The History and Economics of Stock Market Crashes

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The History and Economics of Stock Market Crashes


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“I thought we were just buying a house!”
A Global Systemic Crisis

- Highly leveraged real estate
  - Long period of rising prices
  - Large supply of liquidity & credit
  - Securitized mortgages sold globally
  - Subprime mortgages
  - Failure of rating agencies
  - Widespread fall in prices exposed system wide risk

- Credit Default Swaps
  - Opaque linked together many financial institutions globally
  - Amplified counterparty risk which was underestimated

- Fall of Lehman Brothers triggered a global systemic crisis
- A classic crisis set up by high levels of leverage everywhere
Bubbles and Crashes Globally
The Black Swan

An event that is inconsistent with past data but that happens anyway
Gray Swans

“Events of considerable nature which are far too big for the bell curve, which are predictable, and for which one can take precautions”
Benoit Mandelbrot (inventor of fractal geometry)
“We seem to have a once-in-a-lifetime crisis every three or four years.”

Leslie Rahl
Founder of Capital Market Risk Advisors

Source: Christopher Wright, “Tail Tales,” CFA Institute Magazine, March/April 2007
The Black Turkey

▶ “An event that is entirely consistent with past data but that no one thought would happen” Larry Siegel
# A Flock of Turkeys

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Time period</th>
<th>Peak to trough decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>US stocks (real total return)</td>
<td>1911-1920</td>
<td>51%</td>
</tr>
<tr>
<td>US stocks (DJIA, daily)</td>
<td>1929-1932</td>
<td>89%</td>
</tr>
<tr>
<td>Long US Treasury bond (real total return)</td>
<td>1941-1981</td>
<td>67%</td>
</tr>
<tr>
<td>US stocks</td>
<td>1973-1974</td>
<td>49%</td>
</tr>
<tr>
<td>UK stocks (real total return)</td>
<td>1972-1974</td>
<td>74%</td>
</tr>
<tr>
<td>Gold</td>
<td>1980-1985</td>
<td>62%</td>
</tr>
<tr>
<td>Oil</td>
<td>1980-1986</td>
<td>71%</td>
</tr>
<tr>
<td>Japan stocks</td>
<td>1990-2009</td>
<td>82%</td>
</tr>
<tr>
<td>US stocks (S&amp;P)</td>
<td>2000-2002</td>
<td>49%</td>
</tr>
<tr>
<td>US stocks (NASDAQ)</td>
<td>2000-2002</td>
<td>78%</td>
</tr>
<tr>
<td>US stocks (S&amp;P)</td>
<td>2007-2009</td>
<td>57%</td>
</tr>
</tbody>
</table>

Nominal price return unless otherwise specified.
U.K. Stock Market History, 1900-2010 (July)
## Largest Declines in U.K. Stock Market History, 1900-2010

**Real Total Returns**

<table>
<thead>
<tr>
<th>Peak</th>
<th>Trough</th>
<th>Decline</th>
<th>Recovery</th>
<th>Event(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 1972</td>
<td>Nov 1974</td>
<td>73.81%</td>
<td>Jan 1984</td>
<td>Oil shock</td>
</tr>
<tr>
<td>1913</td>
<td>1920</td>
<td>45.85</td>
<td>1922</td>
<td>World War I</td>
</tr>
<tr>
<td>Dec 1999</td>
<td>Jan 2003</td>
<td>44.91</td>
<td>Apr 2007</td>
<td>Information technology bubble and collapse</td>
</tr>
<tr>
<td>1936</td>
<td>1940</td>
<td>43.71</td>
<td>1946</td>
<td>Second part of Great Depression; World War II</td>
</tr>
<tr>
<td>1968</td>
<td>May 1970</td>
<td>35.80</td>
<td>Apr 1972</td>
<td>Speculation in currencies; Bretton Woods</td>
</tr>
<tr>
<td>1928</td>
<td>1931</td>
<td>30.57</td>
<td>1933</td>
<td>First part of Great Depression</td>
</tr>
<tr>
<td>1946</td>
<td>1952</td>
<td>21.30</td>
<td>1954</td>
<td>Post-World War II correction</td>
</tr>
</tbody>
</table>
# Largest Declines in Japanese Stock Market History, January 1952-June 2009, Real Total Returns

<table>
<thead>
<tr>
<th>Peak</th>
<th>Trough</th>
<th>Decline</th>
<th>Recovery</th>
<th>Event(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 1989</td>
<td>Mar 2003</td>
<td>71.92%</td>
<td>TBD</td>
<td>Easy credit; real estate bubble</td>
</tr>
<tr>
<td>Jun 1961</td>
<td>Jun 1965</td>
<td>34.47</td>
<td>Aug 1968</td>
<td>Yamaichi Securities bailout</td>
</tr>
<tr>
<td>Jun 1953</td>
<td>May 1954</td>
<td>31.98</td>
<td>Dec 1955</td>
<td>Stalin shock</td>
</tr>
</tbody>
</table>

