# ECONOMIC AND MONETARY DEVELOPMENTS

Output, demand and the labour market

# Box 7

# EURO AREA SECTORAL VALUE ADDED GROWTH AND THE PURCHASING MANAGERS' INDEX

Timely and accurate information on sectoral real value added growth is important in assessing the sectoral driving forces of economic growth in real time. However, national accounts data on real value added are only available with a lag. The reporting lag is about two months after the end of the reference period, and so the data are usually released about two weeks later than the first estimate for real GDP. This box focuses on gross value added, i.e. GDP minus taxes on products plus subsidies on products. Unlike GDP, gross value added can be broken down by economic sector. The box considers the use of surveys and, more specifically, the information on business conditions provided by the Purchasing Managers' Index (PMI) survey in determining current real gross value added growth at the sectoral level. PMI survey data are released immediately after the reference period.

# **Opinion surveys: PMI**

Survey indicators are closely monitored as they can provide up-to-date and often unique monthly signals of current economic developments. One feature of the PMI, not shared by survey data released by the European Commission, is that it is straightforward to interpret given its theoretical



"no-change" threshold of 50.<sup>1</sup> Moreover, it has extensive worldwide coverage.

For current value added growth at the sectoral level, i.e. for services, manufacturing and construction, purchasing managers' responses to PMI survey questions on business conditions relative to the previous month are particularly relevant. Private sector services firms respond on business activity and manufacturing and construction firms on output, stating whether there has been an improvement, no change or deterioration. The PMI output indices measure how widespread output changes are across firms but not whether they are large or small, given the qualitative nature of PMI surveys.

Markit, the financial information services company compiling the PMI surveys for euro area countries, also releases a composite output index, based on the services business activity index (covering about 40% of euro area gross value



Note: a value of 50 indicates "no change" relative to the previous month.

added in 2013) and on the manufacturing output index (covering about 15% of euro area gross value added in 2013). The PMI composite output index excludes developments in non-manufacturing industries, construction, trade (retail and wholesale) and public sector services. Besides the four PMI indices mentioned above, Markit also releases a retail PMI for the euro area retail sector.

Chart A plots the PMI output/business activity series for the euro area. The chart shows that the euro area services business activity index and the manufacturing output index generally move in parallel and follow a pattern which is similar to that of the composite output index. The main exceptions are during severe downturns when the manufacturing PMI output declines more than the services PMI business activity. The PMI construction output index exhibits more differentiated dynamics.

### **Real value added growth**

In order to link quarter-on-quarter growth in sectoral real value added to the respective PMI index it is useful to look at a quarterly average of the monthly PMI. A simple quarterly average turns out to perform empirically as well as a theoretically more correct quarterly average which

<sup>1</sup> For euro area empirical evidence on the usefulness of the PMI in predicting current output growth, see, among others, Lombardi, M. J. and Maier, P., "Forecasting economic growth in the euro area during the Great Moderation and the Great Recession", *Working Paper Series*, No 1379, ECB, September 2011 and, for the usefulness of European Commission surveys, see Raffinot, T., "A monthly indicator of GDP for Euro-Area based on business surveys", *Applied Economics Letters*, Vol. 14, issue 4, May 2007, pp. 267-270. For a comparison of the PMI composite output index as well as the European Commission's Economic Sentiment Indicator and current euro area real GDP quarter-on-quarter growth, see Chart 26 in Section 4.



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takes into account that the PMI output indices measure output changes relative to the previous month and, thus, measure month-on-month changes rather than quarter-on-quarter changes.<sup>2</sup>

Charts B to E plot real gross value added growth together with the PMI composite output index and the respective PMI for the services, manufacturing and construction sectors. The y-axes of the four charts differ, illustrating the different cyclicality of the sectors. Services value added growth is comparatively acyclic and, owing to its importance, determines to a large extent the growth pattern for total value added growth. Manufacturing is highly cyclical and construction lies between the two in terms of cyclicality.

