Equity Style Cycles - Stylised Facts and International Evidence
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Abstract

The main objective of the paper is to analyze the cyclical structure of style indices and of selected economic time series. After comparing similarities we examine the relationship between the economic indicators with the style indices to observe interactions and lead-lag structures. Our method of choice is spectral analysis, which provides richer measures than the ones obtained by looking at correlation coefficients in the time domain.

Our results indicate that there is indeed cyclical structure in the style indices, dominated by cycles similar to the short Kitchin cycle (3-5 years). These cycles are related to economic indicators like industrial production, price indices and interest rates. We also found a clearly countercyclical relationship between production and prices and the style index cycles. These stylized facts can be used to set the frame for style selection and style rotation based on economic conditions.

1 Introduction

1.1 The Equity Style Discussion

Since the development of the Capital Asset Pricing Model (CAPM) by Sharpe (1964), Lintner (1965), Mossin (1966) and Black (1972), there is a body of literature demonstrating that the covariation of a security's return with the return on the market (called β) is not sufficient to explain the cross-section of expected returns. In many empirical studies additional explanatory variables could be identified. Since these phenomena are not in line with theory, they are commonly called anomalies. The introduction of the Arbitrage Pricing Theory by Ross (1976) may be seen as a theoretical base for these challenges of the CAPM.

A few of the examined variables have obviously special importance: the price-to-earnings-ratio (Basu, 1977, 1983), the price-to-book ratio (Stattman, 1980; Rosenberg *et al.*, 1985), dividend yield (Litzenberger and Ramaswamy, 1980) or firm size (Banz, 1981). Starting with Fama and French (1992), a still growing stream of research focused mainly on the most prominent anomalies price-to-book ratio ratio and size. The price-to-book ratio (P/B) is commonly used to classify an individual equity either as a value stock (low P/B) or a growth stock (high P/B). The reasoning behind this names is straightforward: if the market price is relatively low with respect to the book-value, the shares are offered at a comparable low price. If investors buy a stock with a high P/B the decision is most probably based on the positive expectations about the future growth of the company. In a series of papers Fama and French among others showed that there are remarkable return differences between value stocks and growth stocks.

The contemporary asset pricing literature discusses two main issues: First, the question on whether there is a significant premium of value stocks in the long run (covering 20 years and more). The second issue is the search

for pronounced differences between the return of value and growth stocks lasting over shorter periods of time (from about 6 months up to some years) exhibiting non-random regularities. These two problems can roughly be desribed as the value-premium question and the style-rotation question.

The explanations for the discrepancies in the observed return-patterns differ and are subject to an ongoing discussion. Some authors (Black, 1998; MacKinlay, 1995) argued that the differences in the US are just a random phenomenon and unlikely to occur out of sample. However, Fama and French (1998) and Davis *et al.* (2000), among others, demonstrated that the value-premiums are evident for other sampling periods and can be observed in markets outside the US.

Another common explanation is that the performance differences are due to a compensation for different types of risk involved. Although Fama and French (1993, 1996, 1998) find some evidence supporting this view, Moskowitz (1999) screening the previous literature and implementing a more general framework could not confirm the result.

Other attempts to solve the puzzle are built on behavioral explanations, mainly on some form of investor irrationality. [1] Because such conclusions are more or less inconsistent with risk-based justifications, models with constraints on investor rationality were constructed.

Recent research, however, showed that there might be a further and probably more straightforward explanation. If the style patterns reflect a changing state of investment opportunity, a direct link between style returns and inherent systematic risk is not entirely necessary. Liew and Vassalou (2000) and Vassalou (2000) showed that there is evidence for a relationship between style factors and GDP growth. Therefore, more specific research is required to clarify the nature of style returns and the most likely relationship with basic economic conditions.

[1] An initial study with this kind of reasoning is DeBondt and Thaler (1985)

1.2 Equity Styles in Asset Management

The terms 'value' and 'growth' (among some others) are broadly used by the investment community for a long time to characterize what is now called the investment style of an asset manager. Farell (1975) called stocks with similar characteristics "clusters" and found evidence for a relationship between these categories and performance patterns.

Practitioners more and more adapted this notion as the "style" of investing. The empirical research discussed above gave further support to this concept of equity management which is by now widely accepted, in particular in the United States. To measure and to compare the success of those strategies, various index providers started to construct and publish so called style indices. The first of these regular offered indices for Value and Growth Styles were created for the US market by Wilshire Associates in 1983. In 1992 Standard & Poors in collaboration with Barra followed with style subindices for the S&P 500. Frank Russell and Morgan Stanley Capital International (MSCI) are offering style indices since the mid 90ths. Up to now Style Indices are calculated by nearly all popular Index Providers including Dow Jones and leading Brokerage Houses like Merrill Lynch, Prudential Securities and Salomon Smith Barney.[2] Unfortunately most indices are created exclusively for tracking the US Equity Market. There are only a few indices also available for the European Markets, the only regular ones are the Value and Growth Indices of MSCI and Salomon Smith Barney.

All Style indices are based on one or more variables serving as the criteria to designate an individual stock as either "growth" or "value". Because various empirical studies have shown that the most notable firm characteristic is the P/B-ratio, this ratio is generally used by all index constructions.[3]

[2] For a comparison of Equity Style indices see Compton (1997).

[3] A comprehensive study with a discussion of index constructing principles is given by Salomon-Smith-Barney (2000).

But, regardless of the discrepancies in index methodologies, all indices are showing substantial divergences in the performance of the value and growth index-portfolios over all countries and over time. Therefore these indices have gained considerable attention as essential tools for the measurement and evaluation of global equity performance.

The implication for asset management resulting from information provided by style indices is straightforward. Because there are obvious differences in the performance of the styles, there seems to be some opportunities for generating superior performance by an asset manager. Over a longer timespan one style may outperform the corresponding market index and over shorter periods there seems to be potential for enhanced performance by selecting the better performing style. The latter strategy is called style rotation, style switching or style tilting. Crucial for this task is clearly the ability of accurately predicting the future performance of styles or at least to decide which style will be comparatively stronger for a specific investment horizon. The Style indices show statistically significant return differences large enough to be economically significant after paying transaction costs.

Emirical research based on some related portfolio construction mechanism again leads to similar results.[4] The main difference between the style indices and the approach frequently used by studies following Fama and French is that the academic research usually utilizes so called factor mimicking portfolios. These portfolios are typically constructed by ranking the stocks according to a single factor (mainly the price-to-book ratio) and then forming two or more mutually exclusive portfolios by definig some breakpoints. The portfolios are then periodically updated to generate time series. In several studies[5] those portfolios are bundled with a long position in a value portfolio (with low P/B) and a short position in a growth

[4] See e.g. Arshanapalli *et al.* (1998) or Fama and French (1998).

[5] E.g. (Fama and French, 1992).

portfolio (with high P/B) to generate artificial zero-investment instruments. Although these more sophisticated approaches certainly may reflect a more detailed and precise framework, the basic properties are comparable with the simpler created style index portfolios. In so far the indices may be seen as proxies for more subtle and complex portfolios. For an analysis and comparison of international equity markets the usage of similar style indices has obvious advantages apart from convenience. The data is transparent for a larger community, used in real asset management and concentrates on basic aspects. Moreover, a look-ahead or survivorship bias does not exist by virtue of construction.

2 Motivation and Approach

To characterize the dynamic behaviour of style returns and their interrelation with economic indicators is the intention of the research presented in this paper. We focus on aggregate series of 11 major stock markets worldwide were we could assume sufficient market capitalization and a reasonably separable economic development. The main perspective is on the empirical regularities apparent from simple visual analysis. But we want to go a step further. To do this, we employ spectral analysis, a method which has to be proven as especially helpful with the analysis of business cycle characteristics and market cycles[6]. Moreover the behaviour of style returns seems to show cyclical fluctuations, too.

The first objective is therefore to analyze the cyclical structure of style indices and of selected economic time series. After comparing similarities, we examine the relationship between the indicators and style indices to identify interactions and lead-lag structures. An identification of these likely influences can set the frame for style selection and style rotation based on

[6] A study by Häflinger and Pitts (1997) demonstrates the advantage of these approach for analyzing sectoral behaviour of stock markets.

economic conditions.

The likely relationship between style cycles and economic cycles can roughly be confirmed by a set of a priori reasons. Clearly the business cycle is associated with the profits cycle, especially for value stocks. Generally these stocks benefit from a growing economic activity and mainly at an upturn. Growth stocks profit from raising expenditures for capital formation which happens for the most part in expanding economies. The interest rate cycle is directly related with the business conditions. The particular discount rate reflects future growth prospects and influences the evaluation of actual stock prices by any type of a future earnings discount approach. Growth stocks thus are suspect to have a greater sensitivity.

Additionally growth companies tend to have a higher debt gearing which could be accelerated by interest rate changes.[7] Without doubt, inflation is one critical factor for interest rates changes and should be considered therefore as well. At least the dynamic structure of the whole equity market should be regarded. With a changing level of the market the relative valuations of value and growth stocks are likely to differ. As the disparity (i.e. the value-growth spread) expands the likelihood of corrections increases.

For a proper judgement of the various influences mentioned an empirical foundation is necessary. A comparison of different equity markets surely facilitates the establishment of some basic stylized facts for further exploration and explanation of the performance differences of value and growth investment strategies. [8]

[7] Grünenfelder (1999) investigates the relationship between style investment and interest rate cycles for Switzerland.

[8] Oertmann (2000) for example uses a regression analysis based on a priori choosen exogenous variables to study their effects on the performance of with MSCI Indices.

3 Data

To investigate major stock markets worldwide with style indices we use the MSCI Indices mainly because of their longer data-history as well as their common reputation and popularity. But additional arguments in favour of the MSCI Style Indices are noteworthy. The construction mechanism relies solely on the price-to-book value which is to be seen as the most important fundamental difference between companies in the research originated by Fama and French. Moreover, this provides a mutually exclusive assignment of the companies to the respective style-indices and, according to Occams razor, has the advantage of being simple albeit not to simplistic and easy to understand. Price-to-book ratios generally tend also to be more stable over time than alternative or additional mesures which should result in a relatively low turnover of the indices. Because there exists no definitive way to characterize a "value" versus a "growth" stock all we expect by a style index is that it should show the general behaviour of the value and growth distinction for a specific market and the resulting different return patterns over time. A comparison of different index approaches shows that there are comprehensible characteristics and recognizable correlations between the various style indices resulting from different construction methodologies.[9]

In short the construction of the MSCI Value and Growth Indices is as follows [10]: For each security in the general market indices of MSCI, two items are collected: price-to-book ratio (P/B) and market capitalization. The securities within each country are then sorted by the P/B in ascending order and market caps are summed until approximately 50% of the total market capitalization has been reached. These securities form the Value subindex while the remaining stocks are designated for the Growth subindex. Within each subindex the stocks are weighted by their market-cap to create

[9] See Prudential-Securities (2000).

[10] A more detailed description is given in MSCI (1997)

the MSCI Value and Growth indices. A security is always fully included in one subindex and not splitted in any way between Value and Growth. A buffer zone is used to reduce the turnover of the indices i.e. frequent flips back and forth between the style indices ("Style Jitter"). In general a security must shift at least with more than 60% of its market-cap into the opposite style segment before it is actually beeing reallocated. The regular rebalance frequency is semi-annual and dividends are reinvested as in the country indices of MSCI.

