



# Non linear and asymmetric linkages between real growth in the Euro area and global financial market conditions: New evidence

Mehdi Mili <sup>a,b</sup>, Jean-Michel Sahut <sup>b,c,\*</sup>, Frédéric Teulon <sup>d</sup>

<sup>a</sup> University of Sfax, Tunisia

<sup>b</sup> CEREGE EA 1722, University of Poitiers, France

<sup>c</sup> HEG Geneva, University of Applied Sciences Western Switzerland, Switzerland

<sup>d</sup> IPAG Lab, France

## ARTICLE INFO

### Article history:

Accepted 9 January 2012

### JEL classification:

E44  
E47  
G21  
O41

### Keywords:

Smooth transition models  
Nonlinear models  
Economic growth  
Business cycle  
Stock market  
Yield spread

## ABSTRACT

This paper deals with transition mechanisms through which financial market conditions affect real economic growth in the Euro area. The informational content of financial variables for predicting real economic growth is assessed, allowing for asymmetric responses to shocks. A nonlinear framework is developed based on a smooth transition model for which the effects of shocks can vary across business cycles when financial indicators modify both the endogenous and state variables. Global financial variables are shown to significantly affect real growth in the Euro area, particularly during periods of recession. Changes in stock market index and yield slope have asymmetric effects on real growth. In recessionary periods, the slope of the US yield curve does not have a significant impact on growth in the Euro area.

Crown Copyright © 2012 Published by Elsevier B.V. All rights reserved.

## 1. Introduction

The role played by financial markets in the real economic shock transmission process has been a matter of renewed interest in the literature since the subprime mortgage crisis in the United States in July 2007. Several studies have examined real growth synchronization through trade channels across country blocs including within the Euro area, with inconclusive results.<sup>1</sup> Only a few have explored the

impact of global financial variables; here too, little consensus exists in the literature (see e.g. [Giannone et al., 2010](#)). The purpose of this paper is to provide new evidence on how the real economy in the Euro area adjusts to financial perturbations that mainly originate in the US economy. We use a nonlinear approach which is robust to alternative characterizations of behavior of agents. We delineate two separate regimes in the economic cycle for which the effects of shocks can differ. The transition from one regime to another is smooth, implying that changes in economic aggregates are influenced by changes in the behavior of many different agents who do not react fully in tandem to a given economic signal. According to [Peters \(1994\)](#), a smooth transition or a continuum of states between the extremes appears more realistic in financial markets with a large number of investors, each switching at different times, as a consequence of heterogeneous objectives.

[Espinoza et al. \(2009\)](#) develop a linear model which suggests that the large increase in equity market volume in the US plays a key role in the transmission of shocks across economic blocks. They argue that at least two potential elements can explain why developments in financial markets may precede turning points in business cycles. First, tighter financial and credit conditions limit the potential for firms to expand their activity, thus constraining their investment decisions. Second, changes in asset prices can give rise to wealth effects.

\* Corresponding author at: Geneva School of Business Administration (HEG Geneva), Campus de Battelle, Bâtiment F, Route de Drize 7, 1227 Carouge, Switzerland. Tel.: +41 22 388 65 72.

E-mail addresses: [Jean-Michel.Sahut@hesge.ch](mailto:Jean-Michel.Sahut@hesge.ch), [jmsahut@gmail.com](mailto:jmsahut@gmail.com) (J.-M. Sahut).

<sup>1</sup> It is widely acknowledged in the economic literature that global shocks play an important role in explaining output fluctuations. Recently, [Dees and Vansteenkiste \(2007\)](#) used a global VAR model to validate this hypothesis for several regions including the Euro area and the US. They found the linkage between the Euro area and the US appeared to be stronger than suggested by pure bilateral trade channels. However, co-movement between US and Euro area growth is difficult to explain in terms of trade linkage alone. Moreover, [Bayoumi and Swiston \(2007\)](#) found that channel transmission of cycles through commodity prices was insufficient to explain further observed linkage. Other researchers such as [Giannone and Reichlin \(2004\)](#), [Giannone et al. \(2009\)](#), and [Favero and Giavazzi \(2008\)](#) have argued that real trade volume only partially explains the real activity statistics due to third country effects.

Dees et al. (2007) develop a global VAR model for 26 countries. Their simulations suggest that financial shocks are transmitted relatively rapidly, and are often amplified as they travel from the US to the Euro area. Equity returns and long-term yields seem far more synchronous compared to real output, inflation and short-term interest rates. Changes in the yield curve contain information about future inflation and the term structure of real rates and; future production in turn responds to changes in inflation expectations and expected real rates.

Simplified linear structures as in Espinoza et al. (2009) and in standard VAR models are limited in the sense that they impose symmetry in the responses to shocks.

A number of studies have attempted to investigate linkages between real activity and financial variables with nonlinear alternatives which do not have this restriction.<sup>2</sup> Univariate models for output growth include Hamilton's Markov-Switching (MS) model (1989) and the Threshold Autoregressive (TAR) models of Tiao and Tsay (1994), Potter (1995), and Pesaran and Potter (1997). Extensions to these univariate specifications that include economic indicators that help to compute forecasts, include Filardo (1994, 1999), Granger and Teräsvirta (1993), Hamilton and Perez-Quiros (1996), Krolzig (1997, 2000), Estrella and Mishkin (1998), Blix (1999), Warne (2000), Beine et al. (2003), and Camacho and Perez-Quiros (2002). More recent developments have led to the characterization of business-cycle asymmetries via a dynamic factor model with regime switching, as in Diebold and Rudebusch (1995), Kim and Nelson (1998), Chauvet (1998, 1999), Fukuda and Onodera (2001), Kim and Murray (2002), and Chauvet and Potter (2002).

