Has the Financial Crisis changed the Business Cycle Characteristics of the PIIGS Countries?

By

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1 Introduction

☐ The question whether business cycles converge goes back at least to Hume (1758).

☐ Two directions:

- ■ Neoclassical growth models converge once they reach their steady state (Solow, 1956).

- ■ Endogenous growth models converge due to investment spill over effects (Romer, 1986 and Lucas, 1988).

1 Introduction

- ☐ Empirical results:
  - ■ Baumol (1986), Barro (1991), Sala-I-Martin (1996) and Mankiw et al. (1992) find convergence of OECD countries which are on the same development level.
  - ■ Quah (1993) finds divergence.
- ☐ In terms of the European business cycle:

1 Introduction

- Artis and Zhang (1997), Frankel and Rose (1998), Razzak (1998) find convergence as long as e/r are successfully pegged.

- Inklaar and de Haan (2000), Hughes Hallett and Piscitelli (2002), and Stock and Watson (2003) find divergence

- Hughes Hallett (2003) and Suardi (2001) find divergence of the UK business cycle to the European one.

1 Introduction

- What drives convergence (Evans and Karras, 1996)?
    - Identical 1st order AR structure
    - Diminishing returns
    - Trade
    - E/r
- Problems (Stock and Watson, 2003):
    - Structural breaks change business cycle properties

1 Introduction

- ☐ Aims:
  - ■ Find structural breaks
  - ■ How did structural breaks change the business cycle?
  - ■ Find correlation (coherence) between business cycle
    - ☐ These coherences may change as well!
  - ■ Which countries converge which diverge?
- ☐ We use a time-frequency approach to tackle these questions.

2 Time-Frequency Analysis

☐ How we do it:

  ◼ We estimate each growth rate individually using an AR(X) specification.

    ☐ This AR(X) specification is time-varying.

  ◼ For each point in time we calculate the Fourier transform.

    ☐ That gives us the time-varying spectrum.

  ◼ This step allows us already to highlight differences in the growth rate.

2 Time-Frequency Analysis

- We then estimate the link between two countries using the Kalman filter.
  - This step results in a time-varying gain.
- Given the individual spectra and the gain, we can now calculate the coherence.
  - This coherence is also time-varying.
- Why?
  - Exploit small samples

2 Time-Frequency Analysis

- We can test AR(X) processes separately.
- We can distinguish components where convergence takes place and components which diverge.
- More advanced technique than just ECM.

□ The coherence is defined as:

$$K_{YX,t}^2 = \frac{1}{\left\{1 + f_{VV}(\omega)_t \Big/ \left(\left|A(\omega)\right|_t f_{XX}(\omega)_t\right)\right\}}$$

3 Empirical Results

- ☐ Here we estimate the following relationship:

$$Y_t = \alpha_{1,t} + \alpha_{2,t} Y_{t-1} + \ldots + \varepsilon_t$$

- ☐ Data are from 1980Q1 – 1991Q4 from Oxford Economic Forcasting.
- ☐ From 1991Q4 – 2005Q4 NAQ.
- ☐ For all countries we took the log of real GDP and differenced it once.

