Economic Modelling 54 (2016) 139–152

Contents lists available at ScienceDirect

Economic Modelling

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

Credit, asset prices and business cycles at the global level☆

Stéphane Dees*

European Central Bank, Sonnemannstrasse 20, 60314 Frankfurt am Main, Germany

ARTICLE INFO

Article history:
Accepted 23 December 2015
Available online xxxx

Keywords:
International transmission of shocks
Financial cycle
Business cycle
GVAR model

ABSTRACT

This paper assesses the role of financial variables in real economic fluctuations, in view of analysing the link between financial cycles and business cycles at the global level. A Global VAR modelling approach is used to first assess the contribution of credit and asset price variables to real economic activity in a number of countries and regions. The GVAR model is based on 38 countries estimated over 1987–2013. An analysis on a sample excluding the post-financial crisis period is also provided to check whether financial variables have gained importance in explaining business cycle fluctuations over the recent past. In a second step, financial shocks are identified through sign restrictions in order to illustrate how financial and business cycles could be related. Overall, the paper shows that the importance of credit and asset price variables in explaining real economic fluctuations is relatively large, but has not significantly increased since the global financial crisis. The international transmission of financial shocks on business cycle fluctuations also tends to be large and persistent.

1. Introduction

The global financial crisis has led to a renewed interest in studying the linkages between financial variables and real economic developments. While financial factors played a minor role in macroeconomics in the pre-crisis period, the most recent research focuses on the inclusion of financial variables and financial channels in macroeconomic analyses and models. The global nature of the crisis also implies that including financial variables may not be sufficient to fully capture real-financial linkages. Therefore, the role of the international transmission of financial shocks on business cycle developments also requires a modelling of the cross-country interactions through which such shocks propagate.[1]

The importance of the links between financial factors and the real economy and their global dimension calls for a rethinking of macroeconomic modelling, which should account both for the inclusion of credit and asset prices and for international linkages. Borio (2012), considering the environment that has prevailed for at least three decades, recognises that it is not possible to understand business fluctuations and the corresponding analytical and policy challenges without understanding the financial cycle. The author defines the financial cycle as "self-reinforcing interactions between perceptions of value and risk, attitudes towards risks and financing constraints, which translate into booms followed by busts" (p2). Against this background, the most parcimonious description of the financial cycle is in terms of credit and property prices owing to their strong comovements (Drehmann et al., 2012), as shown by Fig. 1 based for a sample of 38 countries used in the empirical exercise below. As advocated by Borio (2012), these two variables also combine prices and quantities and capture the two-way interaction between financing constraints (credit) and risk perceptions (property prices).

A modelling of international linkages including financial variables has been provided by Pesaran et al. (2004), who propose a global VAR (GVAR) model to allow for the interdependencies across a large number of countries between national and international factors, including real, monetary and financial variables. This modelling approach has been further developed by Dees et al. (2007), showing that it is quite effective in dealing with the common factor interdependencies and international co-movements of business cycles. More recently, the GVAR methodology has been applied to study how credit supply shocks propagate internationally. Xu (2012) shows that the inclusion of credit variables provides a significant improvement in modelling and forecasting real variables for countries with developed banking sector. There is also strong evidence of the international spillover of US credit shocks and their propagation to the real economy. Eickmeier and Ng (2015) also use a GVAR approach to model financial variables jointly with macroeconomic variables and identify financial shocks through sign restrictions on the short-run impulse responses. They find negative macroeconomic impacts of credit

☆ Any views expressed represent those of the author and not necessarily those of the European Central Bank or the Eurosystem. I thank J. Morley and S. Özyurt for helpful comments.

* Tel: +49 69 1344 8784.
E-mail address: stephane.dees@ecb.europa.eu.

[1] See Morley (2013) for a survey on macro-financial linkages, including empirical research on spillovers from the financial sector to the rest of the economy, as well as across financial markets in different countries.

