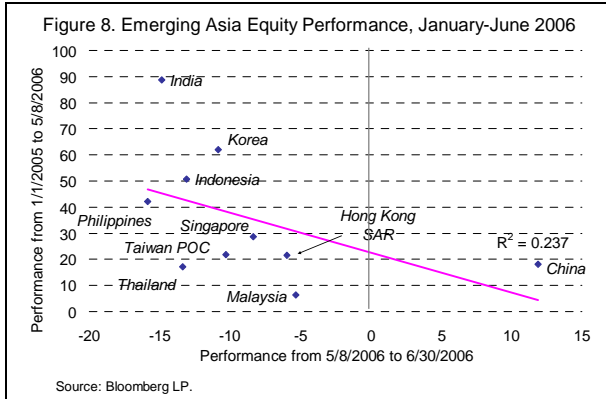
Table 2. Price-Earnings Ratio 1/
(Period average)

	2006 End-October	2006 H1	2001–06	Before 1997 High 2/
India	23.4	21.4	15.9	31.9
Sri Lanka	18.5	20.6	12.5	14.0
Taiwan Province of China	16.6	18.9	29.7	33.0
Singapore	16.8	16.5	17.9	21.4
Philippines	16.0	16.3	18.9	28.0
Hong Kong SAR	16.8	15.4	16.9	17.1
Malaysia	16.7	15.1	17.7	30.9
China	16.2	14.0	15.2	20.2
Indonesia	17.4	13.8	12.6	24.7
Korea	11.0	12.0	11.9	31.4
Thailand	10.2	10.5	23.8	21.9
World	16.4	17.2	20.9	31.7 3/
Emerging Latin America	12.9	13.8	13.1	17.9 3/
Emerging Europe and Middle East	14.1	15.4	14.9	25.7 3/

Sources: Datastream; and Fund staff calculations.
1/ Based on MSCI country index.
2/ Highest annual average between 1990–97. Each economy can have different data starting point.
3/ Historical high since 1995.

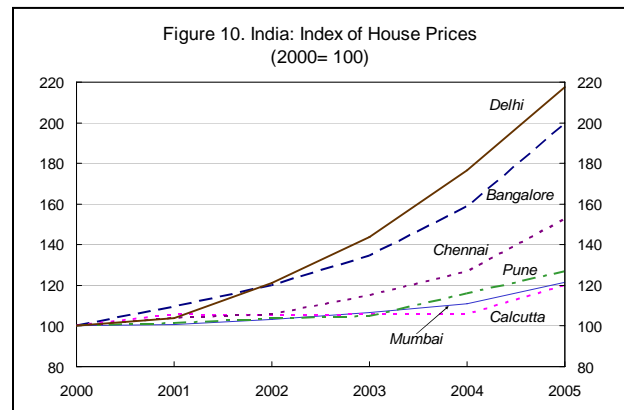
² India's beta versus world markets has increased from -0.2 in 1995–99, to +0.67 in 2000–03, and almost 1.5 in 2004–2005.

³ For example, domestic mutual funds raised some Rs. 1,018 billion or \$23 billion in 2003/04–2005/06 and in 2005, private provident funds were permitted to invest up to 5 percent of their assets in equity.



10. **Nonetheless, valuations by mid-2006 appeared to be broadly in line with India's growth prospects.** Using a standard risk premium assumption of 6 percent, the expected real dividend growth implied by current valuations appear to be in line with estimated medium-term growth potential of about 7 percent.⁴ Ex-post risk adjusted returns look reasonable. The sharpe ratio (which measures excess returns per unit of risk) of 1.3 between 2001–2005 is broadly comparable to the return on U.S. high yield bonds (Purfield and others, 2006). Underlying corporate financial performance is strong. Corporate after tax profits have risen at a compound rate of 37 percent per annum since 2003. These indicators on their own do not provide definite evidence that Indian equity markets are not overvalued, but at least at the macro level current valuations do not appear to be grossly out of line with fundamentals.

