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Short Paper 3: Asset Price Bubbles

Cyclicality is among the most important concepts in finance and investment management. Understanding cyclicality enables a portfolio manager to properly position investments according to each phase of the market cycle. This dynamic adjustment aims to deliver better risk-adjusted returns than simply following the market. A key part of this cyclical nature of markets is a period of price appreciation.

Though an investor would seem enthused by prolonged periods of price appreciation because their asset returns would keep increasing, it also becomes more expensive for new investors to enter the market and realize good returns. Downstream effects of prolonged asset price appreciation can lead to systemic concerns. For example, increased asset prices may cause the holders of those assets to feel wealthier, even though they hold assets with unrealized gains. In other words, the assets must first be sold before realizing the gains. Investors may engage in greater borrowing based on these increasing, unrealized gains because they are wealthier on paper. However, suppose asset prices were to fall for any reason. In that case, investors' levels of borrowing and continuing debt service payments become unsustainable because their unrealized gains would decrease, and they would become less wealthy on paper. This credit collapse could pose a systemic risk, as discussed in earlier papers on deleveraging events.

Now, the question becomes, to what extent is the price appreciation of an asset in a particular market sustainable? Beyond which point does continued asset price appreciation reflect

unjustified valuations which may be due to speculation rather than informed investment? Scholars who study asset bubbles have proposed a variety of reference material that one can use to cautiously estimate if a particular asset class in a country / region is in a bubble stage. Though checklists and the like are a more straightforward way to conveniently evaluate the existence of potential bubbles by offering standardized criteria, ultimately, it is up to the market, i.e., market participants, to decide when a particular asset is overvalued and undervalued, when the price should keep increasing, and when it should fall. Nonetheless, this paper proposes the following criteria, based on reference material from various scholars, to analyze two different asset classes that seem to be in a bubble stage in two different countries, which will be discussed after presenting the theoretical framework.

Economist Robert Shiller defines a bubble as “a situation in which news of price increases spurs investor enthusiasm, which spreads by psychological contagion from person to person, in the process amplifying stories that might justify the price increases and bringing in a larger and larger class of investors...despite doubts about the real value of an investment” (Contessi and Kerdnunvong 6). In other words, the bubble is characterized by price increases that drive certain psychological forces of investors, which in turn cause them to increase their investments, which in turn raise asset prices even more. However, at what point can these price increases be unjustified? Economists Contessi and Kerdnunvong state that when “the asset price surpasses the asset’s fundamental value, the asset can be considered overvalued,” which is a simple analysis to conduct if the market knows the fundamental value of the asset (Contessi and Kerdnunvong 6). Though different models exist to determine the fundamental value of various types of assets, models are only approximations. If the true fundamental value is unknowable from these models and can only be approximated, then the simple analysis becomes exceedingly complex.

This uncertainty increases the chances of an asset price bubble materializing. Economist and former New York Federal Reserve President William Dudley cites an experiment studying the effects of uncertainty in fundamental values of stocks on asset price bubbles in his April 2010 speech to the Economic Club of New York. The authors of the initial experiment gave participating traders an asset paying the “same dividend generated from a known probability distribution” so that all of the traders knew the “expected value of the dividend stream with certainty” and because traders had the same fundamental information, they could theoretically use the dividend discount model to come up with the same fundamental value for the asset (“Dudley: Asset Bubbles and the Implications for Central Bank Policy.” 2). Though one would expect that traders with the same fundamental value information would trade at similar prices and prevent the asset price from appreciating unsustainably, the researchers found “in 14 of the 22 experimental runs, prices rose significantly above fundamental valuations and these price bubbles were followed by crashes” (“Dudley: Asset Bubbles and the Implications for Central Bank Policy.” 2). When uncertainty about fundamental asset valuations is added, it “enhance[s] the propensity for bubbles by increasing the degree of divergence in participants’ initial expectations” (“Dudley: Asset Bubbles and the Implications for Central Bank Policy.” 2). Thus far, the two criteria for characterizing an event as an asset price bubble are to what extent the asset price has surpassed its fundamental value and how much uncertainty there is about that fundamental value.

