Behavioral Finance

Market Bubbles & Crashes

Duke
UNIVERSITY

Introduction

In this section, we take you on a historic tour of some of the great bubbles and crashes throughout history, from the famous tulip mania of the 17th century to the recent housing bubble and credit crisis.

Our goal in this section is to document, and try to categorize, the biases and errors that lead to these bubbles. We would like to develop an understanding of which errors are common to all crash scenarios, versus those that crop up only from time to time, and do not seem to be essential drivers of the bubble to crash cycle.

We would also like to identify some non-behavioral factors that characterize most bubbles: is a certain type of economic environment essential to permit a bubble to start? Is it necessary that all investors "buy in" to the bubble? Are certain regulatory environments more favorable than others?

We will begin with an in-depth analysis of the recent housing bubble and credit crisis. The history of other crises will be brought to you via a series of website articles. You will read about the history of each bubble, and then identify which of a list of factors appear to be prevalent in each case.

US Housing Bubble:
Roots in Dot-Com Bust

- Between 1996 – 2000, the technology-heavy Nasdaq equity index increased more than 8-fold, from 600 – 5,000
  - Thousands of “dot-com” companies went public despite no business plan and no earnings

- The dot-com boom finally ended in early 2000
  - The Nasdaq index peaked in early March, and lost 9% in 3 days that same month
  - The S&P 500 and the broader US stock market turned south 3 months later

- $5 trillion in market value of technology companies wiped out between March 2000 and October 2002

- The Federal Reserve embarked on a sustained series of rate cuts to inject growth into the economy
  - Interest rates fell from 6.00% to 1.75% during 2001, and remained at historically low levels for several years

US Housing Bubble:
A "perfect storm" fueled subprime borrowing

- **Interest rates fell from 8% to historical low of 5.5%** on 30-year fixed rate mortgages from 2000–2003, following rate cuts from the Fed in response to the dot-com bust
- Meanwhile, Congress in the late 1990s had passed a **bill mandating greater access to mortgage loans for "subprime" borrowers**, whose credit history would previously have shut them out of the mortgage market
- Lenders also offered low **"teaser rates" (as low as 3%) on most mortgages** for the first few years, further reducing the required monthly payments and enabling an even larger group of subprime borrowers to take out loans
  - Borrowers' incomes were expected to increase during the teaser period, after which the higher payments were expected to be within the borrowers' budgets
  - 5 year teaser periods were standard practice for "prime" (high credit) borrowers
  - Subprime teasers, however, were often only 2 – 3 years, reducing the time window for these borrowers' incomes to catch up to post-teaser hikes in monthly payments
- In a final abandonment of cautious lending practices, **subprime borrowers were permitted to borrow 100% of the value** of their property, since many had no savings with which to make a down payment
  - Previous practice among mortgage lenders was an 80% "Loan to Value" (LTV) ratio, with borrowers using their savings for the remaining 20% of the purchase price

US Housing Bubble:
The "American Dream" of Home Ownership

- In the early 2000s, US consumers were sold on concept that home ownership is the best way to build wealth
  - President Bush's 2004 campaign slogan was "The Ownership Society"
- House Prices soared as borrowers of all credit levels rushed to take advantage of the low mortgage rates, even lower teaser rates, subprime-friendly mortgage lenders, and the option to borrow 100% of the property price
  - Annual house price appreciation was greater than 10% in California, Florida & most north-eastern states in 2002.
  - Multiple states recorded price increases of 25% per year from 2003 – 2005
  - The surge in home prices boosted financial wealth of home owners from 2002 – 2007; household net worth increased by $18 trillion during this period
  - At the peak, California had a record half-million real estate licensees; one for every 52 adults living in the state
  - The house price bubble reached its peak at the end of 2005
- Even as house prices began to turn south in 2006, the mantra among both homeowners and the lending community was that "house prices never go down"
  - This non-regressive prediction bias led borrowers, lenders, investment bankers, and the international investing community to ignore subprime default risk…

