Chapter 5
Oil Price Shocks and Income Inequality:
Evidence From the US

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ABSTRACT

This study, using the local projections, investigates linear and nonlinear impulse responses of the United States (US) household income inequality to oil price shocks. Oil price shocks are disaggregated according to the origin to test the dynamic response of income inequality to oil price structural shocks which are contingent on the status of oil dependence in individual US states. The results, based on the linear projection model, show that oil supply shocks lead to higher income inequality in the short term, but lower-income inequality in the medium and long terms. Moreover, economic activity shocks and oil inventory demand shocks mainly exert negative impacts on income inequality over time. Both positive and negative effects of oil consumption demand shocks on income inequality are observed. The nonlinear impulse response results reveal some evidence of heterogeneous responses of income inequality to oil price shocks between high- and low-oil-dependent US states.

INTRODUCTION

A growing literature reports that oil price shocks can affect the wider economy through multiple channels (Herrera *et al.*, 2019, for reviews of the relevant literature). Oil shocks can have a big impact on many macroeconomic variables, including employment, economic growth, interest rate, foreign exchange rate, inflation, asset prices, economic uncertainty, etc., (Chisadza *et al.*, 2016; Gupta *et al.*, 2020, 2021; Ji *et al.*, 2020; Shahzad *et al.*, 2019; Sheng *et al.*, 2020, 2021; Bayramov, 2022). In the meanwhile, a related stream of literature finds evidence of a close relationship between changes in macroeconomic

factors and household income inequality (Balcilar *et al.*, 2018, 2020; Berisha *et al.*, 2020; Deyshappriya, 2019; Maestri & Roventini, 2012; Kilinc-Ata, 2022). This linkage provides various transmission mechanisms through which oil price shocks can influence income inequality. For example, the contractionary monetary policy to curb the inflation pressure caused by rising oil prices can raise the observed income inequality in the economy (Coibion *et al.*, 2017; Mumtaz & Theophilopoulou, 2018). Recent studies also suggest that inequality can be affected by macroeconomic uncertainty over time (Fischer *et al.*, 2021; Theophilopoulou, 2021). Fischer *et al.* (2021) show evidence for a dynamic relationship between household income inequality and macroeconomic uncertainty in the US and highlight the importance of uncertainty in affecting household income distributions. Theophilopoulou (2021) examines the responses of income inequality to uncertainty in the UK and find that macroeconomic uncertainty contributes significantly to the variations in income inequality. Given the close link between uncertainty and oil price shocks as reported by previous studies (Bernanke, 2006; Kang *et al.* 2017; Sheng *et al.*, 2020; Su *et al.* 2018), theoretically, the impacts of oil price shocks can also transmit via the uncertainty channel on income inequality.

Although existing literature has reported growing empirical evidence for the impacts of oil shocks on the economy (Gupta *et al.* 2020, 2021; Sheng *et al.* 2020, 2021), no studies so far have investigated the impacts of oil price shocks on income inequality. A good understanding of the factors that affect income inequality, and underlying mechanisms that cause changes in income inequality, prove to be important to policymakers since existing literature has highlighted the linkage between income inequality and the causes of crises (Stiglitz, 2012; Van Treeck, 2014). Note that, although the United States (US) is often praised as a land of equal opportunity for all, the past three-and-a-half decades have seen a rising trend of growing income inequality (Çepni *et al.*, 2020). Hence, the factors that drive inequality is an equally important question for the US, just like any other economy in the world.

Against this background, the main research objective of this study is to investigate the direct impacts of oil price shocks on income inequality in the US. The study attempts to fill the gap in the literature by using a newly constructed, large panel dataset for the US at the state level, which includes the growth rate of real income, employment growth, unemployment rate, and a survey-based measure of income inequality based on the work of Fischer *et al.* (2021). The use of a panel dataset aids in accounting for the existence of large heterogeneities between regions of a big country (such as the US), while the availability of data for a long-time span in the US, results in a large panel dataset. Apart from the variables mentioned above, this study also includes a set of aggregate macroeconomic variables at the country level, including the interest rate, inflation rate, and a ratio of budget deficit to GDP as a measure of fiscal policy in the US. These variables are considered as common factors driving the US business cycles.

Following a seminal work of Baumeister and Hamilton (2019), oil price shocks are disentangled into the oil supply shocks, economic activity shocks, oil inventory shocks, and oil consumption demand shocks. Baumeister and Hamilton (2019) highlight the importance of disaggregating oil price shocks by origin and report a larger contribution of oil supply shocks to historical oil price movements comparing to the findings in earlier studies (Kilian, 2009; Kilian & Murphy, 2012, 2014). Since not all oil price shocks are alike, it is important to distinguish the nature of oil price shocks according to their origin, e.g., whether they are driven by supply- or demand-side factors, as their impacts on income inequality can be dependent on it. Besides, as stressed by Kilian (2009), each type of oil price shock has different impacts on US macroeconomic aggregates and hence income inequality, since oil price movements can not only be caused by fluctuations in oil production, but also changes in global demand, and precautionary and speculative motives of oil traders.

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