Dudley further expands on these two criteria and claims that asset price bubbles usually come from a similar sequence of events. First, “there is typically an innovation that changes the fundamental valuation” of an asset that investors are interested in “a meaningful but uncertain way” (“Dudley: Asset Bubbles and the Implications for Central Bank Policy.” 2). Second, “a surge in economic activity in the particular sector associated with the innovation” happens, leading to

the third phase where there is a positive feedback loop that “tends to reinforce the belief system that underpins the extreme valuations associated with the boom” (“Dudley: Asset Bubbles and the Implications for Central Bank Policy.” 3). Fourth, the number of investors who “believe that a particular episode of asset price increases are justified by the innovation as the boom continues to persist”, i.e., a greater proportion of the market buys into the asset price bubble thinking that returns will continue to increase. Lastly, “asset bubbles occur more easily when it is difficult to short the assets” (“Dudley: Asset Bubbles and the Implications for Central Bank Policy.” 2-4). This framework can be succinctly summarized in terms of American billionaire hedge fund manager Ray Dalio’s seven bubble indicators

1. Prices are high relative to traditional measures
2. Prices are discounting future rapid price appreciation from these high levels
3. There is broad bullish sentiment
4. Purchases are being financed with high leverage
5. Buyers have made exceptionally extended forward purchases, such as of inventories, to speculate or to protect against price appreciation
6. New buyers have entered the market
7. Stimulative monetary policy threatens to inflate the bubble even more

along with the unique criteria Dudley proposes—the uncertainty of fundamental value and a new, innovative product taking hold in the markets (Coy).

The two following situations that are happening currently appear to fit the aforementioned criteria and may be deemed as asset price bubbles. The first situation is the Chinese real estate bubble. The second situation is the environmental, social, governance (ESG) investing that has become more popular in the last few years.

The Chinese real estate bubble started to raise concerns as early as 2016. Chinese lending for medium- and long-term household loans started to grow rapidly from the year before. Coming off the dip in house prices from mid-2015, in which average new home prices declined 5% from the previous year, many new and experienced home buyers rushed into the market (Fong and Wei). This frenzy has continued largely undisturbed through the present day. As of October 10, 2021, Chinese developers have an outstanding \$5 trillion in debt, which had doubled since the end of 2016, when bubble concerns first started to surface. To understand the magnitude of this outstanding debt, it is “more than the entire economic output of Japan, the world’s third-largest economy last year” (Webb and Yifan Xie). To what extent does this Chinese property situation satisfy the aforementioned criteria for determining a bubble?

Addressing Ray Dalio’s checklist, almost all of the criteria are met by the Chinese situation. The first three indicators—prices are high relative to traditional measures, prices are discounting future rapid price appreciation from these high levels, there is broad bullish sentiment—are satisfied through the following metrics. As early as 2016, annual Chinese residential real estate investment surpassed \$1 trillion, reaching \$1.6 trillion in October 2020 (Santilli). Analyzing a more standardized measure, annual Chinese residential real estate investment climbed from about 8% of China’s annual GDP in early 2016 to over 10% in October 2020. In comparison, the United States’ annual residential real estate investment as a percentage of its annual GDP barely increased from under 4% to about 4% in the same period (Santilli). The ratio of the median apartment price to median family disposable income as of mid-2021 ranged from 8x to 20x for developed, Western and Japanese cities like San Francisco, New York, London, Tokyo, and Paris but a staggering 31x to 46x for Chinese cities like Shanghai, Beijing, and Hong Kong (Santilli). In addition, as early as 2019, “the total value of Chinese homes and developers’ inventory hit \$52 trillion, according to

Goldman Sachs Group, Inc., twice the size of the U.S. residential market and outstripping even the entire U.S. bond market” (Yifan Xie and Bird). These metrics clearly indicate bullish sentiment fueling excessively high prices for real estate relative to other regions and relative to other time periods. Chinese real estate purchases are being financed with high leverage and often by new home buyers, satisfying two more of Dalio’s indicators. In the early days of the bubble in 2016, “government data show more than a third of new loans in the first half of 2016 went to housing” whereas “by comparison, an average 17.4% of new loans went to housing between 2010 and 2015” (Fong and Wei). Fast forward to 2020, “China’s household leverage ratio hit a record high of 57.7% in the first quarter” (Yifan Xie and Bird). Addressing Dudley’s additional criteria, there was no significant innovation in this bubble, given that real estate is one of the oldest types of assets. However, there was and still is some uncertainty of fundamental value given “developers’ practice of relying heavily on ‘presales,’ in which buyers pay in advance for still-uncompleted apartments,” and buyers may be unable to accurately understand the fundamental value of their purchase until construction is complete (Webb and Yifan Xie). Overall, China’s real estate market is in a bubble with potentially significant consequences as over \$52 trillion worth of assets continue their journey of increasing prices.

