Int. Fin. Markets, Inst. and Money 32 (2014) 128–149

Contents lists available at ScienceDirect

Journal of International Financial Markets, Institutions & Money

journal homepage: www.elsevier.com/locate/intfin

Financial stress spillovers in advanced economies

George Apostolakis [a,*], Athanasios P. Papadopoulos [b]

[a] Nyenrode Business Universiteit, Straatweg 25, 3621 BG Breukelen, P.O. Box 130, 3620 AC Breukelen, The Netherlands
[b] Department of Economics, University of Crete, Rethymno Campus, 74100, Rethymno, Greece

ARTICLE INFO

Article history:
Received 22 January 2014
Accepted 3 June 2014
Available online 11 June 2014

JEL classification:
C32
C43
F30
G15

Keywords:
Financial stability
Financial stress indices
Dynamic conditional correlations
Stress spillover index
Financial crises

ABSTRACT

In this study, we examine financial stress co-movements and spillovers among the G7 economies by employing a Financial Stress Index as a proxy variable and accounting for financial instability. To examine the interdependence of financial stress, we parse the dynamic conditional correlations of financial stress among these countries for the 1981–2009 period. In addition, we present spillover indices and plots of financial stress that indicate financial stress innovations and spillover dynamics, respectively. Our empirical results suggest a positive association of financial stress co-movements and spillovers with both financial crises and uncertainty. In general, our findings provide a clear view of the transmission of financial stress during important stressful episodes, suggesting the existence of an increased interplay among the financial markets.

1. Introduction

In recent years, financial stability has increasingly gained the interest of the scientific community, especially after the 1990s, when the banking and currency crises were enhanced by financial deregulation and integration (Stiglitz, 2003). The need for policy measures oriented toward safeguarding and

* Corresponding author. Tel.: +31 346291560; fax: +31 346291250.
E-mail address: g.apostolakis@nyenrode.nl (G. Apostolakis).

http://dx.doi.org/10.1016/j.intfin.2014.06.001
1042-4431/

strengthening the financial system motivated us to conduct this research. The field of financial stability is still nascent, but it is growing fast. Nevertheless, a unique acceptable definition of financial stability does not exist (Crockett, 1996; Schinasi, 2004; Allen and Wood, 2006). The current study is consistent with the descriptions of instability outlined by Mishkin (1999) and De Graeve et al. (2008). Mishkin (1999) relates the ability of financial systems to allocate funds to productive investment opportunities. De Graeve et al. (2008) argue the existence of a tradeoff between financial stability and monetary stability by incorporating a measure of banking distress. Therefore, we proxy financial stability using a Financial Stress Index (FSI) developed by International Monetary Fund (IMF) economists. A level of distress in the financial system that is higher than normal is regarded as an indication of financial instability.

The main objective of this paper is to study the underlying dynamic relationship of financial stress episodes between the advanced countries of the G7. The literature on how stress spillovers are transmitted through countries is still nascent. Financial stress episodes are frequently connected with economic downturns, as they destabilize the financial system and hinder its ability to operate smoothly. Recent research has focused on the transmission of financial stress and the likelihood of these stressful episodes to lead to economic downturns (Cardarelli et al., 2009; Balakrishnan et al., 2009).

To the best of our knowledge, this study is the first to use dynamic conditional correlations (DCCs) and spillover indices to examine co-movements and spillovers of financial stress. Our first contribution comes from the examination of stress co-movements among the G7 countries. We examine the conditional correlations using the two-stage DCC multivariate GARCH model developed by Engle (2002). Using this approach, we investigate the pattern of financial stress interdependencies among the G7 countries. The second contribution comes from the examination of stress spillover effects. We study the linkages of financial stress using the vector autoregressive (VAR) framework developed by Diebold and Yilmaz (2009, 2012). Our last contribution to the relevant literature comes from an examination of the stress spillovers of each of the FSI subcomponents—namely, banking sector, securities markets and foreign exchange rate subindices—and an analysis of the volatility stress spillovers among the G7 countries.

The newly developed version of the spillover index, which involves generalized variance decompositions, has recently been applied to the investigation of the interconnectedness of volatility in financial markets (Yilmaz, 2010; Antonakakis and Vergos, 2013). Furthermore, our paper adds to the evolving stream of financial stability literature by employing an FSI as a measure of financial instability and by examining the transmission of stress. A similar FSI has been used to examine the crisis of 2007 in the foreign exchange market (Melvin and Taylor, 2009) and to measure the relationship between monetary and financial instability (Baxa et al., 2013; Martin and Milas, 2013).

The results of our models suggest policy measures oriented toward safeguarding and strengthening financial stability. Several important findings stem from the analysis of the DCC and the generalized spillover indices. In summary, our findings suggest, first, the existence of a positive association between stress co-movements and periods of financial turmoil, such as the Asian and Russian crises, the dot-com crisis and the most recent global financial crisis. The panel regression analysis of the conditional correlations with the conditional volatility provides further evidence of the positive association of stress co-movements with periods of increased uncertainty, particularly for the US, the UK and Canada. Second, cross-country stress spillovers explain a substantial proportion of the forecast error variance beyond own-country stress spillovers. The US is the main transmitter of stress spillovers to other countries, whereas the UK is the main stress receiver. The net directional and pairwise stress spillover plots verify the role of the US as a major transmitter of stress to other countries. In addition, our results indicate that 19.9% of the forecast error variance in the examined countries is derived from stress spillovers.

The examination of the three subcomponents of financial stress provides further evidence of stress spillovers. The total stress spillover index of the securities markets explains a higher proportion of the forecast error variance than banking and exchange total stress spillover indices. This finding indicates that the securities markets are the most important factor in the transmission of financial stress through spillovers among the G7 countries. Finally, results similar to those for stress spillovers stem from the analysis of the volatility spillovers of financial stress, where the total volatility spillover index