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RESEARCH DIGEST ARTICLES

"PRIME MONEY MARKET FUNDS
REGULATION, GLOBAL LIQUIDITY,
AND THE CRUDE OIL MARKET"



BY MIRUNA-DANIELA IVAN, Ph.D., BANK OF ENGLAND, U.K.;

CHIARA BANTI, Ph.D., ESSEX BUSINESS SCHOOL,
UNIVERSITY OF ESSEX, U.K.; and

NEIL KELLARD, Ph.D., ESSEX BUSINESS SCHOOL,
UNIVERSITY OF ESSEX, U.K.



Prime Money Market Funds Regulation, Global Liquidity, and the Crude Oil Market

Miruna-Daniela Ivan, Ph.D.

Policy Analyst in the Financial Stability Strategy and Risk Directorate, Bank of England, U.K.

Chiara Banti, Ph.D.

Associate Professor of Finance, Essex Business School, University of Essex, U.K.

Neil Kellard, Ph.D.

Professor of Finance, Essex Business School, University of Essex, U.K.

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This paper explores how the 2016 U.S. Prime Money Market Funds (PMMFs) regulation affected the crude oil market. This reform led to an increase in short-term dollar borrowing costs and the oil sector became particularly susceptible to disruptions in the global funding market due to a post-financial crisis debt expansion which far outpaced other commodity industries. Building on the global crude oil market SVAR model pioneered by Kilian and Murphy (2014), we find that tighter PMMFs funding conditions have a lagged negative effect on the real price of crude oil and a lagged positive effect on oil production. We show that these responses are driven primarily by a fall in certificates of deposits issued by global banks. Lastly, we evidence that the U.S. nominal effective exchange rate acts as a transmission channel for the negative funding shock to the real price of oil.

Introduction

U.S. Prime Money Market Funds, hereafter PMMFs, are a primary funding source of short-term liquidity, offering financial institutions and non-financial corporations access to wholesale U.S. dollar funding. Given that the U.S. dollar is the foremost funding and investment currency in the international monetary and financial system, the resilience of global economic and financial activity is conditional on the continuous flow of U.S. dollar funding (CGFS, 2020). Consequently, the vital role played by PMMFs in global dollar funding provision during crisis episodes such as the 2007–2009 Global Financial Crisis (GFC), the Eurozone crisis, and the March 2020 “dash-for-cash,” has positioned PMMFs at the center of international policy debate (IMF, 2021).

In 2016, a set of regulatory reforms for PMMFs were introduced to address the vulnerabilities which emerged during the GFC. These regulatory reforms represented an important shift in the intermediation of wholesale bank funding as they increased short-term dollar borrowing costs (BIS, 2016). Oil companies are particularly susceptible to sudden disruptions in the global dollar funding market, given the post-GFC debt expansion in the oil sector, which far outpaced other commodity sectors (Domanski *et al.*, 2015). Specifically, following the GFC, oil companies have borrowed heavily in U.S. dollars from banks as well as in international bond markets.

In this respect, the authors propose two channels through which disruptions in the short-term funding of PMMFs can be transmitted to oil companies which borrow in U.S. dollars: an indirect channel through cross-border bank flows based on the cross-border bank lending model of Bruno and Shin (2015), and a direct channel through PMMFs. The latter channel suggests that disruption in the short-term wholesale



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funding, driven by the reforms, affects oil companies which borrow directly from PMMFs by issuing commercial papers.

Relevance of the Research Question

The relevance of this paper to the global economic outlook lies in the persistent vulnerabilities posed by PMMFs (*i.e.*, via liquidity mismatch). These vulnerabilities are a significant source of risk to global financial stability, and hence, a major source of concern for policymakers. For example, deteriorating global dollar funding conditions, during the acute Covid-related stress period of March 2020, were driven by runs on PMMFs. This episode represents a further reminder of the high reliance of global banks and corporations on the short-term unsecured funding of PMMFs.

Moreover, this is the first study to show that global liquidity matters for the crude oil spot market. In particular, the authors show that strains on U.S. dollar funding from PMMFs affect the price and global production of crude oil. Through the empirical approach employed, they capture not only major disruptions from the introduction of the 2016 regulatory reforms, but also other funding shocks.

This paper contributes to the extant literature on global liquidity and the crude oil market, by introducing novel measures capturing the short-term component of private global liquidity, namely, the U.S. PMMFs investment holdings by global issuance, and by instrument. Through these global liquidity proxies, the authors are able to capture the post-GFC shift in U.S. dollar funding intermediation, referred in the literature as “the second phase of global liquidity.” Specifically, post-GFC, global dollar funding intermediation in advanced economies has moved away from the traditional deposit-based funding towards international debt securities, and non-bank financial institutions have increased their dominance in driving global liquidity (Shin, 2014; Turner, 2014; Aldasoro and Ehlers, 2018; Avdjiev *et al.*, 2020).

Further, the paper explores the effect of global liquidity movements on crude oil prices, channeled through the activity of oil companies rather than the activity of financial investors and commodity consumers, which has been the focus of other empirical studies on the oil market (Ratti and Vespignani, 2013; Beckmann *et al.*, 2014, among others).

Data and Methodology

The empirical analysis builds on Kilian and Murphy’s (2014) pioneering global crude oil market structural VAR (SVAR) model. Structural shocks are identified using Uhlig’s (2005) pure-sign restriction approach. Notably, sign restrictions have become increasingly popular in the empirical literature that explores oil markets (Baumeister and Peersman, 2013a, 2013b; Kilian and Murphy, 2012, 2014).