We examine the following 11 major stock markets: USA, Canada, Japan, United Kingdom, Germany, France, Switzerland, Italy, Spain, Netherlands, and Sweden. Additionaly to the style indices we also acknowledge the market indices of MSCI. As economic data we use aggregate series from the International Monetary Fund (IMF). We concentrate on the business cycle, the interest rate cycle, and inflation. The relevant proxies are the industrial production indices, the consumer price indices and the long and short term interest rates. The observation period is 1974.12 to 2000.07.

4 Method

The focus of this study is on the issue whether we can identify classical business cycle structure in the style indices, and, if this is the case, how this relates to cycles in variables like industrial production, prices, and interest rates.

When analysing the business cycle phenomenon empirically, i.e. describing the stylised facts, we can choose between three methods. The oldest one would be the NBER business cycle chronology, based on the work of Burns and Mitchell. This method is based on consensus view about main phases of the business cycle like contraction, recession, expansion and boom phase for every year. Counting the years between the corresponding phases helps to identify the average duration of the cycle; chosing a reference cycle and comparing phases makes it possible to say something about the lead-lag structure between the cycles.[11]

The most widely used method is correlation analysis in the time domain. Prominent applications are Kydland and Prescott (1990) and Backus and Kehoe (1992). By looking at the empirical auto-correlation function we can assess the extend to which a series exhibits regular fluctuations. The cross-correlation function reveals insight on the lead-lag structure of the series, again in comparison with a reference cycle.

However valuable this information is, we want to go a step further: we want to look at the business cycle phenomenon in the frequency domain, by estimating spectra. Spectral analysis is based on the fact that a stationary time series can be decomposed in superimposed harmonic waves with frequencies in the interval $[-\pi, \pi]$. The spectrum measures the (marginal) contribution of each wave to the overall variance. It is defined as the Fourier transform of the autocovariance function $\gamma_x, \tau = 0, \pm 1, \pm 2, \ldots$:.[12]

$$f_x(\omega) = \frac{1}{2\pi} \sum_{\tau=-\infty}^{\infty} \gamma_x(\tau) e^{-i\omega\tau};\ \omega \in [-\pi, \pi]. \tag{1}$$

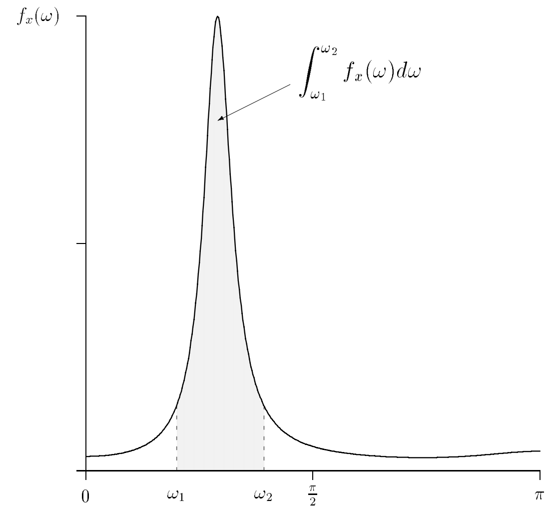
Integrating the spectrum over the frequency band $[-\pi, \pi]$, we obtain the variance of the series:

$$\gamma_x(0) = \int_{-\pi}^{\pi} f_x(\omega) d\omega. \tag{2}$$

After dividing the spectrum by $\gamma_x(0)$, we can calculate the contribution of cyclical components in a frequency band $[\omega_1, \omega_2]$ to the overall variance by integrating over the interval (and multiplying by two), as it is illustrated in Figure 1.

[11] See e.g. the overview in Burns and Mitchell (1946).
[12] For the following. see e.g. Harvey (1993), pp. 175-179, Granger and Newbold (1986), pp. 48-53, Brockwell and Davis (1991), pp. 434-443, Priestley (1981), vol. II, and Koopmans (1974), pp. 119-164.

Figure 1: Univariate Spectrum



Thus it is possible to compare the relative importance of certain frequency bands for the overall variance of the series. We are especially interested in the frequency bands which can be seen as corresponding to the "classical" view of the business cycle: the 7-10 years long Juglar cycle (Juglar, 1889), and the 3-5 years long Kitchin cycle (Kitchin, 1923). In addition, we will present the results for the cycle intervals 10-∞ years, 5-7 years, 3-5 years, 2-3 years, 1-2 years, 6-12 months, and 2-6 months to get an impression of the overall shape of the spectrum.

The multivariate spectrum of two stationary time series X_t and Y_t is defined as the Fourier transform of the covariance function $\mathbf{\Gamma}_{xy}(\tau), \tau = 0, \pm 1, \pm 2, \ldots$:

$$\mathbf{F}_{xy}(\omega) = \frac{1}{2\pi} \sum_{\tau=-\infty}^{\infty} \boldsymbol{\gamma}_{xy}(\tau) e^{-i\omega\tau};\ \omega \in [-\pi, \pi]. \tag{3}$$

The off-diagonal elements of the spectral density matrix $\mathbf{F}_{xy}(\omega)$, $f_{xy}(\omega)$, are called cross-spectra. The cross spectrum at frequency ω is a complex number and given by

$$f_{xy}(\omega) = c_{xy}(\omega) - iq_{xy}(\omega);\ \omega \in [-\pi, \pi], \tag{4}$$

where $c_{yx}(\omega)$ is the cospectrum and $q_{yx}(\omega)$ is the quadrature spectrum.[13] Together with the univariate spectra, the cross spectrum can be used to calculate a measure similar to R^2 in linear regression analysis. This measure is the squared coherency $sc(\omega)$:

$$sc(\omega) = \frac{|f_{xy}(\omega)|^2}{f_x(\omega) f_y(\omega)};\quad 0 \leq sc(\omega) \leq 1. \tag{5}$$

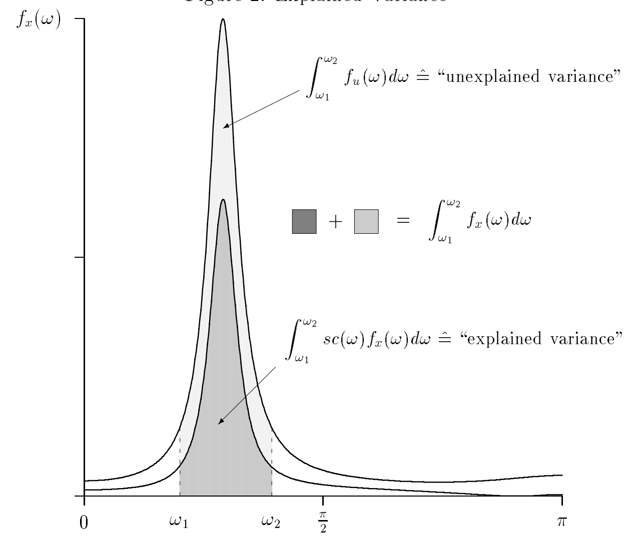
This measure assesses the degree of linear relationship betwee two series, frequency by frequency. If we are interested in the extent to which the variance of cyclical components of the series X_t in the frequency band $[\omega_1, \omega_2]$ can be attributed to corresponding cyclical components in series Y_t, we can use $sc(\omega)$ to decompose the fraction of overall variance in this interval into an explained and an unexplained part:

$$\int_{\omega_1}^{\omega_2} f_x(\omega) d\omega = \underbrace{\int_{\omega_1}^{\omega_2} sc(\omega) f_x(\omega) d\omega}_{\text{“explained” variance}} + \underbrace{\int_{\omega_1}^{\omega_2} f_u(\omega) d\omega}_{\text{“unexplained” variance}} \quad . \tag{6}$$

We will use this decomposition, which is illustrated in Figure 2, to compare the degree of linear relationship between cycles in different series for the intervals given by the Juglar and the Kitchin cycle, as well as the other frequency intervals.

[13] These components are used later on in equation (7) to derive the phase spectrum.

Figure 2: Explained Variance



Another measure which can be derived from the cross-spectrum is the phase spectrum. It measures the phase shift between two cycles at frequency ω, and allows to judge the lead-lag relationship between the two series frequency by frequency:

$$\phi_{xy}(\omega) = -\arctan(q_{xy}(\omega)/c_{xy}(\omega));\ \omega \in [-\pi, \pi]. \tag{7}$$

The phase spectrum measures the phase lead of the series X over the series Y at a frequency ω. We will present an average of the relative phase shifts[14] in the 8 cycle intervals of interest.

To estimate the spectra, we fit autoregressive models in the time domain,

[14] I.e., relative to the cycle length at which the phase shift is calculated. The relative phase shift varies between -0.5 and 0.5.

and calculate the spectra of the estimated models.[15] Assume a univariate AR model of order p, with residual variance σ^2. The spectrum is given by

$$f(\omega) = \frac{1}{2\pi}\frac{\sigma^2}{\left|1 - \sum_{j=1}^{p} \alpha_j e^{-i\omega j}\right|^2}; \ \omega \in [-\pi, \pi]. \tag{8}$$

With a VAR model of order p, the spectral density matrix is given by

$$\mathbf{F}(\omega) = \frac{1}{2\pi}\mathbf{A}(\omega)^{-1}\mathbf{\Sigma}\mathbf{A}(\omega)^{-\star}; \ \omega \in [-\pi, \pi]. \tag{9}$$

$\mathbf{\Sigma}$ is the error variance-covariance matrix of the model, and $\boldsymbol{A}(\omega)$ is the Fourier transform of the matrix lag polynomial $\mathbf{A}(L) = \mathbf{I} - \mathbf{A}_1 L - \cdots - \mathbf{A}_p L^p$.[16] Before we can apply spectral analysis, we need stationary series. Beginning with the seminal work of Chan *et al.* (1977) and Nelson and Kang (1981), there is a body of literature concerning detrending problems and their possible distorting effects on the structure of the filtered series. Incorrect filtering may cause spurious cyclicity, or destroy existing cyclical structure. Our method of choice is a comparison of the outcomes for a variaty of filtering methods, as suggested by Canova (1998a,?). We apply the widely used Hodrick-Prescott filter (for short HP Filter, Hodrick and Prescott (1980)) and a modified version of the recently developed Baxter-King filter (Baxter and King, 1995).[17] These filters are known to produce

[15] This method is based on the seminal work by Burg (1967), who shows that the resulting spectrum is formally identical to a spectrum derived on the Maximum Entropy Principle. This is seen to be a more reasonable approach then the normally used periodogram estimator. The periodogram implies the assumption that all the covariances outside the smple period in the infinite sums in equation (1) and (3) are zero. Given that economic time series are notoriously short, this seems to be a problematic assumption (see the discussion in Priestley, 1981, p. 432, 604-607). For applications to economic time series, see e.g. Hillinger and Sebold-Bender (1992), Woitek (1996), and A'Hearn and Woitek (2001).

[16] L is the backshift operator; the superscript '$\star$' denotes the complex conjugate transpose.