11. **Property prices are also scaling new highs** (Figure 10). Since 2000, residential housing prices in Bangalore, Delhi, and Mumbai have more than doubled, while those in smaller tier II cities (e.g., Chennai and Pune) have risen by 25–50 percent.⁵ Over the same period, increases in commercial real estate rental prices ranged from a high of about 85 percent in Bangalore to a low of 4 percent in Mumbai. Office and retail vacancy rates in the central business districts in India's three main urban centers have fallen to 0–3 percent (Jones Lang La Salle, 2006a). However, in the suburban centers of Delhi and Mumbai, vacancy rates



⁴ Implied dividend growth rates are calculated with the Gordon valuation model: $P_t = D_t (1+g_t) / (r_t + \rho_t - g_t)$; where P_t is the equity price; D_t is the dividend; r_t is the real interest rate; ρ_t is the risk premium; and g_t is the real growth rate. The calculations are sensitive to the assumption on equity risk premiums: a higher risk premium of 8½ percent which is somewhat lower than India's historical equity risk premium of 9.7 percent (Mehra, 2006) would result in current valuations exceeding growth potential by about 1–2 percentage points.

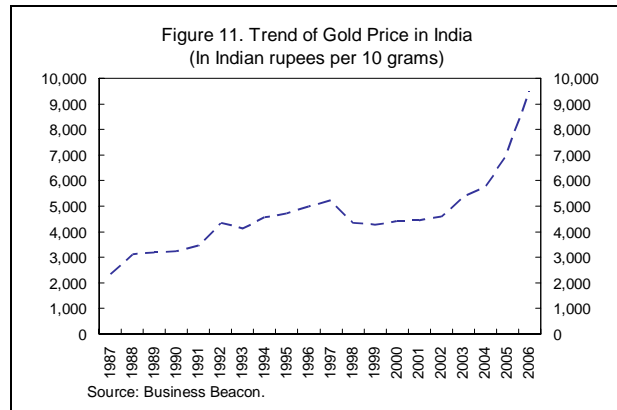
⁵ Data on residential and commercial real estate are provided by HDFC.

in shopping mall developments are in the 10–14 percent range; the mall market could be reaching saturation point given the large number of developments in the pipeline (Jones Lang La Salle, 2006b). Nonetheless, in aggregate, market analysts consider that real estate prices are likely to continue to rise for the foreseeable future with demand outstripping supply on account of demographics and rising incomes.

12. Domestic gold prices have also appreciated aggressively (Figure 11).

Domestic gold prices had risen by about 215 percent since end-2000, with much of the increase occurring since mid-2005 as rising fears of global inflation pushed global prices higher. With households nonmonetary holdings of gold estimated to be in the range of 10,000–15,000 tons in 2002 (Bhattacharya, 2002), by September 2006, households' gold

related wealth would have increased by between \$102–153 billion (approximately 20–30 percent of 2002 GDP) on account of rising gold prices.⁶



13. The analysis suggests that much of the recent rise in asset prices reflects structural changes. The rapid increase in asset prices, especially in real estate, is likely to have contributed to a relaxing of some of the constraints that had limited households and corporates' ability to smooth consumption and borrow. Going forward, asset price developments are likely to become a more important determinant of economic activity, by making consumption and investment less dependent on current income and more sensitive to changes in income, interest rates, and asset prices.

IV. HOW DO ASSET PRICES IMPACT MACROECONOMIC ACTIVITY?

14. There are a number of relationships between asset prices and the real economy. Specifically, asset prices are leading indicators of future changes in economic activity, because asset prices reflect the present discounted value of expected future dividends (and thus expected future growth). Beyond this passive channel, however, there are five main channels whereby asset prices may affect real activity (Morck, Schleifer, and Vishny, 1990)

- *Wealth effects:* Under the life cycle/permanent income hypothesis, higher asset prices raise individuals' lifetime wealth, leading to higher spending.

⁶ Excluding the impact of exchange rate movements against the U.S. dollar.

- *The financing or cost of capital hypothesis:* Rising asset prices, particularly of real estate lower the cost of new capital relative to existing capital, spurring investment.
- *The financial accelerator or credit channel:* When credit markets are imperfect, asset price fluctuations can impact borrowing capacity by affecting borrowers' wealth and the value of assets pledged as collateral (Kiyotaki and Moore, 1997 and Bernanke, Gertler and Gilchrist, 1999). These dynamics affect the finance premium on loans, and thus influence investment and consumption. If borrowers are highly leveraged, changes in net worth arising from moves in asset prices disproportionately impacts real variables, working to propagate and amplify macroeconomic shocks.
- *Balance sheet effects and financial fragility:* Asset-price swings affect financial institutions' net worth by affecting the valuation of asset portfolios, as well as the health of borrowers as noted above (thus potentially boosting nonperforming loans). Severe asset-price crashes can cause intermediaries to cut back credit, potentially dampening aggregate demand. Large shocks can cause feedback into corporate and household income, further weakening intermediaries and prompting further asset-price declines, especially when intermediaries are highly leveraged.
- *Confidence effects:* To the extent that equity and other asset prices signal faster growth of future real incomes, they can also influence consumption. Likewise, stock market and real estate changes may provide entrepreneurs with information about market expectations of future demand, thus influencing investment decisions.