http://dx.doi.org/10.1016/j.econmod.2015.12.027
0264-9993/

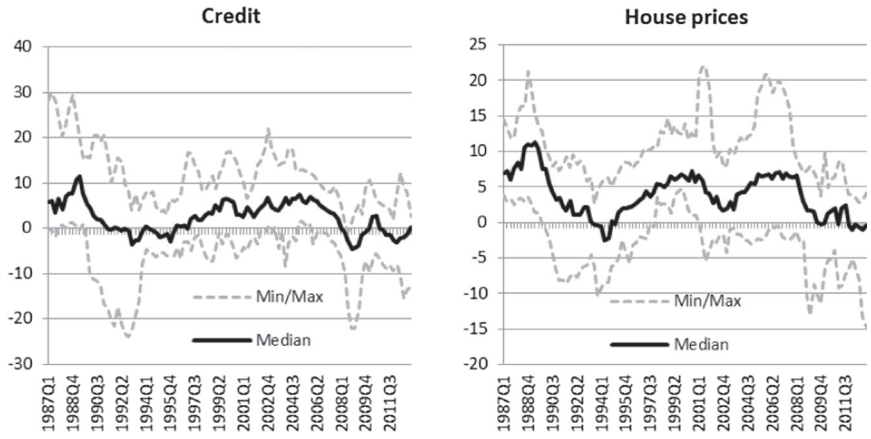

Fig. 1. Year-on-year changes in credit and house prices for a sample of 38 countries (in %).

supply shocks, especially when they originate from the US. Domestic and foreign credit and equity markets also respond significantly to credit supply shocks. Cesa-Bianchi (2013) also uses a GVAR modelling approach to investigate the international spillovers of housing demand shocks on real economic activity and finds evidence for the existence of strong international spillovers of US housing demand shock to advanced economies.

This paper assesses the role of financial variables in real economic fluctuations, in view of analysing the link between financial cycles and business cycles at the global level. A Global VAR modelling approach is used to assess the contribution of credit and asset price variables to real economic activity in a number of countries and regions. The GVAR model is based on 38 countries estimated over 1987–2013. This paper extends previous research in three dimensions. First, the GVAR model includes – in addition to the macroeconomic, monetary and credit variables – property prices in view of capturing all the features of the financial cycle, as defined by Borio (2012). Second, the sample analysed includes a rather long post-financial crisis period, verifying whether financial variables have gained importance in explaining business cycle fluctuations over the recent years. Third, through the inclusion of both credit and asset price variables (both equity and property prices) in the GVAR model, the paper proposes an identification of financial shocks through sign restrictions in order to illustrate how financial and business cycles could be related.

Overall, the results show that the importance of credit and asset price variables in explaining real economic fluctuations is relatively large but has not significantly increased since the global financial crisis. The international transmission of financial shocks on business cycle fluctuations also tends to be large and persistent.

The next section describes the methodology followed for our analysis. Sections 3 and 4 present the empirical results, focusing first on the role of financial variables in real economic developments and, thereafter, by identifying shocks related to the financial cycle and to measure their effect on the business cycle. Section 5 concludes.

Table 1
GVAR Model specification.

US model		All other models	
Domestic	Foreign	Domestic	Foreign
$y_{US,t}$	$y^*_{US,t}$	y_{it}	y^*_{it}
$p_{US,t}$	$p^*_{US,t}$	p_{it}	p^*_{it}
$q_{US,t}$		q_{it}	q^*_{it}
$r_{US,t}$		r_{it}	r^*_{it}
$cr_{US,t}$		cr_{it}	cr^*_{it}
$hp_{US,t}$		hp_{it}	
	$e^*_{US,t} - p^*_{US,t}$	$e_{it} - p_{it}$	
p^o_t			p^o_t

2. Methodology

The analysis is based on a Global VAR model, following Pesaran et al. (2004) and Dees et al. (2007). The GVAR approach consists of specifying and estimating a set of country-specific vector error-correcting models that are consistently combined to generate a global model that can be simultaneously solved for all the variables in the world economy. The GVAR approach principles are first presented, before looking more precisely at the version used in this paper.

2.1. The GVAR approach

The GVAR modelling approach provides a relatively simple yet effective way of modelling complex high-dimensional systems. This methodology relies on a two-step approach. In the first step, country-specific models are estimated conditional on the rest of the world. This addresses the problem of consistently modelling interdependencies among many economies through the construction of "foreign" variables, which are included in each individual country model. Thus, each country model includes domestic variables together with variables obtained from the aggregation of data on the foreign economies using weights derived from bilateral trade statistics. Because the weighting scheme for each country reflects its specific geographical trade composition, foreign variables vary across countries. Subject to appropriate testing, the country-specific foreign variables are treated as weakly exogenous during the estimation

Table 2
VARX* order and number of cointegrating relationships in selected country-specific models.

Country	VARX* (p_i, q_i)		Number of cointegrating relationships
	p_i	q_i	
Austria	2	1	4
Belgium	1	1	2
Finland	2	1	3
France	2	1	3
Germany	2	1	4
Italy	2	1	3
Netherlands	2	1	4
Spain	2	1	4
UK	2	1	4
US	2	1	3