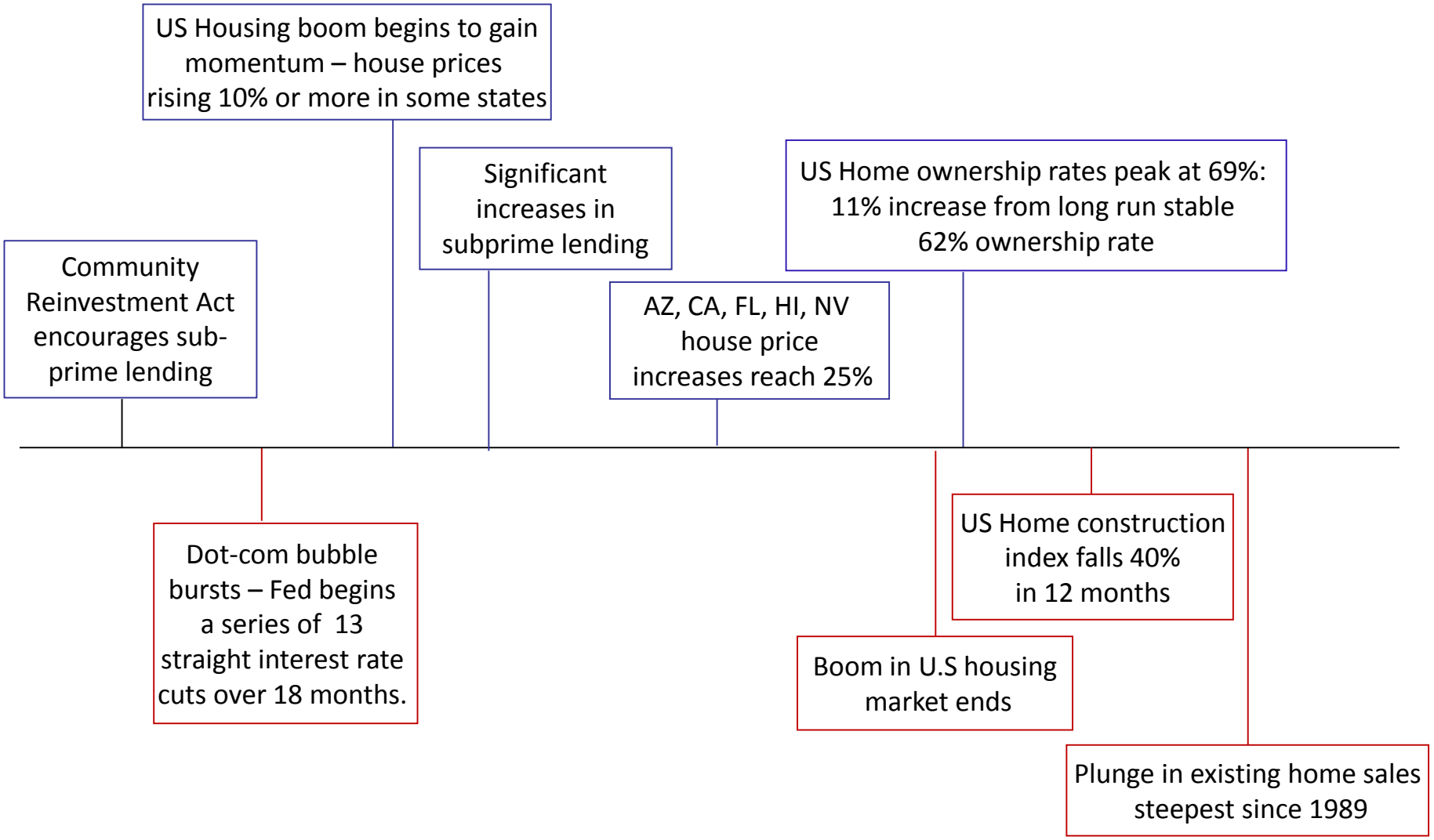
US Housing Bubble:
Increased Borrower Default Risk Largely Ignored

- Lenders and investors were complacent about higher default risk on subprime loans:
  - Mortgage lenders offloaded the risk by packaging the loans into "mortgage-backed securities" and sold them to Wall Street
  - Wall Street offloaded the risk by selling slices of these loans to global institutional investors, who had increasing appetite for their relatively higher "yield" (i.e., expected rate of return) in the prevailing low interest rate environment
  - Global investors weren't worried about defaults, since the loans were backed by the real estate collateral: borrowers who could not pay would have their houses re-possessed and sold to pay off the loan – and they believed that house prices *never go down*

- Subprime borrowers were also complacent about defaulting on their mortgages after the "teaser rate" expired and monthly payments ballooned; they had options:
  - Restructure their loan into a new mortgage with another low teaser rate
  - Sell the property to pay off the loan
  - Both of these alternatives were facilitated by continued low interest rates and rising house prices between 2002 – 2006.