[17] The Baxter-King filter is a symmetric moving average bandpass filter to isolate business cycle components in non-stationary time series. The filter weights are determined in frequency domain by minimizing the sum of squared deviations of the gain of the filter

artificial cyclical structure in integrated series.[18] In addition, we compare the with the outcome for the difference filter.[19]

For relative strength, the construction of the subindices basically results in a bounded variable, which rules out the assumption of an integrated series. Permanent effects of shocks are not possible, but a certain degree of persistence is. This is the effect we are going to analyse when we look at the relationship between longer cycles.

5 Results

As stated above, we are especially interested in the relationship of the MSCI indices to the classical business cycles in the ranges 7-10 years (Juglar cycle) and 3-5 years (Kitchin cycle). To analyse this relationship, we focus on the 8 cycle ranges 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, and (8) 2-6 months. If the business cycle was important for the fluctuations of the style indices, we would expect a concentration of relative power in the ranges (2) and (4), robust with respect to the filtering method.[20]

Let us begin with looking at the German example. In Table 1, the results for the market index and industrial production are displayed, both HP filtered. The first 8 columns contain explained power for the 8 cycle ranges of interest. In the case of Germany, the explained power in the

from an ideal gain, i.e., one that perfectly isolates the business cycle frequency band. The modification uses Lanczos' σ factors to deal with the problem of spurious side lobes, which invariably arises with finite length filters.

[18] A discussion of the effects of the HP filter on the cyclical structure can be found in Harvey and Jaeger (1993) and Cogley and Nason (1995) .For a discussion of the distorting effects of the modified Baxter-King filter and a comparison with the HP filter, see Woitek (1998).

[19] Presenting detailed results for all filtering methods would be beyond the scope of the paper. For the sake of brevity, we only report results which passed the robustness test. Detailed results are available from the authors on request.

[20] The countries we are looking at are GER: Germany, FRA: France, CAN: Canada, USA: United States, SWE: Sweden, SWI: Switzerland, NLD: Netherlands, ESP: Spain, ITA: Italy, GBR: United Kingdom, JPN: Japan.

two "tails" of the spectrum is relatively low. We have around 3-7% in the ranges with cycle lengths near 7 years, and about 8-15% in the ranges with cycle lengths below 2 years. There is a distinct maximum in the interval with cycle lengths between 2 and 5 years; explained power is as high as 23-27%. Obviously, cycles corresponding to the length of the Kitchin cycle are important for the structure of the flutuations in the market index.

Comparing the contribution of German production cycles to the cycles in the index, we see that it is a bit higher for cycles with a length above 5 years (around 11%) than for cycles with a length below 2 years (about 8%). The maximum is again in the range 5-7 years, which is not related to classical business cyle ranges, but is close to the Kitchin cycle.

In Table 21, we have the average relative phase shifts (relative to the cycle length) for each of the 8 cycle ranges, again for the HP filter. In the German case, all the figures are negative. This means that the industrial production cycle leads the cycle in the market index. However, the relative phase shifts are close to 0.5 in absolute terms. With a phase shift close to half the cycle range, one would rather speak about a countercyclical movement than about a lead/lag relationship. The only exception is the interval with the extrmely short cycles (2-6 months); here, the cycles are procyclical, i.e. the phase shift is close to zero.

Starting with the univariate results, we see that for the market index, relative power is concentrated in the range 2-5 years. To decompose the effect on the index for the entire market into value and growth, we look at the commonly used "relative strength", which is the ratio of the respective value index to the growth index. We use this measure as indicator for the style cycle. Relative strength fluctuations seem also to be dominated by 2-5 years long cycles; however, we can also find shorter cycles with a length of 1-2 years.[21] Obviously, the Juglar cycle does not play much of a role for

[21]Note that this result is not robust, but dependent on the choice of the HP filter.

the cyclical structure of the style indices, but the Kitchin cycle seems to be important.

Looking at the multivariate results for industrial production, we see that the maxima of the explained power vary between 30 and 60%. They can be found in the range 2-5 years, which we already identified as the range dominating the cyclical structure of the MSCI indices. Using the BKM filter, we can find maxima of explained power also in the range of the Juglar cycle (7-10 years, CAN, JPN). The contribution of production cycles to relative strength is especially high in the classical business cycle range, with the exception of Spain and Japan, where we cannot find a robust relationship.

The consumer price index does not contribute significantly to the cyclical structure in the indices, at least, we cannot find a systematic pattern here. There is some indication that there is a concentration in the classical business cycle range, but not as clear-cut as in the case of industrial production.

The results for the short-term interest rates show that explained power is again concentrated in the 2-5 years range. Countries with pronounced maxima for the market index (above 20 per cent) are FRA, CAN, USA, SWE, GBR and JPN. If we look at the outcome for relative strength, we see that the location of the maxima of explained power is not systematic, and dependent on the filtering method.

The long-term interest rate cycles have very high explained power when comparing with the short term results (however, not for JPN and GER). Again it is concentrated in the range 2-5 years, Relative strength is not influenced by long-term interest rate cycles in a systematic way; the US indices don't show a relationship at all.

Turning to the interest rate ratio, we find that with the exception of SWE and ITA, there is no robust relationship. Relative strength does not produce systematic patterns at all.

The results for average relative phase shift between the market index and industrial production shows that all countires are procyclical (i.e. the phase shift is close to zero), with the exception of the USA. Relative Strength in GER, CAN, NLD, and ESP is countercyclical over all cycle ranges (i.e. the cycle in industrial production leads/lags the cycle in relative strange with about half a cycle length on average), while it is rather procyclical for the other countries. The exception is ITA and JPN, which show higher phase shifts in the ranges with the shorter cycles (6 months - 3 years).

The cycles in the market index and in CPI are countercyclical for GER, FRA, CAN, SWE, SWI, ESP, GBR, and JPN. Comparing relative strength and CPI we see that the results are not robust. For example, in the case of the USA we get a postive phase shift with the HP filter, and a negative phase shift with the BKM filter. However, since the phase shift is relatively high (i.e. close to half the cycle range), it does not really matter for the result: whether a cycle is countercyclical and leading or countercyclical and laging might not make a huge difference when interpreting the outcome.

Turning to our short-term interest rate series, we see that we have robust results for countercyclical movements of the market index over almost all cycle ranges for FRA, USA, SWE, NLD, ESP, ITA, GBR, and JPN. SWI and GER are clearly procyclical. Similar results can be found for the relative strength. However, the result for GER is no longer robust. The cycles in relative strength for USA, SWI, SWE, and GBR are procyclical.

The cycles in the market index are clearly countercyclical to the cycles in the long-term interest rates. Exceptions are CAN and SWE. If we look at relative strength, we see that the USA, SWE, and JPN are procyclical, while the rest of the countries is countercyclical (the result for SWI depends on the filtering method).

Comparing the cycles in the market index with the cycles in the interest rate ratio, we see that we have obust countercyclical results for GER, CAN, SWI, NLD, ESP, and ITA. USA, SWE, and JPN are robust procyclical. The

relative strength cycles seem to be countercyclical for SWE, SWI and GBR. FRA, CAN, NLD, ESP, ITA, and JPN are robust procyclical.

6 Conclusions

The main objective of the paper was to analyze the cyclical structure of style indices and of selected economic time series. After comparing similarities we examined the relationship between the indicators with the style indices to observe interactions and lead-lag structures.

Our results indicate that there is indeed cyclical structure in the style indices, dominated by cycles similar to the short Kitchin cycle (3-5 years). These cycles are related to economic indicators like industrial production, price indices and interest rates. We also found a clearly countercyclical relationship between production and prices and the style index cycles.

The next step of the analysis will be to investigate how these stylized facts can be used to set the frame for style selection and style rotation based on economic conditions. But this is subject to further research.

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Table 1: Market Index and Industrial Production (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.07	0.03	0.06	0.23	0.27	0.15	0.11	0.08	0.13	0.13	0.12	0.12	0.20	0.07	0.09	0.09
FRA	0.07	0.03	0.05	0.20	0.26	0.18	0.10	0.09	0.05	0.05	0.05	0.07	0.11	0.04	0.06	0.04
CAN	0.06	0.03	0.05	0.24	0.33	0.12	0.09	0.08	0.18	0.20	0.24	0.46	0.52	0.06	0.04	0.07
USA	0.05	0.02	0.04	0.14	0.28	0.22	0.13	0.13	0.22	0.21	0.21	0.31	0.56	0.16	0.05	0.12
SWE	0.05	0.03	0.05	0.21	0.33	0.16	0.10	0.06	0.05	0.13	0.24	0.48	0.33	0.05	0.09	0.09
NLD	0.07	0.03	0.05	0.14	0.19	0.26	0.14	0.11	0.18	0.22	0.25	0.28	0.18	0.08	0.11	0.08
ESP	0.07	0.03	0.05	0.18	0.24	0.18	0.15	0.10	0.09	0.14	0.21	0.43	0.28	0.02	0.02	0.04
ITA	0.09	0.05	0.08	0.27	0.24	0.13	0.08	0.07	0.04	0.04	0.03	0.01	0.02	0.06	0.08	0.10
GBR	0.02	0.01	0.02	0.06	0.19	0.36	0.18	0.16	0.00	0.00	0.00	0.03	0.17	0.09	0.10	0.11
JPN	0.04	0.02	0.03	0.13	0.32	0.22	0.12	0.11	0.03	0.09	0.18	0.43	0.12	0.02	0.02	0.07

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Industrial Production
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 2: Market Index and Industrial Production (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.10	0.05	0.09	0.32	0.20	0.10	0.08	0.05	0.16	0.16	0.14	0.15	0.29	0.07	0.12	0.10
FRA	0.11	0.05	0.08	0.25	0.21	0.16	0.07	0.07	0.21	0.18	0.13	0.03	0.06	0.05	0.06	0.05
CAN	0.07	0.04	0.07	0.31	0.29	0.10	0.06	0.07	0.37	0.38	0.38	0.43	0.59	0.13	0.05	0.10
USA	0.06	0.03	0.05	0.18	0.30	0.18	0.09	0.10	0.01	0.02	0.01	0.28	0.68	0.28	0.10	0.22
SWE	0.10	0.05	0.08	0.31	0.23	0.12	0.07	0.05	0.08	0.19	0.30	0.44	0.24	0.03	0.09	0.11
NLD	0.12	0.05	0.08	0.19	0.19	0.19	0.10	0.08	0.21	0.32	0.37	0.30	0.09	0.07	0.11	0.10
ESP	0.14	0.07	0.10	0.26	0.17	0.12	0.09	0.06	0.04	0.10	0.22	0.44	0.10	0.00	0.03	0.08
ITA	0.12	0.06	0.11	0.36	0.18	0.09	0.04	0.04	0.12	0.10	0.06	0.04	0.12	0.09	0.18	0.18
GBR	0.05	0.02	0.04	0.11	0.20	0.26	0.16	0.16	0.05	0.06	0.06	0.04	0.13	0.19	0.12	0.15
JPN	0.12	0.06	0.08	0.22	0.21	0.16	0.08	0.08	0.15	0.25	0.37	0.39	0.14	0.02	0.01	0.10