15. **Empirical research suggests that the financial wealth channel can be significant even in emerging markets.** Kuralbayeva and N'Diaye (2006) find that in Malaysia, Hong Kong SAR, Indonesia, and Korea, a 10 percent rise in real stock prices increases private consumption by about 0.2–0.3 percent, similar in magnitude to estimates for industrialized countries (see IMF 2000, and Slacalek, 2006).

16. **Several indicators suggest that wealth and financial accelerator effects in the Indian context are however, likely to be small:**

- **Indian households' holdings of marketable financial asset holdings are small**

(Table 3). Almost three quarters of household financial wealth is held in a combination of cash, bank deposits and government securities, compared to about 60 percent in Japan, and 33 percent in Korea. Households' direct holdings of shares account for less than ½ percent of GDP, or

	1993/94	2003/04	2005/06
	(In percent of GDP)		
Total financial assets	12.6	14.0	16.7
Currency	1.5	1.5	1.5
Deposits	5.4	5.8	7.9
Shares and debentures	1.7	0.1	0.8
Government securities/small savings	0.8	2.8	2.5
Insurance funds	1.1	1.9	2.4
Provident and pension funds	2.1	1.9	1.7

Source: Central Statistical Organization; and Reserve Bank of India.

- 2 percent of household wealth. If indirect holdings via institutions are included, these holdings rise to 3½ percent of GDP. Indirect holdings are primarily in the form of public or defined benefits plans, where changes in value of financial assets have little direct impact on households' wealth.
- **Holdings of property and gold are unlikely to be leveraged.** The home equity loan market is not developed. Despite various initiatives to encourage the development of gold markets, retail markets that would allow households to transform gold holdings into capital have failed to flourish (for example, the 1999 gold deposit scheme). Gold Exchange Traded Funds (GETFs), that allow households to buy and sell gold in units of as little as Rs. 100, are still in their infancy.
 - **Corporates' exposure to nondebt asset markets is also small.** Indian corporates primarily invest in government securities rather than equity. About 71 percent of corporate financial assets (25 percent of GDP) are held in government and approved securities, debentures, and Public Sector Undertakings' bonds. Less than 5 percent of funds are invested in mutual funds, and even less in direct equity holdings. Land and property are less than 3 percent of total fixed and financial assets (5.8 percent of GDP). However, financial data could understate the true value of property holdings to if valued at historical purchase prices.
 - **The financial sector could be more exposed to asset price movements, due to indirect exposures via their borrowers and direct exposures on asset holdings** (Table 4). Private sector credit as a share of GDP is now at about 42 percent of GDP up from under 30 percent of GDP in 2000 making the financial sector more exposed to shocks that impact borrowers' repayment capacity. On the other hand, banks' direct holdings of shares and mutual funds are relatively small (0.8 percent of GDP), partly reflecting high Statutory Liquidity Requirements (SLR) and rules that call for non-SLR holdings to be in investment grade securities. However, some banks have relatively high exposures due to the importance of equity-linked earnings. Elsewhere in the financial sector, the insurance sector's exposures to real estate and equity is low and bulk of their assets held in government securities.⁷ The same is true of the pension sector.

