Classes 1 & 2: Financial Markets Amidst Covid-19

Financial Markets, Spring 2020, SAIF

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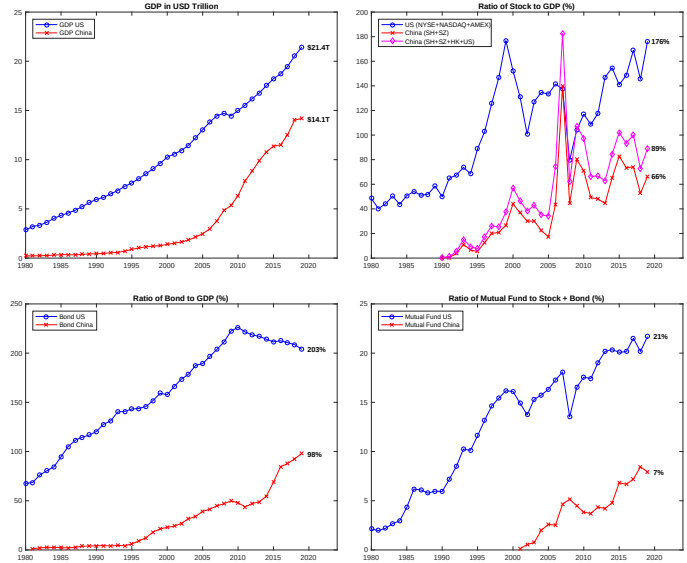
March 27, 2020

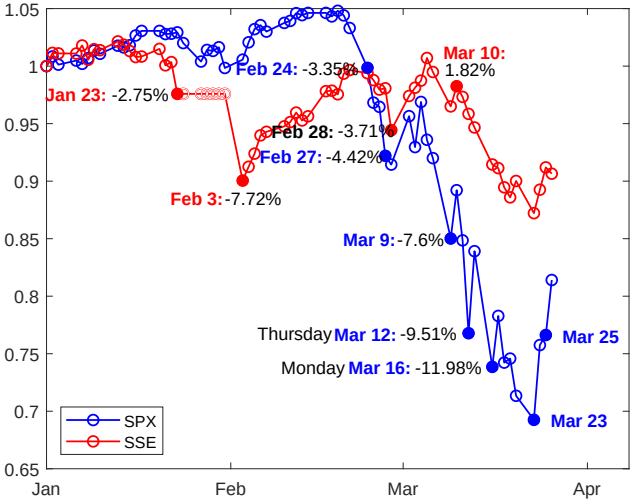
Outline

- During the current Covid-19 crisis, the price discovery function of financial markets becomes all the more important. Financial market should remain open for:
  - Timely aggregation and processing of otherwise diverse information.
  - Efficient allocation and distribution of capital and resources.
- Comparisons to past crises:
  - 1987: stock market crash.
  - 2008: financial crisis.
  - 2020: ?
- The politics of financial markets:
  - Central banks and governments: their respective responses and responsibilities.
  - Collisions of states' interests: an all-out war on oil price in 2020 amid Covid-19.

The Presence of Capital Markets in Economy, US and China



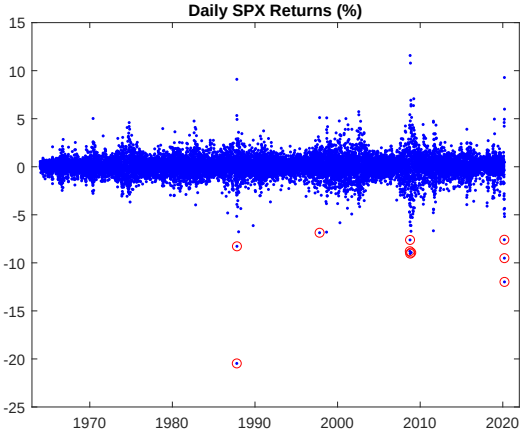
Equity Markets' Reactions to Covid-19: US and China