Our paper contributes to this body of literature by developing a new nonlinear model that takes financial variables into account in forecasting economic growth. Our framework extends Espinoza et al. (2009) and Khan and Abdelhak (2009) who use a linear symmetric response model to test the European economy's response to U.S. shocks to allow for asymmetric effects during recession and expansion regimes.

The remainder of this paper is organized as follows. Section 2 examines the nonlinear relationship between financial development and economic growth. Section 3 develops a specific nonlinear LSTR model for real growth in the Euro area. Empirical results follow in Section 4. In Section 5 we test the forecasting accuracy of the nonlinear model. The paper concludes in Section 6.

### 1.1. Linkage between financial development and real economic growth: a nonlinear consideration

The linkages between financial markets and the real economy have posed a major theoretical challenge for economists working in the fields of macroeconomics and finance. Improved understanding of these linkages is also crucial for EU policy-makers.

Several economic studies have identified channels through which financial market variables significantly affect real business cycles (e.g. Fama, 1990; Schwert, 1990; Estrella and Mishkin, 1998; Hamilton and Kim, 2000; Hassapis and Kalyvitis, 2002). Other results have been more contradictory. Avouyi-Dovi and Matheron (2003), among others, indicate that there does not seem to be a strong dependency link between stock prices and the level of real activity relating to business cycle frequencies except in the United States.

The relationship between financial variables and output growth rate is typically examined by testing for Granger causality where the output growth is explained via vector autoregressive models (VAR) with lagged changes of the financial variable. Hassapis and Kalyvitis (2002) and Caporale et al. (1998) test for Granger causality between financial variables and output. Lutkepohl and Poskitt (1996) discuss the problems that can arise in causality testing by fitting finite VAR

models to infinite order processes. They find that approximating general stationary processes by finite order VARs can lead to relatively misleading results in samples of common size.

Over the past few decades, many financial variables, such as stock prices, interest rates, interest rate spreads, and monetary aggregates, have been widely used to forecast future economic activity. Beckett (1961), Goldsmith (1969), Bosworth (1975), Hall (1978), Fama (1981), Geske and Roll (1983), and more recent studies by Barro (1990), Fama (1990), Schwert (1990), Lee (1992), Atta-Mensah and Tkacz (1998), Estrella and Mishkin (1998), and Hassapis and Kalyvitis (2002) are among the many studies that provide cogent arguments that the stock market index can lead to changes in real economic growth. These studies identify a high correlation between stock returns and future real activity.

Hassapis (2003) supports the existence of several transmission channels through which stock markets lead to changes in economic activity. The anticipation of a future increase in corporate profits may lead to an increase in equity markets and wealth. This will increase consumer demand and investment goods. Similarly, asset prices evolve according to anticipated changes in interest rates and profitability in the case of an expansionary policy shock. This affects wealth and spending and fuels a rise in supply equilibrium output, which justifies the initial rise in share prices. In this sense, asset prices tend to affect future anticipation of economic growth. Other channels linked to the informational content of financial markets may explain the relationship between asset returns and real activity. In general, the valuation of assets on financial markets is a key investment determinant. When the market value of an additional unit of capital exceeds its replacement cost, then the firm can improve its profits by investing. Information asymmetries in financial markets can justify the linkage between economic growth and share prices. Thus, the increase in stock price improves the firm's balance sheet by providing external financial resources which facilitates the increase in the firm's investments. Stock market performance can be linked to future economic growth. Stock prices reflect anticipations of future corporate earnings, and in turn, changes in future economic conditions. Hence if profits are procyclical, then changes in stock prices may provide useful information about real activity changes in the future.

Certainly, the banking sector has an impact on real economic growth, but its effect is transmitted, as in the case of the recent financial crisis, through the contagion effect of financial markets. For this reason, in this paper we consider only the impact of stock markets on real economic growth.

Another financial variable for predicting economic growth that has attracted considerable attention of monetary policy makers is the yield spread. Several researchers have recently argued that there is a significant correlation between the yield spread and increased business activity. In general, a positive yield differential implies economic expansion, while a negative difference implies economic recession. Hassapis (2003) suggests that the economic growth rate is linked to the magnitude of the yield spread. A large body of literature has confirmed the significant relationship between yield spread and real economic activity.

Black et al. (2000) and Galbraith and Tkacz (2000) argue that the yield spread outperforms many other financial variables such as interest rate levels, money stocks, and stock prices as predictors of output growth. Hassapis (2003) suggests that the positive relationship between yield spread and real growth is justified for two reasons. First, yield spread may contain information about the future prospects of monetary policy. Thus, adopting a tighter monetary policy may increase short-term rates, which in turn will reduce spending in economies sensitive to interest rates. This monetary policy induces a link between the narrowing of the yield spread and slower activity growth in the future. The second justification relates to the fact that the yield spread reflects market expectations for future economic growth. As Harvey (1988) notes, anticipation of rising real incomes

<sup>2</sup> The assumption of symmetry only began to be questioned in the mid 1980s, partly due to the influential paper by Neftci (1984), although prior to this, several authors postulated the existence of cyclical asymmetries (Hicks, 1950; Mitchell, 1913).

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات