# Executive Summary of Oil Price Shocks and the U.S. Stock Market: Do Sign and Size Matter?

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# 1 Executive Summary

For many years, researchers compiled conflicting evidence regarding the nature of the relationship between changes in crude oil prices and stock returns. On the one hand, Chen, Roll and Ross (1986) and Huang, Masulis and Stoll (1996) found no evidence of a negative relationship between prices of oil futures and stock returns. Similarly, Wei (2003) encountered that the oil price shock of 1973-74 had no impact on stock returns. On the other hand, work by Kling (1985) and Jones and Kaul (1996) pointed towards a negative effect of oil price shocks on stock returns. Yet, in recent years, a consensus appears to have emerged among academics: oil price shocks exert a negative impact on most stock returns, though the nature of the relationship depends on the underlying shock. In particular, Kilian and Park (2009) find that oil price shocks that are driven by innovations to the precautionary demand for crude oil have a negative impact on U.S. stock returns. They show that the response differs significantly depending on the source of the oil price shock (e.g., supply or demand driven). Thus, changes in the composition of oil price shocks over time help explain why, in the past, researchers failed to find evidence in favor of an effect of oil price innovations on U.S. stock returns.

An alternative explanation for these contrasting results could stem from the possibly nonlinear nature of the relationship between stock returns and oil price shocks. For instance, if people's perception of the importance of an oil price shock depends on the past history of oil prices (Hamilton 1996, 2003), or if firms' cash flows respond differently to positive and negative oil price innovations, then the effect of an oil price shock on stock returns will also depend on the size and the sign of the shock.

In this paper, we investigate the effect of oil price innovations on the U.S. stock market using a

model that nests symmetric and asymmetric responses to positive and negative oil price innovations. We find no evidence of asymmetry for aggregate stock returns, and only very limited evidence for49 industry-level portfolios. Moreover, these asymmetries do not match up well with conventional views regarding energy-dependent sectors of the economy. Instead, asymmetries are more likely driven by the effect of oil prices innovations on expected and/or realized demand. We inquire whether the size of the shock matters in that doubling the size of the shock more (or less) than doubles the size of the response, finding that the effect of a 2.s.d innovation is just about double the magnitude of the impact of a 1.s.d innovation. Furthermore, we find no support for the conjecture that shocks that exceed a threshold have an asymmetric effect on stock returns.

Our estimation results suggest the response of aggregate stock returns is well captured by a linear model. This is also the case for most of the 49 industry-level portfolios. Yet, there are a small number of portfolios (candy and soda, apparel, healthcare, textiles, aircraft, and insurance) where we find evidence of asymmetry. Many of these industries are neither energy-intensive in consumption nor in production, thus our evidence should not be necessarily viewed as support for conventional models of asymmetry. Yet, these results imply that financial investors interested in the latter industries should consider asymmetries in the response of stock returns to oil price innovations when forming their portfolios. Similarly, for financial forecasters, innovations of the same magnitude but opposite sign should not enter their loss function in a symmetric manner.