

György Komáromi<sup>1</sup>

## Was there a stock market bubble in Hungary?

### Introduction

*Bubble* is one of the most frequently used and colorful terms in economics. However, it is rarely explained in detail, most economists more or less agree on what it means. In the following paper we are going to show that the widely accepted explanation of *bubble* contains controversial, tautological reasoning. It is challenged from the theoretical side, but practical consequences will also be mentioned. Two questions hiding in the title above will be answered. First is to give a conceptual framework for analyzing stock prices to decide whether we can label as a *bubble* particular movements, upward and downward tendencies in stock prices. Second, with a coherent and consistent definition we will be able to answer the question whether there was a *bubble* in the Hungarian stock market between 1995-2002.

To take one of several possible starting points in this paper, we get the Palgrave Dictionary of Economics, and open it at the word *bubble*. Kindleberger (1991) gives the following definition: “A *bubble* may be defined loosely as a sharp rise in price of an asset [...] in a continuous process, with the initial rise generating expectations of further rises and attracting new buyers – generally speculators interested in profits from trading in the asset rather than its use of earning capacity. The rise is usually followed by a reversal of expectations and a sharp decline in price often resulting in financial crisis.” Although this description was not intended to meet requirements of rigorous definitions, we will use it for our analysis as a general view on *bubbles*, because it is widely accepted; many discussions among economists refer to it. We will go through its five important elements step by step with a critical approach: (1) sharp rise and sharp decline in price, (2) initial rise, (3) new buyers, (4) speculators interested in profits from trading, and (5) financial crises.

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## 1. Sharp rise and decline

In general, *bubbles* are associated with augmentations in prices of stocks during a long period of time. In 20<sup>th</sup> century US stock markets there are strong statistical evidence for positive trends of stock returns in 5-8 year periods (during the 1920s, 1960s 1970s 1980s and 1990s) (Shleifer, 2000). The literature supports the existence of investors' underreaction to news in short periods, and overreaction over long horizons. These behavioral patterns are called momentum and reversal effects. This is nothing more than theoretical formulation and empirical support of the traditional view on *bubbles*. Now an important remark for the further investigation has to be made. These effects described in detail in behavioral finance (BF) literature always follow one another; therefore, there are no *bubbles* without crashes (sharp decline).

The core message of the efficient market hypothesis is that market returns are not predictable from past information. BF literature argues that some old news can determine a significant fraction of future stock returns. While, the empirical results of stock market analysis draw a general picture of serial correlation (Shleifer, 2000; Barber et al., 2003), they give us no clue for explaining a particular event. Predictability can be demonstrated in general, but exact dates for particular crashes along with other non-series events cannot be given. Possibility of crashes can be estimated, but they are not predictable. Sornette (2003) tries to apply sophisticated econometric tools to estimate exact dates of crashes, but his argument is quite controversial, because his mathematical model usually predicts twice as many crashes of the DOT or the DJIA as really occurs.

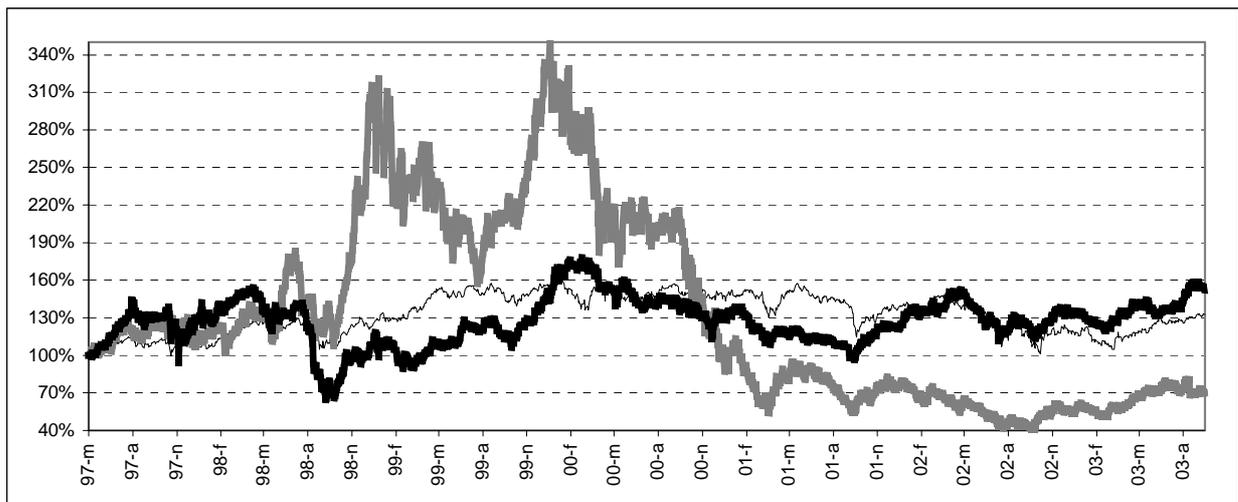
At least two questions arise here: when should examined periods start and end? How sharp should prices rise and decline? One can argue here that if we use benchmarks from historical data, we can characterize *bubbles* afterwards. It would help us a lot, and make our job easier, but in our opinion it would lead to an extremely superficial analysis. Looking at Figure 1, at first glance can we decide which indices look bubbles and which do not?

