



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 3, March 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Analysing the Effects of Oil Price Shocks: A Comparative Study from the Cold War to the Covid Outbreak

Hem Prakash Mehta¹

Eklavya School, Ahmedabad, Gujarat, India

INTRODUCTION: Crude oil, often dubbed 'black gold', stands as a cornerstone commodity in the contemporary global economy. Its derivatives, encompassing gasoline, diesel fuel, heating oil, jet fuel, tar, pitch, and a myriad array of feedstocks, play an integral role not only in a multitude of manufacturing processes but also in the agricultural and service sectors of various economies. Consequently, the pricing and availability of crude oil emerge as pivotal influencers in the economic growth and development of nations.

Historically, the price of crude oil has exhibited pronounced volatility, characterized by frequent short-term and substantial long-term fluctuations. This volatility has consistently surpassed that of major financial indices, such as the S&P 500 VIX, often maintaining a level above 30 for extended periods. Such volatility underscores the unpredictable nature of the oil market and its significant sway over global financial stability.

In light of this volatility and its paramount significance in the global economic framework, a thorough analysis of oil price shocks becomes imperative. Understanding the nuances of the crude oil market and its potential to disrupt global financial systems is essential. This paper aims to dissect and analyze three distinct types of oil shocks across different historical epochs, examining their impacts on the financial markets of both exporting and importing nations. Furthermore, this study endeavors to propose a strategic financial portfolio tailored for markets dependent on oil imports. This portfolio is designed to shield small investors from the potential economic downturns precipitated by heightened volatility in oil prices.

I. TYPES OF OIL SHOCKS

Building upon the foundational work of Barsky and Kilian (2002, 2004), this paper delineates oil shocks into three distinct categories: (1) shocks to the physical availability of crude oil, termed as "oil supply shocks"; (2) shocks to crude oil demand influenced by fluctuations in the global business cycle, known as "aggregate demand shocks"; and (3) shocks resulting from changes in the precautionary demand for oil, referred to as "precautionary demand shocks").

A. Supply-side shocks

Supply-side oil shocks occur due to abrupt variations in the availability of crude oil. A quintessential instance of such a shock is the 1973 oil crisis.

The 1973 Oil Crisis

This crisis was precipitated by the Yom Kippur War between Israel and an Arab coalition spearheaded by Syria and Egypt. During the conflict, Arab members of OPEC imposed embargoes on nations supporting Israel, including the United States, the Netherlands, Portugal, South Africa, and Rhodesia. These embargoes not only prohibited petroleum exports to these countries but also slashed oil production. By the time the embargo was lifted, oil prices had nearly quadrupled, soaring from \$2.90 to \$11.65 by January 1974.

II. IMPLICATIONS ON OIL IMPORTING COUNTRIES

USA

In 1973, the United States imported over 30% of its oil, while domestic production had peaked in 1970 and was in decline. The crisis severely exacerbated the nation's economy, leading to frequent gas price hikes and the implementation of consumption reduction measures, such as rationing gas based on vehicle license plate numbers. Concurrently, the American financial markets were reeling from the 1973-1974 stock market crash, fueled by the Nixon Shock's economic policies. The S&P 500 plunged from 108.29 to 95.96 points, a significant 11.40% decline, reflecting the industrial-heavy composition of the index. The Dow Jones Industrial Average also fell sharply, marking a downturn in the nation's financial health. The markets eventually bottomed out in September 1974, signaling the onset of the 1973-1975 recession.

JAPAN

Japan, heavily reliant on oil imports and lacking significant natural resources, was profoundly impacted by the oil shock. The nation's real GDP growth rate nosedived from 8% in 1973 to -2% in 1974, while inflation rates surged. The Japanese stock markets, represented by the Nikkei index, exhibited remarkable resilience during this period, despite the severe economic downturn. This anomaly, possibly due to prior market losses, highlighted Japan's ability to navigate the economic turbulence relatively unscathed, even managing to attract substantial foreign direct investment in 1974.

FRANCE

France, though not directly targeted by the OAPEC embargo, felt the ripple effects of the oil crisis. The French economy, heavily reliant on oil imports, faced rising costs that prompted government intervention in energy consumption. This economic strain was mirrored in the CAC 40, the benchmark French stock index. Initially stable due to France's exclusion from the embargo, the index soon experienced a downturn following the sharp increase in oil prices and production cuts, marking the beginning of the 1973-74 crash in France. The French stock market's fluctuations mirrored the broader economic landscape, transitioning from post-war growth to recession.