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Industrial Production
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 3: Relative Strength and Industrial Production (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.03	0.01	0.02	0.09	0.38	0.35	0.07	0.05	0.11	0.11	0.11	0.12	0.23	0.08	0.04	0.04
FRA	0.11	0.04	0.05	0.10	0.12	0.36	0.13	0.08	0.21	0.23	0.25	0.32	0.19	0.30	0.06	0.05
CAN	0.07	0.03	0.05	0.15	0.21	0.26	0.13	0.09	0.34	0.37	0.41	0.38	0.21	0.24	0.11	0.09
USA	0.10	0.04	0.05	0.12	0.14	0.29	0.15	0.10	0.30	0.30	0.31	0.35	0.27	0.03	0.08	0.11
SWE	0.06	0.03	0.04	0.14	0.27	0.27	0.10	0.09	0.19	0.27	0.34	0.40	0.27	0.20	0.12	0.07
NLD	0.09	0.04	0.06	0.16	0.18	0.24	0.14	0.08	0.21	0.33	0.44	0.59	0.50	0.15	0.06	0.03
ESP	0.08	0.04	0.06	0.20	0.27	0.18	0.08	0.09	0.00	0.01	0.02	0.03	0.01	0.08	0.13	0.14
ITA	0.07	0.04	0.06	0.22	0.30	0.15	0.10	0.06	0.02	0.05	0.10	0.25	0.19	0.11	0.09	0.06
GBR	0.06	0.03	0.05	0.18	0.29	0.20	0.09	0.09	0.33	0.30	0.26	0.13	0.03	0.12	0.04	0.06
JPN	0.05	0.02	0.04	0.11	0.23	0.30	0.16	0.09	0.00	0.00	0.01	0.01	0.09	0.10	0.06	0.12

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Industrial Production
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 4: Relative Strength and Industrial Production (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.13	0.06	0.10	0.27	0.18	0.12	0.09	0.05	0.08	0.14	0.21	0.30	0.16	0.05	0.05	0.07
FRA	0.14	0.07	0.09	0.21	0.17	0.16	0.09	0.07	0.14	0.26	0.40	0.47	0.25	0.29	0.07	0.10
CAN	0.12	0.06	0.09	0.26	0.20	0.14	0.06	0.07	0.14	0.21	0.31	0.38	0.24	0.22	0.15	0.14
USA	0.16	0.07	0.09	0.19	0.14	0.17	0.11	0.06	0.21	0.26	0.32	0.38	0.25	0.05	0.10	0.15
SWE	0.08	0.04	0.06	0.19	0.27	0.19	0.09	0.09	0.14	0.22	0.27	0.25	0.22	0.08	0.13	0.12
NLD	0.16	0.07	0.09	0.20	0.15	0.18	0.09	0.05	0.31	0.56	0.70	0.71	0.40	0.15	0.11	0.05
ESP	0.16	0.07	0.11	0.25	0.18	0.12	0.06	0.05	0.12	0.13	0.13	0.07	0.01	0.05	0.07	0.16
ITA	0.14	0.07	0.11	0.28	0.18	0.09	0.08	0.05	0.06	0.21	0.35	0.49	0.26	0.07	0.15	0.14
GBR	0.11	0.05	0.09	0.31	0.24	0.11	0.05	0.05	0.66	0.62	0.55	0.24	0.03	0.11	0.07	0.09
JPN	0.12	0.05	0.08	0.21	0.21	0.17	0.11	0.06	0.05	0.02	0.00	0.03	0.09	0.12	0.13	0.11

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Industrial Production
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 5: Market Index and CPI (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.07	0.03	0.06	0.23	0.26	0.15	0.13	0.08	0.06	0.21	0.35	0.52	0.30	0.11	0.03	0.07
FRA	0.07	0.03	0.05	0.20	0.26	0.18	0.10	0.09	0.18	0.23	0.26	0.27	0.08	0.17	0.09	0.06
CAN	0.06	0.03	0.05	0.25	0.33	0.11	0.08	0.08	0.21	0.24	0.25	0.19	0.23	0.12	0.09	0.08
USA	0.05	0.02	0.04	0.14	0.28	0.22	0.13	0.13	0.16	0.10	0.04	0.07	0.23	0.05	0.09	0.10
SWE	0.06	0.03	0.05	0.21	0.32	0.17	0.11	0.06	0.01	0.02	0.04	0.08	0.08	0.18	0.15	0.10
SWI	0.07	0.03	0.06	0.21	0.26	0.15	0.13	0.09	0.03	0.07	0.10	0.19	0.15	0.05	0.10	0.04
NLD	0.07	0.03	0.05	0.14	0.19	0.26	0.14	0.11	0.05	0.15	0.21	0.19	0.06	0.18	0.39	0.08
ESP	0.07	0.03	0.05	0.18	0.24	0.18	0.15	0.10	0.17	0.17	0.16	0.13	0.03	0.02	0.08	0.03
ITA	0.09	0.05	0.08	0.27	0.24	0.13	0.08	0.07	0.02	0.02	0.01	0.04	0.05	0.08	0.08	0.09
GBR	0.02	0.01	0.02	0.06	0.19	0.36	0.18	0.16	0.01	0.02	0.03	0.04	0.22	0.16	0.08	0.14
JPN	0.04	0.02	0.03	0.13	0.33	0.22	0.12	0.11	0.09	0.10	0.11	0.12	0.06	0.04	0.03	0.05

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in CPI
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 6: Market Index and CPI (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.09	0.05	0.09	0.34	0.21	0.09	0.07	0.05	0.35	0.52	0.60	0.61	0.34	0.11	0.04	0.11
FRA	0.11	0.05	0.08	0.25	0.22	0.16	0.07	0.07	0.14	0.18	0.23	0.29	0.09	0.15	0.04	0.06
CAN	0.07	0.04	0.06	0.31	0.29	0.09	0.06	0.07	0.37	0.48	0.53	0.44	0.26	0.18	0.06	0.09
USA	0.06	0.03	0.05	0.18	0.30	0.18	0.09	0.10	0.01	0.02	0.05	0.13	0.18	0.07	0.16	0.14
SWE	0.10	0.05	0.08	0.32	0.23	0.11	0.07	0.04	0.01	0.02	0.05	0.10	0.05	0.26	0.27	0.15
SWI	0.08	0.04	0.07	0.31	0.25	0.11	0.09	0.05	0.19	0.24	0.28	0.37	0.19	0.04	0.13	0.04
NLD	0.11	0.05	0.08	0.20	0.21	0.18	0.09	0.07	0.01	0.02	0.02	0.03	0.11	0.32	0.36	0.14
ESP	0.14	0.07	0.10	0.26	0.17	0.12	0.09	0.06	0.36	0.27	0.21	0.08	0.03	0.08	0.12	0.06
ITA	0.12	0.06	0.11	0.36	0.18	0.09	0.05	0.04	0.01	0.01	0.01	0.14	0.23	0.09	0.19	0.19
GBR	0.05	0.02	0.03	0.11	0.21	0.26	0.16	0.16	0.15	0.16	0.17	0.21	0.23	0.07	0.09	0.12
JPN	0.12	0.06	0.08	0.22	0.21	0.16	0.08	0.08	0.45	0.39	0.33	0.19	0.02	0.06	0.05	0.08

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in CPI
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 7: Relative Strength and CPI (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.05	0.02	0.03	0.10	0.18	0.43	0.12	0.07	0.06	0.17	0.27	0.35	0.16	0.08	0.14	0.07
FRA	0.10	0.04	0.05	0.10	0.11	0.40	0.12	0.08	0.34	0.35	0.36	0.33	0.15	0.25	0.08	0.09
CAN	0.07	0.04	0.06	0.19	0.26	0.18	0.11	0.10	0.13	0.26	0.37	0.47	0.24	0.16	0.02	0.08
USA	0.10	0.04	0.05	0.12	0.14	0.29	0.15	0.10	0.06	0.07	0.07	0.06	0.08	0.14	0.10	0.08
SWE	0.06	0.03	0.04	0.12	0.23	0.30	0.13	0.09	0.27	0.23	0.17	0.05	0.12	0.23	0.21	0.04
SWI	0.08	0.04	0.05	0.13	0.16	0.30	0.13	0.11	0.24	0.18	0.12	0.05	0.07	0.07	0.04	0.08
NLD	0.09	0.04	0.06	0.16	0.18	0.25	0.14	0.08	0.01	0.02	0.03	0.06	0.16	0.19	0.02	0.05
ESP	0.08	0.04	0.06	0.20	0.26	0.18	0.09	0.10	0.05	0.08	0.13	0.24	0.15	0.03	0.15	0.10
ITA	0.08	0.04	0.06	0.18	0.25	0.21	0.13	0.06	0.08	0.12	0.18	0.26	0.05	0.11	0.10	0.16
GBR	0.06	0.03	0.05	0.18	0.29	0.20	0.10	0.09	0.07	0.15	0.23	0.33	0.15	0.15	0.14	0.07
JPN	0.05	0.02	0.03	0.11	0.24	0.31	0.15	0.09	0.02	0.06	0.09	0.16	0.20	0.06	0.05	0.03

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in CPI
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 8: Relative Strength and CPI (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.13	0.06	0.10	0.27	0.18	0.12	0.09	0.06	0.26	0.36	0.43	0.46	0.21	0.02	0.10	0.12
FRA	0.15	0.07	0.09	0.21	0.16	0.16	0.09	0.07	0.05	0.15	0.28	0.41	0.12	0.33	0.24	0.09
CAN	0.12	0.06	0.09	0.26	0.20	0.14	0.06	0.07	0.22	0.56	0.66	0.62	0.44	0.29	0.06	0.08
USA	0.16	0.07	0.09	0.19	0.14	0.17	0.11	0.06	0.04	0.04	0.02	0.02	0.07	0.18	0.14	0.11
SWE	0.07	0.03	0.05	0.19	0.27	0.18	0.10	0.09	0.47	0.38	0.26	0.05	0.12	0.32	0.34	0.05
SWI	0.21	0.09	0.12	0.22	0.13	0.12	0.05	0.06	0.02	0.03	0.04	0.07	0.08	0.13	0.08	0.16
NLD	0.16	0.07	0.09	0.20	0.15	0.18	0.09	0.05	0.11	0.21	0.19	0.11	0.19	0.27	0.03	0.07
ESP	0.16	0.07	0.11	0.25	0.18	0.12	0.06	0.05	0.51	0.36	0.27	0.17	0.08	0.05	0.28	0.13
ITA	0.14	0.07	0.10	0.28	0.18	0.09	0.08	0.05	0.16	0.01	0.08	0.23	0.08	0.27	0.14	0.19
GBR	0.11	0.05	0.09	0.31	0.24	0.11	0.05	0.05	0.38	0.55	0.62	0.51	0.09	0.19	0.22	0.06
JPN	0.11	0.05	0.07	0.20	0.21	0.18	0.11	0.06	0.10	0.04	0.05	0.15	0.19	0.06	0.07	0.06

