Box 1. Labour productivity and the business cycle in Romania

It is a widely accepted view that labour productivity is pro-cyclical, rising during expansions and falling during contractions (Biddle, 2014). The main explanation given in the literature lies in the prevalence of factor hoarding among economic agents as their response to a demand-side shock. This implies relying more on the intensive margin (i.e. the degree of utilisation of production factors) in order to adapt to the new (favourable or restrictive) demand conditions than on the extensive margin, which involves factor adjustment via job creation/job destruction and/or an increase/a decrease in capital, strategies deemed costlier. Thus, the pro-cyclicality of productivity entails the underutilisation of production factors during recessions and their overutilisation during expansions. Nevertheless, in certain countries such as the USA (Fernald, 2015) or Spain (Jalón, 2017) the pro-cyclicality of productivity shows signs of waning (and even reversing), as economic agents prefer to adjust labour quantity, once labour markets have gradually become more flexible, given that capital is harder to adjust over the short term. The pursuit of such a strategy is also suggested by the more stable developments in the degree of factor utilisation.

Chart A. GDP and labour productivity

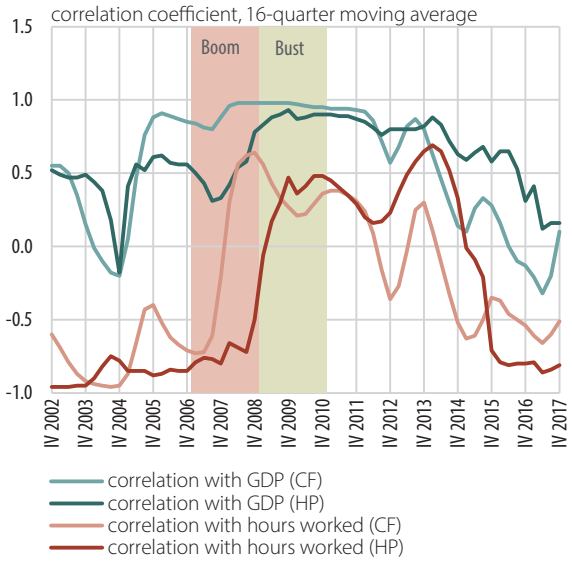
Source: NIS, NBR calculations

As shown in Chart A, in Romania there is a strong correlation between the growth rate of labour productivity and that of GDP, with slightly diverging trends having emerged however over the recent period. In this context, the box aims to assess the cyclical behaviour of labour productivity in the domestic economy, whether there are signals suggesting changes in the said behaviour and which are the potential determinants of such developments.

Building on the model of Galí and van Rens (2014), the assessment of the cyclicality of labour productivity in Romania was conducted based on rolling correlations over longer time periods between the cyclical component of labour productivity (calculated as a ratio of GVA to the number of hours worked by the persons employed) and that of GDP (a measure of output), as well as that of hours worked (a measure of input) respectively. Given the small size of the sample of available data (1999 Q1 – 2017 Q4), the window for the calculation of correlations was set at only 4 years. Two filtering techniques were used to isolate the cyclical component of each indicator: the Christiano-Fitzgerald band-pass filter, with a frequency band of 6 to 32 quarters, and the Hodrick-Prescott filter, with $\lambda = 1{,}600$. The data series concerning GVA and GDP were extracted from national accounts statistics, while the data on the persons employed and the number of hours actually worked from the Household Labour Force Survey.

The most relevant stages of the business cycle for assessing how firms adjust to demand-side shocks in terms of labour productivity are the peak and the trough. As far as labour is concerned, companies will start to hire at a fast pace during expansions, paying less attention to workers' skill level and thus reducing average productivity per employee/to easily lay off surplus staff during recessions, generating productivity gains per employee (counter-cyclical behaviour), or will keep their payrolls relatively stable over the entire cycle and opt for adjusting their degree of utilisation (pro-cyclical behaviour). Thus, the distinction between the two types of behaviour will be made more easily in the extreme points of the business cycle.

Chart B. Cyclical correlations



Source: NIS, NBR calculations and estimates

Table A. Change in cyclical behaviour of labour productivity

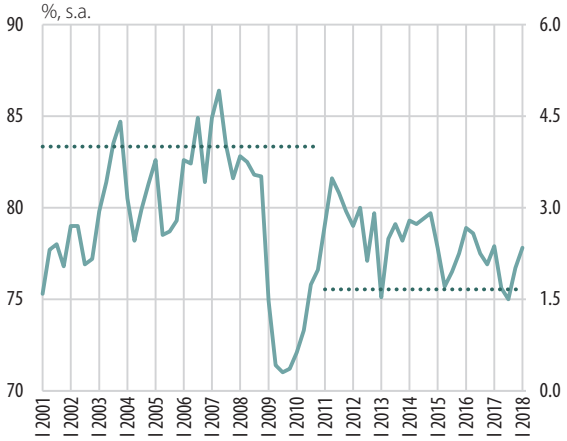
	Correlation with output			Correlation with input		
	1999 Q1 – 2010 Q4	2011 Q1 – 2017 Q4	diff.	1999 Q1 – 2010 Q4	2011 Q1 – 2017 Q4	diff.
CF	0.86	0.25	-0.61	-0.07	-0.39	-0.32
HP	0.84	0.62	-0.22	0.14	0.02	-0.12

Source: NIS, NBR calculations and estimates

The dataset available for Romania covers a single full business cycle, the results confirming the pro-cyclicality of labour productivity at the peak of expansion (2007-2008) and during the subsequent severe recession (2009-2010) respectively (Chart B). The slower pace of contraction in labour input during the crisis as compared with that in economic activity (Table A) is indicative of the prevalence of labour hoarding, which translated into a stronger pro-cyclicality of labour productivity.

A potential change in the degree of pro-cyclicality of labour productivity may only be assessed at the end of the current business cycle (which is in the expansion stage at present), hence after the peak is reached and recession ends. Nevertheless, the weaker correlation between the two variables as of 2014 and particularly the substantial decline in the variability of the factor utilisation rate in industry in the post-crisis period (Chart C), a broad-based trend among the main industrial groupings, suggest a reduction in the pro-cyclicality of labour productivity in Romania. One of the key factors that might explain this trend reversal is the enhanced flexibility of the labour market, which was probably driven by the changes introduced by the new Labour Code and the Law on Social Dialogue in 2011, via measures such as the increase in the probationary period, the extension of the duration of fixed-term contracts, the possibility of a reduction in working hours, the elimination of the national collective bargaining agreement, etc. As a matter of fact, a recent survey conducted by Deloitte Legal in 2018 shows that Romania currently ranks among the countries with the lowest dismissal costs in Europe. The downward trend in the pro-cyclicality of aggregate productivity was also probably favoured by the larger share of the tertiary sector, where factor utilisation is generally more stable and firms prefer the extensive margin for adjustment. Looking ahead,

Chart C. Capacity utilisation rate in industry: lower volatility



Note: The standard deviation for 2001-2010 and for 2011-2018 respectively is shown by the dotted line on the right-hand scale.

Source: EC-DG ECFIN, NBR calculations

higher investment spending on intangible assets, such as research and development expenditure, which is typically made during booms, might also diminish the pro-cyclicality of productivity, as it implies costs that have null or negative effects on productivity at the time they are incurred, but provide benefits in this respect over the longer term.

Even though the small set of available observations does not allow drawing a certain conclusion, the pro-cyclicality of labour productivity in Romania seems to have waned recently. In so far as the trend is confirmed, the following recession is likely to be accompanied by less severe contractions in labour productivity, concurrently with the adjustment of the activity of economic agents along the extensive margin.

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