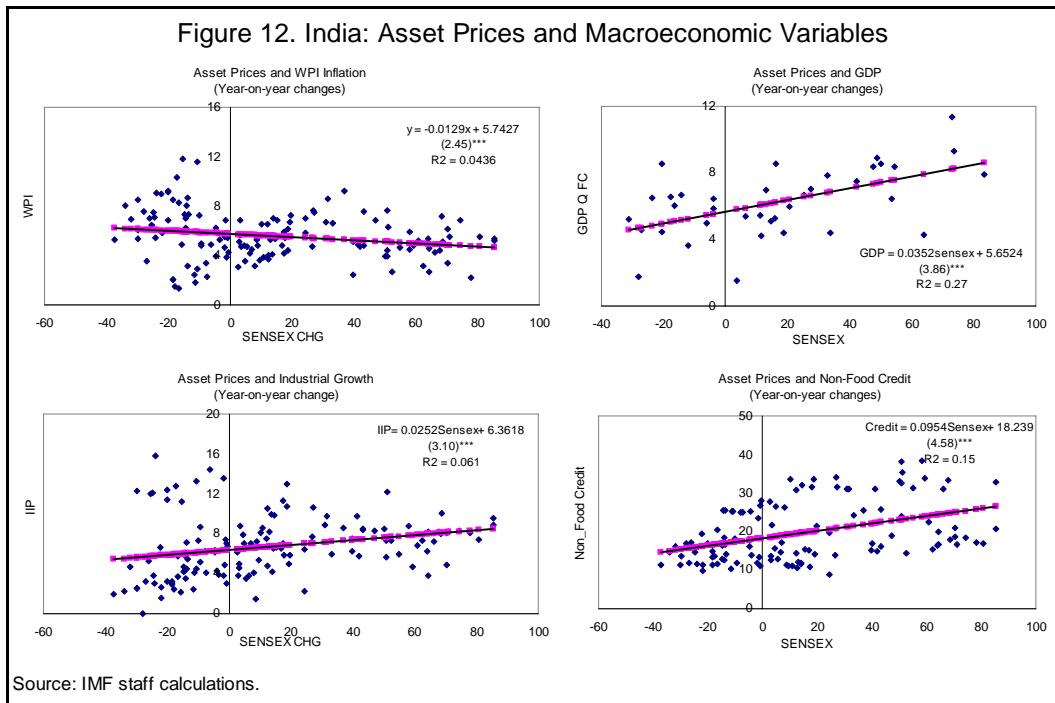
Table 4. India: Overall Contribution of Equity Linked Businesses and Income to Banks Value

	Equity Linked Businesses	Equity Linked Revenues	Total
(In percent)			
Kotak	60.0	6.0	66.0
ICICI Bank	19.1	28.0	47.1
HDFC	7.6	25.2	32.8
UTI Bank	0.0	24.7	24.7
HDFC Bank	0.0	9.4	9.4

Source: Morgan Stanley, June 2006.

⁷ For example, IRDA reports that total fixed assets of insurers in Indian, including property amounted to Rs. 146.6 million in 2005/06. Moreover, investments in equity are restricted to AA-rated paper and must be
(continued...)

17. **There is also no clear or strong relationship between asset prices, inflation, and aggregate demand** (Figure 12). Using changes in the Sensesx to proxy changes in assets prices, asset prices and WPI inflation are negatively correlated. While the correlations between equity prices and real activity and credit are positive and significant, the relationships are very weak. Moreover, given the endogeneity of asset prices to economic activity, even a finding of positive correlation does not necessarily imply an effect of asset prices on economic activity, per se.



18. **An econometric investigation into the determinants of consumption for India confirms that the macro impact of asset prices is relatively small.** A VECM model is used to examine the linkages between asset prices and consumption. However, a natural limitation of such a procedure is that it only allows for conclusions about the general relationships in the model and not causality. The model includes four variables: real private consumption per capita, real stock exchange index to proxy for developments in asset prices (time series on property and gold holdings are not available), real short-term interest rates to control for the impact of monetary policy, and real per capita income to proxy for income, as well as an exogenous dummy variable to capture the structural changes in the economy following the 1991 balance of payments crisis.⁸ The data are annual from 1979–2005, all variables (with

liquid, and investments in equity cannot exceed 50 percent of investor and sector exposure limits (10 percent of free capital and 10 percent of total industrial sector exposure).

⁸ Unfortunately, stock market capitalization figures which would represent a more correct measure of households' wealth are not available for the full sample period.

the exception of the dummy) are specified in logs. Augmented Dickey Fuller tests confirm that the series are I(1) (Table 5). Johansen trace statistics reveal the existence of a single cointegration vector with a trend and intercept, which can be interpreted as the consumption function (Table 6). Lag selection tests suggest a lag of two is sufficient for all variables.

	Level	First Difference 2/
Ln_Real_Consumption_Per_Capita 1/	11.7	-8.70 ***
Ln_Interest_rate	-0.44	-6.06 ***
Ln_Real Per Capita Income 1/	5.73	-7.40 ***
In_Stock_Market Index	1.61	-6.31 ***
1 percent critical value (excluding trend or intercept)	-2.63	-2.64

1/ Test included a significant time trend.
 2/ * Test statistic significant at 10 percent level; ** test statistics significant at 5 percent level; *** test statistics significant at 1 percent level.

