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## PRESS RELEASE

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### **A generalised dynamic factor model for the Belgian economy Useful business cycle indicators and GDP growth forecasts**

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This paper contributes to the business cycle analysis by empirically modelling the business cycle as a common fluctuation underlying the movements of numerous macroeconomic indicators, according to the definition of Burns and Mitchell found in the literature.

Thanks to advanced statistical methods, the generalised dynamic factor model developed by Forni, Hallin, Lippi and Reichlin (2005), used in this paper, can extract this underlying common variation from a great number of variables in an optimal way. Every variable reacts differently to this variation, both in terms of extent and timing. As such, the model splits each indicator into a common component, driven by the underlying fluctuation, and a specific component. The larger the first component, the more accurately the indicator is related to the cyclical movement.

Furthermore, it also allows to assess the cyclical relationships between the various variables. Therefore, the time lag between the cyclical movements of the various variables is measured. Considering the great importance attached to GDP by macroeconomists, it is verified for all variables whether they are leading, lagging or coincident with respect to Belgian GDP. Finally, the model also enables to generate forecasts for GDP, using each indicator's common component.

This methodology has been applied to a data set of 509 macroeconomic indicators for Belgium, over a period from the first quarter of 1990 up to and including the third quarter of 2003. The data set does not only include national indicators, since international indicators can also provide information regarding the Belgian economy, owing to the latter's openness.

The results reveal that the *European Commission's economic sentiment indicator for Belgium* and the *Bank's overall synthetic indicator* are among the most valuable business cycle indicators, since their movements are driven to a great extent by the common variation of the data set.

Next, the paper examines how the various indicators behave with respect to Belgian GDP. 22% of the indicators are found to be leading with respect to GDP. Amongst the confidence indicators with the highest lead, we find the *ISM indicators* and the *OECD indicators* for the US and the UK. Furthermore, a great number of financial variables is classified as leading, especially the exchange rate and the stock market developments, which appear to lead GDP by as much as 2 to 3 quarters. It should be pointed out, however, that this classification occurs on the basis of the common component of the variables, which in some cases relates to only a very small fraction of the overall movement of the series, since quarter-on-quarter movements are typically characterised by a very strong idiosyncratic behaviour.

Furthermore, Belgian business confidence is generally found to coincide with Belgian GDP, whereas consumer confidence turns out to be lagging. The model also confirms the documented leading behaviour of Belgian business confidence with respect to euro area confidence indicators and GDP. From the mutual relationships, it can be concluded that this leading behaviour is mainly attributable to the fact that Belgian economic activity leads that of the euro area.

Lastly, the model is used in order to forecast GDP's quarter-on-quarter growth over a forecasting horizon of three quarters on the basis of the common variation of the series. However, the results show that the quarter-on-quarter growth rate of GDP is subject to a considerable forecasting error as a result of strong idiosyncratic movements.

The paper contributes to the dynamic factor model literature by demonstrating that this idiosyncratic component can be reduced through a selective data reduction process. However, this reduction does not lead to significantly improved forecasting results.

In spite of its moderate forecasting results, the model does complement the structural macroeconomic models for assessing short-term economic developments, in particular since it offers a framework allowing to mutually compare the importance of various macroeconomic indicators.