The attention garnered by ESG investing over the last few years is commendable, given an increased societal interest in ESG-related issues. According to Bloomberg Intelligence, flows into global ESG ETFs started to pick up significantly in 2019 after seven years of relatively minor inflows averaging under \$5 billion per year. \$26 billion flowed into those funds in 2019, \$80 billion in 2020, and \$89 billion in 2021 so far, causing the green investment industry to amass over \$35 trillion in assets (Lee). Applying the aforementioned criteria from Dalio and Dudley to this ESG investment situation, the situation meets several criteria for a bubble. Prices for these ESG assets

are increasing, just like the overall market has been increasing to record highs regularly. However, relative to the market, often, ESG assets are more expensive. For example, “an S&P index of global clean energy stocks trades at 44 times its earnings, double that of large-caps overall” (Lee). Given increased social attention to ESG issues and pressure from the general public, investors, regulators, and board members, funds across Wall Street are embracing ESG assets faster than before, contributing to bullish sentiment. In fact, “some estimates indicate ESG-focused assets...now account for more than a third of all assets professionally managed by banks and investment funds” (Jones). Though much of the ESG asset purchases are not made using leverage, there are large inflows of new investors to this market. Addressing Dudley’s criteria, ESG investing is a relatively new aspect of the investment industry, at least in terms of mainstream acceptance, satisfying Dudley’s criterion for a new, innovative product taking hold in the markets. The uncertainty in determining the fundamental value of these ESG assets may be about the same as in determining the fundamental value of regular public equities and public fixed income, just with added checklists and guidance for what makes a particular asset ESG-friendly or not. Though the ESG investment situation does not meet as many of the criteria as the Chinese property bubble does, perhaps one of the most important external factors to consider for the ESG situation is the expected return for ESG returns if these unusual fund inflows do not occur. In a typical year, how might ESG assets perform? Studies cited by Bloomberg show that without the massive inflows seen by ESG funds, “the green factor in stocks would indeed have lost money in the eight years through 2020” (Lee). Researcher Philippe van der Beck’s study concludes that “moving \$1 from a regular market portfolio to a typical ESG one boosts the value of stocks favored by the latter by as much as \$2.50. Without inflows, a long-short ESG strategy would have recorded ‘significantly negative’

alpha” (Lee). Though ESG investing is commendable for social reasons, the space currently seems to be in a financial bubble with asset prices unjustified by their fundamentals.

The Chinese property and ESG investing bubbles are still experiencing a period of price appreciation. When should investors expect these bubbles to pop? The timing for when these bubbles pop depends on each of their underlying vulnerabilities and when those vulnerabilities will overcome the bullish sentiment driving the bubble. Regarding the Chinese property bubble, the main vulnerability is the cessation of easier mortgage lending to finance the purchase of new property, leading to moderation and collapse of property prices as the demand for property falls even as new supply comes online. One of the most important factors that may contribute to this cessation is already partially in place—the central government in China tightening mortgage lending restrictions—and eventually, as interest rates rise post-COVID, mortgages will become more expensive for borrowers. These events may occur over the next three quarters to one year, depending on the willingness of the Chinese central government to follow through on its promises to dampen property prices and how quickly the Chinese economy recovers and grows post-COVID.

Regarding the potential ESG investment bubble, it is unlikely that ESG fervor will be dampening anytime soon. As such, ESG funds will continue to experience great inflows, and as mentioned before, these inflows will continue to yield previous investors decent returns. If the narrative surrounding ESG is allowed to consider fundamental values of the ESG assets being held rather than relying on fervor, investors may reallocate funds to more traditional assets and moderate ESG investment. This moderation, absent abnormally high returns based on fundamentals, will result in ESG asset returns falling and the bubble popping.

Overall, periods of price appreciation, sometimes leading to bubbles, are a natural part of financial markets' cyclical nature. Academics and investment professionals alike have studied past asset bubbles and have proposed certain guidelines to consider in determining if a situation may be considered an asset price bubble. The current Chinese real estate and ESG investment situations satisfy many of the criteria established and may be considered bubbles. However, the markets will ultimately determine if these situations are bubbles based on how they allocate funds to those situations and if asset prices will come crashing down in the near future. Both situations have vulnerabilities, but the Chinese real estate bubble seems to be more vulnerable in the near time horizon of within one year. ESG investing may turn out to be a more long-term trend, and as such, the bubble's peak may come further in the future. The adept portfolio manager should scan the investment landscape for events such as these and position their portfolio appropriately according to clients' interests.

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