**Where Are We In Understanding Bubbles?**

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**Looking Backwards**

Most Bubbles have been identified retrospectively. “Yes, that was a financial Bubble.” Similarly from an historical perspective we can divide our understanding of Bubbles into three major stages, though in all three stages Bubbles have been recognized and analyzed after the fact. These three major analytical stages are Pre-1978; 1978 to 2000; and then after 2000.

 In the Pre-1978 stage financial Bubbles were recognized and assessed as a social or crowd-based phenomenon [Bagehot], even a type of sickness that could affect the masses [Dickens]. There were also detailed descriptions and analyses of specific Bubbles such as the great South Sea, Mississippi, and 1929 Bubbles. Already in the 19th Century Walter Bagehot observed “Much has been written about panics and manias, …; but one thing is certain, that at particular times a great deal of stupid people have a great deal of stupid money; it seeks for someone to devour it; … there is speculation; it is devoured and there is panic.”

**Greater Analysis**

 The publication in 1978 of Charles Kindleberger’s Manias, Panics and Crashes and the contemporaneous research of Hyman Minsky identified Bubbles as having a particular pattern or paradigm that usually began with a displacement or shock to an asset market, the economy, or the financial system that created an investment opportunity that led to a rapid rise in real asset prices that attracted speculation.

 This rapid rise in real asset prices can be seen for example in the case of the US in 1929, Japan in the 1980s and more recently the Dot.Com boom and bust. In 1929 a combination of disruptive new technologies such as radio and the availability of margin credit caused the inflation adjusted S&P to rise 396% from a 1921 low to the 1929 high. This process began to accelerate after 1925 with the P/E for the S&P index reaching 32.6 in 1929. Similarly in Japan the Nikkei 225 was below 10000 in 1983 but by 12/24/89 it peaked at 38,957 a compound annual growth of over 20% even though the Japanese CPI never rose above 3% from 1984-89 and in fact averaged only 1.4% during this period.[[1]](#footnote-1) Yet both situations were followed by what Kindleberger and Minsky saw as the inevitable panic and crash. The Panic of 1929 began on October 24 with the crash continuing until 1932 when the Dow reached bottom at 41, down from 381 in 1929. The Nikkei began its slide in the Spring of 2000 ultimately returning to the 10,000 mark and then going below.

**More Analytical Power**

 The Dot.com Bubble and more recent US housing Bubble have led economists and policymakers to greater analytical efforts with respect to financial Bubbles, using econometrics, statistical analysis and mathematical modeling to identify and quantify them. The Dot.Com Bubble started in 1995 and lasted until 2000. Some landmarks include the August 1995 Netscape IPO and the Amazon IPO in 1997. As with previous Bubbles the process began with a major displacement that opened many new business opportunities. Real prices of related assets rose rapidly. The NASDAQ where most of these stocks were listed in 1995 was 1000+ but reached a high on March 10, 2000 of 5133 [413% up]. At the same time US Inflation during this period was quite low. The annual CPI average was 2.55% or just a 15.3% increase over the period.

 Thus the Dot.Com Bubble confirmed the Bubble pattern identified by Kindleberger and Minsky. There was a rapid real price increase for assets relative to the general price level that attracted speculator interest that kept driving up asset prices. In addition this interest resulted in more market volatility and high optimism that led to herding where the speculators drove out rational investors [irrational exuberance].

 However as some more rational speculators began to recognize the risks and started leaving the market this had the effect of slowing price increases, signaling a measurable loss of momentum. This seems to indicate the market is close to the top. Throughout the Bubble there is excess optimism though it is not clear that it can be measured [“irrational exuberance”]. Yet once doubt creeps in panic and then a crash can be close behind.

 One reason that Bubbles are receiving more attention is that there have been several major Bubbles in relatively close succession: Japan 1980s, Mexico 1990s, Asian Financial Crisis, Ruble Crisis and LTCM, Dot.Com Boom and Bust, and US Housing Crisis. So

identifying Asset Bubbles is seen as being important since if some of these Bubbles could have been identified at an early stage in their formation it might have benefitted the investment community, central bankers and economic policy makers.

**Tests**

 Some current models and tests that have been developed to identify Bubbles include: the PWY Test, the GSADF Test, and the Bank of Finland Model. Applications of the PWY Test based on a 5% significance level as the critical value indicate that the Internet Bubble emerged from July 1995 and collapsed in July 2001. The SADF test has been generalized to the GSADF test to test the occurrence of multiple bubbles for episodes with durations ≥ 6 months. The Great Crash episode (1929M01-M09); Black Monday in October 1987 (1987M02-M09); the Dot.Com bubble (1995M12-2001M06) are all noted. The Bank Of Finland has an even more comprehensive analytical model and analysis with the 200-page paper available for download.

 Yet from a policy standpoint these models and econometric analyses have clear limitations. This is because not all Bubbles are alike and thus need to be identified. But the tests noted above do not identify the different bubble types that include: stocks, emerging markets, bonds, real estate, commodities, and technology. These Bubbles will have a common rise in real asset prices but are all different in terms of their economic impacts and also may be combined and intertwined to varying degrees. Thus 1929 combined stocks, real estate and technology. Japan 1980s combined stock, bonds and real estate. The Dot.Com boom and bust was almost purely technology.