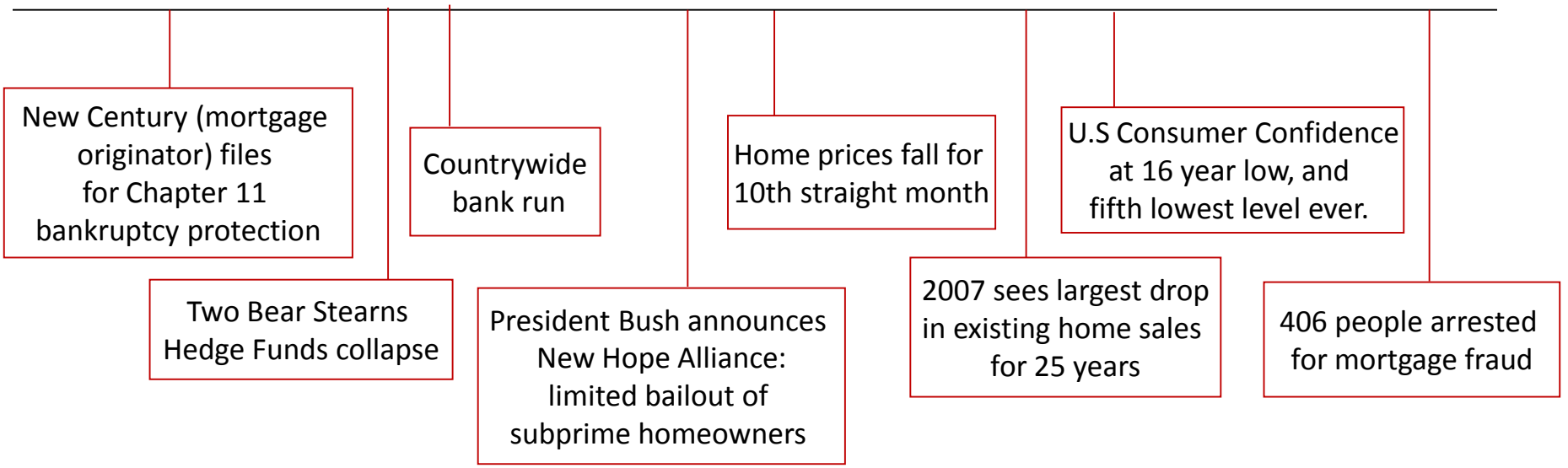
US Housing Bubble

The Bubble Timeline

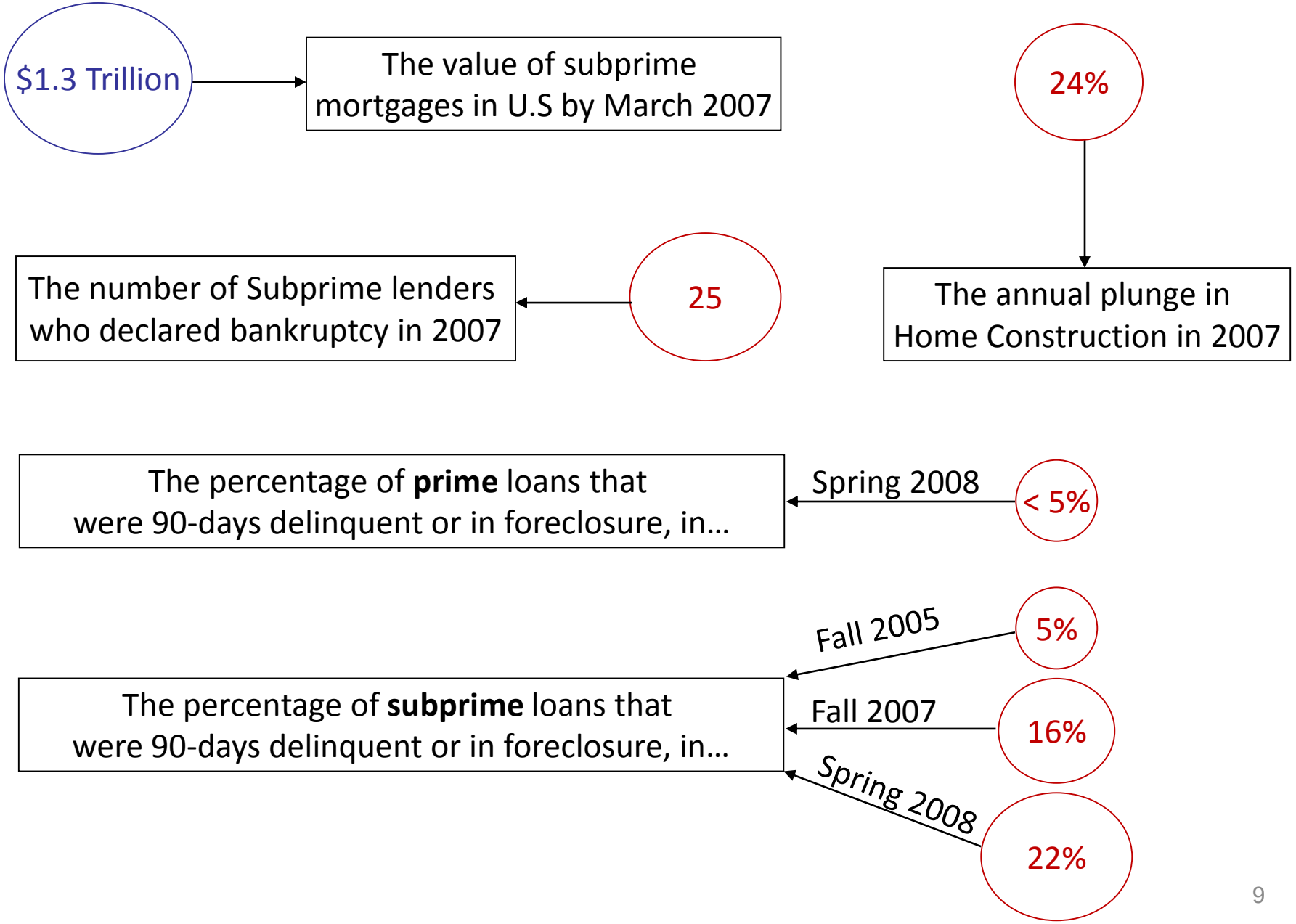


US Housing Bubble

The Crash Timeline



The Collapse of the Subprime Market



US Housing Crash & Credit Crisis

- Ultimately the party ended, as the fevered property market turned south across the entire US in 2006
  - As subprime teaser periods ended and borrowers could not make the higher payments, they were forced to sell their homes
  - Falling property values on loans that were for 100% of the purchase price meant that lenders did not recoup the full value of the loan
  - The increasing size and quantity of shortfalls rippled through the international investment community, as investments in pools of mortgage loans failed to deliver the expected cash flows

- High levels of investor leverage (borrowing) significantly amplified investors' losses, leading to the Great Recession in the US, and a global economic slowdown of previously unmatched proportions

US Housing Crash & Credit Crisis
Behavioral biases

- Behavioral biases that fuelled the housing bubble and subsequent crash:
  - Availability heuristic: the increasing number of borrowers, and the growing availability of loans, led to “cascades”, in which house “flipping” became a national pastime and added to demand for real estate investments
  - Non-regressive prediction: no one had seen a nationwide fall in US house prices, so buyers and investors alike assumed that this could not happen, fueling…