Chart B shows that the quarterly PMI composite output index is a generally reliable tracker of current real value added quarter-on-quarter growth, with the main exception being the sharp drop in the first quarter of 2009.<sup>3</sup> For comparison purposes, real GDP growth is also plotted, as there can be some differences between the two growth rates.<sup>4</sup> It is important to bear in mind that value added and real GDP are revised over time, whereas this is generally not the case for survey data. These revisions are typically not negligible. For example, the average absolute revision (latest data compared with the first estimate) in quarter-on-quarter growth of real GDP in the euro area between the first quarter of 2003 and the last quarter of 2010 is 0.2 percentage point.<sup>5</sup> For the



# Chart C Real services value added and services PMI business activity

(quarter-on-quarter percentage changes; quarterly average of monthly diffusion index)





Sources: Eurostat and Markit. Note: Q1 2014 observation is based on Eurostat's flash estimate for March. Sources: Eurostat and Markit. Note: Q1 2014 observation is based on Eurostat's flash estimate for March.

2 A simple average takes 1/3 for each month of the quarter. The weighting scheme for a theoretical correct average is 1/9, 2/9, 3/9, 2/9, 1/9 for the second and third months of the previous quarter and for the first, second and third months of the current quarter, respectively.

For a detailed description of the reliability of surveys up to September 2008 including a comparison with previous periods of financial turmoil, see the box entitled "The reliability of survey data during periods of financial turmoil", *Monthly Bulletin*, ECB, November 2008.
For more details, see the box entitled "What is behind discrepancies between growth in GDP and gross value added?", *Monthly Bulletin*, ECB, December 2003.

5 See "Revision fact sheets on the reliability of first estimates for GDP and expenditure components in the euro area", ECB, February 2012 (available on request).



first quarter of 2014, the PMI composite output index indicates a pace of growth broadly similar to that observed in the previous quarter, marking the fourth consecutive quarter of positive real total value added growth. Both services (Chart C) and manufacturing (Chart D) contribute to these positive developments. The services PMI business activity index shows growth in services value added for the first quarter of this year to be similar to that in the previous quarter. Further growth in real value added in the first quarter is also indicated by the PMI manufacturing output index. The PMI construction output index suggests slightly negative real construction value added growth for the first quarter of this year (Chart E). However, construction value added growth is comparatively erratic, in part because of its sensitivity to weather conditions.

Looking at the PMI indices as a tracker for current sectoral value added growth, the performance of construction PMI output is, albeit significantly informative, comparatively poor compared with manufacturing PMI output and services PMI business activity. This can be explained by volatile value added growth in the construction sector and the PMI coverage at the euro area level. The PMI for euro area construction covers Germany, France and Italy; the PMI for euro area services additionally covers Spain and Ireland; and the PMI for euro area manufacturing additionally covers Austria, Greece and the Netherlands.

In sum, the PMI output and business activity indices appear to be useful for tracking real value added growth and provide valuable input in assessing the sectoral driving forces of economic growth. For the first quarter of this year, the PMI composite output index suggests a pace of growth broadly similar to that observed in the last quarter of 2013, marking the fourth consecutive quarter of positive real total value added growth and pointing to a continuation of the recovery. At the sectoral level, the latest PMI indices indicate that euro area real value added growth is strongest in the manufacturing sector, followed by services, whereas the construction sector is lagging.

#### Chart D Real manufacturing value added and Chart E Real construction value added and manufacturing PMI output construction PMI output (quarter-on-quarter percentage changes; quarterly average of (quarter-on-quarter percentage changes; quarterly average of monthly diffusion index) manufacturing real value added (left-hand scale) construction real value added (left-hand scale) construction PMI output (right-hand scale) manufacturing PMI output (right-hand scale) . . . . . 3.00 70 6.0 70 4.5 65 2.25 65 3.0 60 60 1.5 55 1.50 50 0.0 0.75 55 -1.5 45 -3.0 40 0.00 50 -4.5 35

30

25

20

15

10

monthly diffusion index)

2006

2008

2010

2012



Note: Q1 2014 observation is based on January and February.

FCR Monthly Bulletin April 2014

-6.0

-7.5

-9.0

-10.5

-12.0

2000

2002 2004

Sources: Eurostat and Markit