Analyzing Commodity Prices in the Context of COVID-19, High Inflation, and the Ukrainian War: An Interview with James Hamilton

Fredj Jawadi[a]

ABSTRACT

The following interview with Prof. James Hamilton was conducted in September 2022 by Dr. Fredj Jawadi with the assistance of Professor Adonis Yatchew in association with the 6th International Workshop on Financial Markets and Nonlinear Dynamics (FMND) held in Paris, France. The interview includes 20 questions related to commodity price dynamics. The aim of the discussion was, first, to help readers gain a better understanding of the factors driving commodity price volatility during the COVID-19 pandemic. Second, we analyzed commodity reactions to the ongoing Ukrainian war. Third, we examined the impact of changes in commodity prices on the economy as a whole and on inflation in particular. Finally, we discussed projections related to the dynamics of commodity prices in the future and the impact on the energy transition process. We hope that this interview will give readers clearer insights into the causes and consequences of commodity price changes and their evolution over time.

Keywords: Commodity prices, COVID-19, Oil price shock, Uncertainty, Ukrainian War.

https://doi.org/10.5547/01956574.44.1.fjaw

1. BACKGROUND AND INTRODUCTION

James (Jim) D. Hamilton has been a professor in the Economics Department at the University of California, San Diego since 1992, where he currently holds the Robert F. Engle endowed chair in Economics. He served as department chair from 1999–2002, and has also taught at Harvard University and the University of Virginia. He earned a Ph.D. in Economics from the University of California, Berkeley, in 1983. Professor Hamilton has published on a wide range of topics. His research in areas that include econometrics, business cycles, monetary policy, and energy markets (Hamilton, 1983; 1996, 2003, 2009, etc.) has gained him over 81,923 citations. His graduate textbook on time series analysis has sold over 50,000 copies to date and has been translated into Chinese, Japanese, and Italian. He also contributes to Econbrowser, a popular economics blog. Academic honors include Research Associate with the National Bureau of Economic Research, Best Paper Award for 2010–2011 from the International Institute of Forecasters, and the 2014 award for Outstanding Contributions to the Profession from the International Association for Energy Econom-

a IAE Lille University School of Management, 104 Avenue du Peuple Belge, 59043, Lille, France. E-mail: fredj.jawadi@univ-lille.fr.

This interview with Prof. James Hamilton was conducted by Fredj Jawadi (University of Lille, France) with the assistance of Adonis Yatchew (University of Toronto) in Paris in September 2022 following the 6th International Workshop on Financial Markets and Nonlinear Dynamics (www.fmnd.fr), where Professor Hamilton was among the Keynote Speakers.

ics. He is a Fellow of the Econometric Society and the *Journal of Econometrics*, and a Founding Fellow of the International Association for Applied Econometrics. He has been a visiting scholar at the Federal Reserve Board in Washington, DC, as well as the Federal Reserve Banks of Atlanta, Boston, New York, Philadelphia, Richmond, and San Francisco. He has also been a consultant to the National Academy of Sciences, the Commodity Futures Trading Commission, and the European Central Bank, and has testified before the United States Congress. Professor Hamilton has received six teaching awards from the UCSD Economics Department.

The main focus of our interview is on James Hamilton's work in the field of energy economics and the macroeconomy. The aim is to improve our understanding of the drivers of commodity price dynamics during the COVID-19 pandemic and the impact on the macroeconomy, not only in the past, but also more recently during the COVID-19 and the Ukrainian war. Jim was the plenary speaker at the 6th International Workshop on Financial Markets and Nonlinear Dynamics (Paris, June 2–3, 2022), and he was kind enough to agree to this interview.

We hope that this interview will provide you with further insights into the recent dynamics of commodity prices and their impact on the real economy.

The interview is organized into five sections. The second section deals with issues covering commodity price dynamics in the context of COVID-19. Section 3 focuses on commodity price changes and geopolitical tension. Topics related to the macroeconomy–commodity price relationship are discussed in section 4. Finally, section 5 concludes with some projections about commodity prices in the future.

2. COMMODITY PRICE DYNAMICS IN TIMES OF COVID-19

Fredj: Q1. What are your views on the present levels of commodity prices, especially oil and gas?

Jim: The price of oil nearly tripled between June 2020 and March 2022, and more than tripled if you mark the change from the ridiculously low prices of April 2020. That definitely puts this most recent episode in the same class as the big historical oil shocks that have received a lot of study. And it's mirrored to some degree in commodity prices more broadly. For example, the price of copper nearly doubled over that period.

Fredj: Q2. Commodity prices displayed high volatility during the COVID-19 outbreak and even in the post-COVID-19 period. Is there a linkage between COVID-19 and the volatility of commodity prices?

Jim: Oh, Absolutely. COVID brought much economic activity to a virtual standstill. People weren't driving to work, they didn't want to fly. This might have been the biggest short-run shock to demand that we've ever seen.

