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# International Review of Economics and Finance

journal homepage: [www.elsevier.com/locate/iref](http://www.elsevier.com/locate/iref)

## Credit risk and bubble behavior of credit default swaps in the corporate energy sector

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### ARTICLE INFO

#### JEL classification:

C22  
G01  
G12

#### Keywords:

CDS  
CDS index  
Bubble  
Crude oil futures  
CAPEX  
Taper tantrum

### ABSTRACT

This paper analyzes the determinants of credit risk in the energy sector using CDS spreads of energy corporations as well as CDS energy sectorial indexes to assess whether credit risk can be linked to the crude oil price fundamental and to other exogenous financial variables. Applying the multiple bubble methodology proposed by Phillips Shi and Yu (2015) we associate bubble behavior in CDSs with fundamentals via a series regressions applied to time changing autoregressive coefficients. Our results show that there is bubble propagation which should be closely monitored by market participants as an early signal of deteriorating market conditions.

### 1. Introduction

In this paper, we analyze the determinants of credit risk in the energy sector in terms of the price behavior of its debt collateral the crude oil price as well as other financial variables. We consider for this purpose the time series properties of crude oil futures prices, the 10 year US real bond yield rate as well energy corporate balance sheet measures focusing on the effects of the 2013 taper announcement.

Over the 2013–2016 period, the US and European economies saw energy companies defaulting on hundred billions worth of debt, signaling a significant increase in the degree of financial stress led by US oil and gas companies. Low oil prices left many energy corporates with challenging debt loads causing them to default at an extraordinary rate. As a result, Credit Default Spreads (CDSs thereafter) of leading energy corporates exhibited episodes of abrupt spread increases not seen since the 2007–2008 Global Financial Crisis (GFC thereafter). CDS premia of the main global corporates such as Chevron or British Petroleum rose more than a fourfold in 2015. Energy sectorial CDS indexes also saw sharp increases in the aftermath of the tapering announcement and the collapse of energy prices. This paper illustrates how the end of monetary impulses in the spring of 2013 increased default probabilities forcing energy corporates to reduce their debt financed investments. In doing this we explore the extent to which credit market frictions in energy markets help to explain the potency of monetary policy shedding light to the credit channel theory of [Bernanke and Blinder \(1992\)](#).

There are a number of subsequent events that explain the rising tide of defaults in the energy sector. Industry experts and academics

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<https://doi.org/10.1016/j.iref.2023.07.033>

Received 15 September 2021; Received in revised form 21 June 2023; Accepted 24 July 2023

Available online 4 August 2023

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