 In addition the models while able to signal that one is indeed in a Bubble offer no policy prescriptions on how to manage it. This is important since there is no record of any government successfully managing an asset Bubble. Since the models and statistics do not explain how bubbles generally or specific types actually start and develop, policymakers can easily be co-opted by those involved with perceived greater expertise that argue this situation is different. The mixing of risks also complicates the appropriate targeting of any policy response.

 Thus the disruptive technologies in 1929 and Dot.Com boom both attracted risk capital creating a bubble in tech stocks but whereas bank loans expanded real estate and stock bubbles in 1929 and Japan in the 1980s, increasing the crash’s harm to economy, margin requirements limited the economic damage from the collapse of the Dot.com Bubble. Conversely bank leverage supporting investment banks, hedge funds, SIVs exacerbated the economic impact on the Great Recession of the US housing bust fueled by the collapse of subprime mortgages and in turn housing prices. Dodd-Frank therefore properly identified deleveraging and limitations on certain bank lending as appropriate rules to moderate future bubbles, even though it is not clear these measures go far enough.

 Based on recent experience policy differences can be important since generally strict rules seem to work best in limiting harmful fallout from a Bubble’s boom and bust cycle with the bust always more dramatic than the boom because the nature of a Bubble is that it reaches it largest size relative to the economy just before its collapse. Regulations and capital at risk also seem to work better than monetary or fiscal policy.

 This is because the former particularly raises the cost of investments while the latter either reduces economic activity or increases taxes. Therefore perversely these actions push money into the speculative market because this is where investors envision they can cover the increased funding costs or defer taxable gains. Meanwhile the higher market rates or reduced economic activity discourage more rational investments undermining the real economy and making the crash’s economic impact worse when it occurs. For example tech stocks soared relative other stocks both in the 1920s and 1990s. Between 1925 and 1929 Radio [RCA] rose from $11 to $114 or 936% and from 1995 to 2000 the adjusted price for Microsoft rose from $2.79 to $37. Based on these kinds of results no speculator is going to be discouraged by tighter fiscal or monetary policies.

**Policy Issue**

A close examination and analysis of the historical record in light of the various paradigms indicates that the panics and crashes with the big negative externalities are caused when people borrow money to buy inflated assets and the banks are involved in providing this funding. That is new ventures or financial innovations pose risks to the financial system and in turn the general economy dependent on bank lending when bank exposure and leverage are involved. Further the greater the involvement and leverage the greater the systemic risks and the eventual harm to the economy.

 This is why strict laws such as margin limits or loan to value limits on real estate transactions appear to work better than regulators’ discretion since the latter seem to get caught up in the Bubble’s optimism and are co-opted. The history lesson from 1929 is that broker loans required only 10-20% margin and as prices rose investors/speculators could borrow more. In turn the brokers and trusts borrowed from the banks. Thus when the crash came, the loan pyramid collapsed and since the banks themselves were leveraged relative to their depositors they failed as well.

 Something very similar happened in Japan in the 1980s. Speculators borrowed from banks based on stock and real estate assets [120% A/L]. Further banks were allowed to count 40% of the value of stocks they owned as capital. Thus as they lent more for stock speculation and prices rose the amount they could lend based on their capital also rose. However when stock prices started to decline this financial rocket was reversed with a huge jump in non-performing loans [NPL] and the collapse and merger of major banks. The Japanese economy and stock market are still trying to recover over 20 years later. In sum if the policy objective is to keep the financial system and especially the banks sound while providing funds needed to support economic growth and new technologies, the history of great bubbles supports the concept that given their leverage banks should not provide this risk capital.

 Further it is clear that lending decisions that might make sense on a micro basis often do not when done in volume [herding] such as real estate or stock loans in Japan based on appreciated assets or the margin loans in the US prior to 1929 crash. Similarly the housing loans and mortgage pools that created the US 2003-2007 housing boom offered no out when the defaults came. Massive foreclosures soured the market and drove prices well below loan levels while the political and economic backlash created a bank management and mortgage loan servicing nightmare.

**Prices Key**

 Understanding price action is the key to identifying bubbles and the proper policy response. Increased prices create optimism attracting speculators and making lenders and regulators feel good. Indeed governments usually benefit from higher tax revenues [Clinton Surplus]. Though price increases attract more participants at some point price volatility leads some to exit especially if they are highly leveraged. This development can create a policy lever by limiting access to the debt needed to support further price increases. Price declines generally will create a panic especially if speculators are heavily indebted. However this proposition supports a policy that limits leverage and compels more committed capital because there is now more of a downside cushion and less pressure on the banks and the financial system when prices decline. This situation should also reduce the impact of the crash as prices collapse. Dodd-Frank seems to support this rationale.

