György Komáromi

ANATOMY OF STOCK MARKET BUBBLES

Ph.D. dissertation

THESES

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1. Theses

Theses (1) – (5) summarize and recompose the theoretical, and contradictory results of related literature, which are the basic points of the dissertation. The purpose of my work is to clear these contradictions and to put theoretical problems into a new framework, and finally to give a more appropriate explanations for stock market bubbles. Further propositions comprise the essence of new results and conclusions of the dissertation. Proposition (6) sheds a light on the relationship between investors' behavior and a stock market bubble, and explains the role of noise trading. Points (7) – (9) summarize the phenomena that may be signals for the dominance of noise trading. Thesis (10) is the main statement of the dissertation, it gives typical features of stock market bubbles. In proposition (11) we express the effects of stock market bubbles on real economy. Propositions (11) – (12) explain the experience of two cases: Dutch Tulip Mania and Hungarian booms and crashes between 1996 and 2003. Each proposition contains references to the chapters of the dissertation in [ ].

(1) Mathematical economics defines asset price bubble as a positive difference between actual and fair (fundamental) prices of the asset. On the contrary, "bubble" in verbal (literacy) economics usually covers (i) a more general, broader economic phenomenon, when asset prices increase significantly and continuously, which is fueled by investors' expectation for further increase, and (ii) may be accompanied by macroeconomic effects (Kindleberger's definition). The two definitions seem to be different, however, they basically mean the same: stock prices definitely deviate from economic fundamentals. The difference stems from the different sets of tools used by two approaches (mathematical and verbal economics). [1. Intr.; 1.1 Intr.; 1.3 Intr.]

(2) The strong and irrational deviation of a stock or stocks from fundamental value (overvaluation) cannot be proven. One of its reasons is that it is difficult to give the fundamental value of a financial asset and its change in practice. If it is no doubt that a stock price obviously differ from its fundamental value (e.g. closed-end funds, twin-stocks), we cannot decide whether we face with over- or undervaluation. [1.1.1; 1.1.2; 1.1.3; 1.1.5]

(3) In the laboratory experimental simulations we can directly observe how bubble occur most of the time, because future dividends are previously given, and no news but subjects' selling/buying decisions determine stock prices. On the other hand, in these experiments we cannot filter out the distorting effects of laboratory environment. Even this, when changing the conditions in experiments, we can conclude that the extent of price bubbles depends on the liquidity and the information subjects have. [1.2]

(4) Investors essentially buy a stock to obtain its future returns (dividends, profits from selling at higher prices). Apart from frauds and swindles, any future dividends can be expected that may justify the actual stock price. In the case of stocks we rarely face with Ponzi-financing, on the contrary when we have loans for instance, and paying interests can only be financed by other new loans. [1.1.5]

(5) Kindeberger's definition is not appropriate to differentiate regular fluctuations of stock prices from economic, scientific aspect. The weakness of his argument comes from not giving the standard level of speculation. On the other hand, there

is no sense in defining such a level, we have to define bubbles in a different way. [1.3 Intr.; 1.3.5]

(6) I strongly argue that a stock market bubble should be define as a consequence of investors' behavior. I disregard other possible economic reasons, their roles are not mentioned in my definition, because in stock markets, prices primarily reflects investors' expectations (see Keynes). In fact, investors just take bets on future prospects of listed firms. Expansions and bursts of bubbles can be traced back to specific features of investors' behavior, especially overconfidence. "Overconfidence" means, when investors would be better off not trading on the available information, but nevertheless they trade. When it happens, investors have an illusion of knowledge, which is accompanied by increase in public and private information, and irrelevant information (noise). To put it other way, when a stock market bubble occurs, the intensity of noise trading increases too. [1.1.3; 2.Intr.; 2.1; 2.1.1]

(7) If economic policy makers become more active, it refers to the increase of noise trading. Different policy actions are signals for the investors, and drive investors' attention, and investors take these signals into account in their expectations but with delay and inaccurately. Same effect can be found when number of news about scandals, frauds, and corruption increases, and these signals may indicate sales of stocks of not related firms. [1.3; 2.2]

(8) Leveraged trading is noise trading in one respect, because of finite duration of the particular asset involves short sale constraint, and investors do not trade on public but private information and in consequence of private constraint (deadline of repayment of private loan). Leverage also increases liquidity of investors involved. [1.3; 2.2]

(9) If stock prices move together, and no fundamental factors justify this synchronicity, it may indicate noise trading. There is no standard level of price comovement, but if it rises significantly without change of any economic or market factors, it may show that investors' decision making progress is becoming unsophisticated. To measure price synchronicity we can take average R-squared between stocks and market index, if the stocks belong to one industry or one well defined market. In these cases, investors regard the stocks as one bunch, and the increase of comovement rises the level of noise trading. [1.3; 2.1.2; 2.2]