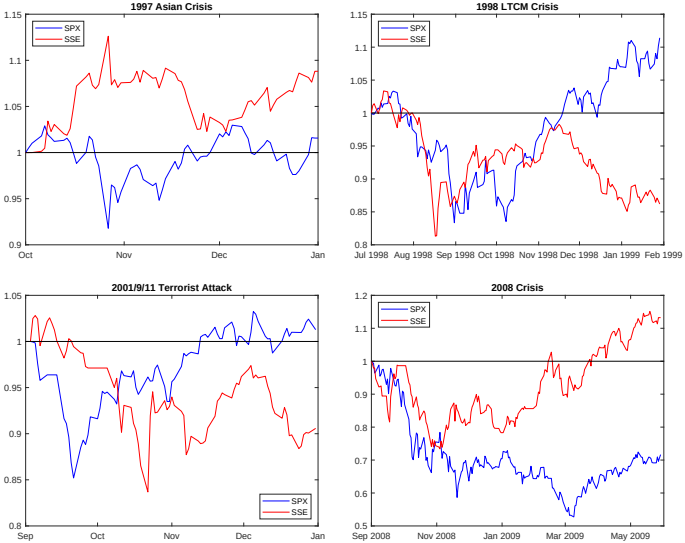
1/23: Wuhan lockdown.
2/04: Covid19 test approved by FDA.
2/12: CDC: Faulty virus tests.
2/24: Virus widely spread outside China.
2/25: Trump: USA under control.
2/26: Trump: Pence leads virus response.
2/27: CDC: test criteria revised.
3/03: Fed: rate cut by 50 bps.
3/10: President Xi visits Wuhan.
3/11: Trump: TV address.
3/12: Fed: injects $1.5T via term repo.
3/13: Trump: national emergency.
3/15: Fed: rate to zero and $700B QE.
3/17: Fed: CP funding & PD credit facility.
3/18: Fed: MMMF liquidity facility.
3/23: Fed: Infinite QE announced at 8 am.
3/25: Senate: $2T relief bill passed 96-0.

Top 10 Worst One-Day SPX Returns

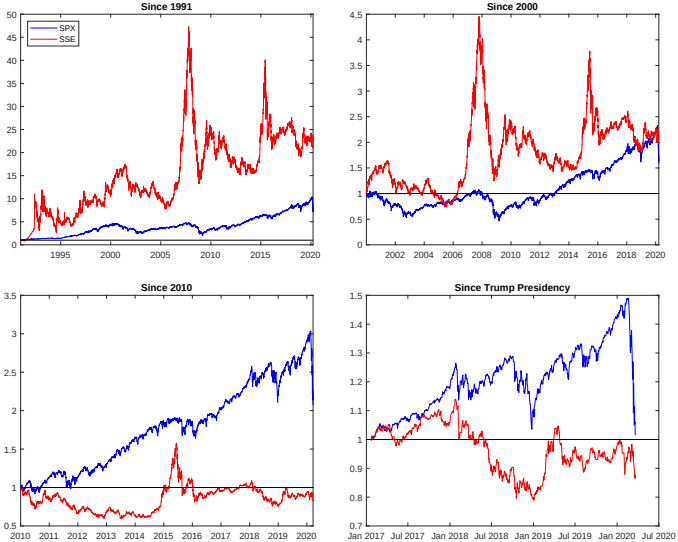
Rank		SPX Ret (%)	VIX (%)	SSE Ret (%)
1	10/19/1987	-20.47	150.19	
2	3/16/2020	-11.98	82.69	-3.40
3	3/12/2020	-9.51	75.47	-1.52
4	10/15/2008	-9.03	69.25	-1.12
5	12/1/2008	-8.93	68.51	1.25
6	9/29/2008	-8.79	46.72	0.00
7	10/26/1987	-8.28	113.33	
8	10/9/2008	-7.62	63.92	-0.84
9	3/9/2020	-7.60	54.46	-3.01
10	10/27/1997	-6.87	31.12	4.88