 From a policy standpoint it also important to note that in retrospect not all Bubbles are uniformly bad since some Bubbles involving disruptive technologies and large investment requirements have had positive externalities such as the railroads and the Internet. Over-investment in these technologies and subsequent bankruptcies lowered the capital cost of using these technologies where marginal costs have often been low. This has led to the development of new companies and businesses such as mail order [Sears] and e-commerce [Amazon and Google]. Indeed this process seems to be a natural outcome of the capitalistic system given that Russia and China did not have Bubbles until they became more market oriented. The key policy issue is to retain the benefits while reducing the apparent risks to the financial system and the economy.

 Margin requirements for stock have worked fairly well in this regard in that the Dot.Com Boom and Bust or the collapse of some social media shares [Groupon] have had little negative impact on the real economy as a whole or the financial system. Hopefully deleveraging bonds and derivatives will have similar results. Other policy suspects that are related to the risky price action of Bubbles include: financial innovations, increased leverage, complexity, concentration of underpriced risk such as AIG, and pro-cyclical regulation.

Interestingly News stories seem to play little role in starting panics or crashes. Rather it is that price action that all participants can see that is the key with newspapers merely reporting the result. In turn systemic risk with global implications emerges when the following are involved or occur: potential banking losses, capital losses for large highly leveraged multi-national institutions such as LTCM [Long-term Capital Management], Metallgessellshaft or AIG, or investor capital is minimal such as in 1929 [reverse high margin Internet stocks]. Derivatives and foreign exchange effects can increase leverage and magnify any losses on a global basis as they did in Japan’s collapse and the Asian Financial Crisis respectively.

**Regulating Aftermath**

While lenders of last resort [Governments, Central Banks and/or the IMF] often act after the fact to deal with the economic and financial mess of a crash, legislative actions frequently will also work to prevent or moderate the next bubble. Interestingly when such legislation is later modified or repealed it can be a signal for the emergence of a new Bubble [Glass-Steagall versus Gramm, Leach, Bliley or NY 1907 Bucket Shop Law versus Credit Default Swaps]. Often the objective is to counter excessive optimism by forcing investors and speculators to risk more of their own money or to control optimistic contracting as in the case of Japanese Real Estate laws and regulations introduced during the 1980s boom. Prosecutions are also seen as a way to deter future bad acts.

**Our Current Understanding Of Bubbles Still Leaves Policy Gaps**

Bubbles seem to be a natural outcome of human greed and market conditions related to risk taking that are an integral part of the capitalistic system. Thus they are probably something we have to accommodate but nevertheless manage to moderate the negative externalities and amplify the benefits of capital allocation to new ventures and technologies. Indeed when there is excess capital and returns are low the willingness to take more risk and probably underprice it increases. The policy issue then becomes whether this should be discouraged as not promoting economic growth.

Yet Bubbles that have promoted growth include Canals, Railroads and the Internet while those that have not have instead promoted real estate speculation and risky bank lending [Japan and the recent US housing Bubble]. In this respect Government Actions and Reactions to a rapid rise in asset prices are critical if society as a whole is not to suffer from the crash, though recognizing individual investors will always be at some risk. At the same time history indicates that these government actions should be targeted at the specific Bubble after analyzing its characteristics, since the perverse effects of credit tightening can actually stimulate a Bubble and as explained above can exacerbate the economic and social impact of the ultimate crash when funds flow to the higher perceived yields offered through speculation [1929, Asian Financial Crisis and Japan 1980s].

Some targeted guidelines include limiting the concentration of credit risk due to foreign exchange effects, counterparty issues, or Ponzi Finance [adding required loan repayments or interestr to principal]. Such policy regimes need to lean against the wind by limiting the 3-sided [lender, borrower, regulator] optimism and asymmetric incentives in financial contracting. This will require sensible regulatory policies by Central Banks or other government agencies with oversight authority versus co-option so that set rules should impose some limits on flexible regulations or Regulators.

Of the three current Bubbles: Social Media, Emerging Market Debt, and Long-term high quality sovereign debt, the first falls into our disruptive technology category with debt exposures handled through margin requirements. Further participants own much of the inflated stock. Emerging market bonds and long-term high quality sovereign debt such as 30-year US bonds or 20-year Japanese bonds however could have high degrees of associated debt and/or derivative leverage and exposure with potentially significant systemic risk. But our data and understanding of these exposures remains murky. Further they do not seem to be getting much attention from regulators and policy makers who for obvious economic policy reasons continue to keep interest rates low.

Based on our brief analysis of Bubbles above, this situation argues for a regulatory and policy approach that limits direct and indirect leverage through strict and relatively high capital and margin requirements.

1. Stock price increases accelerated after 1985 [13000+], then in 1986 to 18,800+, in 1987-88 to 20000+ after recovering from the global stock market swoon, then 30000+ from 1988-89 and finally the December 1989

Peak of 38,957. Real Estate prices also rose rapidly in tandem with stock prices: 1985-86 residential prices rose 45% and commercial properties 122%. By 1991 Commercial Real Estate was up 303% and Residential 181% from the 1985 base. [↑](#footnote-ref-1)