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in CPI
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 9: Market Index and Short Term Interest Rates (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.07	0.03	0.06	0.23	0.26	0.15	0.13	0.08	0.06	0.07	0.09	0.11	0.03	0.04	0.03	0.05
FRA	0.07	0.03	0.05	0.21	0.29	0.18	0.09	0.09	0.16	0.18	0.22	0.31	0.18	0.06	0.04	0.12
CAN	0.06	0.03	0.05	0.25	0.33	0.11	0.08	0.08	0.03	0.05	0.10	0.34	0.30	0.03	0.17	0.13
USA	0.05	0.02	0.04	0.14	0.28	0.22	0.13	0.13	0.16	0.19	0.23	0.28	0.18	0.15	0.09	0.15
SWE	0.06	0.03	0.05	0.21	0.32	0.17	0.11	0.06	0.30	0.30	0.31	0.32	0.22	0.14	0.25	0.10
SWI	0.07	0.03	0.06	0.21	0.26	0.15	0.13	0.09	0.05	0.06	0.07	0.09	0.11	0.07	0.08	0.08
NLD	0.06	0.03	0.04	0.13	0.21	0.28	0.16	0.10	0.04	0.06	0.09	0.17	0.22	0.17	0.11	0.06
ESP	0.07	0.03	0.05	0.18	0.24	0.18	0.15	0.10	0.06	0.06	0.06	0.05	0.07	0.07	0.11	0.05
ITA	0.09	0.05	0.08	0.27	0.24	0.13	0.08	0.07	0.02	0.03	0.04	0.07	0.03	0.01	0.18	0.09
GBR	0.02	0.01	0.02	0.06	0.19	0.36	0.18	0.16	0.02	0.03	0.05	0.09	0.25	0.30	0.22	0.12
JPN	0.04	0.02	0.03	0.13	0.33	0.22	0.12	0.11	0.11	0.13	0.17	0.33	0.53	0.15	0.13	0.10

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Short-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 10: Market Index and Short Term Interest Rates (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.09	0.05	0.09	0.34	0.21	0.09	0.07	0.05	0.00	0.00	0.01	0.04	0.01	0.02	0.12	0.05
FRA	0.11	0.05	0.08	0.23	0.22	0.18	0.06	0.07	0.42	0.43	0.42	0.31	0.11	0.07	0.04	0.34
CAN	0.07	0.04	0.06	0.31	0.29	0.09	0.06	0.07	0.05	0.09	0.17	0.46	0.36	0.04	0.21	0.17
USA	0.06	0.03	0.05	0.18	0.30	0.18	0.09	0.10	0.13	0.18	0.22	0.24	0.20	0.13	0.08	0.20
SWE	0.10	0.05	0.08	0.32	0.23	0.11	0.07	0.04	0.16	0.20	0.26	0.41	0.40	0.20	0.33	0.12
SWI	0.08	0.04	0.07	0.32	0.25	0.10	0.08	0.05	0.10	0.11	0.12	0.17	0.14	0.07	0.07	0.15
NLD	0.11	0.05	0.07	0.19	0.19	0.20	0.10	0.08	0.06	0.19	0.28	0.31	0.17	0.14	0.14	0.09
ESP	0.14	0.07	0.10	0.26	0.17	0.12	0.09	0.06	0.03	0.12	0.20	0.28	0.27	0.18	0.09	0.07
ITA	0.12	0.06	0.11	0.36	0.18	0.09	0.05	0.04	0.02	0.03	0.05	0.11	0.15	0.15	0.17	0.16
GBR	0.05	0.02	0.03	0.11	0.21	0.26	0.16	0.16	0.05	0.07	0.09	0.11	0.15	0.07	0.20	0.12
JPN	0.12	0.06	0.08	0.22	0.21	0.16	0.08	0.08	0.06	0.09	0.13	0.27	0.23	0.08	0.10	0.08

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Short-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 11: Relative Strength and Short Term Interest Rates (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.05	0.02	0.03	0.10	0.18	0.43	0.12	0.07	0.10	0.15	0.20	0.29	0.12	0.31	0.03	0.02
FRA	0.09	0.04	0.05	0.13	0.16	0.29	0.14	0.10	0.56	0.55	0.54	0.50	0.31	0.13	0.10	0.10
CAN	0.07	0.04	0.06	0.19	0.26	0.18	0.11	0.10	0.14	0.15	0.16	0.13	0.02	0.12	0.09	0.06
USA	0.10	0.04	0.05	0.12	0.14	0.29	0.15	0.10	0.05	0.15	0.25	0.31	0.08	0.10	0.06	0.11
SWE	0.06	0.03	0.04	0.12	0.23	0.30	0.13	0.09	0.07	0.15	0.25	0.45	0.29	0.22	0.14	0.14
SWI	0.08	0.04	0.05	0.13	0.16	0.29	0.13	0.11	0.03	0.12	0.22	0.35	0.28	0.08	0.08	0.02
NLD	0.10	0.04	0.06	0.15	0.18	0.27	0.12	0.08	0.26	0.25	0.23	0.21	0.24	0.10	0.04	0.07
ESP	0.08	0.04	0.06	0.20	0.26	0.18	0.09	0.10	0.06	0.08	0.12	0.22	0.20	0.07	0.04	0.08
ITA	0.08	0.04	0.06	0.18	0.25	0.21	0.13	0.06	0.26	0.28	0.30	0.30	0.17	0.08	0.06	0.06
GBR	0.06	0.03	0.05	0.18	0.29	0.20	0.10	0.09	0.01	0.04	0.08	0.25	0.16	0.06	0.02	0.05
JPN	0.05	0.02	0.03	0.11	0.24	0.31	0.15	0.09	0.24	0.25	0.25	0.21	0.22	0.21	0.16	0.10

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Short-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 12: Relative Strength and Short Term Interest Rates (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.13	0.06	0.10	0.27	0.18	0.12	0.09	0.06	0.09	0.29	0.48	0.42	0.17	0.07	0.05	0.08
FRA	0.09	0.04	0.06	0.18	0.20	0.21	0.13	0.09	0.71	0.71	0.70	0.59	0.28	0.14	0.22	0.17
CAN	0.12	0.06	0.09	0.26	0.20	0.14	0.06	0.07	0.18	0.26	0.36	0.38	0.26	0.31	0.09	0.09
USA	0.16	0.07	0.09	0.19	0.14	0.17	0.11	0.06	0.22	0.44	0.59	0.51	0.09	0.17	0.16	0.18
SWE	0.07	0.03	0.05	0.19	0.27	0.18	0.10	0.09	0.12	0.20	0.29	0.44	0.30	0.19	0.21	0.18
SWI	0.21	0.09	0.12	0.22	0.13	0.11	0.06	0.06	0.37	0.53	0.64	0.66	0.34	0.06	0.03	0.05
NLD	0.15	0.07	0.09	0.20	0.16	0.18	0.09	0.05	0.61	0.62	0.61	0.46	0.14	0.04	0.09	0.11
ESP	0.16	0.07	0.11	0.25	0.18	0.12	0.06	0.05	0.16	0.17	0.17	0.15	0.06	0.07	0.07	0.13
ITA	0.14	0.07	0.10	0.28	0.18	0.09	0.08	0.05	0.04	0.09	0.15	0.28	0.14	0.03	0.04	0.10
GBR	0.11	0.05	0.09	0.31	0.24	0.11	0.05	0.05	0.21	0.33	0.47	0.58	0.16	0.10	0.05	0.07
JPN	0.11	0.05	0.07	0.20	0.21	0.18	0.11	0.06	0.02	0.04	0.05	0.04	0.01	0.15	0.15	0.09

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Short-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 13: Market Index and Long-Term Interest Rates (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.07	0.03	0.06	0.23	0.26	0.15	0.13	0.08	0.01	0.01	0.01	0.05	0.12	0.03	0.07	0.20
FRA	0.07	0.03	0.05	0.20	0.26	0.18	0.10	0.09	0.36	0.40	0.46	0.62	0.31	0.09	0.18	0.21
CAN	0.06	0.03	0.05	0.25	0.33	0.11	0.08	0.08	0.10	0.14	0.20	0.38	0.36	0.10	0.19	0.28
USA	0.05	0.02	0.04	0.14	0.28	0.22	0.13	0.13	0.10	0.12	0.16	0.36	0.47	0.16	0.20	0.21
SWE	0.06	0.03	0.05	0.22	0.32	0.16	0.09	0.06	0.00	0.02	0.07	0.33	0.57	0.26	0.33	0.26
SWI	0.07	0.03	0.06	0.21	0.26	0.15	0.13	0.09	0.03	0.04	0.05	0.05	0.22	0.17	0.18	0.16
NLD	0.07	0.03	0.05	0.14	0.19	0.26	0.14	0.11	0.08	0.07	0.06	0.14	0.34	0.29	0.25	0.13
ESP	0.06	0.03	0.05	0.18	0.24	0.18	0.15	0.10	0.36	0.41	0.46	0.58	0.45	0.13	0.29	0.16
ITA	0.09	0.05	0.08	0.27	0.24	0.13	0.08	0.07	0.08	0.14	0.20	0.23	0.11	0.06	0.09	0.10
GBR	0.02	0.01	0.02	0.06	0.19	0.36	0.18	0.16	0.13	0.15	0.18	0.27	0.39	0.28	0.26	0.21
JPN	0.04	0.02	0.03	0.13	0.33	0.22	0.12	0.11	0.02	0.03	0.03	0.07	0.10	0.04	0.03	0.10

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Long-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 14: Market Index and Long-Term Interest Rates (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.09	0.05	0.09	0.34	0.21	0.09	0.07	0.05	0.02	0.03	0.04	0.15	0.33	0.13	0.10	0.28
FRA	0.11	0.05	0.08	0.25	0.22	0.16	0.07	0.07	0.42	0.51	0.61	0.74	0.41	0.14	0.17	0.36
CAN	0.07	0.04	0.06	0.31	0.29	0.09	0.06	0.07	0.15	0.30	0.47	0.75	0.63	0.12	0.22	0.31
USA	0.06	0.03	0.05	0.18	0.30	0.18	0.09	0.10	0.12	0.16	0.22	0.49	0.53	0.16	0.23	0.27
SWE	0.12	0.06	0.09	0.28	0.21	0.14	0.06	0.04	0.08	0.04	0.02	0.26	0.32	0.30	0.37	0.27
SWI	0.08	0.04	0.07	0.31	0.25	0.11	0.09	0.05	0.09	0.09	0.08	0.19	0.51	0.27	0.19	0.16
NLD	0.11	0.05	0.08	0.20	0.21	0.18	0.09	0.07	0.15	0.15	0.21	0.48	0.64	0.40	0.15	0.21
ESP	0.13	0.06	0.09	0.24	0.18	0.13	0.09	0.07	0.39	0.57	0.71	0.78	0.62	0.26	0.30	0.14
ITA	0.12	0.06	0.11	0.36	0.18	0.09	0.05	0.04	0.10	0.18	0.26	0.23	0.08	0.04	0.07	0.09
GBR	0.05	0.02	0.03	0.11	0.21	0.26	0.16	0.16	0.23	0.24	0.25	0.26	0.28	0.29	0.19	0.19
JPN	0.11	0.05	0.08	0.22	0.22	0.16	0.08	0.08	0.12	0.29	0.44	0.56	0.27	0.16	0.30	0.09

