

## Oil Price Shocks and Welfare Social Consequences

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The recent and unprecedented surge observed in energy prices, and especially in the price of crude oil, from 2003 to 2008, has given rise to heated public and academic debates about the true nature of these shocks. Due to the potential impact of these huge movements on most economies (Sadorsky (1999); Hamilton (2003); Edelstein and Kilian (2007); Kilian (2008), among others), the effectiveness of economic policies strongly depends on the identification of the major causes of oil prices movements. Since Greenspan's (2004) intervention regarding the existence of speculators in oil market, a popular view of the origins of the price surge has been that these movements cannot be attributed to economic fundamentals (such as changes in the conditions of supply and demand), but were caused by the increasing financialization of commodities. This financialization should in turn cause volatility clustering phenomena, extreme movements, higher comovements between oil, financial assets, and commodity prices, as well as an increased impact of financial investors' decisions (such as hedge funds, swap dealers, . . .).

While several papers have documented the specific nature of oil price (see among others, Büyüksahin et al. (2009), Büyüksahin et al. (2010a), Büyüksahin et al. (2010b), Alquist and Kilian (2010), Silvennoinen and Thorp (2010), Brunetti et al. (2011), Hamilton and Wu (2012), Joëts (2013) limited works have been done about the welfare consequence of these movements. However, this question appears to be of primary importance from both the economic and the political point of view. For instance, the recent financialization of oil price and the potential welfare social consequences raise the economic question of the trade-off between private and public interest, since financialization is often defined as being beneficial from the private perspective without any beneficial considerations from a social planner's point of view. Politically, the debate is even more relevant since it lends credibility to the regulation of the markets for commodity derivatives in the same way that the G20 governments try to regulate financial markets by limiting speculative behavior.

In this review we expose and discuss preliminary results about the social cost of oil price from the paper "What is the welfare social cost of oil price movements?" (Joëts and Razafindrabe (2014)). By considering an economy that is populated by four types of agents in a dynamic stochastic equilibrium framework ((i) home firms that are composed of a continuum of monopolistic, competitive firms that produce non-oil intermediate goods, a continuum of energy firms that import crude oil in the international market and produce refined-oil intermediate goods, (ii) final good firms that produce homogenous goods to be used in consumption, investment and government purchases, (iii) households which consume, invest and supply labour, and (iv) a central bank, we investigate the welfare social cost of oil price depending on the origin of shocks (i.e. oil supply shock, oil demand shock, speculative demand shock). This framework allows us to see the shock which affects the most the oil price and the consequence in terms of welfare in an oil importing country.

It appears that social welfare is affected in different ways depending on initial shocks. Fundamental shocks have usually less impact on welfare than speculative shocks. More precisely, fundamental shocks from physical supply and demand conditions are largely anticipated compared to speculative ones. In consequence, the welfare cost is less affected when the fundamental component of the oil price is dominant, since households usually smooth their consumption of refined products. However, when speculative shocks occur, evolution of the oil price seems to be more uncertain and then future evolution less predictable leading to more impact on welfare. A frequency analysis which separates short-term and long-term movements of the oil price, further shows that persistent shocks affect social welfare in a larger manner, because the smoothing behaviour of households seems to be limited at longer horizons. Finally, large oil importing countries are impacted by oil price shocks depending on the origin of shocks. If a shock is not predictable it has generally a stronger effect on welfare.

### References

Alquist, R., Kilian, L (2010), "What Do We Learn from the Price of Crude Oil Futures?", *Journal of Applied Econometrics*, 25, 539-573.

Brunetti, C., Büyüksahin, B., Harris, J.H. (2011), *Speculators, Prices, and Market Volatility*, Working Paper, John Hopkins University.

Büyüksahin, B., Haigh, M.S., Harris, J.H., Overdahl, J.A., Robe, M. (2009), *Fundamentals, Trader Activity, and Derivative Pricing*, CFTC Working Paper.

Büyüksahin, B., Haigh, M.S., Robe, M. (2010a), *Commodities and Equities: Ever a 'Market of One'?*, *Journal of Alternative Investments*, 12, 76-95.

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Büyüksahin, B., Robe, M, (2010b), Speculators, Commodities, and Cross- Market Linkages, Working Paper, CFTC.

Edelstein, P., Kilian, L. (2007), The Response of Business Fixed Investment to Changes in Energy Prices: A Test of Some Hypotheses about the Transmission of Energy Price Shocks, *The B.E. Journal of Macroeconomics*, 7(1).

Greenspan, A. (2004), Testimony before the US house of representatives budget committee, September 2008.

Hamilton, J. D. (2003), What Is an Oil Shock?, *Journal of Econometrics*, 113, 363-398.

Hamilton, J.D., Wu, C. (2011), Effects of index-fund investing on commodity futures prices, Working Paper, University of California San Diego.

Joëts, M. (2013), Heterogeneous beliefs, regret, and uncertainty: The role of speculation in energy price dynamics, FEEM Working Paper, n°32.

Joëts, M., Razafindrabe, T (2014), What is the welfare social cost of oil price movements?, mimeo.

Kilian, L., 2008, Exogenous Oil Supply Shocks: How Big Are They and How Much Do They Matter for the U.S. Economy?, *Review of Economics and Statistics*, 90(2), 216-240.

Sadorsky, P., 1999, Oil Price Shocks and Stock Market Activity, *Energy Economics*, 21, 449-449.

Silvennoinen, A., Thorp, S., 2010, Financialization, crisis, and commodity correlation dynamics, Working Paper, University of Technology, Sydney.



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