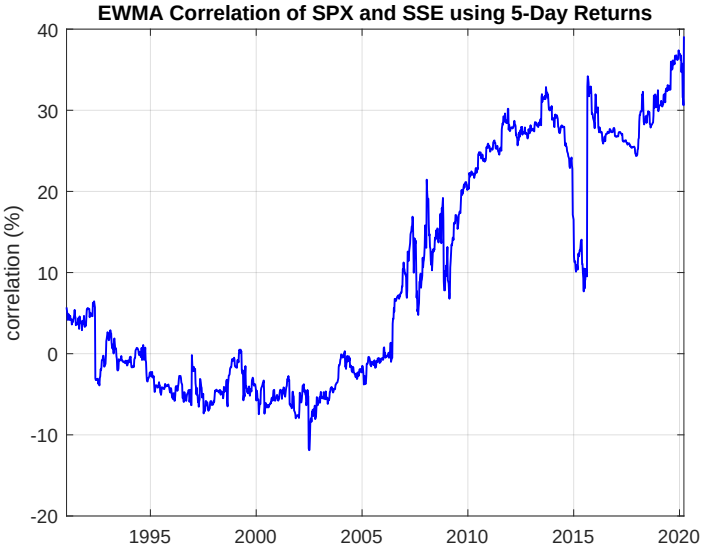
Past Crises: SPX vs. SSE



Cumulative Capital Gains, SPX vs SSE

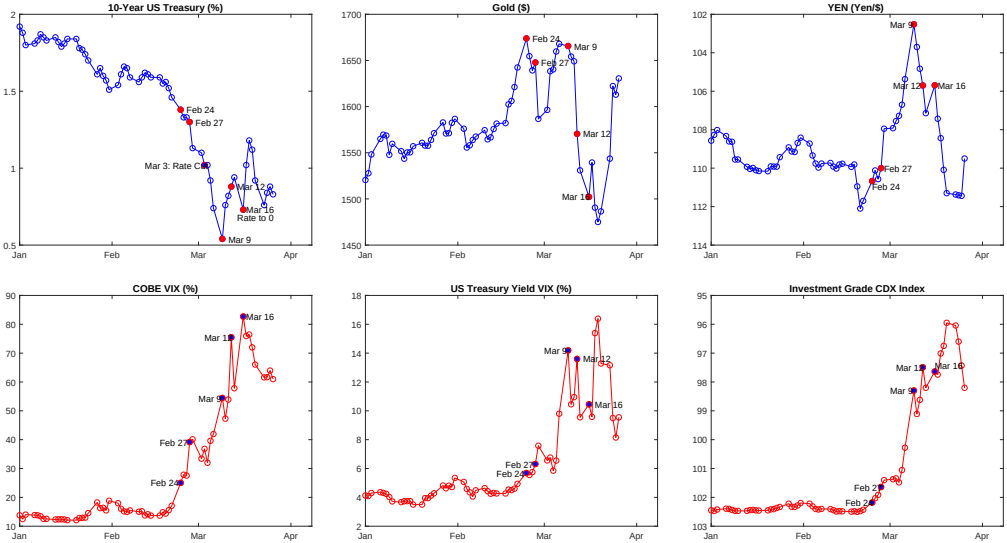


Correlations: SPX and SSE

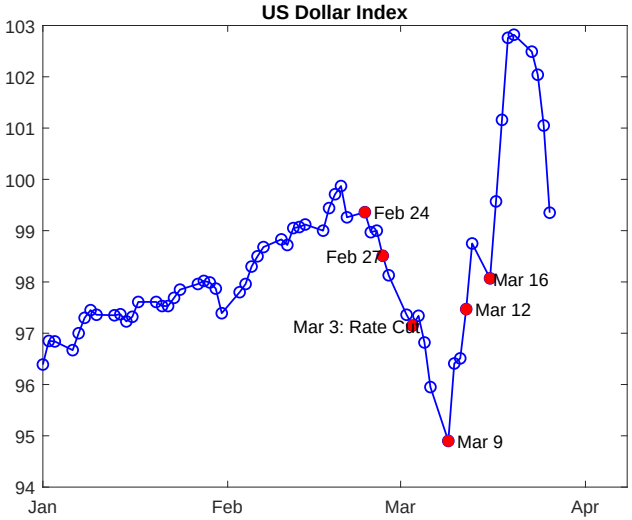


Review: US and Chinese Financial Markets

Traditional Safe Havens and Fear Gauges in 2020



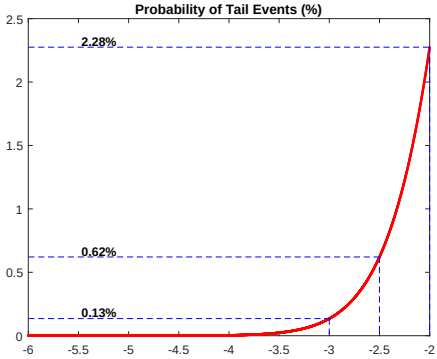
The Global Dollar Shortage in 2020



Capital Markets Amidst Covid-19

Daily movements measured in their respective historical standard deviations (sigma):