	Null	Alternative	Test Statistics 2/	95 Percent Critical Value
Johansen's Likelihood Ratio	H=0	H=1	75.36 ***	47.86
Trace Statistic	H<=1	H=2	18.76	29.80
	H<=3	H=2	4.48	15.49
Johansen's Maximum Eigenvalue Test	H=0	H=1	56.60 ***	27.58
	H<=1	H=2	14.28	21.13
	H<=3	H=2	4.11	14.26

1/ Test included an intercept in the cointegrating vector.
 2/ *** Test statistics significant at 1 percent level.

19. **The results reveal that a 10 percent increase in the stock market index is associated with an increase in consumption of one tenth of 1 percent.** The VECM revealed the following long-run relationship (with standard errors in parentheses):

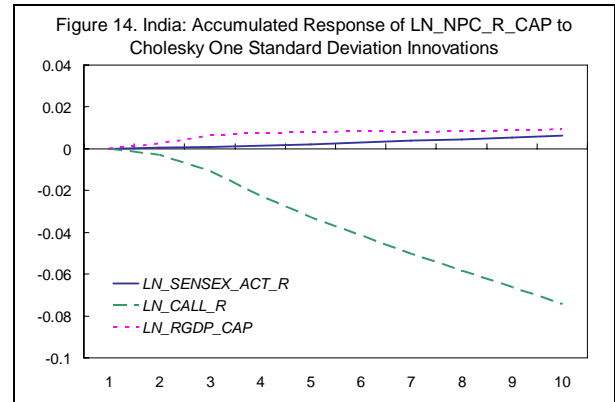
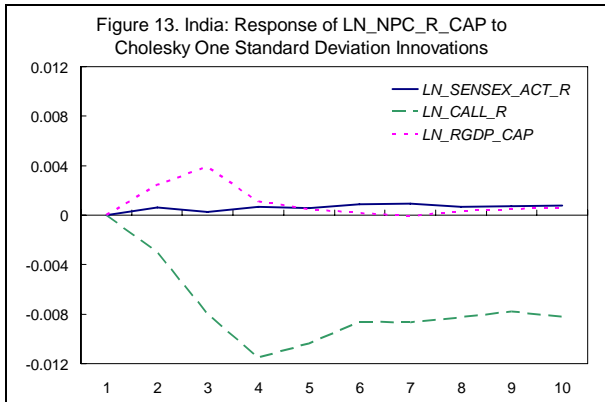
$$Consumption = -3.64 + 0.01Sensex - 0.05InterestRate + 0.60Income$$

(0.00373)
(0.00657)
(0.02093)

The coefficients are of the correct sign: consumption increases with rising asset prices, as proxied by stock market prices and incomes, but decline with rising interest rates. However, as expected the impact of asset prices on consumption is relatively small. The short-run adjustment mechanism is modeled as an ECM with the implied error correction vector z_{t-1} derived from the Johansen procedure together with the lagged first differences of the model's endogenous variables.

$$\begin{aligned} \Delta Consumption = & \underbrace{-0.047}_{(-0.012)} + \underbrace{1.05Z_{t-1}}_{(0.291)} - \Delta \underbrace{0.335Con_{t-1}}_{+0.324} - \Delta \underbrace{0.031Con_{t-2}}_{(+0.007)} + \Delta \underbrace{0.009Sensex_{t-1}}_{(+0.007)} + \Delta \underbrace{0.005Sensex_{t-2}}_{(+0.007)} \\ & - \Delta \underbrace{0.041R_{t-1}}_{(+0.013)} - \Delta \underbrace{0.018R_{t-2}}_{(+0.012)} + \Delta \underbrace{0.244Income}_{0.285} + \Delta \underbrace{0.081Income_{t-2}}_{(+0.109)} + \Delta \underbrace{0.030Dummy90}_{(0.011)} \end{aligned}$$

Again variables are of the correct sign and the coefficients are jointly significant.⁹ The impulse response and accumulated impulse response functions of real per capita private consumption to a one standard deviation shock to real per capita income, interest rates, and stock prices were identified using a choleski recursive scheme. Using this ordering, changes wealth, as approximated by stock market prices, have no contemporaneous impact on the other variables in the model which appears a plausible given the lags in monetary policy transmission effects, and in households translating gains in wealth to greater liquidity. The response functions suggest that increases in stock market value in India have a very small long-run impact on consumption (Figures 13 and 14). As expected, increases in real per capita income permanently boost wealth. Increases in interest rates result in lower consumption over the longer term.



