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# Nonlinearities in the Response of Real GDP to Oil Price Shocks

Mohamad B. Karaki\*

## Abstract

This paper re-examines whether real GDP growth responds asymmetrically to real oil price increases and decreases using a sample that includes the recent oil price declines. I follow Kilian and Vigfusson (2011a) and conduct a test of symmetry. I find no evidence against the null of symmetry using the 3-year net oil price increase specification. Moreover, I find that the results are not stable for different nonlinear transformations of the real price of oil. Finally, evidence of asymmetry vanishes after computing specification robust critical values.

*Keywords:* asymmetry, business cycles, oil prices, net oil price

*JEL Classification:* C3, C22.

## 1 Introduction

Up to the early 2000s, there was a clear consensus in the literature that macroeconomic aggregates respond asymmetrically to positive and negative oil price innovations. Yet, research by Kilian and Vigfusson (2011a) - hereafter KV (2011a) - proved that models previously used to evaluate the relationship between oil prices and the economy generate inconsistent estimates. **They propose an alternative simultaneous equations model that can be estimated consistently and evaluated by Monte Carlo integration. KV (2011a) estimate this model with six lags and develop a test of the symmetry of the impulse response function. They** find that GDP, consumption and unemployment respond symmetrically to positive and negative oil price innovations. Yet, using a longer sample that ends in 2009:Q4, Kilian and Vigfusson (2011b) - hereafter KV (2011b) - found evidence against the null of symmetry in the response of real GDP growth for a 2 standard deviation (large) oil price shock using the 3-year net oil price increase measure proposed by Hamilton (2003). They argue that their findings are associated with spurious overfitting

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