	SPX ret	UST Δy	USD ret	Yen ret	Gold ret	VIX chg	TVIX chg	-CDX chg
2/24/2020	-3.3	-1.2	0.2	1.4	1.6	5.0	2.1	1.7
2/25/2020	-3.0	-0.8	-0.8	0.8	-0.9	1.8	-0.4	1.0
2/26/2020	-0.4	0.0	0.1	-0.6	-0.8	-0.2	0.6	0.8
2/27/2020	-4.4	-0.5	-1.0	0.8	0.4	7.3	1.6	1.8
2/28/2020	-0.8	-2.6	-0.8	2.9	-3.0	0.6	3.6	1.6
3/2/2020	4.6	-0.5	-1.6	0.0	0.5	-4.2	-2.9	0.2
3/3/2020	-2.8	-1.2	-0.4	0.5	2.1	2.1	0.6	0.2
3/4/2020	4.2	0.0	0.4	0.4	0.1	-3.1	-2.6	-0.9
3/5/2020	-3.4	-1.5	-1.1	0.8	1.0	4.8	2.0	2.8
3/6/2020	-1.7	-2.8	-1.8	1.9	0.4	1.5	9.1	5.2
3/9/2020	-7.5	-3.1	-2.2	4.2	-0.1	7.9	12.3	13.4
3/10/2020	4.9	3.4	3.2	-1.8	-0.6	-4.5	-10.5	-5.6
3/11/2020	-4.8	0.9	0.2	-1.7	-0.3	4.2	1.4	3.4
3/12/2020	-9.4	0.9	2.0	-1.3	-3.9	13.6	7.4	7.8
3/13/2020	9.2	0.9	2.7	-2.1	-2.0	-11.1	-11.4	-4.9
3/16/2020	-11.9	-3.2	-1.4	-0.0	-1.5	15.7	2.5	-0.0



Capital Markets Amidst Covid-19

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	SPX ret	UST Δy	USD ret	Yen ret	Gold ret	VIX chg	TVIX chg	-CDX chg
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2/26/2020	-0.4	0.0	0.1	-0.6	-0.8	-0.2	0.6	0.8
2/27/2020	-4.4	-0.5	-1.0	0.8	0.4	7.3	1.6	1.8
2/28/2020	-0.8	-2.6	-0.8	2.9	-3.0	0.6	3.6	1.6
3/2/2020	4.6	-0.5	-1.6	0.0	0.5	-4.2	-2.9	0.2
3/3/2020	-2.8	-1.2	-0.4	0.5	2.1	2.1	0.6	0.2
3/4/2020	4.2	0.0	0.4	0.4	0.1	-3.1	-2.6	-0.9
3/5/2020	-3.4	-1.5	-1.1	0.8	1.0	4.8	2.0	2.8
3/6/2020	-1.7	-2.8	-1.8	1.9	0.4	1.5	9.1	5.2
3/9/2020	-7.5	-3.1	-2.2	4.2	-0.1	7.9	12.3	13.4
3/10/2020	4.9	3.4	3.2	-1.8	-0.6	-4.5	-10.5	-5.6
3/11/2020	-4.8	0.9	0.2	-1.7	-0.3	4.2	1.4	3.4
3/12/2020	-9.4	0.9	2.0	-1.3	-3.9	13.6	7.4	7.8
3/13/2020	9.2	0.9	2.7	-2.1	-2.0	-11.1	-11.4	-4.9
3/16/2020	-11.9	-3.2	-1.4	-0.0	-1.5	15.7	2.5	-0.0

The 10 Worst Performing Days of SPX since 1964

Daily movements measured in their respective historical standard deviations (sigma):