20. **In sum, macroeconomic linkages with assets prices are still embryonic.** However, as financial markets develop, the sector will become more exposed to asset prices via their borrowers. Looking forward, the onus will be on the financial system regulators to manage incentives so that asset price movements do not undermine financial stability.

⁹ The figures in parentheses are standard errors. For the regression $R^2=0.67$ and the Log likelihood ratio = 80.12.

V. SHOULD MACROECONOMIC POLICIES ADJUST TO ASSET PRICE DEVELOPMENTS?

21. **There is no broad consensus on the role of monetary policy in dealing with sharp asset price movements.** On one hand, Bernanke (2002) proposes that monetary policy should only respond to observed changes in asset prices to the extent that they signal current or future changes in inflation or output. The alternative view, supported by Cecchetti, Genbery, Lipsky and Wadhvani (2000) is that monetary policy should try to counter directly the expansionary effects of rising asset prices so to preserve financial stability and avert sharp output corrections. In a sense, this school is willing to trade off higher than otherwise interest rates, and thereby lower growth, in the short-term to safeguard long-run growth prospects.

22. **A stringent set of preconditions need to be met for monetary policy to respond effectively to asset prices.** It is necessary that

- Policymakers can accurately identify asset price misalignments and bubbles.
- Fluctuations in asset prices are sizeable, macroeconomically significant, and lead to fallout that monetary policy cannot readily offset after a correction.
- There is an identifiable causal relationship from asset prices and inflation, and to aggregate demand.
- There is a dependable relation between changes in monetary policy and changes in asset prices.

23. **These conditions do not appear to be fulfilled in India.** India's economy is undergoing profound structural change, making reliable identification of periods of asset price misalignment difficult. While real estate ownership and credit are growing rapidly, it is doing so from a relatively small base, reflecting economic development, deregulation and financial deepening. In such circumstances, it is difficult for policymakers to decipher if rapid growth reflects misalignment with underlying fundamentals or structural change. Even if equity and asset prices are misaligned with fundamentals, the analysis suggests that a correction is unlikely to have a sizeable macroeconomic impact. As such, monetary policy should be capable of countering any deflationary effects arising from a correction, ex post rather than ex ante. Moreover, there appears to be no strong relationship between monetary policy and asset prices (asset prices have continued to climb despite increasing interest rates over the past two years).

24. **This is not to say that there is no role for more targeted policies to address potential risks.** Changes in financial regulation can play a useful role in addressing risks associated with asset prices by ensuring appropriate incentives to limit participation in the buildup of price bubbles, and the consequences of a bust on the financial system become more limited. Applying microeconomic policies when asset prices are escalating can promote

financial sector stability and avoid the destabilizing effects of falling asset values that have been pledged as loan collateral. These policies are generally viewed as more effective because they specifically target problem sectors and this limits the risk of derailing macroeconomic growth. In contrast, interest rates increases impact the economy with a long lags and have broad macroeconomic consequences, including on sectors that are not overheating.

25. Various prudential measures have been adopted successfully in other countries:

- *Higher and/or differentiated capital requirements or risk weights:* Bulgaria, Bosnia, Croatia, Norway, and Poland (Hilbers and others, 2005) have increased risk weights by loan type, maturity, or currency composition to reduce overall lending capacity, particularly in categories experiencing rapid growth. In 2005 and 2006, India progressively raised risk weights on loans for housing, consumer credit, capital market investment and commercial real estate to levels above those recommended by the Basel Capital Accord.
- *Tighter/differential loan classification and provisioning requirements:* Banks' lending capacity is reduced by requiring greater resources to be set aside for provisioning. Bulgaria, Croatia, and Romania have raised general and/or category specific risk provisions. By October 2006, Indian classification norms for doubtful loans were at 12 months, below the international standard of 180 days. Although the general provisioning rate on standard loans in high-risk areas (retail credit, capital market exposures and commercial real estate and housing loans) was increased to 1 percent in April 2006, the provisioning rate on priority sector loans, where credit growth is rapid, is only at half the level (i.e., 0.4 percent) of the general provisioning rate.
- *Tightening loan eligibility criterion:* By reducing loan-to-value (LTV) ratios from 90 percent to 70 percent in 1991, and to 40 percent in 1994, Hong Kong's financial system was better able to withstand the sharp correction in property prices in 1997. LTV ratios of between 60–70 percent in India are relatively conservative. More importantly, lending decisions are primarily based on borrowers' capacity to repay and not asset values.
- *Tightening rules on credit concentration:* Tighter limits on banks' exposures to particular sectors or large borrowers could help reduce excessive expansion in risk sectors and encourage portfolio diversification. At the time of writing, Indian exposure limits on group and connected party lending were relatively high at 40 percent and 50 percent, respectively.