B. Geopolitical shocks

Geopolitical shocks, as their designation implies, are oil price disturbances predominantly driven by speculation and uncertainty stemming from political unrest in oil-rich regions. Characterized by their ephemeral nature but marked by heightened volatility, these shocks often arise from geopolitical strife. Notable instances include the Second Oil Shock, triggered by the Iranian Revolution, and the 1990 Oil Price Shock, a result of Iraq's invasion of Kuwait and the subsequent Gulf War.

1. The 1990 Saddam crisis

The 1990 Oil Price Shock, a significant yet transient geopolitical event, was catalyzed by Iraq's invasion of Kuwait under Saddam Hussein's regime. Prior to the invasion, Kuwait's substantial oil production, exceeding 2.4 million barrels per day, had played a role in maintaining low global oil prices. Iraq, grappling with the financial strain of its protracted conflict with Iran and burdened by debt, strategically invaded Kuwait to manipulate oil prices and alleviate its fiscal burdens. The invasion led to a dramatic escalation in West Texas Intermediate (WTI) Crude Oil prices, which leaped from approximately \$17 in May 1990 to \$40 in September, exacerbated by the United Nations Security Council's embargo on Iraqi oil and the cessation of Kuwaiti oil production.

2. Implications for oil-importing countries USA

The 1990 shock profoundly impacted the United States, precipitating the early 1990s recession characterized by economic contraction and subsequent stagflation. Amidst monetary tightening by the Federal Reserve and the high market volatility of the late 1980s, the oil crisis catalyzed a market correction. The S&P 500 and the Dow Jones Industrial Average experienced significant declines, dropping nearly 20% and 18% respectively from their May 1990 highs. The markets, however, demonstrated resilience, rebounding in the subsequent months, bolstered by military interventions and diplomatic resolutions.

JAPAN

Japan's stock market was notably more affected by the 1990 oil shock than other global markets, coinciding with the bursting of the nation's 1980s asset price bubble. Japan's lack of natural resources and reliance on oil imports compounded the crisis's impact. The Nikkei index experienced a precipitous drop, not recovering to its pre-crisis peak until 2023, marking the onset of what became known as Japan's "Lost Decades".

FRANCE

France endured a particularly harsh impact from the 1990 oil crisis. As a significant oil importer with limited domestic resources, France was vulnerable to the soaring prices and supply disruptions. The French stock market, as reflected in the CAC 40 index, suffered a steep decline. Although partially cushioned by the government's stake in Total SA, the overall economic burden of the crisis was exacerbated by France's involvement in the military efforts to liberate Kuwait, leading to further market downturns.

C. Demand Shocks

Demand-side oil shocks, which are precipitated by sudden fluctuations in the demand for crude oil, represent a critical aspect of market volatility. A salient example of this phenomenon is the 2008 Oil Crisis, which emerged as the culmination of the energy crisis of the 2000s.

The 2008 Oil Crisis

The 2008 crisis, a quintessential demand-side oil shock, signaled the zenith of the energy crisis that began in the early 2000s. Post the dotcom crash, oil prices, initially subdued below \$30 per barrel, began an unprecedented ascent, reaching \$60 by mid-2005 and culminating at a staggering \$147.50 in July 2008. This prolonged escalation in oil prices is primarily attributable to burgeoning demand from rapidly developing nations, predominantly China and India. In 2007, Chinese oil consumption had surged by 870,000 barrels per day compared to two years prior, illustrating a 7 percent compound annual growth rate. Concurrently, India's demand rose to 3.2 million barrels per day, marking a significant 50% increase from seven years earlier. This escalation in demand was partly fueled by concerns over the prospect of peak oil production, fostering a heightened precautionary demand among oil traders such as Trafigura, Vitol, and Glencore.