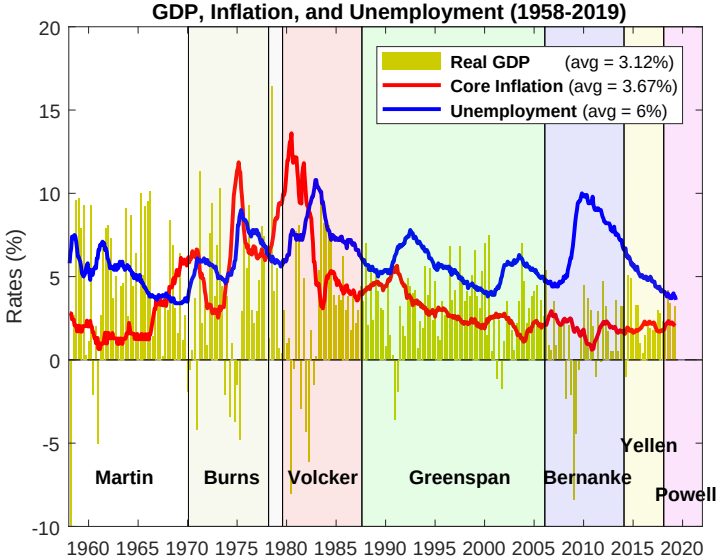
	SPX ret	UST Δy	USD ret	Yen ret	Gold ret	VIX chg	TVIX chg	-CDX chg	Oil ret
10/19/1987	-20.3	-1.2	-2.0	1.5	2.9				-0.3
3/16/2020	-11.9	-3.2	-1.4	-0.0	-1.5	15.7	2.5	-0.0	-3.5
3/12/2020	-9.4	0.9	2.0	-1.3	-3.9	13.6	7.4	7.8	-3.2
10/15/2008	-9.0	-0.6	1.7	1.7	0.8	8.9	-1.1	6.3	-2.6
12/1/2008	-8.9	-3.2	0.5	2.4	-3.9	8.4	2.6	1.9	-1.7
9/29/2008	-8.7	-3.7	1.4	1.7	0.8	7.6	3.6	1.4	-1.7
10/26/1987	-8.2	-2.8	-0.5	1.9	0.6				-0.3
10/9/2008	-7.5	1.8	0.6	-1.1	-1.4	4.0	0.2	4.0	0.4
3/9/2020	-7.5	-3.1	-2.2	4.2	-0.1	7.9	12.3	13.4	-6.8
10/27/1997	-6.8	-1.5	-1.5	-0.6	-1.3	5.0			0.0

Review: The Broad Spectrum of Capital Markets

Comparisons of 1987, 2008, and 2020

- President: Ronald Reagan, George W. Bush, and Donald Trump
- Fed Chair: Alan Greenspan, Ben Bernanke, and Jerome Powell
- 10-Year Treasury: 10% in 1987, 3.5-4% in 2008, and 1% in 2020.
- Fed Fund Rates:
  - 1987/10: 7.25% $\rightarrow$ 6.75% $\rightarrow$ 6.5% on Feb 10.
  - 2008/10: 2.0% $\rightarrow$ 1.5% $\rightarrow$ 1.0% $\rightarrow$ 0.25% on Dec 16.
  - 2020/03: 1.75 $\rightarrow$ 1.25% $\rightarrow$ 0.25% on March 16.
- Macroeconomic Fundamentals:
  - 1987: GDP = 3.5%, Unemployment = 5.7%, Inflation = 4.4%.
  - 2008: GDP = -0.1%, Unemployment = 7.3%, Inflation = 0.1%. (Recession)
  - 2020: ? (2019: GDP = 2.1%, Unemployment = 3.5%, Inflation = 2.3%)
- Causes: 1987 inconclusive, 2008 financial industry, 2020 virus.
- **My take:** 1987 liquidity crisis, 2008 credit crisis, and 2020 structural crisis.

Macroeconomic Indicators



Fear of the Unknown Amidst Covid-19

- Asset prices are driven by cash flow expectations and risk aversion:

$$P = \frac{D(1+g)}{r-g}$$

- The unprecedented sudden stop in US economic activity disrupts the cash flow D and its expected growth g. The biggest unknown: the **duration** of this disruption.
- Goldman Sachs forecasts:
  - Quarter-on-quarter annualized growth rates: -6% in Q1, -24% in Q2, $+12\%$ in Q3, $+10\%$ in Q4. The full-year Q4/Q4 growth: -3.1%.
  - The largest increase and the highest level on record of initial jobless claims: rose to 2.25 million for the week of March 15-21. (Official release: March 26)
- The fear of the unknown drives up the risk aversion and the discount rate r.