  - Belief perseverance and confirmation bias, as greater numbers of global participants in the US housing market looked only for information that supported their view of ever-increasing house prices and thus the safety of their related investments

Non-Behavioral factors seen in Bubble-Crash Cycles

- Since the so-called Tulipomania of the 1630s, the world has seen a multitude of bubble-crash cycles
- There are many non-behavioral factors that tend to facilitate asset bubbles, although not all of them are present in every bubble-crash cycle
  - Availability of credit: easy borrowing conditions are precursors to many financial bubbles, as the addition of leverage increases the size and extent of investment in the bubble asset, as well as inflating the downside risk
  - Extensive use of derivatives such as futures and options are also common features of bubbles, providing further tools for investors to increase their exposure to the bubble asset
  - A significant new and/or disruptive technology, such as automobiles in the 1920s, and the internet in the 1990s
  - International "contagion" in which multiple countries are negatively affected by the economic downturn following the crash
- You will now be directed to a series of websites that describe several other historic bubbles
  - Watch out for evidence of both the behavioral and non-behavioral factors that we have discussed above as you read about bubbles throughout recent history

Bubble-Crash Cycles throughout History

www.thebubblebubble.com/tulipmania/

www.thebubblebubble.com/south-sea-bubble/

www.thebubblebubble.com/railway-mania/

www.thebubblebubble.com/1929-crash/

www.thebubblebubble.com/dotcom-bubble/