Standard Deviation (60 days trailing)

- Stalin died
- Black Monday
- Bubble Economy ends
- Post Lehman Shock


March 2000 = 100

Land Price

Stock Price
October 1987 Stock Market Total Return (% U.S. Dollars)

- Hong Kong: -45.8
- Malaysia: -39.3
- Japan: -7.7
- Singapore: -41.6
- United States: -21.6
- Mexico: -37.6
- Norway: -28.2
- Sweden: -18.6
- Denmark: -7.3
- United Kingdom: -22.1
- Ireland: -25.4
- Netherlands: -18.1
- Belgium: -18.9
- France: -19.5
- Germany: -17.1
- Austria: -5.8
- Spain: -23.1
- Switzerland: -20.8
- Italy: -12.9
- South Africa: -29.0
- Australia: -44.9
- New Zealand: -36.0
Real Stock Price Indices Excluding Dividends, 1929-1935

31 December 1929 = 100

- Japan
- United Kingdom
- United States
- France
Largest Peak-to-Trough Declines in 8 Countries Since 1969
Month-end results as of July 2010 in inflation-adjusted local currency

<table>
<thead>
<tr>
<th>Country</th>
<th>Peak</th>
<th>Trough</th>
<th>Decline</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>April 1973</td>
<td>April 1980</td>
<td>85.36%</td>
<td>December 1996</td>
</tr>
<tr>
<td>Italy</td>
<td>January 1970</td>
<td>December 1977</td>
<td>82.58%</td>
<td>March 1986</td>
</tr>
<tr>
<td>U.K.</td>
<td>April 1972</td>
<td>November 1974</td>
<td>73.81%</td>
<td>January 1984</td>
</tr>
<tr>
<td>Japan</td>
<td>December 1989</td>
<td>April 2003</td>
<td>70.33%</td>
<td>To Be Determined</td>
</tr>
<tr>
<td>Germany</td>
<td>February 2000</td>
<td>March 2003</td>
<td>69.44%</td>
<td>To Be Determined</td>
</tr>
<tr>
<td>France</td>
<td>August 2000</td>
<td>March 2003</td>
<td>60.52%</td>
<td>To Be Determined</td>
</tr>
<tr>
<td>Canada</td>
<td>February 1980</td>
<td>June 1982</td>
<td>51.38%</td>
<td>March 1986</td>
</tr>
<tr>
<td>U.S.</td>
<td>December 1999</td>
<td>February 2009</td>
<td>54.84%</td>
<td>To Be Determined</td>
</tr>
</tbody>
</table>

Source: Morningstar EnCorr, MSCI Barra, International Monetary Fund
Drawdowns Around the World, January 1988 – September 2010

- Asia ex-Japan
- Japan
- Europe
- Latin America
- USA

Year

Bases on monthly inflation-adjusted returns on the MSCI UK Gross Return index: January 1970 — July 2010
Source: Morningstar EnCorr, MSCI Barra, and International Monetary Fund
Why Do Crashes Occur?
Economic Thought and Financial Crises

- Wicksell and Fisher
  - Over optimism leads to excessive leveraged real investment
  - Eventually reality hits and there is an economic crisis

- Keynes
  - Confidence crisis, liquidity trap, and market imbalance makes government intervention necessary to remedy a recession

- Hayek
  - Government and central bank stimulation increase leverage, thus deepening recessions during the inevitable deleveraging

- Minsky
  - Market calm lulls people into underestimating risk and over optimism
  - Some government intervention needed to mitigate this behavior
The Crash of 2007-2009 in Light of Economic Theory

- Regulators permitted excessive risk taking by allowing excessive leverage
- Central banks fueled excessive leverage with expansionary policies
- Lack of sound risk management
- Market participants underestimated risk
- Academics overly believed in market efficiency
- Politicians benefited from excessive short run economic growth
- CEOs focused on short-term profits, hoping to retire before the inevitable crash
Policy Conclusions
Steps To Reduce Likelihood of a Future Crises

- Regulatory Reform
  - Transparency
  - Limit leverage
  - Enlarge scope to all financial institutions
- Risk modeling reform
  - Include scenarios of sudden flight to quality
  - Model systemic risk
- Reform the financial infrastructure for more transparency
  - OTC derivatives
  - Off-balance-sheet vehicles