2020: Foremost a Health Crisis

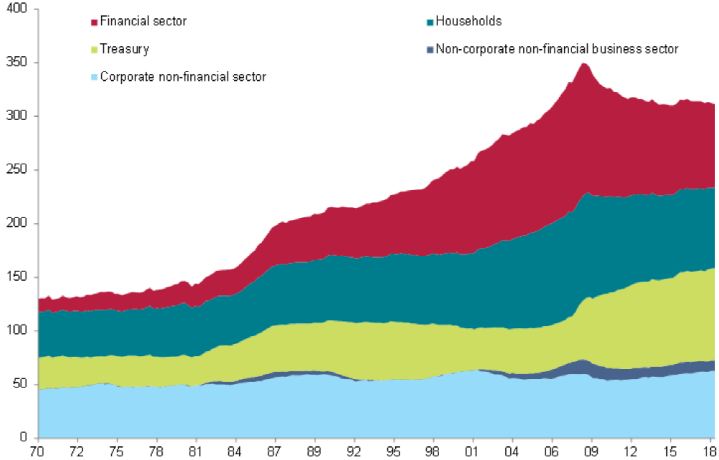
- As we've just endured for the past two months in China, the virus was extremely difficult to contain.
- Governments in the West have been informed for weeks. Instead of using this headstart to protect its own citizens, parts of the US government establishment, including the White House, have pushed to downplay the risk.
- At a fundamental level, the US governing structure and philosophy makes it unable and unwilling to adopt the measures taken by the Chinese government.
- Absent effective containment, this health crisis can escalate into an economic crisis:
  - Financial markets, reflecting this reality, have priced in an economic recession with high probabilities.
  - The markets have also priced in an incoming $1T pandemic relief bill for businesses and families.
  - But what if the virus lingers on for months? This $1T will not be enough.

Pre-Existing Conditions

- All of this happens at a time of large deficits, high leverage, and limited room for monetary policy:
  - Government deficits at $1T, hiked by 2017 Trump tax cuts.
  - Total debt is 333% of GDP, federal debt 101% of GDP, non-financial corporate debt 74% of GDP.
  - Extremely low long-term rates and an existing QE at $4T from 2008 crisis.
- The post-2008 banking rules to prevent another "2008" are making "2020" worse:
  - Cracks in almost all markets: the MBS, credit, even the US Treasury market.
  - Cash in USD becomes the only safe haven.
  - To avoid a potential crisis in liquidity, the Fed is injecting liquidity:
    - at an unprecedented speed,
    - with an unprecedented magnitude,
    - covering an unprecedented range.

US Debt to GDP

Figure 1: US debt (as % of GDP)



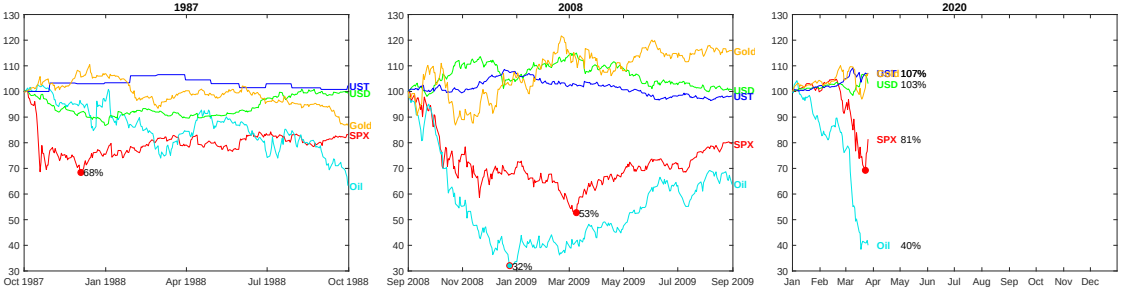
Sources: Euler Hermes, Allianz Research

Fed: Liquidifying the Markets

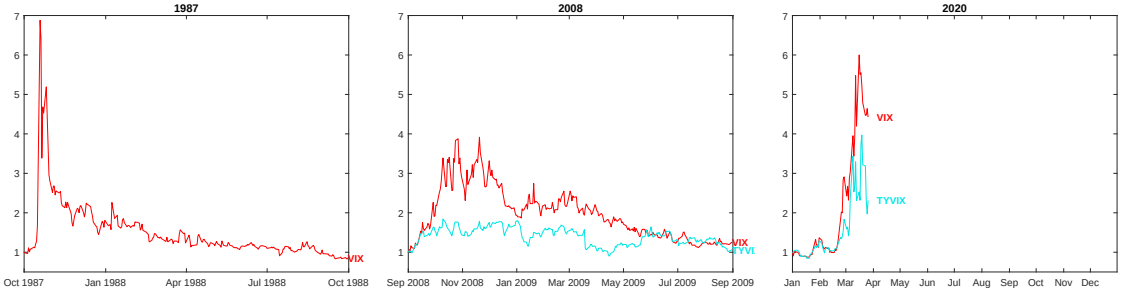
One week in 2020 feels like one month in 2008:

- 3/03: Emergency rate cut by 50 bps.
- 3/12: Injects $1.5T via term repo.
- 3/15: Fed fund rate to zero.
- 3/15: $700B QE: $200B in MBS and $500B in Treasury.
- 3/17: Commercial paper funding facility (CPFF).
- 3/17: Primary dealer credit facility (PDCF).
- 3/18: Money market mutual fund liquidity facility (MMFL).
- 3/20: Expand MMFL to include short-term muni debt.
- 3/20: Expand dollar funding around the world.
- 3/20: $1T overnight repo per day till the end of March.
- 3/23: Extensive measures to support the economy.