The authors use monthly data for global crude oil production, global real economic activity, global crude oil inventories and the real price of crude oil, variables employed by Kilian and Murphy (2014), to which they add two novel global liquidity measures: PMMFs investment holdings by global issuance, and by instrument. Certificates of deposits and commercial paper are investment instruments held by PMMFs and introduced in the model to capture the two proposed transmission channels of PMMFs funding shocks



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to oil companies. Notably, certificates of deposits became the most important unsecured wholesale funding source for banks following the GFC, and a barometer for bank funding conditions (Eren *et al.*, 2020), while commercial paper represents the primary financing source used to balance short-term liquidity requirements by major oil companies.

The price of crude oil can be exposed to fluctuations in the value of the U.S. dollar via oil supply, oil demand and financial markets (Breitenfellner and Cuaresma, 2008). The authors account for an appreciation in the value of the U.S. dollar against other major currencies driven by lower dollar supply from U.S. PMMFs, by employing the U.S. nominal effective exchange rate in their modeling approach.

Main Results

This study shows that tighter U.S. dollar funding conditions, driven by the 2016 regulatory reform for U.S. PMMFs, have an impact on the crude oil market. The authors find compelling evidence of a lagged negative effect of tighter funding conditions on the real crude oil spot price, measured by the U.S. refiners' acquisition cost for imported crude oil, and of a lagged positive effect on oil production. Furthermore, the paper finds that the effect of PMMFs funding disruption on the crude oil market is driven by a fall in certificates of deposits. This highlights the importance of cross-border bank flows in the transmission of liquidity shocks to the crude oil market.

Their empirical results confirm the theoretical predictions of Domanski *et al.* (2015) who argue that, in response to higher short-term dollar funding costs, oil producers seek to increase their output levels to raise short-term cash flow. Sustaining the continuity of short-term cash flows is needed for oil producers to meet obligations and to avoid suppressing market demand in the long run.

Lastly, the authors show that the U.S. nominal effective exchange rate acts as a complementary transmission channel of PMMFs funding disruptions to oil companies – an appreciation of U.S. dollar driven by lower U.S. dollar supply coming from PMMFs, leads to a decline in the real crude oil price via oil production, oil demand and the hedging activity of oil producers.

Conclusions

PMMFs represent a vital source of U.S. dollar funding for non-U.S. financial institutions and non-financial corporations, especially during crisis episodes. In 2016, regulatory reforms for U.S. PMMFs introduced to address the vulnerabilities which emerged during the GFC, have led to higher short-term U.S. dollar borrowing costs. The post-GFC expansion of debt in the oil sector made oil companies particularly vulnerable to sudden disruptions in short-term dollar funding markets.

Augmenting the global crude oil market model of Kilian and Murphy (2014), this study is the first to show that tighter short-term U.S. dollar funding conditions driven by the 2016 U.S. PMMFs reforms affect the crude oil market. The authors find that following a negative funding shock, oil production increases and in turn, the real price of oil declines. The authors suggest that the positive response of the oil production to tighter short-term U.S. dollar funding conditions can be explained by oil companies increasing output



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levels to raise short-term cash flows, which enable them to remain liquid and meet dividend payments or to stabilize the purchasing power value of their export revenues in dollars.

Further, the paper finds that the effect of the PMMFs funding disruption on the crude oil market is driven by a fall in certificates of deposits, which constitute the most important unsecured wholesale funding for global banks. Hence, the U.S. dollar funding disruption triggered by the PMMFs reform is transmitted indirectly from PMMFs to oil companies, through cross-border bank flows.

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Keywords

Prime money market funds, global liquidity, the real crude oil price, sign-identified structural VAR models, cross-border flows.

Author Biographies

MIRUNA-DANIELA IVAN, Ph.D.

Policy Analyst in the Financial Stability Strategy and Risk Directorate, Bank of England, U.K.

Dr. Miruna-Daniela Ivan is a Policy Analyst in the Financial Stability Strategy and Risk Directorate at the Bank of England. Her research explores the links between commodity markets, monetary policy, liquidity, and non-bank financial institutions. Her articles have been published in the *Journal of International Money and Finance* and in *Studies in Higher Education*.

CHIARA BANTI, Ph.D.

Associate Professor of Finance, Essex Business School, University of Essex, U.K.

Dr. Chiara Banti is an Associate Professor of Finance at Essex Business School, University of Essex, and a Fellow of the Emerging Markets Group at Bayes Business School (formerly Cass). Her research is in the fields of international finance and FX market microstructure, and she studies the implications of the global movement of large pools of liquidity on recipient economies, in terms of their credit, currency and financial market dynamics and development. Her work has been published in the *Journal of International Money and Finance*, *Journal of Financial Stability*, and *Journal of Financial Research*, among others.

NEIL KELLARD, Ph.D.

Professor of Finance, Essex Business School, University of Essex, U.K.

Dr. Neil Kellard is a Professor of Finance at Essex Business School, University of Essex and also an Academic Fellow at Centre for Responsible Banking and Finance, University of St Andrews. His research examines the linkages between commodity prices, environmental finance, regulation, efficiency, risk measurement, health, and inequality. Professor Kellard's articles have been published in the *Review of Economics and Statistics*, the *British Journal of Management*, *Social Science and Medicine*, *Journal of International Money and Finance*, the *Journal of Development Economics*, the *European Journal of Finance*, the *Journal of Empirical Finance*, and the *Journal of Futures Markets*, among others.



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BAYES
BUSINESS SCHOOL
CITY, UNIVERSITY OF LONDON

Physical Address
Bayes Business School
106 Bunhill Row
London, EC1Y 8TZ
United Kingdom

Website
bayes-cid.com

Contact
To submit articles,
authors can contact
the editors via
editors@bayes-cid.com

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