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Long-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 15: Relative Strength and Long-Term Interest Rates (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.05	0.02	0.03	0.10	0.18	0.43	0.12	0.07	0.11	0.11	0.12	0.16	0.16	0.22	0.15	0.12
FRA	0.10	0.04	0.05	0.10	0.11	0.40	0.12	0.08	0.34	0.37	0.40	0.45	0.15	0.04	0.06	0.08
CAN	0.07	0.04	0.06	0.19	0.26	0.18	0.11	0.10	0.22	0.24	0.27	0.29	0.13	0.13	0.09	0.06
USA	0.10	0.04	0.05	0.12	0.14	0.29	0.15	0.10	0.08	0.07	0.06	0.04	0.01	0.03	0.07	0.13
SWE	0.06	0.03	0.04	0.15	0.28	0.23	0.11	0.10	0.28	0.27	0.27	0.29	0.51	0.21	0.35	0.15
SWI	0.08	0.04	0.05	0.13	0.16	0.30	0.13	0.11	0.15	0.18	0.23	0.33	0.15	0.05	0.08	0.14
NLD	0.09	0.04	0.06	0.16	0.18	0.25	0.14	0.08	0.03	0.03	0.04	0.10	0.18	0.21	0.11	0.10
ESP	0.09	0.04	0.06	0.20	0.25	0.18	0.08	0.09	0.01	0.06	0.12	0.21	0.05	0.10	0.09	0.14
ITA	0.08	0.04	0.06	0.18	0.25	0.21	0.13	0.06	0.10	0.15	0.22	0.39	0.12	0.23	0.07	0.05
GBR	0.06	0.03	0.05	0.18	0.29	0.20	0.10	0.09	0.04	0.13	0.24	0.42	0.21	0.34	0.05	0.10
JPN	0.05	0.02	0.04	0.12	0.24	0.28	0.15	0.10	0.00	0.01	0.01	0.02	0.05	0.11	0.19	0.11

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Long-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 16: Relative Strength and Long-Term Interest Rates (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.13	0.06	0.10	0.27	0.18	0.12	0.09	0.06	0.03	0.14	0.27	0.33	0.03	0.08	0.16	0.14
FRA	0.15	0.07	0.09	0.21	0.16	0.16	0.09	0.07	0.22	0.35	0.48	0.57	0.10	0.04	0.09	0.15
CAN	0.12	0.06	0.09	0.26	0.20	0.14	0.06	0.07	0.13	0.23	0.34	0.43	0.17	0.16	0.18	0.12
USA	0.16	0.07	0.09	0.19	0.14	0.17	0.11	0.06	0.12	0.12	0.12	0.10	0.02	0.01	0.10	0.13
SWE	0.20	0.08	0.10	0.18	0.12	0.14	0.09	0.10	0.24	0.15	0.08	0.15	0.39	0.07	0.22	0.28
SWI	0.21	0.09	0.12	0.22	0.13	0.12	0.05	0.06	0.05	0.15	0.28	0.49	0.34	0.05	0.13	0.14
NLD	0.16	0.07	0.09	0.20	0.15	0.18	0.09	0.05	0.02	0.04	0.06	0.13	0.26	0.28	0.07	0.09
ESP	0.16	0.08	0.11	0.26	0.17	0.12	0.05	0.04	0.05	0.19	0.32	0.36	0.06	0.10	0.13	0.13
ITA	0.14	0.07	0.10	0.28	0.18	0.09	0.08	0.05	0.01	0.03	0.07	0.09	0.08	0.16	0.02	0.05
GBR	0.11	0.05	0.09	0.31	0.24	0.11	0.05	0.05	0.09	0.34	0.58	0.51	0.19	0.40	0.05	0.18
JPN	0.11	0.05	0.07	0.20	0.21	0.19	0.11	0.06	0.06	0.07	0.07	0.06	0.01	0.10	0.34	0.11

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Long-Term Interest Rates
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 21: Average Relative Phase Shift, Relative Strength and Industrial Production (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.49	-0.50	-0.50	-0.49	-0.49	-0.48	-0.42	-0.03
FRA	-0.01	-0.02	-0.02	-0.04	-0.06	-0.10	-0.17	-0.02
CAN	-0.49	-0.50	-0.50	-0.50	-0.50	-0.50	-0.48	-0.20
USA	0.00	0.00	0.00	0.00	0.00	0.01	0.04	-0.01
SWE	0.01	0.02	0.02	0.04	0.06	0.08	0.09	-0.13
NLD	-0.48	-0.47	-0.45	-0.43	-0.39	-0.33	-0.25	0.03
ESP	0.47	0.43	0.40	0.37	0.34	0.30	0.28	0.33
ITA	-0.02	-0.06	-0.08	-0.11	-0.14	-0.18	-0.21	0.08
GBR	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.07
JPN	0.03	0.08	0.10	0.15	0.20	0.27	0.22	-0.14

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 22: Average Relative Phase Shift, Relative Strength and Industrial Production (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.48	-0.47	-0.46	-0.44	-0.41	-0.36	-0.27	0.05
FRA	-0.01	-0.03	-0.04	-0.07	-0.10	-0.15	-0.18	-0.01
CAN	-0.49	-0.50	-0.49	-0.49	-0.48	-0.47	-0.41	-0.20
USA	-0.00	-0.01	-0.01	-0.02	-0.03	-0.04	0.01	0.12
SWE	0.01	0.03	0.04	0.06	0.08	0.11	0.09	0.03
NLD	-0.47	-0.45	-0.43	-0.40	-0.36	-0.31	-0.25	0.04
ESP	0.49	0.49	0.48	0.47	0.46	0.42	0.29	0.25
ITA	-0.05	-0.11	-0.14	-0.18	-0.22	-0.26	-0.29	-0.01
GBR	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.13
JPN	0.00	0.01	0.01	0.01	0.02	0.05	-0.24	-0.09

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 17: Market Index and Interest Rate Ratio (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.07	0.03	0.06	0.23	0.26	0.15	0.13	0.08	0.10	0.12	0.16	0.24	0.07	0.02	0.06	0.13
FRA	0.07	0.03	0.05	0.21	0.29	0.18	0.09	0.09	0.00	0.00	0.01	0.04	0.08	0.01	0.03	0.08
CAN	0.06	0.03	0.05	0.25	0.33	0.11	0.08	0.08	0.00	0.00	0.02	0.16	0.16	0.05	0.15	0.07
USA	0.05	0.02	0.04	0.14	0.28	0.22	0.13	0.13	0.12	0.14	0.16	0.20	0.14	0.09	0.06	0.06
SWE	0.06	0.03	0.05	0.22	0.32	0.16	0.09	0.06	0.29	0.30	0.31	0.33	0.17	0.18	0.25	0.13
SWI	0.07	0.03	0.06	0.21	0.26	0.15	0.13	0.09	0.08	0.10	0.12	0.17	0.17	0.08	0.08	0.07
NLD	0.06	0.03	0.04	0.13	0.21	0.28	0.16	0.10	0.05	0.06	0.07	0.12	0.12	0.14	0.13	0.04
ESP	0.06	0.03	0.05	0.18	0.24	0.18	0.15	0.10	0.07	0.07	0.07	0.09	0.15	0.11	0.09	0.07
ITA	0.09	0.05	0.08	0.27	0.24	0.13	0.08	0.07	0.03	0.09	0.17	0.30	0.13	0.06	0.18	0.06
GBR	0.02	0.01	0.02	0.06	0.19	0.36	0.18	0.16	0.00	0.00	0.00	0.01	0.10	0.16	0.06	0.06
JPN	0.04	0.02	0.03	0.13	0.33	0.22	0.12	0.11	0.20	0.21	0.22	0.28	0.36	0.12	0.06	0.09

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Interest Rate Ratio
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 18: Market Index and Interest Rate Ratio (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.09	0.05	0.09	0.34	0.21	0.09	0.07	0.05	0.01	0.01	0.03	0.12	0.13	0.03	0.12	0.16
FRA	0.11	0.05	0.08	0.23	0.22	0.18	0.06	0.07	0.04	0.01	0.00	0.24	0.44	0.08	0.04	0.23
CAN	0.07	0.04	0.06	0.31	0.29	0.09	0.06	0.07	0.02	0.02	0.03	0.18	0.17	0.06	0.17	0.10
USA	0.06	0.03	0.05	0.18	0.30	0.18	0.09	0.10	0.14	0.18	0.20	0.19	0.17	0.12	0.07	0.06
SWE	0.12	0.06	0.09	0.28	0.21	0.14	0.06	0.04	0.31	0.31	0.32	0.31	0.14	0.22	0.07	0.14
SWI	0.08	0.04	0.07	0.32	0.25	0.10	0.08	0.05	0.18	0.20	0.24	0.35	0.28	0.10	0.08	0.13
NLD	0.11	0.05	0.07	0.19	0.19	0.20	0.10	0.08	0.02	0.05	0.07	0.08	0.08	0.06	0.10	0.08
ESP	0.13	0.06	0.09	0.24	0.18	0.13	0.09	0.07	0.16	0.14	0.12	0.10	0.08	0.21	0.16	0.14
ITA	0.12	0.06	0.11	0.36	0.18	0.09	0.05	0.04	0.14	0.29	0.46	0.59	0.19	0.09	0.20	0.12
GBR	0.05	0.02	0.03	0.11	0.21	0.26	0.16	0.16	0.00	0.01	0.02	0.07	0.14	0.14	0.07	0.12
JPN	0.11	0.05	0.08	0.22	0.22	0.16	0.08	0.08	0.10	0.11	0.11	0.08	0.19	0.19	0.17	0.11

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Interest Rate Ratio
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 19: Relative Strength and Interest Rate Ratio (HP Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.05	0.02	0.03	0.10	0.18	0.43	0.12	0.07	0.04	0.08	0.13	0.18	0.17	0.47	0.03	0.03
FRA	0.09	0.04	0.05	0.13	0.16	0.29	0.14	0.10	0.25	0.22	0.18	0.08	0.02	0.03	0.08	0.13
CAN	0.07	0.04	0.06	0.19	0.26	0.18	0.11	0.10	0.07	0.08	0.09	0.07	0.01	0.06	0.09	0.11
USA	0.10	0.04	0.05	0.12	0.14	0.29	0.15	0.10	0.06	0.24	0.42	0.56	0.17	0.27	0.08	0.10
SWE	0.06	0.03	0.04	0.15	0.28	0.23	0.11	0.10	0.05	0.12	0.20	0.39	0.20	0.07	0.16	0.20
SWI	0.08	0.04	0.05	0.13	0.16	0.29	0.13	0.11	0.05	0.12	0.20	0.32	0.27	0.08	0.08	0.03
NLD	0.10	0.04	0.06	0.15	0.18	0.27	0.12	0.08	0.21	0.19	0.16	0.11	0.16	0.08	0.03	0.08
ESP	0.09	0.04	0.06	0.20	0.25	0.18	0.08	0.09	0.13	0.18	0.24	0.37	0.16	0.15	0.11	0.15
ITA	0.08	0.04	0.06	0.18	0.25	0.21	0.13	0.06	0.07	0.07	0.06	0.03	0.11	0.17	0.04	0.10
GBR	0.06	0.03	0.05	0.18	0.29	0.20	0.10	0.09	0.01	0.01	0.02	0.08	0.21	0.07	0.04	0.03
JPN	0.05	0.02	0.04	0.12	0.24	0.28	0.15	0.10	0.18	0.20	0.22	0.16	0.12	0.24	0.14	0.14

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Interest Rate Ratio
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 20: Relative Strength and Interest Rate Ratio (BKM Filter)