Financial Markets in 1987, 2008, and 2020

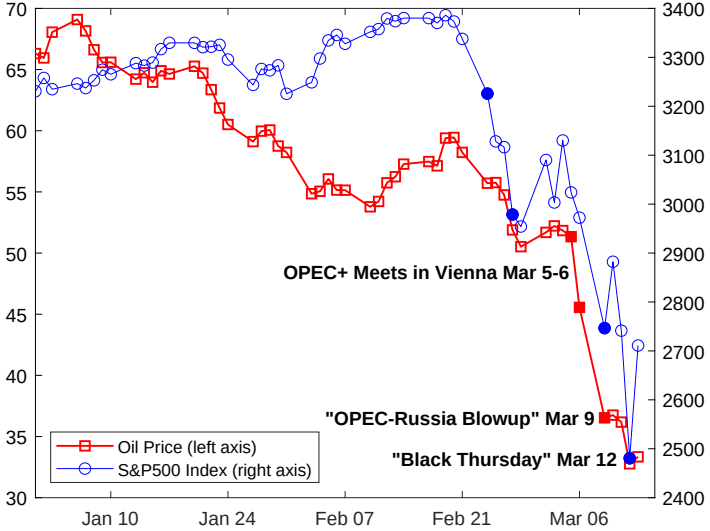


Fear Gauge in 1987, 2008, and 2020



Review: Comparison of 2020 with Prior Crises

The OPEC-Russia Blowup and All-Out Oil Price War

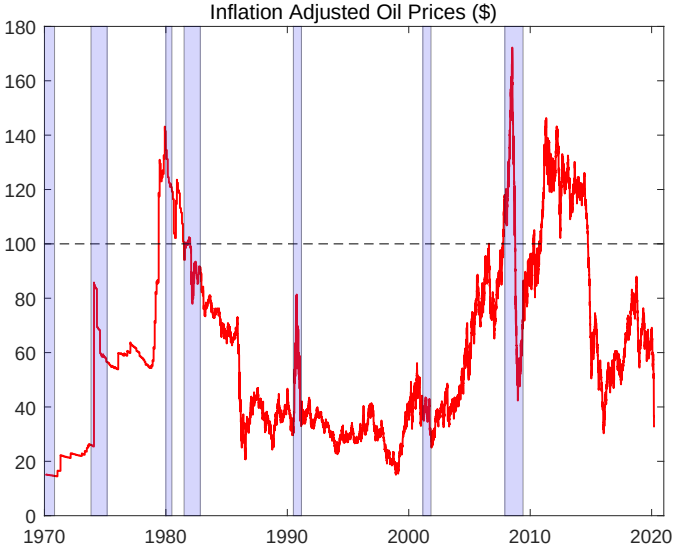


The Geopolitics of Oil Prices

- On March 5-6, Saudi Arabia and other big OPEC countries and Russia gathered in Vienna to plan production cuts to put a floor under falling prices due to the outbreak of Coronavirus.
- Moscow refused to sign on to Saudi Arabia's proposed cuts, sending the price of oil sharply down. Riyadh responded by slashing its oil prices and later announced plans to massively increase oil output, further driving down the price of oil.
- For Russia and Saudi Arabia, both more or less dependent on oil sales to fund their national budgets, it is a dangerous game of chicken.
- "It reminds me of the First World War, when France and Germany went to war thinking they'd be home by Christmas, and spent four years in the trenches."

Source: Standish and Johnson (2020), Foreign Policy.

History of Oil Prices



Russia Strikes Back?

- Russia spent the last five years tightening its budget and building up $550 billion in reserves, allowing it to cope with oil prices $25-$30 a barrel for up to a decade.
- That war chest is the result of Moscow's decision to restructure its economy after it was pushed into recession in 2015, following Western sanctions over the annexation of Crimea and OPEC's decision to open the spigots the year before.
- Driving the price down would both inflict economic harm on the United States and undermine its ability to wield its favorite tool of international coercion: sanctions.