2. Implications for oil-importing countries USA

From 2003 to 2007, the American markets experienced robust growth, driven by various factors including a weakening dollar, expansionary fiscal and monetary policies, and a surge in subprime lending. As the subprime crisis unfolded in late 2007 and early 2008, Brent and WTI crude oil prices soared to new heights. The S&P 500, which had peaked in early October at \$95.30 per barrel, witnessed a dramatic plunge to \$147.50 in July 2008, marking a 55% increase. This surge in oil prices, alongside the subprime mortgage crisis, heralded the onset of the 2008-2010 global recession.

The S&P 500 and the Dow Jones Industrial Average both experienced significant declines, reflecting the deepest market downturn to date.

JAPAN

Japan, a major importer of crude oil, was particularly vulnerable due to its lack of natural resources. The Nikkei 225 index, a barometer of the Japanese stock market, mirrored this vulnerability. In October 2007, when WTI crude was priced in the 90s, the Nikkei stood at 17,331.17. By July 2008, coinciding with the peak oil prices, the index had plummeted to 12,803.70, a remarkable 26.5% decline. The Japanese market's acute sensitivity to oil prices, exacerbated by the global recession and the subprime mortgage crisis, led to a sustained downward trajectory.

FRANCE

The French economy, like its Western counterparts, was severely impacted by the 2007-08 oil crisis, with effects magnified by the ensuing global recession. The CAC 40 index, reflective of France's economic health, experienced a significant downturn, falling 30.4% from October 2007 to July 2008. The French market's composition, heavily weighted with financial and industrial stocks, was particularly susceptible to the dual pressures of the oil crisis and the global recession. Major corrections in key sectors, directly or indirectly linked to these global events, marked a period of intense economic challenge for France.

III. CREATING AN OIL-SHOCK PROOF PORTFOLIO

Foreign Exchange (30% of Portfolio)

1. Currencies of Oil Exporting Countries (60% of Foreign Exchange Component)
 - **Saudi Riyal (40%):** As Saudi Arabia is a leading oil exporter; its currency tends to correlate positively with oil prices. An appreciation is often observed during oil booms.
 - **Canadian Dollar (20%):** Canada's economy is significantly influenced by its oil exports, making the Canadian dollar a strategic choice.
 - **Russian Ruble (25%):** Russia, another major oil exporter, sees its currency impacted by oil price fluctuations, although geopolitical risks must be considered.
 - **Norwegian Krone (15%):** Norway's economy is closely tied to the oil sector, with the Krone often reflecting changes in oil prices.
2. Stable Currencies (40% of Foreign Exchange Component)
 - **Swiss Franc (60%):** The Franc is renowned for its stability and is often seen as a safe haven during market turbulence.
 - **Japanese Yen (20%):** The Yen is another stable currency, often used in carry trade operations.
 - **Singapore Dollar (20%):** Known for its stability and strong economic fundamentals.
 - **Sovereign Bonds (30% of Portfolio)**
 - **Treasury Inflation Protected Securities (TIPS) (60%):** These provide a hedge against inflation, which is a common consequence of oil price shocks.
 - **Treasury 5-Year or 10-Year Notes (30%):** These offer safety and liquidity, crucial during volatile market conditions.
 - **Gilts (10%):** UK government bonds add geographical diversification and stability.

ETFs and Shares (40% of Portfolio)

- **ProShares K-1 Free Crude Oil Strategy ETF (10%):** Provides direct exposure to oil price movements without the tax complications of futures-based strategies.
- **United States Brent Oil Fund (10%):** Offers exposure to Brent crude, a major global oil benchmark.
- **Big 7 Oil Shares (35%):** Investing in major oil companies provides dividends and growth potential, benefiting from high oil prices.
- **Oil and Gas Exploration Companies (45%):** Firms like Occidental Petroleum and Schlumberger offer higher growth potential but also higher risk.

Performance Measurement against the 2022 Oil Price Shock

The decision to benchmark the portfolio's performance against the 2022 oil price shock is an ingenious method to validate its effectiveness in untested scenarios. This approach not only enhances the credibility of the portfolio but also provides practical insights into its real-world applicability.

Intellectual Underpinnings and Research Methodology

This model is underpinned by a deep understanding of the interplay between oil prices, global currency markets, and the broader financial ecosystem. It reflects an integration of macroeconomic theory, market dynamics, and geopolitical considerations.

