Economics Letters 144 (2016) 75–79

Contents lists available at ScienceDirect

Economics Letters

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

Time–frequency characterization of the U.S. financial cycle☆

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HIGHLIGHTS

- Empirical studies on the financial cycle are rare compared to those on the business cycle.
- We use continuous wavelet tools to extract financial cycles from the data.
- We find that the U.S. financial cycle is (much) longer than the business cycle.
- We do not find strong evidence supporting the view that the financial cycle has lengthened during the Great Moderation period.

ARTICLE INFO

Article history:
Received 5 February 2016
Received in revised form
28 March 2016
Accepted 20 April 2016
Available online 4 May 2016

JEL classification:
C49
E32
E44

Keywords:
Time–frequency estimation
Wavelets
Financial cycle
Business cycle
Credit
Asset prices

ABSTRACT

Despite an increase in research – motivated by the global financial crisis of 2007–08 – empirical studies on the financial cycle are rare compared to those on the business cycle. This paper adds some new evidence to this scarce literature by using a different empirical methodology – wavelet analysis – to extract financial cycles from the data. Our results confirm that the U.S. financial cycle is (much) longer than the business cycle, but we do not find strong evidence supporting the view that the financial cycle has lengthened during the Great Moderation period.

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1. Introduction

The global financial crisis of 2007–08 has stimulated new interest in the so-called financial cycle and its interaction with the business cycle. A key issue in the current empirical literature is to measure the duration and amplitude of fluctuations in financial variables. Recent empirical studies (see *e.g.* Strohsal et al., 2015) have found that (i) the financial cycle has a much lower frequency than the business cycle and (ii) its duration has increased considerably, especially in the course of the Great Moderation starting in the mid-1980s.

As for the business cycle, standard empirical approaches to analyze the characteristics of the financial cycle rely on (i) the analysis of turning points (Claessens et al., 2012), (ii) frequency-based filter methods (Drehmann et al., 2012), or (iii) pure frequency domain methods, *i.e.* the well-known Fourier transform (Strohsal et al., 2015). The turning point approach requires a prespecified rule which is used to find local maxima and minima of an observed time series. The pure frequency domain approach has the advantage, over frequency-based filter methods, that no *a priori* assumption is needed as to the frequency range at which the financial cycle is assumed to operate. Despite its usefulness, the Fourier transform only provides information regarding how much of each frequency exists in the time series; it does not locate the points in time when these frequency components exist. The Fourier transform does not therefore provide any information

☆ We thank Silvio Contessi for providing the data on total credit. The views expressed in this paper are those of the author, and do not necessarily reflect the views of the Bank of Finland. Any errors are our own.

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http://dx.doi.org/10.1016/j.econlet.2016.04.024
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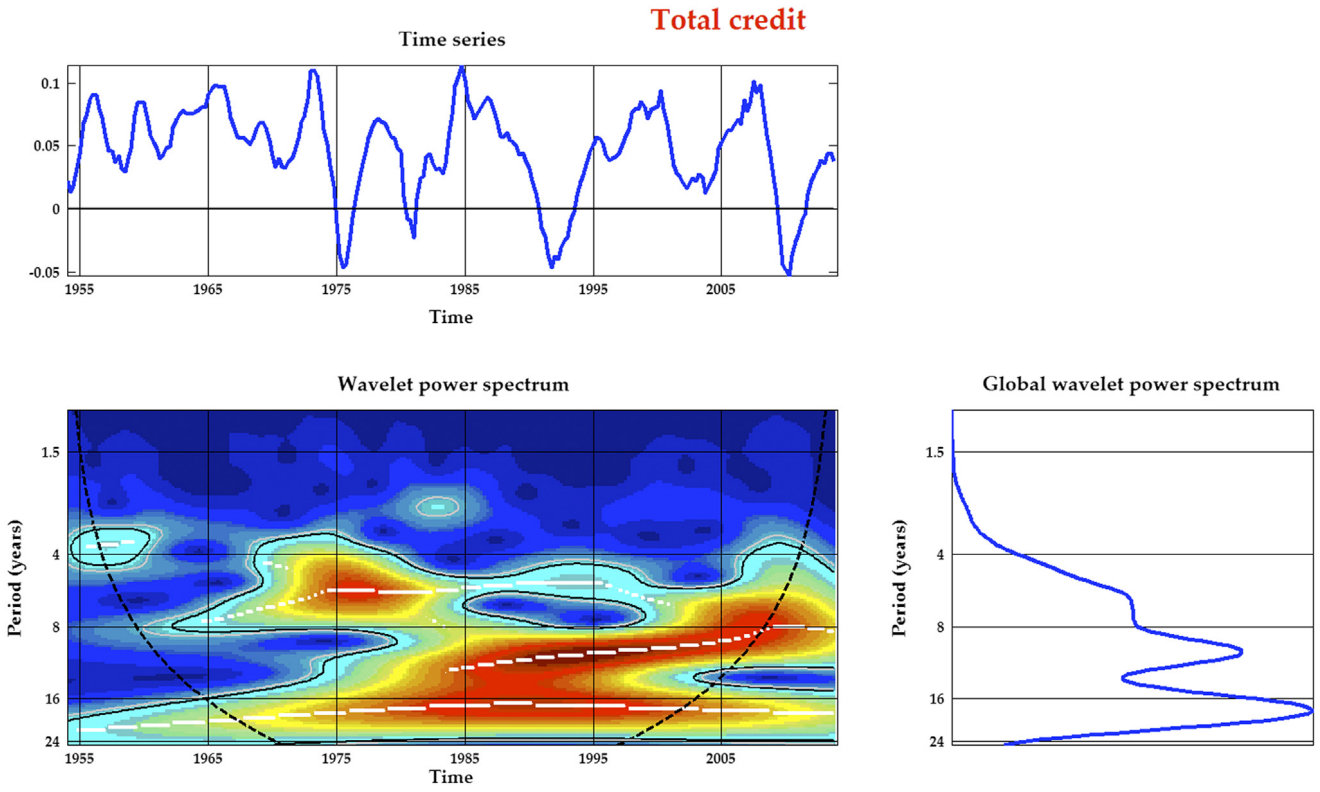