	Relative Power								Explained Power							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.13	0.06	0.10	0.27	0.18	0.12	0.09	0.06	0.04	0.16	0.29	0.28	0.15	0.19	0.06	0.07
FRA	0.09	0.04	0.06	0.18	0.20	0.21	0.13	0.09	0.53	0.53	0.51	0.40	0.37	0.19	0.32	0.15
CAN	0.12	0.06	0.09	0.26	0.20	0.14	0.06	0.07	0.14	0.21	0.29	0.37	0.31	0.33	0.11	0.13
USA	0.16	0.07	0.09	0.19	0.14	0.17	0.11	0.06	0.18	0.47	0.68	0.61	0.08	0.27	0.13	0.18
SWE	0.20	0.08	0.10	0.18	0.12	0.14	0.09	0.10	0.60	0.68	0.72	0.66	0.34	0.07	0.08	0.23
SWI	0.21	0.09	0.12	0.22	0.13	0.11	0.06	0.06	0.38	0.51	0.61	0.62	0.30	0.06	0.04	0.05
NLD	0.15	0.07	0.09	0.20	0.16	0.18	0.09	0.05	0.58	0.58	0.56	0.37	0.06	0.04	0.09	0.12
ESP	0.16	0.08	0.11	0.26	0.17	0.12	0.05	0.04	0.14	0.26	0.39	0.45	0.09	0.19	0.22	0.21
ITA	0.14	0.07	0.10	0.28	0.18	0.09	0.08	0.05	0.01	0.04	0.08	0.23	0.29	0.07	0.03	0.12
GBR	0.11	0.05	0.09	0.31	0.24	0.11	0.05	0.05	0.14	0.12	0.15	0.36	0.32	0.04	0.09	0.05
JPN	0.11	0.05	0.07	0.20	0.21	0.19	0.11	0.06	0.21	0.21	0.20	0.12	0.01	0.17	0.31	0.12

Notes:
Relative Power: Share of Total Variance; Explained Power: Share of Total Variance explained by cycles in Interest Rate Ratio
Columns (1)-(8): relative power/explained power for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 23: Average Relative Phase Shift, Market Index and Industrial Production (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.00	0.01	0.01	0.02	0.03	0.04	-0.07	-0.13
FRA	0.00	0.00	0.00	0.01	0.01	0.02	-0.11	-0.14
CAN	0.00	0.01	0.01	0.01	0.02	0.02	-0.06	-0.11
USA	0.48	0.45	0.44	0.41	0.38	0.36	-0.17	-0.32
SWE	-0.02	-0.06	-0.08	-0.11	-0.15	-0.21	-0.27	0.07
NLD	-0.02	-0.04	-0.05	-0.08	-0.11	-0.15	-0.19	-0.06
ESP	-0.02	-0.04	-0.06	-0.09	-0.12	-0.18	-0.24	-0.07
ITA	0.01	0.01	0.02	0.03	0.04	0.08	0.11	-0.22
GBR	-0.01	-0.02	-0.02	-0.04	-0.06	-0.09	-0.21	-0.32
JPN	-0.01	-0.03	-0.04	-0.07	-0.10	-0.16	-0.27	0.13

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 24: Average Relative Phase Shift, Market Index and Industrial Production (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.00	0.01	0.01	0.02	0.03	0.04	-0.07	-0.13
FRA	0.00	0.00	0.00	0.01	0.01	0.02	-0.11	-0.14
CAN	0.00	0.01	0.01	0.01	0.02	0.02	-0.06	-0.11
USA	0.48	0.45	0.44	0.41	0.38	0.36	-0.17	-0.32
SWE	-0.02	-0.06	-0.08	-0.11	-0.15	-0.21	-0.27	0.07
NLD	-0.02	-0.04	-0.05	-0.08	-0.11	-0.15	-0.19	-0.06
ESP	-0.02	-0.04	-0.06	-0.09	-0.12	-0.18	-0.24	-0.07
ITA	0.01	0.01	0.02	0.03	0.04	0.08	0.11	-0.22
GBR	-0.01	-0.02	-0.02	-0.04	-0.06	-0.09	-0.21	-0.32
JPN	-0.01	-0.03	-0.04	-0.07	-0.10	-0.16	-0.27	0.13

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 25: Average Relative Phase Shift, Relative Strength and CPI (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.03	-0.07	-0.10	-0.13	-0.16	-0.19	-0.20	0.02
FRA	-0.49	-0.50	-0.50	-0.49	-0.49	-0.49	-0.47	0.12
CAN	0.02	0.04	0.05	0.08	0.11	0.16	0.20	-0.03
USA	0.49	0.48	0.47	0.45	0.43	0.37	0.19	-0.12
SWE	-0.00	-0.00	-0.00	-0.01	-0.01	-0.02	-0.12	0.14
SWI	0.50	0.50	0.50	0.49	0.49	0.48	0.39	-0.01
NLD	0.30	0.27	0.28	0.28	0.30	0.34	0.13	-0.29
ESP	-0.01	-0.01	-0.02	-0.03	-0.04	-0.06	-0.07	0.24
ITA	-0.49	-0.49	-0.48	-0.48	-0.47	-0.45	-0.44	0.02
GBR	-0.47	-0.46	-0.45	-0.42	-0.39	-0.36	-0.34	-0.18
JPN	0.06	0.13	0.16	0.19	0.23	0.26	0.31	0.13

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 26: Average Relative Phase Shift, Relative Strength and CPI (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.47	-0.45	-0.43	-0.40	-0.35	-0.29	-0.19	-0.22
FRA	-0.48	-0.47	-0.46	-0.45	-0.45	-0.47	-0.03	-0.14
CAN	0.07	0.14	0.16	0.18	0.20	0.20	0.15	-0.13
USA	-0.49	-0.49	-0.49	-0.49	-0.48	-0.46	-0.21	-0.14
SWE	-0.00	-0.00	-0.00	-0.01	-0.01	-0.02	-0.12	0.20
SWI	-0.05	-0.11	-0.14	-0.19	-0.25	-0.35	0.18	0.03
NLD	0.05	0.11	0.14	0.18	0.22	0.27	0.30	-0.31
ESP	-0.01	-0.02	-0.02	-0.04	-0.06	-0.10	-0.22	-0.04
ITA	-0.00	-0.00	-0.01	-0.01	-0.02	-0.24	0.15	0.16
GBR	-0.48	-0.47	-0.45	-0.43	-0.40	-0.36	-0.32	-0.13
JPN	0.01	0.02	0.02	0.04	0.07	0.17	0.34	0.16

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 27: Average Relative Phase Shift, Market Index and CPI (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.43	0.36	0.33	0.30	0.27	0.25	0.20	-0.13
FRA	-0.48	-0.49	-0.48	-0.47	-0.46	-0.44	-0.43	0.01
CAN	-0.49	-0.49	-0.48	-0.48	-0.46	-0.44	-0.33	0.11
USA	-0.00	-0.00	-0.01	-0.01	-0.02	-0.03	-0.30	0.39
SWE	-0.49	-0.49	-0.49	-0.48	-0.47	-0.46	-0.41	0.20
SWI	0.49	0.47	0.46	0.44	0.42	0.39	0.36	0.22
NLD	-0.06	-0.13	-0.16	-0.19	-0.21	-0.24	-0.28	-0.22
ESP	0.50	0.50	0.50	0.49	0.49	0.48	0.46	-0.09
ITA	-0.01	-0.01	-0.02	-0.03	-0.05	-0.10	-0.06	0.06
GBR	-0.46	-0.44	-0.42	-0.39	-0.37	-0.36	-0.15	0.10
JPN	-0.48	-0.48	-0.47	-0.46	-0.44	-0.41	-0.40	-0.07

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 28: Average Relative Phase Shift,Market Index and CPI (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.48	0.45	0.43	0.40	0.35	0.29	0.20	-0.15
FRA	0.50	0.49	0.49	0.49	0.48	0.48	0.46	0.08
CAN	-0.48	-0.47	-0.46	-0.44	-0.42	-0.39	-0.41	0.15
USA	-0.02	-0.05	-0.07	-0.10	-0.16	-0.28	-0.41	0.45
SWE	-0.02	-0.05	-0.07	-0.11	-0.19	-0.31	-0.39	0.15
SWI	0.49	0.47	0.46	0.44	0.42	0.39	0.37	0.24
NLD	-0.05	-0.11	-0.14	-0.17	-0.21	-0.25	-0.37	-0.30
ESP	0.49	0.48	0.48	0.47	0.45	0.42	0.38	-0.09
ITA	-0.04	-0.08	-0.11	-0.15	-0.19	-0.28	0.23	0.07
GBR	-0.49	-0.50	-0.50	-0.49	-0.49	-0.23	0.46	0.08
JPN	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.44	-0.05

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 29: Average Relative Phase Shift, Relative Strength and Short-Term Interest Rate (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.48	-0.48	-0.47	-0.45	-0.43	-0.39	-0.33	0.24
FRA	-0.49	-0.50	-0.49	-0.49	-0.48	-0.47	-0.43	0.08
CAN	-0.49	-0.50	-0.50	-0.50	-0.49	-0.49	-0.27	-0.24
USA	-0.03	-0.07	-0.09	-0.12	-0.16	-0.19	-0.20	0.18
SWE	-0.02	-0.04	-0.05	-0.08	-0.11	-0.16	-0.21	-0.00
SWI	-0.08	-0.16	-0.18	-0.20	-0.22	-0.23	-0.23	-0.10
NLD	-0.49	-0.49	-0.48	-0.48	-0.46	-0.43	-0.34	-0.22
ESP	-0.49	-0.49	-0.48	-0.48	-0.46	-0.44	-0.40	-0.04
ITA	-0.49	-0.49	-0.49	-0.49	-0.48	-0.46	-0.44	0.04
GBR	-0.02	-0.06	-0.08	-0.12	-0.16	-0.22	-0.28	-0.13
JPN	-0.48	-0.48	-0.48	-0.46	-0.44	-0.40	-0.29	-0.07

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 30: Average Relative Phase Shift, Relative Strength and Short-Term Interest Rate (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.03	-0.08	-0.11	-0.14	-0.18	-0.22	-0.30	0.18
FRA	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.39	-0.02
CAN	0.49	0.49	0.48	0.47	0.46	0.43	0.40	-0.31
USA	-0.02	-0.04	-0.06	-0.08	-0.12	-0.16	-0.19	0.19
SWE	-0.01	-0.03	-0.04	-0.05	-0.08	-0.13	-0.20	-0.41
SWI	-0.01	-0.03	-0.05	-0.07	-0.10	-0.16	-0.24	-0.10
NLD	-0.48	-0.49	-0.48	-0.47	-0.46	-0.42	-0.36	-0.15
ESP	0.50	0.50	0.50	0.50	0.49	0.49	0.46	0.17
ITA	-0.49	-0.50	-0.50	-0.49	-0.49	-0.48	-0.47	-0.16
GBR	-0.01	-0.03	-0.05	-0.07	-0.11	-0.18	-0.28	-0.09
JPN	-0.48	-0.47	-0.45	-0.43	-0.39	-0.33	-0.23	-0.23

