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PRESS RELEASE

Do survey indicators let us see the business cycle? A frequency decomposition

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Confidence indicators are commonly used to gain insight into the business cycle position which, in practice, is often measured by year-on-year GDP growth. Their timely availability and strong correlation with GDP growth make these indicators eminently suited to this task[1]. Nevertheless, not every movement in a confidence indicator, particularly in the sub-components, can be interpreted entirely as a change in the business cycle.

This paper discusses the extent to which the variations of confidence indicators are attributable to business cycle movements (fluctuations between 18 and 96 months), short-term movements and long-term movements, and how this affects the indicators' correlation with year-on-year GDP growth .

To achieve the division into different frequency components, the paper uses the Baxter-King filter, which enables a quasi-exact and additive decomposition of the series. The analysis is applied to the confidence indicators of the European Commission for the countries in the euro area and to the indicators from the Bank's monthly business cycle survey for Belgium.

On average, the confidence indicators are determined primarily by business cycle movements. However, they are also driven to a significant extent by long-term fluctuations and, to a lesser extent, by short-term movements. Nonetheless, the results differ greatly from one indicator to another. Thus, the general confidence indicators (NBB overall synthetic curve, EC economic sentiment indicator) are mainly determined by business cycle variations, whereas the confidence indicators for trade are strongly affected by short-term movements and the construction indicators by long-term fluctuations. The paper also shows that, just like the confidence indicators, year-on-year GDP growth is affected not just by business cycle fluctuations but also by long-term movements and, to a lesser extent, short-term movements.

Given the presence of movements regarding the short-term, business cycle and long-term frequency in year-on-year GDP growth and the survey indicators, the overall correlation between them depends on the correlation at these different frequencies and the weight of these frequencies in the variance of both the indicators and GDP. The following facts emerge:

- short-term or irregular movements affecting the indicators are predominantly idiosyncratic, i.e. weakly correlated with the short-term component of GDP growth. Therefore, a large weight of the short-term component in the variance of a survey indicator is detrimental to its overall correlation with GDP growth;

- at the business cycle frequency, the correlation is strong, and furthermore, it tends to increase with the weight of the business cycle component in the indicator. As such, the larger this weight, the stronger the overall correlation of the indicator with GDP growth;

- the correlation between the indicators and GDP growth is on average strongest at the long-term frequency. However, in some cases the long-term movements contained in the indicators are idiosyncratic with respect to those in GDP growth.

These findings provide some evidence why certain confidence indicators are better correlated with GDP growth than others. Indicators that are well correlated, such as general confidence indicators (NBB overall

[1] Besides the correlation, the Bank's indicators also owe their success to their leading nature with respect to the indicators for the euro area, see WP 12.

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synthetic curve, EC economic sentiment indicator) and industry indicators, generally contain a large business cycle component and a significant long-term component. Indicators that are less well correlated, on the other hand, are often heavily influenced by a short-term component (e.g. trade confidence indicator) or an idiosyncratic long-term component (e.g. construction confidence indicator).

In general, the results of the NBB survey indicators for Belgium and the average results for the euro area countries based on the EC survey indicators are similar, albeit with a number of small differences. While the services confidence indicator in Belgium displays a relatively high correlation with GDP growth due to its large business cycle component, this does not apply equally to the euro area as the corresponding services indicator is more prone to short-term variations which weaken its correlation with GDP growth. On the other hand, in Belgium the construction indicator is somewhat less well correlated with GDP growth due to a stronger long-term cycle.

Finally, an application of the frequency decomposition to the NBB smoothed business survey series shows that the simple statistical smoothing technique applied by the NBB to the gross indicators successfully eliminates the undesirable short-term variation, thereby producing indicators which are more useful for business cycle analysis. In addition, the NBB smoothing technique is an efficient tool, given that the data loss (four months) remains limited compared to the more complex and exact filters, such as the Baxter-King filter.

The findings of this paper can be used to improve the interpretation of certain confidence indicators, in order to obtain a more accurate analysis of the business cycle. They are also important for controlling the quality of the business cycle indicators and, in future, it may be possible to use them to revise the indicators.