Fredj: Q3. What mechanisms explain the interaction between commodity markets and coronavirus? Can we talk about three shocks: a policy shock, a demand side shock, a supply side shock?

Jim: There were certainly disruptions to both supply and demand, but I would emphasize demand as the initial factor. There was supply from inventory that people weren't buying. And the demand shock in turn was heavily influenced by policy, as you mentioned, namely the mandated lockdowns. But later on it turned out very much to be a story about supply. The crazy low prices caused a lot of producers to go out of business, and those that remained were much more cautious about putting money back and investment into the business. The U.S. still has not recovered today the level of production that we were seeing pre-COVID. That is 100% an issue of supply, not demand.

Fredj: Q4. In April 2020, the WTI price turned negative, reaching –37.63US$ a barrel and losing about –300%, which is its largest one-day decrease since 1983. Would you please comment on the causes of the negative oil prices? Was this incident a simple inventory problem?

Jim: That's an interesting story. The negative price was a result of the mechanics by which the U.S. oil futures contracts are settled. These contracts are settled by physical delivery of the product in Cushing Oklahoma. The vast majority of traders don't actually want physical delivery, so buyers and sellers of futures contracts usually net out their positions before expiry. But if no one wants to take your long position off your hands, the exchange will ask you, "where do you want us to put your 10,000 barrels of oil?" And if storage facilities are all booked, you may actually have to pay somebody to take the oil off your hands—a negative price. It's like a classic short squeeze only in reverse. In this case, buyers of the futures contracts got squeezed. Of course that's an artifact of the exchange mechanics. But it also reflects a fundamental reality that demand temporarily fell tremendously. And it was a real development in the sense that many other contracts get written using the spot or settlement price of WTI as a reference. This negative price definitely contributed to the shake-out in the industry and bankruptcy of a number of producers.

Fredj: Q5. Over the last few decades, commodity prices have also shown high volatility and extreme corrections, especially in 2008–2009 and 2014–2015. Are there any useful similarities or lessons that can be drawn from these earlier periods and today?

Jim: Yes. Both demand and supply have always been relatively price inelastic. This means that even if the shock to quantity is relatively modest, you can end up seeing huge swings in price. That was true historically, and it's still true today.

3. COMMODITY PRICE CHANGES AND GEOPOLITICAL TENSIONS

Fredj: Q6. In an interview we conducted in 2019 that was published in *Energy Journal* (Jawadi, 2019), you mentioned that historical supply shocks typically represented a disruption of about 5% of total world production. How does that compare with the size of the actual and potential disruptions associated with Russia's attack on Ukraine?

Jim: Russia today accounts for about thirteen percent of total world field production of crude. So if all of Russian oil production was knocked out, that would be twice as big as any of these historical oil disruptions. But what's happened so far is that while the U.S. And Europe are buying less oil from Russia, other countries are buying more. So actually as of now, it has not been that big a shock to total world production, though the potential is certainly there. Now natural gas is a different story, because it's a much more localized market. Germany gets more than half its natural gas from Russia, and if that's lost it's much harder to buy it from any place else. So what happens in Russia could be a potentially huge event, particularly as far as Europe is concerned.

Fredj: Q7. We always supposed that exogenous geopolitical events (the Suez crisis in 1956/57, the OPEC embargo, the Iranian revolution, the Iraq/Iran war, the first Persian Gulf War in 1990/91, etc.) produced inflationary pressure on commodity prices as a whole and on oil prices in particular. Why did these events provoke a change in supply side uncertainty and therefore commodity prices?

Jim: When you look at the months around those particular events, the price of oil moved much more than other commodities. So the events you mention are somewhat specific to the oil market. However, several of these events, such as the three you mentioned from the 1970s—the OPEC embargo, Iranian revolution, and Iraq/Iran war—also took place within the context of broader inflationary

pressures. Many industries besides the oil sector were facing challenges in keeping production up with demand. You can make a case that those broader inflationary pressures could have contributed even to some of the geopolitical events. For example, OPEC might have been emboldened by the tight oil market to follow through with the embargo when the Arab-Israeli war broke out.

Fredj: Q8. What are the main mechanisms through which the ongoing Ukrainian war has resulted in a change in commodity prices? Is the effect of this war on commodities different from the shocks of previous geopolitical events? If so, why?

Jim: Well, the price of oil surged on Russia's initial invasion but it has come back to where it had been before the invasion. The market for oil is very much a world market. The product is relatively easily transported and sells for a similar price everywhere in the world. So if the U.S. and Europe stop buying oil from Russia, but China and India increase the quantity they get, the impact on the global price may not be that great. People didn't know when the invasion started how that was going to play out. But so far, it seems not to have been that big a disruption in production of all. Natural gas is a very different story, as I mentioned. It's possible to ship liquified natural gas across oceans, but the volume is much too small to arbitrage the price across local markets. So this may be different from historical energy shocks in that its impact is felt much harder in some places, such as European users of natural gas. But we still don't know how events are going to unfold. It's a tragic situation, and things could change at any minute.