3 Empirical Results

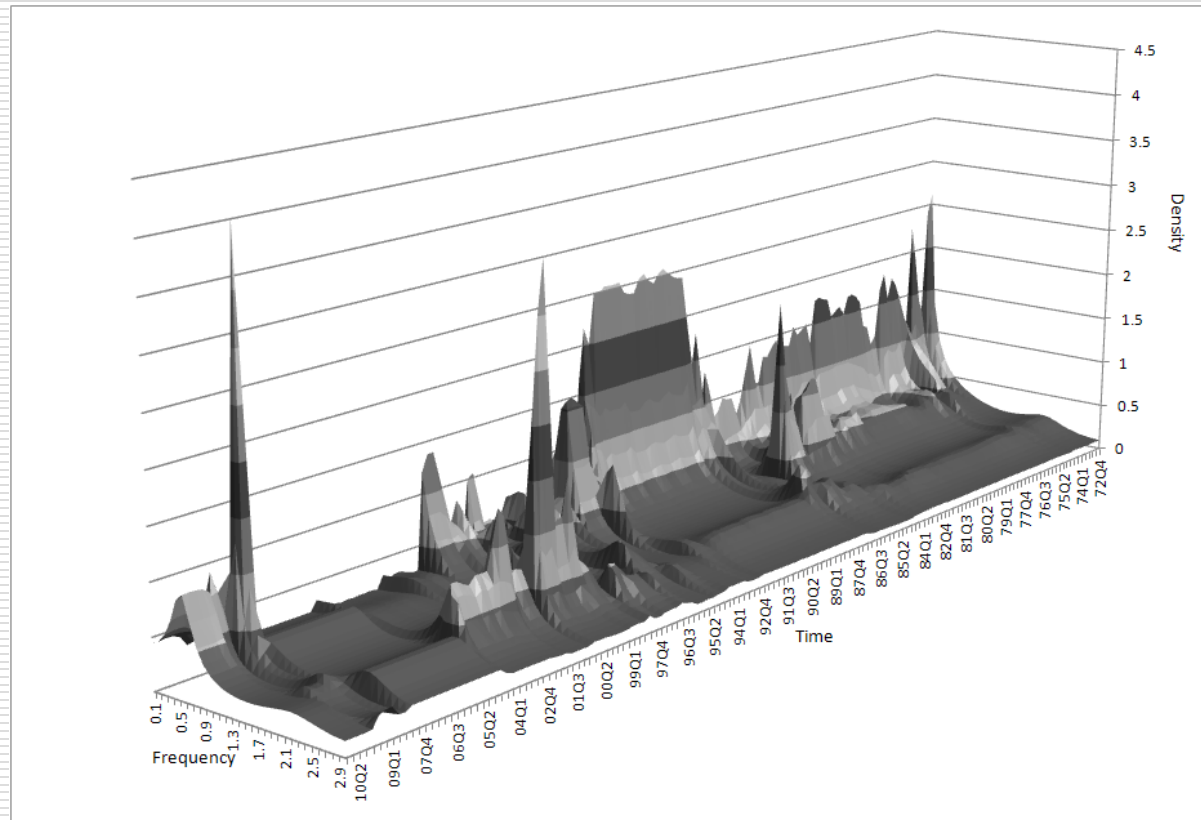Figure 1: Spectrum of the Italian Growth Rate