(10) We distinguish bubbles from other fluctuations of stock market with the following feature – (i) A stock market bubble starts with a strong and continuously rise in stock prices, mostly due to a macroeconomic shock. (ii) This initial displacement positively affect investors' expectations on the future. The volume of stock market also rises significantly, and the noise trading increases. We regard booms as bubbles if the probability of large price drop – market crash – is considerable. (iii) Final, probably the most important feature of stock market bubbles is the real effect at macroeconomic or regulating level. We differentiate bubbles from regular fluctuations caused by instability of stock markets with the features, consequently these characteristics give the economic importance to the term "bubble". [2.2]

(11) Trading in stock exchanges is basically a zero-sum game, its role is only to distribute wealth, but indirectly has effects on macro- and microeconomic levels. This is a compulsory feature of bubbles. There are some negative effects, when stock prices are rising, and firms make over- and malinvestments financed by

public offerings. These decisions have repercussions on firms' revenues and cash flows, also increase investors' risk. Other well-known effect of stock market booms is the wealth-effect. If value of household-owned stocks increases, their consumption also rises, and it may follow from the foregoing that inflation may accelerate. At micro level, firms may easily obtain quasi-venture capital when market is soaring. In these periods investors make decisions on less information or noise. It may give an impulse to the industry and the economy as well. An other positive output is when market crash force important changes in regulatory environment, and the efficiency of market may improve. [1.3; 2.2]

(12) If we use the bubble-description of the dissertation, we cannot classify the Dutch tulip-speculation as a typical bubble. First reason is that there are no reliable data. Apart from missing sources, this speculation could not cause any real effects on the economy or the regulatory environment in Netherlands. [1.3.1]

(13) Booms at Budapest Stock Exchange (BSE) between 1996 and 2003 are not considered as bubbles. In the Hungarian stock market some bubble-phenomena (comovement of prices, leverage) can be seen between 1997 and 2000, but the BSE plays an insignificant role for financing firms or accumulate savings in Hungary. In this period Hungarian firms were not active in raising their capital through public offerings. Other signal that supports the statement above, is that stock exchange had not been prerequisite for foreign capital inflow to Hungary. Some formerly state-owned companies (e.g. MATÁV, MOL, OTP) became privatized, stakes were sold directly to foreign investors, but insignificant activity of domestic investors did not mean risk-sharing opportunities for them. [3]

2. Publications and conference lectures in related topic

KOMÁROMI Gy. [2004]: "Was there a stock market bubble in Hungary?", *Competitio*, Vol. 3. No. 1. pp. 169-178.

KOMÁROMI Gy. [2003*a*]: "Hogyan hat a tudásillúzió a tőzsdei árfolyamokra?", In: *PhD Konferencia Kiadvány 2003*. Gazdaságtudományi Intézet, Veszprémi Egyetem, pp. 66-72

KOMÁROMI Gy. [2003*b*]: "Befektetési döntések és a tudásillúzió", *Competitio*, Vol. 2. No. 1. pp. 1-9.

KOMÁROMI Gy. [2003*c*]: "Pszichológiai megközelítés a pénzügyekben", In: *Doktoranduszok a számvitel és a pénzügy területén*. Számviteli és Pénzügyi Tanszék, Szent István Egyetem, 2003. pp. 75-81.

KOMÁROMI Gy. [2002*a*]: "A hatékony piacok elméletének elméleti és gyakorlati relevanciája", *Közgazdasági Szemle*, Vol. 49. No. 5. pp. 377-395.

KOMÁROMI Gy. [2002*b*]: "Why have the stock markets become noisier after the revolution of information and technology?", In: *Evolutions of Institutions and the Knowledge Economy Conference Proceedings*. University of Debrecen, 2002.

KOMÁROMI Gy. [2000]: "Behavioral Finance-tól a Pénzügyi Viselkedéstanig", In: *Doktoranduszok Fóruma 2000*., Gazdaságtudomány Kar Szekciókiadványa. Miskolci Egyetem. pp. 27-34.

KOMÁROMI Gy. [1999]: "A tőkepiac mint egy nem zéró összegű játék", közgazdasági tanulmány, kézirat BKE VKI, 1999. október.

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KOMÁROMI Gy.: „Which stock market fluctuations are bubbles?"
RESEARCH IN ECONOMICS: Aims and Methodologies, *2nd PhD Conference in Economics* Pavia, Olaszország, 2004. szeptember 23-25.

KOMÁROMI Gy.: „Why do the stock prices move together in Hungary?"
Summer Workshop of Central European Program in Economic Theory, Udine, Olaszország, 2004. június 16-18.
Ronald Coase Institute Workshop on Institutional Analysis, Budapest, 2003. szeptember 6-11.

KOMÁROMI Gy.: „Positive Impacts of Stock Market: Hungarian Case"
World Economy and European Integration: 3rd Annual Conference of European Economics and Finance Society, Gdansk, Lengyelország, 2004. május 13-16.

Contact to:

György KOMÁROMI

University of Veszprém, Department of Finance (Room A216)
H-8200 Veszprém, 10, Egyetem str. Hungary

Tel.: +36 30 619 0074
Email: gyorgy@komaromi.net
Website: http://www.komaromi.net

CV and publications can be downloaded from http://www.komaromi.net