Source: Standish and Johnson (2020), Foreign Policy.

Vulnerable US Shale Producers

- Loaded with high-yielding debt, US shale producers are a fuse that could blow up the whole US corporate debt market. If Russia wants to push buttons to cause chaos in the United States, that's a good one.
- That's why some experts are calling for a very targeted government intervention, not to save the billionaire oil executives, but to forestall a wider credit collapse.
- But the US shale industry has proved resilient in the past, as when OPEC tried to smother it in 2014-2015 with a flood of cheap oil. When prices fall, US production falls, just enough to get prices up, and then rigs start pumping again – a self-regulating mechanism.

Source: Standish and Johnson (2020), Foreign Policy.

Saudi: Recklessness or Expanding Market Share?

- Saudi Arabia has cash reserves to withstand lower prices, though less than it did in 2014 – and less than Russia does today, given its budget imperatives. The Saudi financial war chest could take that for about four years at best – but Riyadh is clearly hoping for a short and sharp oil war.
- On the other hand, by raising exports from 7-plus million barrels a day to 9-plus million barrels a day, or even more, Saudi Arabia can make the same amount of money as it would have in a world without Russian cooperation, but snatching more market share.

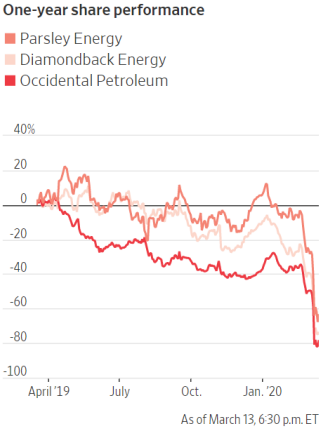
Source: Standish and Johnson (2020), Foreign Policy.

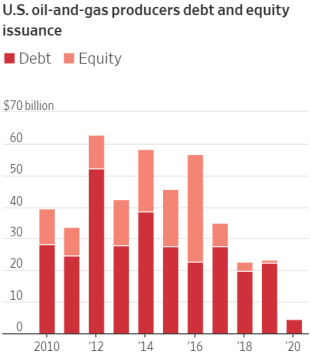
Largest One-Day Percentage Drops in Oil Prices

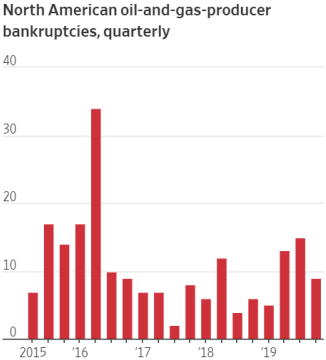
Daily movements measured in their respective historical standard deviations (sigma):

Date	Oil	SPX	USD	EUR	UST	CAN	NOR	DAN	CHF	YEN	VIX Level
1/17/1991	-12.2	3.7	-4.1	3.9	-2.9	-1.2	2.1	2.7	1.1	3.4	27.45
2/3/1986	-7.0	1.0	0.9	-0.7	-0.9	-1.6	-0.1	-0.4	-0.2	1.2	
4/1/1986	-6.9	-1.6	0.1	-0.3	-0.3	0.9	0.5	-0.4	0.5	1.7	
3/9/2020	-6.8	-7.6	-2.2	1.8	-3.1	-1.7	-3.9	1.6	1.2	4.2	54.46
4/30/1974	-5.5	0.3	0.6	1.2	0.2						
10/22/1990	-4.5	0.7	1.6	-1.4	0.2	-0.9	-0.0	-0.8	-1.0	-0.0	27.27
2/1/1982	-4.5	-2.2	2.4	-0.8	6.8	-0.9	-1.0	-2.1	-2.1	-2.6	
9/24/2001	-4.4	3.9	-0.4	-0.2	0.5	0.3	-1.5	-0.1	-2.0	-1.1	37.75
12/17/1998	-4.2	1.5	-0.3	0.2	0.0	-0.3	2.6	0.3	-0.4	-0.3	27.96
11/30/1990	-4.1	1.8	-0.8	-0.7	-0.9	-0.3	-1.7	-1.6	-1.5	-2.9	22.16

US Shale Companies: Potential Casualties of Oil-Price War







Review: The Politics of Financial Markets

Review: Main Takeaways

- Comparison of the US and Chinese markets.
- The broad spectrum of capital markets and their performance during crises.
- Comparison with past crises.
- The politics of financial markets.