- *Dynamic provisioning (DP)*: A reserve is built to cover expected losses from the time a loan is contracted.¹⁰ A reserve builds up in years where actual losses fall short of expected losses, and is drawn down when losses exceed the expected level. DP requires the recognition of general provisions as a tax-deductible expense, as well as the technical capacity to estimate expected losses. The effects of DP can, however, be mimicked in a traditional provisioning system by introducing DP as a supervisory buffer to complement regulatory capital, or by enriching impairment definitions, or introducing finer risk and provisioning categories.
- *Fair value accounting*: Changes in the net present value of assets and liabilities are immediately reflected in financial institutions' accounts. As such banks' balance sheets reflect value of net assets after accounting for both credit and interest risk. The United States and Denmark require banks to report their accounts in a way that proxies fair value accounting, showing market values for marketable instruments, and in the case of Denmark, a provision for nonmarketable assets to cover embedded losses (Jackson and Lodge, 2000). However, there are some practical problems to extending mark-to-market practices to the banking (held-to-maturity) book. Loans are not generally traded making difficult to establish a benchmark market value. There is also the possibility that banks might be taxed on unrealized gains, and the system can impart greater volatility in banks' measured capital and earnings.

26. **Supervisory policies can also be tightened.** More refined stress tests, intensified on- and off-site supervision, and closer monitoring of loan underwriting procedures are some possible steps. For example, Thailand conducts stress tests on a bank's vulnerability to large falls in property prices, and requires quarterly reports on approvals of high value real estate loans. Korea requires special diagnostic reports on mortgage lending. Japan identifies the largest corporate borrowers and those banks that had greatest exposure to them for closer supervision. Under Basel II, banks in India will have to develop their own stress tests of the risk of their asset portfolios. However, this framework could be made robust by encouraging banks to apply stress tests "over the economic cycle" rather than just at a point in time, and to specific asset market exposure. These tests should be required to indicate downside risks including default probability and the loss given default result. The RBI could also work with other financial regulators to assess risks in the insurance, pension, and mutual fund industries given the increasing prevalence of asset holdings via these vehicles amongst households.

27. **The development of market risk management instruments and tax reform can also play a role in limiting potential risks from asset prices.** For example:

¹⁰ Spain began DP in 2000 in the context of a property price boom and rapid credit expansion. Loans are divided into six categories (ranging from 'without risk' to 'high risk') with the risk weight for each categories determined in by historical experience of default over the economic cycle.

- *Short selling:* Can help create conditions for more balanced asset price valuations. If expectations among investors differ markedly, asset prices may be subject to an upward bias arising from the inability to short sell. Short selling adds discipline to valuations by allowing prices to be determined by two groups of investors: those with long positions and those who expect the price to decrease and go short. Restricting short selling may force pessimistic investors from the market and contribute to inflated asset prices. Empirical evidence suggests that short selling is crucial to limiting the emergence of asset price bubbles (Aker and others, 2000), and increases the speed with which asset prices adjust to new information. Admittedly, the impact of short-selling restrictions may be limited when the market is dominated by optimistic expectations. By end-2006, short selling in India of equities by foreign and domestic institutional investors was prohibited, and in government securities limited to intra-day transactions.
- *Securitization:* The relatively homogenous nature of various loans lends them to repackaging and sale to investors as asset backed securities. Issuers typically transfer the asset to a special purpose vehicle that issues securities to investors. This allows banks to obtain long-term financing, transfer the associated credit risks to capital investors, and reduce capital requirements (IMF, 2006). While the asset-backed securities market in India has been growing at annual rates in excess of 100 percent in recent years, issues still lag behind Korea, the region's largest market. In addition, mortgage-backed securities have seen only modest growth. Obstacle to the development of the market include high and divergent rates of stamp duties (ranging from 0.1 percent to 8 percent) across Indian states; lack of a common benchmark interest rate yield curve for pricing, particularly at longer maturities; ineffective foreclosure laws; and lack of a secondary market (as asset backed securities are inadequately defined as a "security" for stock exchange listing purposes).¹¹ Prepayment risk is also an issue given lack of a hedging tool and propensity of borrowers to prepay loans (without penalty) as interest rates fell.
- *Phasing out of tax incentives:* By allowing full deductibility of mortgage interest, households can become more leveraged which may exacerbate financial sector instability in the event asset prices decline. The gradual removal of mortgage interest deductibility has been a successful tool in moderating property price increases in other countries (Box 1).