We claim that we do not have to concentrate on what a *bubble* looks like, but why a particular *bubble* may occur. Econometric regression analysis can explain regular events in detail, and can also put rare events in the picture when introducing dummy variables as well; but statistics cannot provide a full explanation of certain economic phenomena, such as *bubbles*. Instead of creating hard statistical criteria, and so avoiding a subjective elements, we focus on the reasons for price movement.

## 2. Initial rise

Kindleberger (2000) gives an intuitive framework in his classical literary economic work for the causes of initial rises. After Minsky (Kindleberger, 2000:14) he calls “displacement” the primary shock to a macroeconomic system that leads to *bubbles*. Stock markets respond to exogenous shocks; investors form bright new expectations for the future. Stock markets with an inherent instability tend to become certain that the business environment has changed. It is becoming widely accepted that something new and good is going on in the real economy.

**Figure 1**  
Stock market indices between 1997-2003



Thin black line: Dow Jones Industrial Average (DJIA),

Gray line: Average prices of Dot.com companies in NASDAQ (DOT)

Thick black line: Official Index of Budapest Stock Exchange - BSE (BUX)

Data: <http://finance.yahoo.com> and <http://www.portfolio.hu>

The nature of displacement may vary from one market or period to another (see historical overviews in Kindleberger (2000), Shleifer (2000) and Komáromi (2003)). These are the labels of the stock market booms that indicate the beginning of new eras. The obvious deduction is that in the US market and in Hungary there should have been different basic causes of initial rises. We do not neglect the effect of interlinked international capital markets, but try to focus on the distinguishing reason of the initial rise of Hungarian stock prices.

From the mid 1990s to the new millenium there was fast development of information technology (Internet and telecommunication) in the US, accompanied by rapid growth of Dot.com companies. The Internet driven new era thinking (Shiller, 2000) made the DJIA more than five times higher, and the DOT twenty times higher during the decade. New companies based on information technology were founded and went public soon. Firms of the “Old Economy” also benefited from the soaring liquidity; they could attract new capital, because it was widely accepted that their efficiency also increased significantly, because new ways of communication drove their transaction costs down (Komáromi, 2002).

In Hungary there are two different periods of stock market boom. The first period started in the autumn of 1995 and ended in the spring of 1998 when the BUX achieved its first historical peak around 9000 points. The “displacement” in the Hungarian stock market was caused by the “Bokros-package” (Lajos Bokros was Minister of Finance at that time), which stabilized the Hungarian economy, budget and public finances. New markets emerged to

invest in. Foreign investors came to Hungary because the Bokros-package launched a crawling peg exchange rate system, which led to a stable exchange rate for the national currency (HUF). As a consequence of these steps the most important elements of investors' risk, currency risk diminished. In the first three years massive privatization started in several industries such as the oil, pharmaceutical, food, and chemical industries and the banking sector as well. 40 % of total FDI coming to Hungary between 1995-2003, 10 billion USD spread to several companies listed on the Budapest Stock Exchange; such as Hungarian Oil Company (MOL), National Savings Bank (OTP), Richter, and EGIS (BSE, 2003).

In 1998 the BUX suffered a sharp decline, and dropped by half within a few months. This loss was at the same time that the New York Stock Exchange and NASDAQ stock prices fell, but its drop was much bigger. Reasons could be easily found when examining the nature of primary security market in Hungary. The Hungarian State had sold the major part of its shares in previously state-owned companies, privatization via the stock exchange halted. During the second period the BUX touched its historical peak in March 2000 at 10,472 points, but the driving force was different than previously; it followed an international trend to a smaller extent.