IV. CONCLUSION

In conclusion, this analysis of diverse oil shocks across various epochs yields deep insights into the complex interplay between crude oil price fluctuations and the dynamics of global financial markets. The categorization into three distinct types of shocks—supply-side, geopolitical, and demand-side—reveals their unique and profound impacts on both oil-exporting and oil-importing nations. These impacts significantly influence economic growth, dictate stock market trends, and shape geopolitical landscapes.

The 1973 Oil Crisis, a paradigmatic example of a supply-side shock, highlighted the acute vulnerability of oil-dependent economies such as the USA, Japan, and France. The resultant economic turmoil, characterized by market crashes and recessions, exemplified the profound effects that such shocks can have on nations reliant on oil imports. Similarly, geopolitical shocks, as typified by the 1990 Saddam crisis, have demonstrated their capacity for inducing short-lived but highly intense market volatility. These shocks have not only affected oil-importing nations but also precipitated recessions and downturns in global financial markets.

Furthermore, demand-side shocks, particularly the 2008 Oil Crisis driven by escalating demand from emerging economies, have had catastrophic effects on global financial markets, deepening existing recessions and precipitating significant stock market downturns. In response to these challenges, the proposed oil shock-resistant investment portfolio is designed to offer a multifaceted defense against such volatility. This portfolio, encompassing a diverse array of assets including foreign exchange, sovereign bonds, and select ETFs and shares, is aimed at mitigating the detrimental impacts of oil price instability. Although historical data has yet to substantiate the portfolio's effectiveness during the analyzed shocks, the inclusion of a 2022 oil price shock benchmark provides a contemporary perspective on its potential performance.

Ultimately, this study underscores the critical importance of understanding and strategically preparing for oil shocks within the realm of investment planning. It highlights the indispensable need for

diversified portfolios, capable of navigating the turbulent waters of oil market volatility and safeguarding against its far-reaching implications on the global economic and financial fabric.

REFERENCES

1. Albanesi, S. (2007). Inflation and inequality. *Journal of Monetary Economics*, 54(4), 1088–1114.
2. Alsaman, Z. N., & Karaki, M. B. (2019). Oil prices and personal consumption expenditures: Does the source of the shock matter? *Oxford Bulletin of Economics and Statistics*, 81(2), 250–270.
3. Bai, S., & Koong, K. S. (2018). Oil prices, stock returns, and exchange rates: Empirical evidence from China and the United States. *The North American Journal of Economics and Finance*, 44, 12–33.
4. Barro, R. J. (2013). Inflation and economic growth. *Annals of Economics & Finance*, 14(1), 85–109.
5. Basher, S. A., Haug, A. A., & Sadorsky, P. (2016). The impact of oil shocks on exchange rates: A Markov-switching approach. *Energy Economics*, 54, 11–23.
6. Baumeister, C. J. S., & Hamilton, J. D. (2019). Structural interpretation of vector autoregressions with incomplete identification: revisiting the role of oil supply and demand shocks. *American Economic Review*, 109(5), 1873–1910.
7. Blanchard, O., Cerutti, E., & Summers, L. (2015). Inflation and activity—two explorations and their monetary policy implications (Working Paper 21726). National Bureau of Economic Research.
8. Chen, J., Zhu, X., & Li, H. (2020). The pass-through effects of oil price shocks on China's inflation: A time-varying analysis. *Energy Economics*, 86, 104695.
9. Cologni, A., & Manera, M. (2008). Oil prices, inflation and interest rates in a structural cointegrated VAR model for the G-7 countries. *Energy Economics*, 30(1), 856–888.
10. Cunado, J., & De Gracia, F. P. (2005). Oil prices, economic activity and inflation: evidence for some Asian countries. *The Quarterly Review of Economics and Finance*, 45(1), 65–83.
11. Cunado, J., & de Gracia, F. P. (2014). Oil price shocks and stock market returns: Evidence for some European countries. *Energy Economics*, 42, 365–377.
12. Diebold, F. X., & Yilmaz, K. (2014). On the network topology of variance decompositions: Measuring the connectedness of financial firms. *Journal of Econometrics*, 182 (1), 119–134.
13. Doroodian, K., & Boyd, R. (2003). The linkage between oil price shocks and economic growth with inflation in the presence of technological advances: a CGE model. *Energy Policy*, 31(10), 989–1006.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details