Fredj: Q9. In this context of war and geopolitical instability, what would be the best solution to lessen the volatility of commodities, especially for the gas market in Europe?

Jim: I'm disappointed that the United States did not respond more aggressively to take measures to boost natural gas production and build up the infrastructure to get it to Europe. Europe is going to face a real crunch this winter, and we've known that for a long time. Longer term, the more diversified we are in sources of energy, the less disruptive events like this can be and the easier it is to deal with events like this. Many people are catching on I think that the move away from nuclear energy may have been ill-advised. And the geopolitical costs of depending on a country like Russia for key energy supplies are now clear to everyone.

Fredj: Q10. Both the US and the EU have imposed a series of sanctions on Russia, in the hope that it would constrain Russian ability to fund the war. In your view, have they been successful? Price caps on Russian oil and now natural gas are being considered. Are such mechanisms feasible from an implementation point of view? Are they likely to be successful?

Jim: Stopping U.S. purchases of Russian oil was largely symbolic, to the extent that other countries bought the oil instead. Sanctions on sales of specialized equipment to Russia may be much more important and effective. The idea of price caps I think caught on politically as something that maybe you could build a more effective coalition for. But I think in part this was based on wishful thinking. The real way to negotiate a lower price is to buy less. And this is what the world so far hasn't been willing to do.

Fredj: Q11. Could you comment on whether Europe can survive the winter if Russia completely cuts off natural gas exports?

Jim: Well, it will impose significant hardships and adjustments that could have a big effect on the European economies. But certainly Europe will survive a cut-off in natural gas deliveries. When the missiles start flying, that's when the real threat to survival comes in. It makes me so sad that the

tragic conflicts that many of us hoped we'd left behind in the twentieth century are still taking so many lives today.

Fredj: Q12. How quickly do you think Europe will be able to substitute away from Russian-supplied energy through LNG, conservation and renewables?

Jim: Unfortunately, some of the substitution has to take the form of going back to using coal, at least to get through this winter. And I think both near term and longer term, nuclear has to be part of the picture. I do hope that LNG will be stepped up, but it's going to take some time before that can make a big difference.

4. COMMODITY PRICES AND THE MACROECONOMY

Fredj: Q13. At present[1], the inflation rate has reached the highest level in the US and Europe. What portion of the inflation is due to commodity price increases? What are the other forces driving inflation?

Jim: One rule of thumb is that if the price of oil goes up $10/barrel and no other price changes, it would add 0.2% to the headline inflation rate. When you do that calculation, you conclude that maybe ¼ of the rise in inflation in 2021 could be attributed to oil. But the reason oil prices were going up last year was because demand recovered from COVID faster than production. We saw the same thing in a number of other sectors. For example, a shortage of chips was holding back car production, and workers who retired early and didn't come back to work. That's creating some supply pressure, shortages, and increase of prices. This gave rise to broader inflationary pressures of which commodity markets were just one example.

Fredj: Q14. Over the two last years, the world has been through a major pandemic with COVID-19, followed by the invasion of Ukraine, resulting in considerable geopolitical tension. Both events have impacted commodities and the whole economy. In what way did these events impact the relationship between commodities and the economies of developed and emerging countries?

Jim: I worry not just about the added energy bill for developing economies but also food prices. Ukraine had been a key food producer for the world. And if we do see an economic slowdown in Europe and the U.S. that will be a big hit for emerging country exports. I also think that China may be experiencing a separate shock from the ongoing efforts to contain COVID there. If that happens, it would also be important in terms of depressing the prices the developing countries receive for their exports of raw materials, for example. So the whole world's in this, not just Europe.

Fredj: Q15. The US dollar recently reached parity with the Euro. How do commodity prices impact this parity and be impacted by this parity?

Jim: The U.S. Federal Reserve seems committed to trying to bring inflation down by raising interest rates. That leads to an appreciation of the dollar and lowers U.S. demand for goods. And it may be one factor, the higher dollar and lower demand. that has contributed to the recent declines in commodity prices since the invasion started.

1. See Hamilton (1983, 1996, 2003, 2009) for more details on the impact of oil price on the real economy.

Fredj: Q16. The current context characterized by high commodity price uncertainty and increasing inflation has troubled investors and policymakers. Could you comment further on how does this commodity uncertainty affect the US and European economies?

Jim: There is a very strong correlation between gasoline prices and consumer sentiment in the U.S. data. When gasoline prices go up as much as they did in 2021, it makes people much more pessimistic. This was likely a factor contributing to the slower economic growth that we've seen in the recent data, and sometimes can interact with other shocks and pressures on demand to bring the economy into a recession. We're hoping that's not going to happen this time. But it could.

Fredj: Q17. The Fed and the ECB have announced that they will continue to increase interest rates to attenuate the inflation rate. Are the current policies calibrated well in your view? Will they have an impact on commodity prices and their uncertainty?

Jim: I worry that the Fed thinks it has more control over inflation than it really does. It seems their plan is to continue to raise interest rates until inflation returns to normal levels. I think if they follow through on that, it could well result in a recession. There are already significant threats to economic growth that we talked about earlier, and monetary contraction could tip the scales. Obviously U.S. monetary and fiscal policy went overboard with too much stimulus focused in 2020 and 2021, but you can't undo the effects of that within a few short months in 2022. I would favor a more gradual and longer term focus on trying to bring inflation down because it's a very careful path, and a narrow path, that we have to walk on at the moment.

Fredj: In two thousand and one, the Fed decided to decrease its rate to avoid the recession, it was a great policy, but it caused hereafter inflation and then it increases its rate to reduce inflation. Actually, for example, the Fed wants to fight against the inflation, but we know that it can provoke an economic recession. Is there any trade-off between inflation and economic recession?

Jim: Well, sure there's a trade-off. But, as I say, I think we don't want to be overconfident. It's not as if it has a button to push, and bing inflation goes right there to three percent or 2.5, or whatever. There are lags in these things. And so, if you're asking, is it possible to have two percent inflation for the next year and not have an economic downturn, my answer to that would be no. I think that's not feasible. We have to be more realistic, more humble about the situation that we face, and it's going to be very hard, as I say, to try to bring inflation down now that the genie is out of the bottle without causing other serious problems.

5. COMMODITIES IN THE FUTURE

Fredj: Q18. There has been always a challenge and uncertainty about commodity supply yielding commodity price volatility. The uncertainty and volatility have rapidly increased because of the war in Ukraine; in your view, will the OPEC countries be able and willing to adjust their supplies adequately and therefore attenuate this volatility and uncertainty?

Jim: I don't think so. OPEC has always been a loose collection of countries whose interests are often quite different. It's hard for Saudi Arabia and Iran to agree on anything. And what happens in places like Venezuela and Nigeria is beyond even those own countries to control. In the modern world, U.S. shale fields, not OPEC, are the world's swing producer and that's the factor that can stabilize markets. And it's partly because, as I mentioned it, it took longer for that production from the U.S. to recover. That was a big factor in the recent run-up in oil prices. So I think we should be looking to the United States, not OPEC.

Fredj: Q19. If the US dollar continues to remain near parity going forward, how will this impact the price of oil?

Jim: The key feature in the strong dollar is U.S. monetary policy. As long as the Fed remains focused on higher interest rates, it will be a factor in holding the price of oil down.

Fredj: Q20. Has it become more difficult to forecast commodity prices?

Jim: No. It's always been very hard. When supply and demand are as price-inelastic as they are, a small change in quantities can lead to huge changes in price. And many of the events that bring about significant changes in quantities, like war in the Middle East, COVID, or the latest developments in Russia, are inherently impossible to predict. So it's always been hard, and it's still hard today.

Fredj: Thank you Professor Hamilton for answering my questions

Jim: It's my pleasure.

REFERENCES

Hamilton, J. (1983). "Oil and the Macroeconomy Since World War II." *Journal of Political Economy* April 1983: 228–248. https://doi.org/10.1086/261140.

Hamilton, J. (1996). "This is what happened to the oil price–macroeconomy relationship?" *Journal of Monetary Economics* 38: 215–220. https://doi.org/10.1016/S0304-3932(96)01282-2.

Hamilton, J. (2003). "What Is an Oil Shock?" *Journal of Econometrics* 113: 363–398. https://doi.org/10.1016/S0304-4076(02)00207-5.

Hamilton, J. (2009). "Causes and Consequences of the Oil Shock of 2007–08." Brookings Papers on Economic Activity, Spring 2009: 215–259. https://doi.org/10.3386/w15002.

Jawadi, F. (2019). "Understanding Oil Price Dynamics and their Effects over Recent Decades: An Interview with James Hamilton." *The Energy Journal* 40(SI2): 1–14.

IAEE

International Association for
ENERGY ECONOMICS

The IAEE is pleased to announce that our leading publications exhibited strong performances in the latest 2021 Impact Factors as reported by Clarivate. The Energy Journal achieved an Impact Factor of 3.494 while Economics of Energy & Environmental Policy received an Impact factor of 1.800.

IAEE wishes to congratulate and thank all those involved including authors, editors, peer-reviewers, the editorial boards of both publications, and to you, our readers and researchers, for your invaluable contributions in making 2021 a strong year. We count on your continued support and future submission of papers to these leading publications.