¹¹ An amendment to the Securities Contract Regulation Act that will pave the way for the development of a secondary securities is pending parliamentary approval.

Box 1. Mortgage Interest Deductibility and Real Estate Prices

The United Kingdom began to gradually phase out mortgage interest deductibility starting in 1974 by placing a cap on the maximum deductible amount, and by gradually reducing the deductible tax rate starting in 1994 until all incentives were eliminated in 1999. The nominal cap became increasingly effective over time; by 1998, it applied to over two-thirds of all U.K. mortgages. However, the reduction in the deductible rate coincided with falling interest rates, and housing prices continued to rise.

In Sweden, mortgage interest payments were fully deductible against the owner's marginal income tax prior to 1983 which implied a house owner could deduct up to 80 percent of the interest. Since 1983, interest deductions were successively reduced and capped at 30 percent in 1991. It is estimated that this tax reform may have caused housing prices to decline over time by between 10–15 percent.

Yelten (2006) estimates the impact of phasing out mortgage interest deductibility on housing prices in the Netherlands. While an immediate removal of interest deductibility would lead in a dramatic fall in housing prices (for those in high income brackets the fall over a six-year period would range from 3½ percent if the economy were growing fast, to 36 percent if it were in recession), a gradual phasing is less disruptive. For example, the introduction of a cap on interest deduction reduces the decline in house prices in upper income brackets to –13 percent in a recession. In the event the economy were growing, prices would instead rise by about 30 percent fast over a six-year period. This increase is about 17 percentage points lower than if mortgage interest deductibility continued unchanged.

VI. POLICY RECOMMENDATIONS AND CONCLUSION

28. **Higher income, low interest rates, and financial market liberalization have caused asset markets in India to boom.** Following several years of rapid price increases, asset markets in India now comprise substantial part of the economy. Estimating whether these markets are characterized by overheating is, however, tricky. The analysis conducted in this paper suggests that for the most part, asset prices in India reflect structural rather than speculative pressures. This is not to say the risk of an asset price correction can be ruled out, prices in some asset segments do appear high (as in real estate markets for malls), and a shock to growth would likely cause asset prices to adjust.

29. **The linkages between asset prices and the macro economy are at this juncture relatively undeveloped.** Households, corporates and banks' direct holdings of equity are small, it remains difficult to leverage gold and property holdings. The econometric analysis conducted in this paper confirms potential wealth effects are small: a 10 percent increase in equity prices is associated with a rise in real private consumption of less than one tenth of one percent. Nonetheless, as asset markets gain importance, and indebtedness rises, the financial sector will become more exposed to variables that impact borrowers' repayment capacity. As such, financial regulators will have to ensure that borrowers and lenders have the correct incentives to appropriately manage the associated risks to avoid the development of boom and boost cycles.

30. **At this juncture, monetary policy may not be the most effective tool in guarding the financial system against asset price volatility.** In an economy that is undergoing rapid structural change, macro policy actions could risk derailing the financial deepening process, and could worsen the affects of an asset price reversal by negatively impacting macroeconomic activity. Moreover, in the case of India the effects of such a policy are not

predicable, given the weak relationship between asset prices and macroeconomic indicators on one hand, and between monetary policy and asset prices on the other.

31. **Targeted changes in financial regulations can better address potential risks.** At this juncture the measures that appear to have greatest potential in the Indian context include tighter loan classification, provisioning, and loan eligibility requirements. These could be combined with efforts to improve accounting and disclosure standards to capture market, interest, and credit risk, and enhanced stress testing and surveillance of financial institutions' loan portfolios. Finally, further development of short selling and securitization markets would also facilitate better risk management practices, while the re-evaluation of tax incentives for particular asset classes could help ensure a more orderly evolution of asset prices.

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