3 Empirical Results
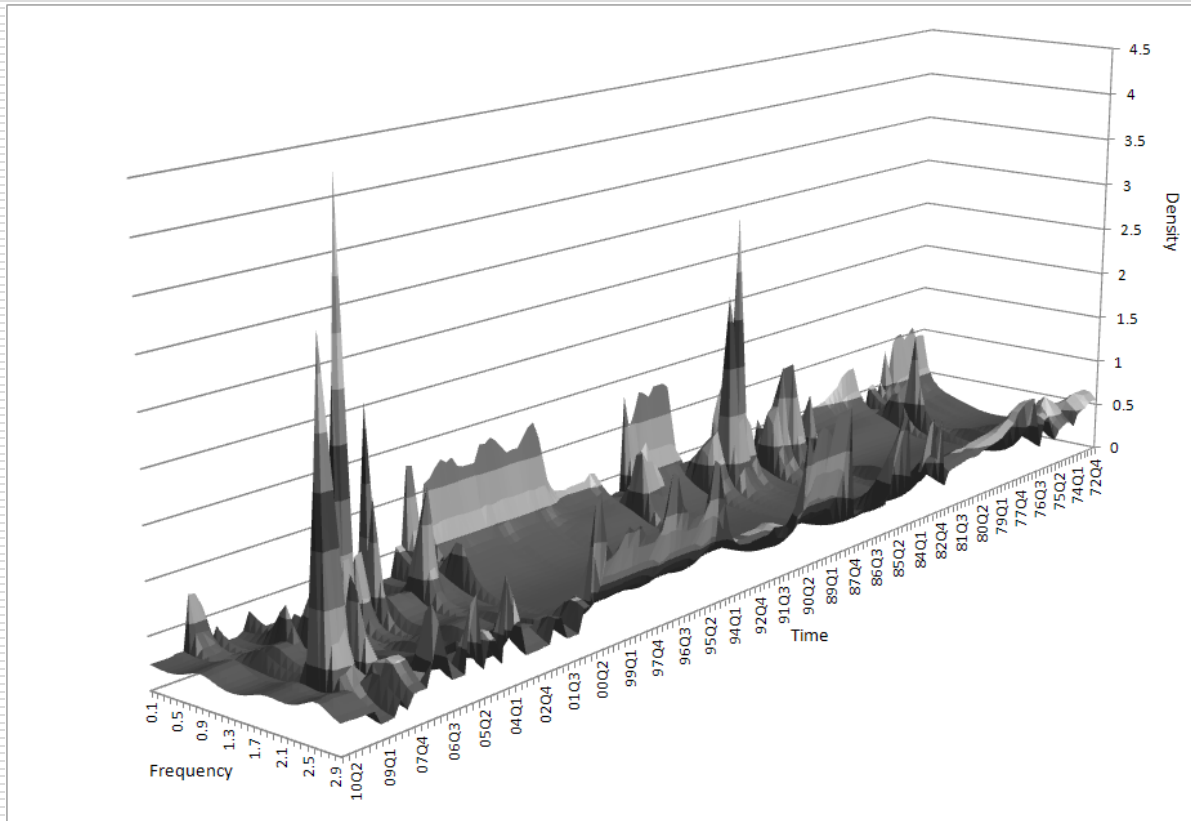

Figure 2: Spectrum of the Spanish Growth Rate

3 Empirical Results

Figure 3: Spectrum of the Irish Growth Rate
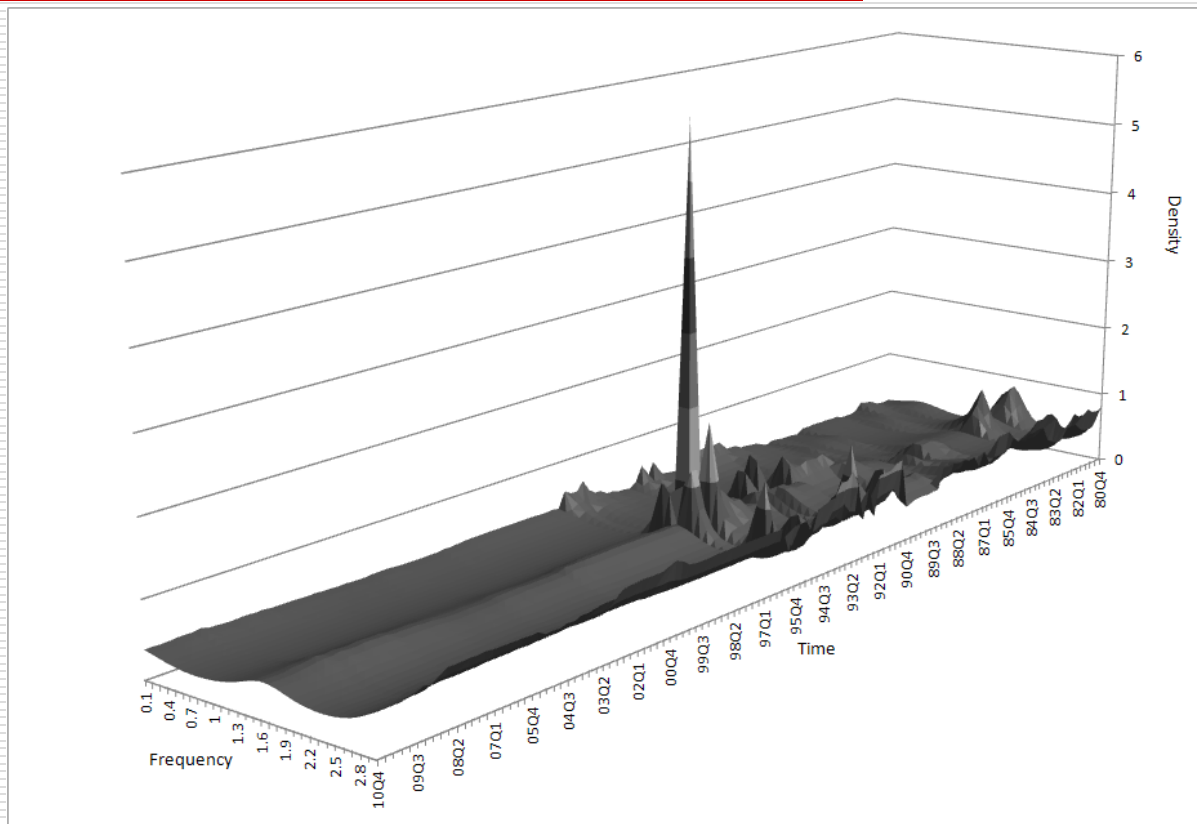
3 Empirical Results