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 31: Average Relative Phase Shift, Market Index and Short-Term Interest Rate (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.01	0.01	0.02	0.03	0.04	0.07	0.12	-0.20
FRA	-0.49	-0.49	-0.49	-0.48	-0.47	-0.44	-0.39	0.01
CAN	-0.01	-0.03	-0.04	-0.06	-0.09	-0.15	-0.24	0.09
USA	0.50	0.49	0.49	0.48	0.48	0.46	0.46	-0.24
SWE	0.50	0.50	0.50	0.50	0.50	0.50	0.33	-0.44
SWI	0.01	0.01	0.02	0.03	0.04	0.07	0.07	-0.06
NLD	-0.01	-0.02	-0.03	-0.04	-0.06	-0.09	-0.13	-0.35
ESP	0.50	0.50	0.50	0.49	0.49	0.48	0.41	-0.04
ITA	0.49	0.49	0.48	0.47	0.46	0.43	0.38	0.24
GBR	-0.48	-0.48	-0.48	-0.47	-0.45	-0.42	-0.42	0.34
JPN	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.40	-0.15

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 32: Average Relative Phase Shift,Market Index and Short-Term Interest Rate (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.00	0.01	0.01	0.02	0.03	0.03	-0.00	-0.16
FRA	-0.49	-0.49	-0.48	-0.47	-0.46	-0.43	-0.34	-0.03
CAN	-0.01	-0.03	-0.04	-0.07	-0.10	-0.16	-0.27	0.09
USA	0.50	0.49	0.48	0.48	0.46	0.45	0.37	-0.28
SWE	0.50	0.49	0.49	0.49	0.48	0.47	0.47	-0.23
SWI	0.00	0.01	0.01	0.02	0.03	0.04	0.05	-0.04
NLD	-0.45	-0.41	-0.38	-0.35	-0.31	-0.28	-0.24	-0.24
ESP	-0.46	-0.42	-0.40	-0.37	-0.35	-0.34	-0.41	0.20
ITA	0.49	0.48	0.47	0.45	0.43	0.39	0.39	0.43
GBR	-0.49	-0.49	-0.49	-0.49	-0.48	-0.47	0.08	0.17
JPN	-0.49	-0.49	-0.49	-0.48	-0.47	-0.44	-0.39	-0.38

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 33: Average Relative Phase Shift, Relative Strength and Long-Term Interest Rate (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.38	-0.27
FRA	-0.48	-0.49	-0.48	-0.47	-0.46	-0.43	-0.38	-0.07
CAN	0.50	0.49	0.49	0.49	0.48	0.46	0.44	-0.26
USA	0.00	0.00	0.01	0.01	0.01	0.03	0.09	-0.12
SWE	-0.00	-0.01	-0.01	-0.02	-0.03	-0.06	-0.14	-0.19
SWI	-0.48	-0.48	-0.48	-0.47	-0.45	-0.41	-0.35	-0.11
NLD	-0.48	-0.48	-0.48	-0.46	-0.44	-0.39	-0.26	-0.16
ESP	0.37	0.29	0.28	0.27	0.25	0.24	0.21	0.15
ITA	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.44	-0.18
GBR	-0.46	-0.43	-0.41	-0.37	-0.34	-0.31	-0.28	0.02
JPN	0.02	0.05	0.07	0.10	0.13	0.16	0.16	-0.03

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 34: Average Relative Phase Shift, Relative Strength and Long-Term Interest Rate (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.43	-0.38	-0.35	-0.33	-0.31	-0.30	-0.31	-0.07
FRA	-0.48	-0.47	-0.46	-0.45	-0.42	-0.38	-0.32	0.18
CAN	0.49	0.47	0.46	0.44	0.42	0.37	0.33	-0.26
USA	-0.00	-0.01	-0.01	-0.02	-0.03	-0.06	-0.10	0.12
SWE	-0.00	-0.01	-0.01	-0.02	-0.03	-0.07	-0.30	0.26
SWI	-0.03	-0.07	-0.09	-0.13	-0.18	-0.23	-0.30	-0.16
NLD	0.49	0.49	0.48	0.48	0.47	0.41	-0.38	-0.18
ESP	0.46	0.41	0.39	0.35	0.32	0.29	0.27	0.07
ITA	0.50	0.50	0.49	0.49	0.49	0.49	-0.20	-0.11
GBR	-0.20	-0.24	-0.24	-0.25	-0.25	-0.26	-0.26	0.05
JPN	0.00	0.01	0.01	0.02	0.03	0.04	0.05	-0.03

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 35: Average Relative Phase Shift, Market Index and Long-Term Interest Rate (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.49	-0.49	-0.49	-0.48	-0.48	-0.45	-0.37	-0.22
FRA	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.40	-0.06
CAN	-0.01	-0.02	-0.03	-0.05	-0.07	-0.12	-0.21	-0.39
USA	-0.49	-0.50	-0.50	-0.50	-0.50	-0.49	-0.47	-0.33
SWE	-0.05	-0.12	-0.15	-0.20	-0.24	-0.30	-0.36	0.16
SWI	0.49	0.48	0.48	0.47	0.45	0.42	0.23	-0.37
NLD	-0.49	-0.50	-0.50	-0.49	-0.49	-0.47	-0.33	-0.30
ESP	-0.49	-0.49	-0.49	-0.49	-0.48	-0.47	-0.47	-0.02
ITA	-0.48	-0.48	-0.47	-0.45	-0.42	-0.38	-0.36	-0.04
GBR	-0.49	-0.49	-0.49	-0.48	-0.48	-0.46	-0.44	0.03
JPN	-0.01	-0.01	-0.02	-0.03	-0.05	-0.09	-0.17	-0.06

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 36: Average Relative Phase Shift,Market Index and Long-Term Interest Rate (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.49	0.48	0.48	0.46	0.45	0.44	-0.18	-0.26
FRA	-0.48	-0.49	-0.48	-0.47	-0.46	-0.43	-0.39	-0.45
CAN	-0.02	-0.04	-0.06	-0.09	-0.13	-0.19	-0.27	-0.39
USA	-0.49	-0.50	-0.50	-0.49	-0.49	-0.48	-0.45	-0.35
SWE	0.01	0.01	0.02	0.03	0.05	0.11	0.00	0.11
SWI	0.49	0.49	0.48	0.47	0.46	0.44	-0.08	-0.38
NLD	-0.49	-0.49	-0.49	-0.48	-0.47	-0.43	-0.32	-0.32
ESP	-0.48	-0.48	-0.47	-0.46	-0.44	-0.41	-0.41	0.03
ITA	-0.48	-0.47	-0.46	-0.44	-0.42	-0.37	-0.35	0.03
GBR	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.43	-0.48
JPN	-0.47	-0.45	-0.43	-0.40	-0.37	-0.35	-0.33	-0.19

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 37: Average Relative Phase Shift, Relative Strength and Interest Rate Ratio (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.02	0.04	0.05	0.07	0.11	0.15	0.19	-0.15
FRA	-0.00	-0.00	-0.00	-0.01	-0.01	-0.02	-0.04	0.05
CAN	0.00	0.01	0.01	0.02	0.03	0.05	0.08	0.09
USA	0.10	0.18	0.20	0.22	0.23	0.25	0.27	-0.06
SWE	0.49	0.46	0.45	0.43	0.40	0.36	0.33	0.10
SWI	0.48	0.45	0.43	0.40	0.36	0.32	0.30	0.24
NLD	0.00	0.01	0.01	0.02	0.03	0.05	0.15	0.27
ESP	0.01	0.01	0.02	0.03	0.04	0.07	0.11	-0.21
ITA	0.00	0.00	0.01	0.01	0.02	0.03	0.04	-0.14
GBR	0.49	0.48	0.48	0.46	0.44	0.37	0.22	0.19
JPN	0.01	0.02	0.02	0.04	0.06	0.10	0.18	0.00

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 38: Average Relative Phase Shift, Relative Strength and Interest Rate Ratio (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.29	0.26	0.26	0.25	0.25	0.25	0.22	-0.06
FRA	0.00	0.01	0.01	0.02	0.03	0.05	0.14	-0.02
CAN	-0.00	-0.01	-0.01	-0.01	-0.02	-0.03	0.00	0.24
USA	0.47	0.44	0.42	0.38	0.35	0.31	0.29	-0.10
SWE	0.49	0.49	0.48	0.47	0.46	0.44	0.42	-0.07
SWI	0.49	0.47	0.46	0.44	0.41	0.35	0.28	-0.14
NLD	0.01	0.01	0.02	0.03	0.04	0.07	0.15	-0.08
ESP	0.01	0.03	0.04	0.06	0.08	0.11	0.13	-0.32
ITA	0.01	0.02	0.03	0.05	0.06	0.07	0.05	-0.13
GBR	0.49	0.48	0.48	0.46	0.43	0.36	0.20	0.21
JPN	0.00	0.01	0.01	0.02	0.03	0.06	0.12	0.10

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 39: Average Relative Phase Shift, Market Index and Interest Rate Ratio (HP Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	-0.48	-0.49	-0.48	-0.47	-0.46	-0.43	-0.38	0.09
FRA	-0.48	-0.47	-0.46	-0.43	-0.41	-0.39	-0.38	-0.15
CAN	0.49	0.47	0.45	0.43	0.39	0.31	0.23	-0.16
USA	-0.01	-0.01	-0.02	-0.03	-0.05	-0.09	-0.18	0.14
SWE	-0.00	-0.01	-0.01	-0.01	-0.02	-0.03	-0.07	0.05
SWI	-0.49	-0.49	-0.49	-0.48	-0.47	-0.45	-0.44	0.23
NLD	0.50	0.50	0.50	0.49	0.49	0.48	0.47	0.18
ESP	0.50	0.50	0.50	0.50	0.49	0.49	-0.16	-0.09
ITA	-0.46	-0.43	-0.41	-0.37	-0.34	-0.31	-0.29	-0.01
GBR	0.47	0.42	0.39	0.35	0.30	0.23	0.11	-0.13
JPN	0.00	0.00	0.01	0.01	0.01	0.03	0.07	0.05

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.

Table 40: Average Relative Phase Shift,Market Index and Interest Rate Ratio (BKM Filter)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GER	0.50	0.50	0.50	0.50	0.50	-0.29	-0.43	-0.30
FRA	0.00	0.00	0.01	0.01	0.02	0.06	-0.18	-0.26
CAN	0.50	0.49	0.48	0.48	0.46	0.41	0.25	-0.16
USA	-0.01	-0.02	-0.03	-0.04	-0.07	-0.11	-0.21	0.23
SWE	-0.00	-0.01	-0.02	-0.03	-0.04	-0.08	-0.15	-0.00
SWI	-0.49	-0.49	-0.49	-0.48	-0.48	-0.46	-0.44	0.05
NLD	0.47	0.44	0.42	0.39	0.36	0.35	0.40	0.02
ESP	-0.49	-0.50	-0.50	-0.49	-0.49	-0.47	-0.37	0.18
ITA	-0.47	-0.46	-0.45	-0.42	-0.39	-0.34	-0.27	-0.05
GBR	-0.03	-0.06	-0.08	-0.11	-0.13	-0.13	-0.15	-0.25
JPN	-0.01	-0.01	-0.02	-0.03	-0.04	-0.07	-0.06	-0.01

Columns (1)-(8):
average relative phase shift for cycle lengths (1) 10-∞ years, (2) 7-10 years, (3) 5-7 years, (4) 3-5 years, (5) 2-3 years, (6) 1-2 years, (7) 6-12 months, (8) 2-6 months.