Fig. 1. Total credit. Time series (upper panel); wavelet power spectrum (bottom left panel); global wavelet power spectrum (bottom right panel). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

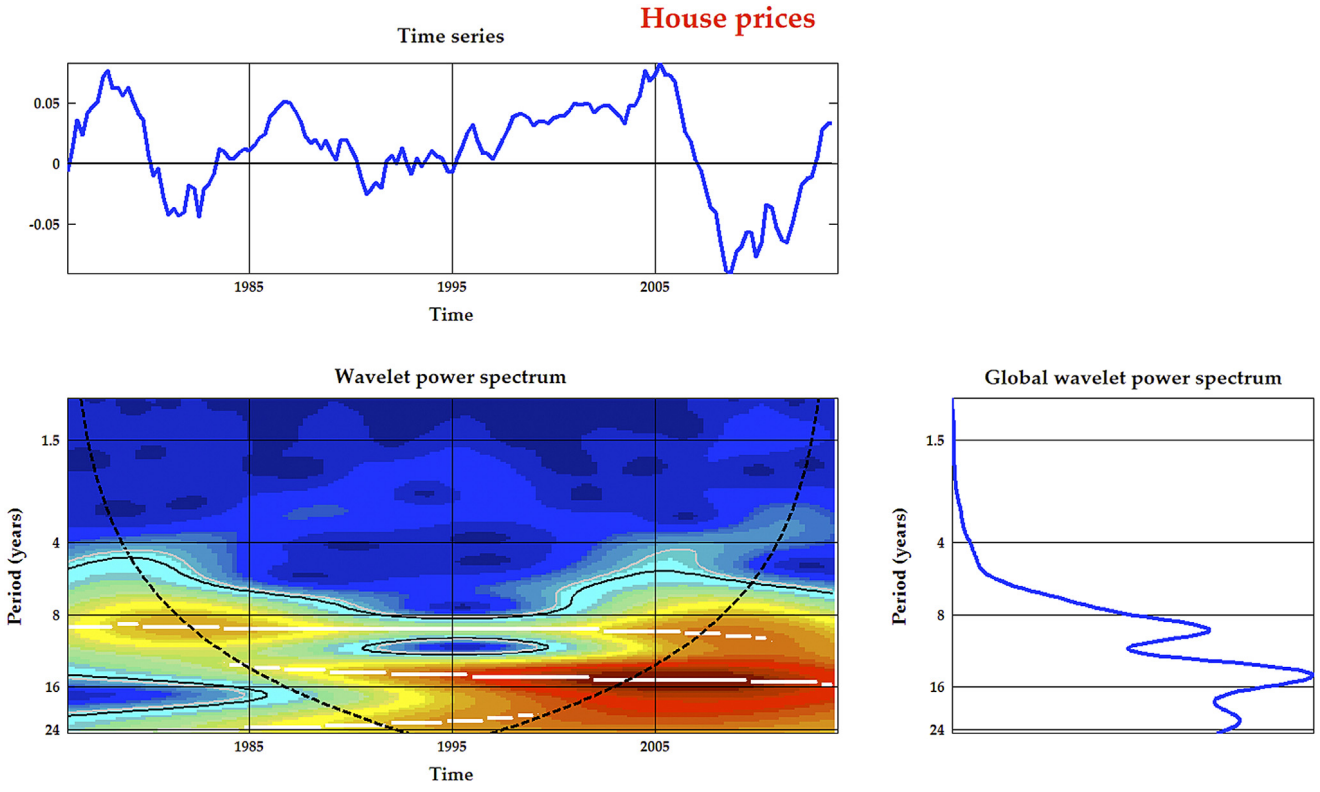

Fig. 2. House prices. Time series (upper panel); wavelet power spectrum (bottom left panel); global wavelet power spectrum (bottom right panel). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

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