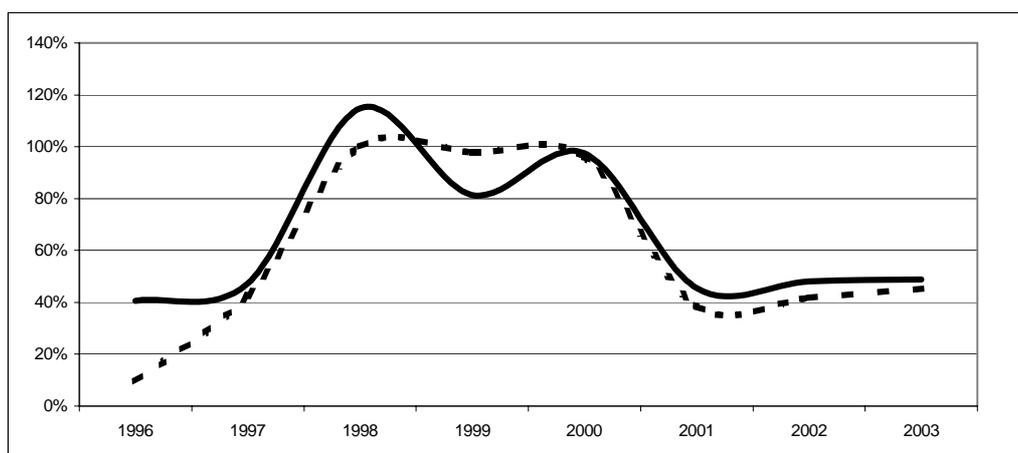
To sum up, on one hand we argue that the second period between 1998-2000 cannot be considered as a Hungarian stock market *bubble*. (We will give some support to this proposition in the following section.) On the other hand, we found the displacement of the first period (1995-1998), namely the Bokros-package which increased the attractiveness of the new Hungarian market including the primary and secondary markets (privatization via the stock exchange). We already know what fuelled stock market booms in Hungary, and now we have to answer the next question: who was behind the price movement?

### **3. New buyers**

An increase in stock price attracts new buyers, who invest heavily in the market, and put significantly more money in the "listed stocks". In US markets Dot.com companies were the favorite of investors; however, cost efficiency caused by new technology increased the attractiveness of almost all stocks in the market. Hungary is a quite small market for international investors, therefore, Hungarian stocks got into one basket. Up to 80 percent of the risk of an average Hungarian stock is systematic (market or country) risk, that is we can disregard non-systematic analysis or dividing the market into smaller groups for now.

From the beginning of 1996 fresh money (new investors) flowed into the Hungarian market. Turnover increased both in absolute term (in HUF) and in relative terms (divided by actual market capitalization) as well (Figure 2).

**Figure 2**  
Trading activity in Budapest Stock Exchange (BSE)



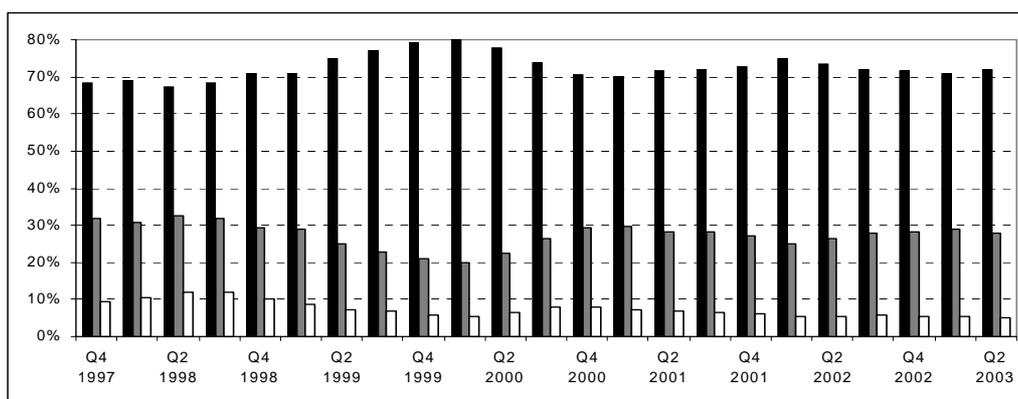
Broken line indicates the annual turnover of BSE, 1998= 100%.  
Solid line shows the turnover velocity. Calculation: annual turnover divided by average stock market capitalization.

*Data: BSE (2003), <http://www.fese.org>*

The BSE is a small market dominated by international investors. After its rapid growth international investors held 69% of listed stocks in BSE in 1997 (Figure 3). By the end of 1999 it reached 80%, which demonstrates that after the first boom period one-third of domestic investors withdrew from the stock market because, as we saw in Figure 2, trading activity remained at the same level between 1999-2000.

When the international climate for investors dramatically changed in 2000, it seems that domestic investors returned. The recovery in number due to the fact that stocks held by domestic investors lost smaller a part of their value after 2000. The prices of stocks preferred by international hedge funds decreased on average more significantly. It also confirms that there were different reasons behind the two boom periods in Hungary. The first boom was driven by the domestic shock (Bokros-package) and accompanied by mobilization of domestic capital (also households), while the second basically reflected international trends. The ratio of resident to non-resident has remained constant so far. From this point of view no “domestic” *bubble* has occurred in Hungary since 1998.

**Figure 3**  
Owner structure of listed stocks in BSE



Black column – non-residents (international investors) in % of total capitalization

Gray column – residents (domestic investors) in % of total capitalization

White column – households in % of total capitalization

*Data: <http://www.mnb.hu>*

#### 4. Speculators interested in profit from trading

This part of Kindleberger’s definition contains the more controversial and debatable elements. In our paper we disregard most of the theoretical challenges, but we underline that contrasting speculators with investors has more drawbacks than advantages. Speculators (*ad definitionem*) are interested in profit from trading rather than future cash flows stocks will hopefully provide. But we cannot distinguish them from “real investors” with their interests, because they have fundamentally the same motivations. A speculator buys a stock, if she thinks its price will go up; an investor buys a stock, if she is sure that its future cash flows (dividend or price) will increase. So price plays the same role for investors as well. In addition, both of them behave in the same way in the reverse situation. One difference may be found in that investors are supposed to invest for the long run, and speculators are interested in profits in the short run. In this case we are faced with the same argument discussed before, because investment decisions are quickly reversible and easy to realize in capital markets.

Kindleberger (2000), Shiller (2000) and Shleifer (2000) make a distinction between rational and irrational players. They argue that prices can rise above their rational level, where behavior of irrational actors determine prices, and usually it gives a warning signal before markets collapse. The rational level is defined as the fundamental value of stocks (equal to discounted future cash flows). Since we cannot give this value, Shiller (2000) proposed to use proxies such as the P/E (Price per Earnings ratio). There is a great debate in finance about how to measure fundamental value, or whether we can take it as a reference point at all. Garber (2000) showed that even in the “Tulip Mania” which is considered as one of the classical examples of an asset price deviating from its fundamental price, this deviation or irrational pricing cannot be proved in absolute or relative terms (with proxies) either.

Komáromi (2003) introduced a noise-trader approach in order to make a more consistent framework for understanding *bubbles*. Noise is loosely defined as non-relevant information, but it plays a major role in trading or providing permanent liquidity in markets (Black, 1986). Noise traders, those who are trading on noise, may increase the risk of the particular stock or the whole market (De Long et al., 1990). We have two different stages of a market:

Stage *COLD*: when investors' opinions on particular stocks are sophisticated, and their expectations are heterogeneous. Players trade on colorful information. Noise arrives randomly.

Stage *HOT*: investors' views become homogeneous, they do not distinguish the fundamentally different stocks. At this stage noise becomes systematic, investors make the same errors when assessing stocks. They trade on noise rather than on information.

The two stages differ in the information content of stock price movement. While we cannot measure levels of noise, the synchronicity of stock prices, which is not due to corporate or market information may help to measure the level of market-wide noise. Figure 4 shows how the stock prices in the BSE moved together during the two market boom periods.

As we can see in Figure 4 from the end of 1997 to the beginning of 1999, stocks tended to move together more than in other periods. The basic comovement index is almost four times higher in the entire period around the end of first period when the BUX touched its first local maximum in 1998. An intuitive explanation comes from behavioral finance. People usually make mental mistakes in their decision making process (details Shleifer, 2000; Barber et al., 2003). One of the significant features is that investors tend to be overconfident (Odean, 1999; Komáromi 2003) assumes that these psychological factors, especially overconfidence become more significant in periods of stage *HOT*. We can explain why markets become optimistic when soaring, why they become more volatile, because prices contain less information, and risk and uncertainty increases.

**Figure 4**  
BUX and daily comovement between 1996-2003



Gray line indicates the BUX

Blank lines show the daily comovement (thick line - moving average). Basic comovement index is equal R squared of firm level regressions of daily stock returns on local index with 20 days periods (Morck et al., 2000; Barberis et al., 2003). Komáromi (2003) introduced another comovement index for more accurate measuring comovement over time.

Data: <http://www.portfolio.hu>

## 5. Financial crisis

The period between 1995-1998 was fitted into Kindleberger's framework: four out of five descriptions confirmed that the Hungarian market experienced a *bubble* in this period. The last element is an optional criterion: "[bubbles] often resulting in financial crisis" (Kindleberger, 1991). We will modify this element, and show that it should be an essential part of characterizing *bubbles*.

As we can notice in the related literature (Kindleberger, 2000; Shiller, 2000; Shleifer, 2000) *bubbles* were usually followed by declines in economic performance. All stock market *bubbles* are famous for their negative impact on the macroeconomy, because confidence in all assets weakened in the short run. Probably in most cases it is not the stock market *bubble* that is responsible for the downturn of an economy, but it just reflects economic players' prospects and views on their futures. It is more or less true that a stock exchange index shows one dimension of how economic actors look at their perspectives. But stock prices are very sensitive to good or bad news and therefore may exaggerate them. This is why we associate *bubbles* with mania (when prices are increasing) and panic (when prices are dropping). For the most part, after crashes firms have difficulties in going public, make IPOs, and listed companies could not (and wish not to) raise their capital. They may look for other forms of financing, but as the stock market crashes, banks became more cautious in providing loans, they assess new loans riskier offering higher rates for credit. *Bubbles* may not be the real causes of economic slumps, but may generate a deeper recession, because of their negative effects on the general confidence.

However, while we saw it is not necessary to have financial crisis after *bubbles*, we always experience some negative impacts on real economic indicators. We argue that this "negative impact on the real economy" feature probably plays the most important role in characterizing *bubbles*. There should be negative consequences after *bubbles*. These consequences include political reactions (authoritative steps that try to solve some direct and immediate reasons), bankruptcies and hardening financing conditions for firms, and postponing investing in non-financial assets.

If a *bubble* matters, it has real direct and indirect costs. Stock markets do not draw out money from the real economy, because even after a crash one wins what other loses in the market. Direct costs are related to the change in risk. As we mentioned above the cost of financing may increase for firms and governments as well. In emerging countries most of time a decline in stock prices is accompanied by decreasing prices of government bonds. In some cases policy makers also make costly actions, e.g., to protect the national currency, to intervene in treasury markets and to take restrictive steps in their policies to enhance confidence in the economy. These burdens are the direct costs of *bubbles*.

When stock markets are booming, investors may overinvest in favorite (labeled) industries, and underinvest in others, but when prices are falling, it may lead to a misallocation of capital. This is the main source of indirect costs of *bubbles*, because it may lower the potential growth of the economy. On the other hand, as Komáromi (2003) argues, in a broader context we have to take into account that a *bubble* may play positive effects too in the economy. In a word, we should use the colorful term *bubble* when it matters, when it has negative impacts on real economic performance.

## 6. Conclusion

We have revised the five important elements of Kindlerberger's description for *bubbles* so far. We noticed that there have been two booming periods in the BSE during the last decade, but only the period of 1995-1998 may fit into our framework in accordance with the first four criteria. There remains one cutting edge criterion to decide whether there was a stock market *bubble* in Hungary.

Did the crash in 1998 result in negative economic consequences? After 1998 macroeconomic indicators became very attractive: the growth of GDP was stable and relatively high in Central and Eastern Europe, inflation was decreasing at a great pace in Hungary. It seems that there was no sign of accompanying direct or indirect costs at the macro level. From an investors' point of view, we have to take some important facts into consideration. Before 1998 there were few IPOs, the privatization of previously state-owned companies dominated the capital movements in Hungary. There were about 50 companies listed in the BSE, but 6-7 stocks were frequently traded. These stocks represented more than 95 % of total annual turnover of the market. In spite of policy makers' intentions, which was to increase the numbers of firms quoted in the BSE, this number diminished, and there have remained only four Hungarian "blue chips" (MOL, OTP, MATAV, RICHTER) (BSE, 2003). The BSE does not seem to be able to accomplish its major function to enhance new capital accumulation for firms; it plays no significant role in financing companies today. On the other hand, as we can see in Figure 3, the proportion of residents (included households) from the total stocks dropped considerably. In spite of this big change in the owners' structure, we can notice no consequences for the players' expectation; therefore, no effect seems to have spread to the real economy in Hungary.

To put it concisely, according to the framework discussed above we could not find facts or features that would favor our main question. Probably the main doubt emerges from the fact that BSE does not fulfill its role in financing companies in Hungary. We think that the term *bubble* would be superficial and misleading, if used to characterize price movements in the BSE. Therefore we argue that there were no *bubbles* in Hungary between 1995-2002.

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