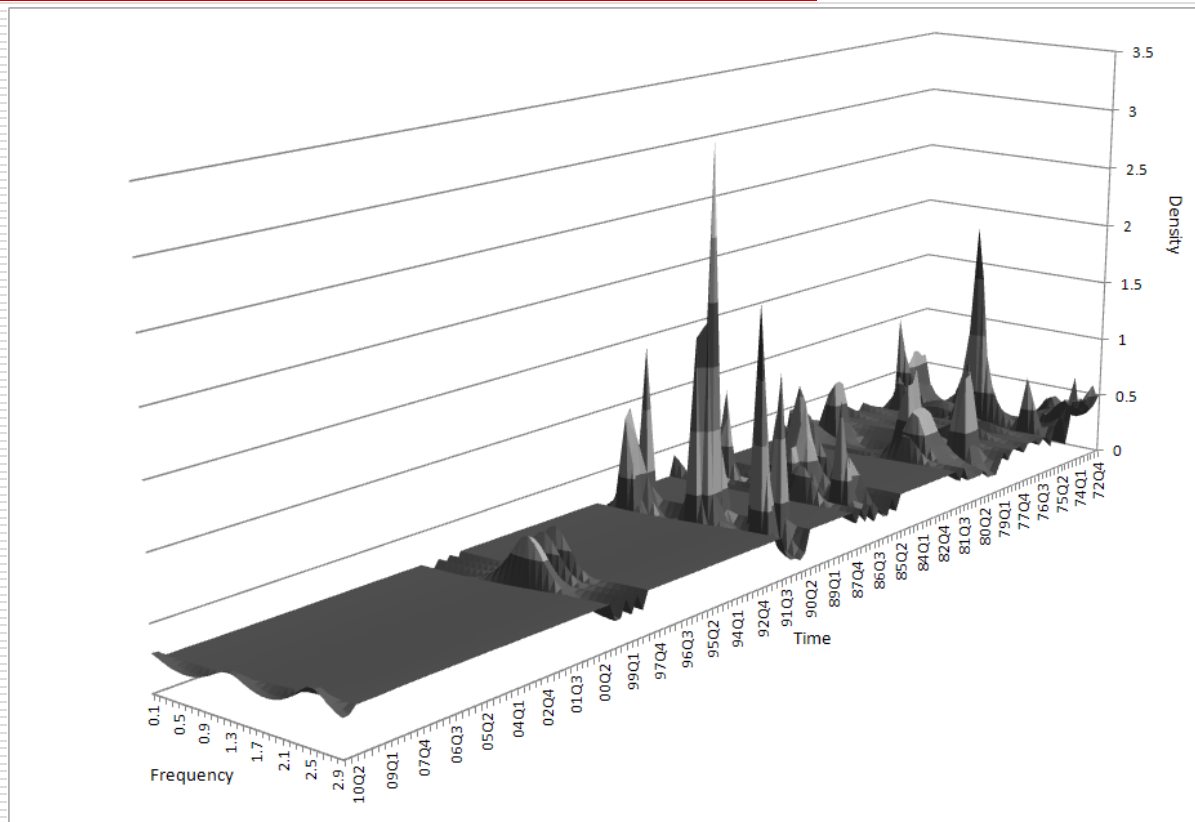Figure 4: Spectrum of the Portuguese Growth Rate

3 Empirical Results

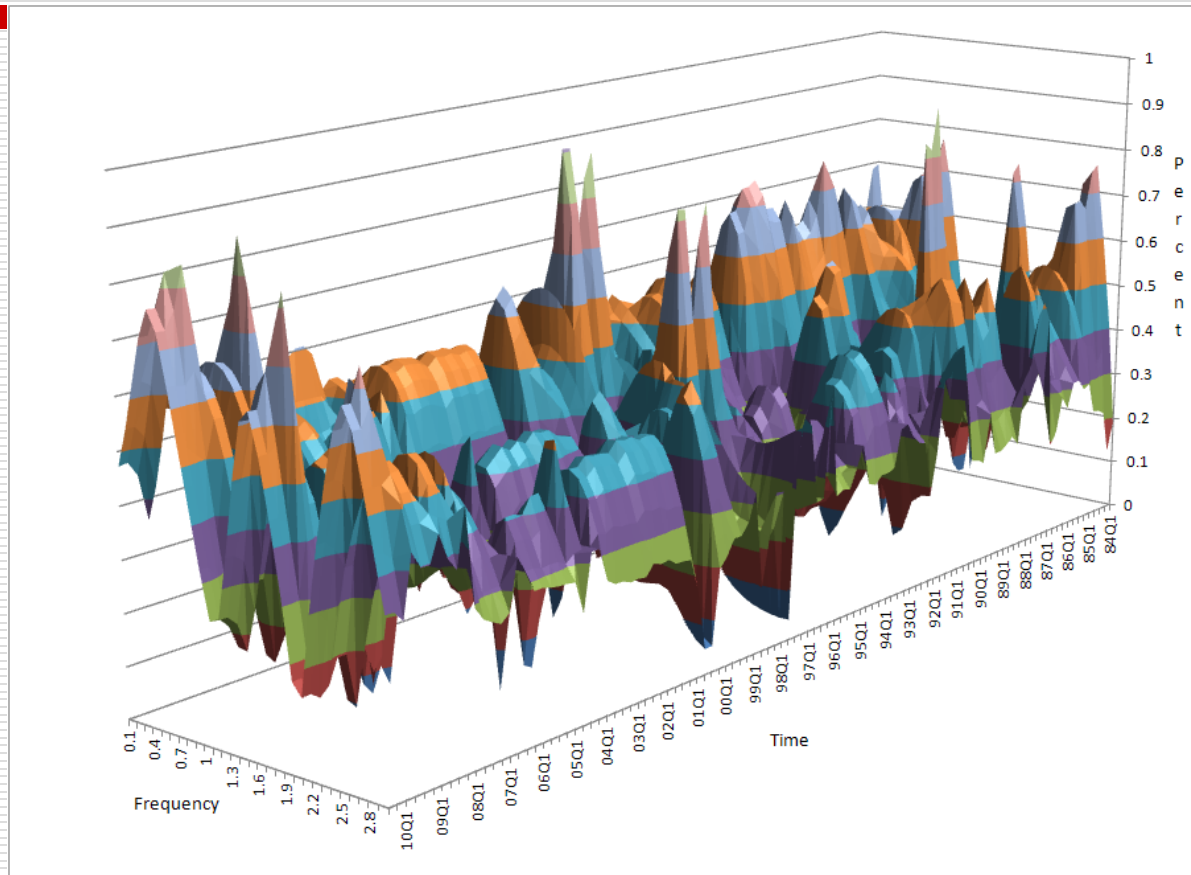Figure 5: Spectrum of the Greek Growth Rate

3 Empirical Results

Figure 6: Coherence between Italy and the Eurozone
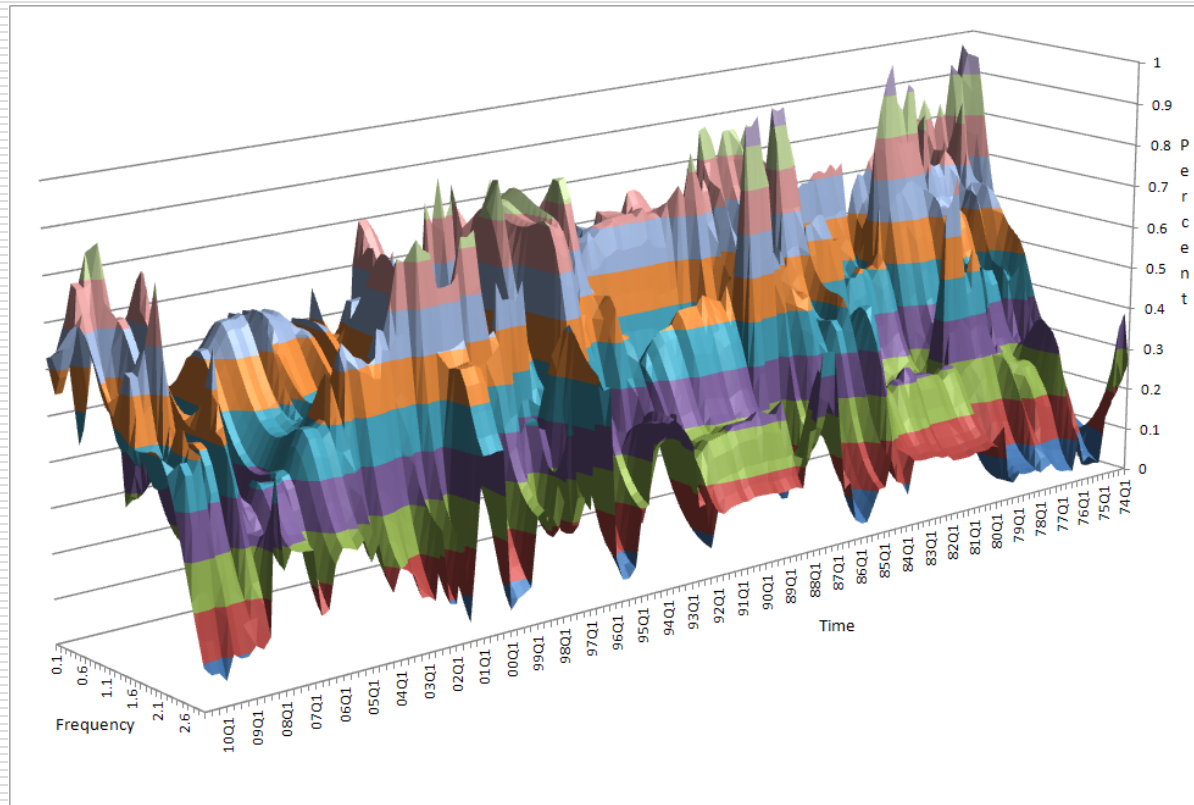
3 Empirical Results

Figure 7: Coherence between Spain and the Eurozone
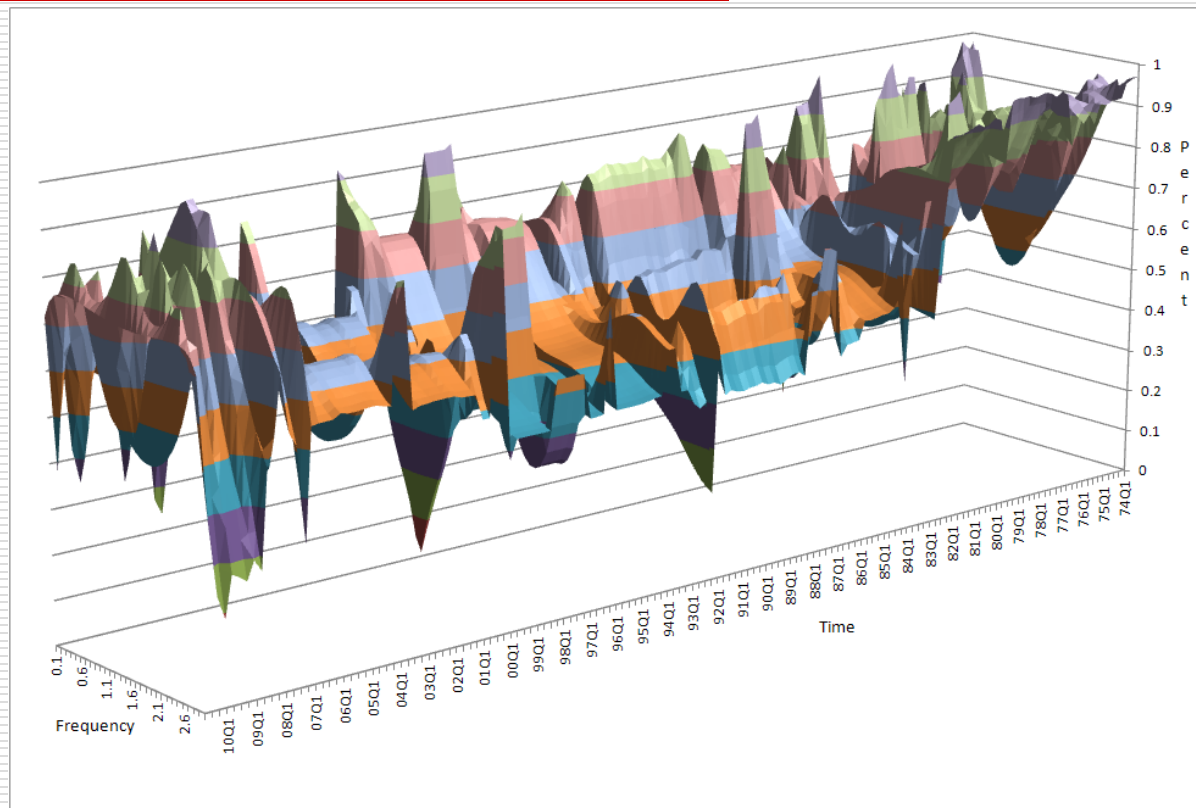
3 Empirical Results

Figure 8: The Coherence between Ireland and the Eurozone
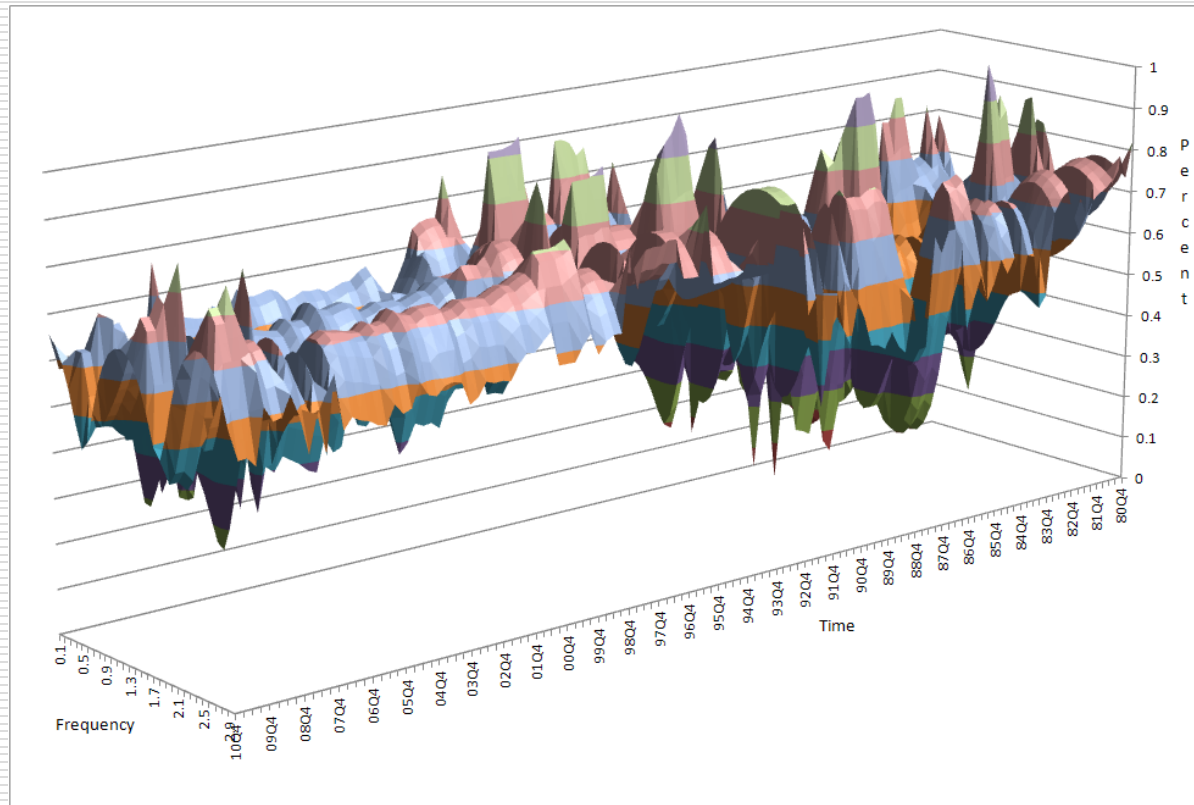
3 Empirical Results

Figure 9: The Coherence between Portugal and the Eurozone
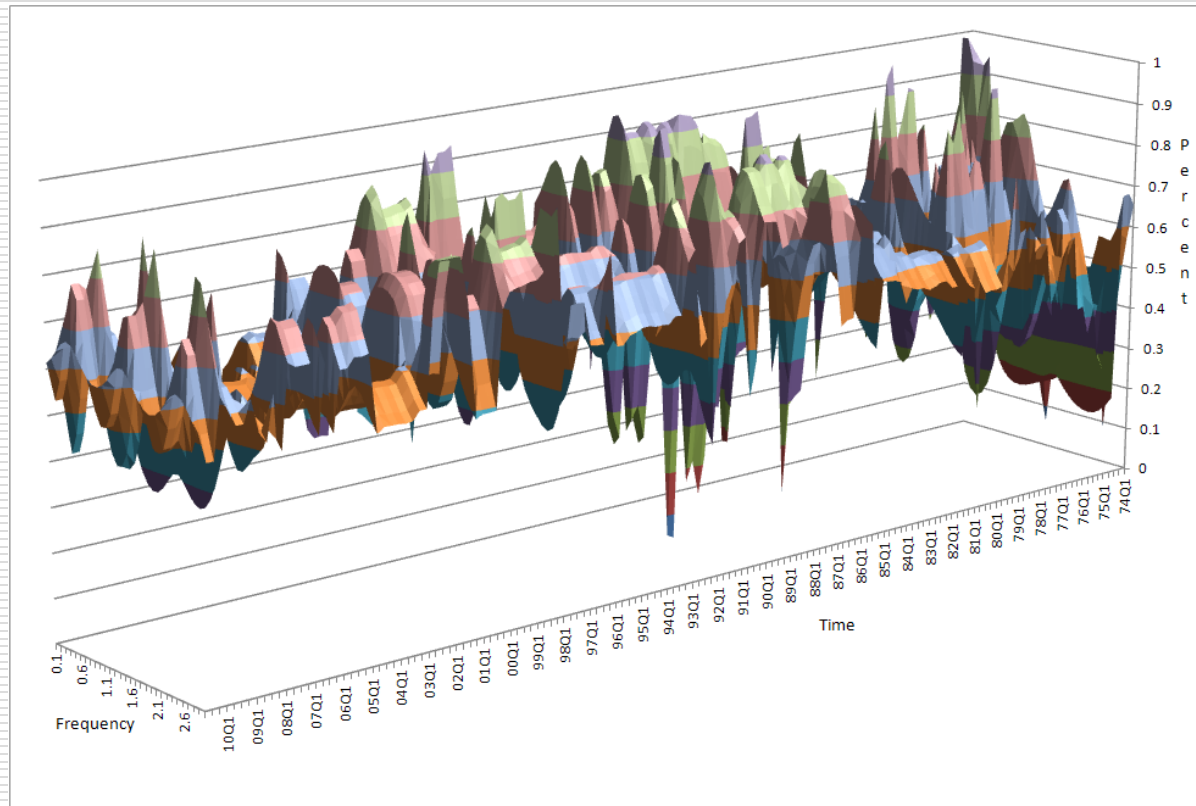
3 Empirical Results

Figure 10: Coherence between Greece and the Eurozone

4 Conclusion

- ☐ We presented a technique by which business cycles can be decomposed into their component cycles.

  - ■ We showed that business cycles vary over time.

  - ■ As a result we could show that the data generating processes are different to each other.

4 Conclusion

☐ We showed how to extend univariate analysis to the coherence between different economies and that it varies over time.

☐ The Euro did not lead to a greater convergence, but (in some cases) to a more stable link between the countries and the Eurozone.

☐ Not every financial crisis leads to divergence, but

4 Conclusion

- ☐ The greater convergence was short lived.

- ☐ It seems that the recent turmoil causes a greater divergence.

- ☐ So some financial crises have the potential to increase convergence whilst others lead to divergence.