[*OIL PRICE BEHVIOR AND CORPORATE BOND MARKET PERFORMANCE*]

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Overview

Oil is crucial in current society. It accounted for 31.2% of the energy mix, followed by coal at 27.2% and natural gas at 24.7% in 2020 (BP, 2021). It can also affect different markets: oil price and the stock market (Kang et al., 2016; Bastianin and Manera, 2018), economic performance (Gronwald, 2008; Kilian, 2008), exchange rate (Omolade et al., 2019), industrial production (Valenti et al., 2020), and monetary policy (Kilian and Lewis, 2011).

Bond market has become more and more important in recent years. However, only a handful of studies have carried out the research on the connection between oil price and bond markets. Thus, this study investigates the connection between the oil market and particularly the US corporate bond markets over a ten-year period from November 2010 to November 2020 to fill in the literature gap.

Methods and data

Main methods: Vector autoregressive models (VAR), Granger causality analysis, Impulse response analysis, Forecast error variance decomposition analysis.

Data: we use S&P 500 bond index to represent the whole US corporate bond market, which is used by many researches. Federal Reserve (Fed) variables are used to control for Fed effect. Different oil price level variables are used to reflect different magtitude of oil price shocks.

Results

In this study, we investigate the connection between oil price and bond markets, using weekly data on a system of SP500 bond returns, oil price, Federal rate, and Federal assets from November 2010 to November 2020. Our main findings are as follows:

First, the Granger causality test finds that the oil price relates significantly to the S&P 500 bond return and risk premium. This is mainly driven by decreasing oil prices, especially for the large negative oil price changes. No evidence was found to suggest that positive oil price changes (increasing oil prices) cause changes in SP500 bond returns or bond market risk premium.

Second, applying the standard VAR model, we find that the S&P 500 bond index and risk premium respond to oil price shocks. There is an immediate negative response followed by a rebound with gains in week 5, and then fluctuating and dying out in 25 weeks. The overall oil price shock roughly accounts for 10% of the forecast error variance of the S&P 500 bond return.

Third, we find that the relationship between oil price and bond market returns is asymmetric, driven by negative oil price changes. Both the S&P 500 bond return and risk premium are more responsive to negative oil price shocks. More than 20% of their forecast error variances are explained by negative oil price shocks. In contrast, positive oil price shocks barely cause changes in bond returns and the bond market risk premium.

Fourth, we find that the bond market is more responsive to the oil price changes when the oil price is low and volatile, and this effect becomes more prominent for negative oil price changes when we divide the sample period into two different subsmaples. By controlling for credit risk, we find that S&P 500 high yield bonds are more responsive to oil price shocks than S&P investment grade bonds.

Our results are robust using different analytical methods (e.g., Bayesian VAR and VECM) and in different bond markets (e.g., UK and Eurozone bond markets). Our results are also supported by evidence from Spill-over table analysis that the bond market is the biggest contributor to the market, followed by oil price, while Federal Reserve (assets and rates) are the biggest receivers of market information.

Conclusions

This recent ten years coincided with unconventional financial policy period after the 2008 Great Financial Crisis which was worth the analysis. We find a significant impact of oil price shocks on bond market returns. This effect is mainly driven by negative oil price changes, especially large-scale changes, in contrast to the mainstream literature that oil price increases are found to be much more important in affecting GDP than are decreases. We also find that the bond market is more responsive to oil price changes during the low oil price period than the high oil price period. Our results are robust to different models and hold for the UK and Eurozone bond markets.

Our findings have important policy implications given the importance of oil for any economy. Better understanding of oil price behaviour and its influences on financial markets will guide policy makers to formulate more effective policy for stable and sustainable growth. For instance, policy makers should pay more attention to oil price decreases as they tend to have more profound impacts. Our findings are also of practical importance for investors. Future research may explore the long-run relationship between oil price and bond markets (or other financial markets) at the firm level using panel data analysis.

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