EDITORIAL

EUROZONE: INFLATION THROUGH THE LENS OF BUSINESS SURVEYS - THE CASE OF INDUSTRY

Each quarter, the European Commission asks companies about the factors limiting their production: insufficient demand, supply constraints (labour market, shortage of material and/or equipment) and a financial factor. The survey can help in getting a better understanding of the inflation drivers. A quantitative model of producer price inflation suggests that the pace of disinflation will be slow considering that, contrary to the demand factor, which is close to its long-term average, supply factors in industry continue to act a constraint on production far more than is the case normally. Although the analysis was conducted in terms of producer price inflation, given its close relation with consumer price inflation (HICP) in the Eurozone , the conclusions are also relevant for the latter.

Each quarter, the European Commission asks companies about the factors limiting their production. It thereby distinguishes between demand, supply (labour market bottlenecks, shortage of material and/or equipment) and financial factors[1]. Chart 1 shows the z-score of the survey results, based on data going back to 1985, except for the financial factor, where data are only available as of the first quarter of 2002[2]. Historically, and up until 2019, demand as a factor limiting production has fluctuated more than labour or shortage of material and/or equipment. This suggests that over this period, swings in demand have played a dominant role in Eurozone business cycles, especially during the two successive crises of 2008 and 2011. The chart also illustrates the unique nature of the Covid-19 shock and its aftermath. In a first stage, weak demand due to lockdowns was weighing on production, but soon supply factors (labour, material and equipment) became the binding constraint whereas demand picked up again on the back of income support measures and the lifting of restrictions on mobility. This implied that the Eurozone economy, as well as many other countries, were facing the combination of a positive demand and a negative supply shock, with the well-known consequences in terms of inflation. It is clear from chart 2 that 2021 and 2022 were a 'perfect storm' for producer price inflation with elevated demand[3], labour market bottlenecks, a shortage of material and equipment –supply disruption related to the pandemic and, in 2022, the war in Ukraine - as well as an accommodating financial environment. Focusing on the latest Eurostat inflation data and the European Commission's survey results, one notices a big decline in producer price inflation[4] and a softening of the demand situation: the percentage of companies reporting that demand is constraining their production is on the rise, albeit from a very low level. After having increased significantly, in line with the rise in interest rates, the financial factor is weighing less on production than previously, although more than average over the long term. Finally, supply constraints (labour, material and equipment) have eased as well whilst remaining well above the historical average.

EUROZONE INDUSTRY: FACTORS LIMITING THE PRODUCTION

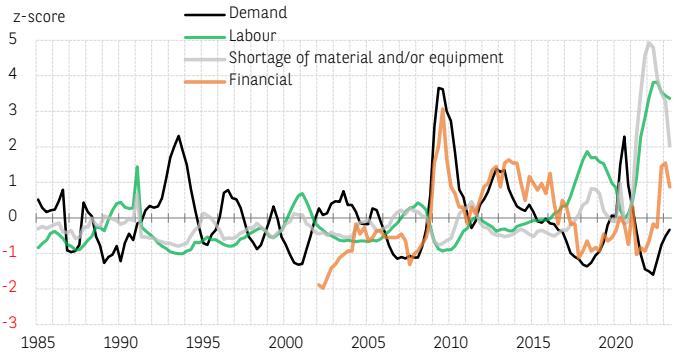

CHART 1

SOURCE: EUROPEAN COMMISSION, BNP PARIBAS CALCULATIONS

Table 1 presents the results of a univariate regression analysis with annual producer price inflation as the dependent variable and the four factors that may limit production as explanatory variables. The first part shows the results for the full data set whereas the second part is limited to the pre-Covid era. All variables are significant, except for the financial factor in the full data set, and all coefficients have the expected signs. When using the full data set –the first part of the table – labour as well as material and equipment are hugely significant and the respective R^2s are a lot higher. It shows the role of supply factors in the evolution of inflation since the pandemic.

1The question is formulated as follows: "What main factors are currently limiting your production? None; insufficient demand; shortage of labour force; shortage of material and/or equipment; financial constraints; other factors." Source: European Commission, The Joint Harmonised EU Programme of Business and Consumer Surveys User Guide, January 2023.
2 The volatility of the survey data differs, so to facilitate the comparison, data have been transformed into a z-score.
3 In chart 2 the demand series from the European Commission has been transformed by subtracting the survey results from 100. A high number corresponds to elevated demand, which does not act as a constraint on production. This introduces a positive correlation between demand and inflation, which facilitates the interpretation of the chart.
4 On a quarterly basis, producer prices were virtually stable in the fourth quarter of 2022 and declined 3.6% in the first quarter of this year.

> A quantitative model of producer price inflation suggests that the pace of disinflation will be slow considering that supply factors in industry continue to act a constraint on production far more than is the case normally.

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However, the mostly low R²s, particularly in the pre-Covid-19 period, remind us that only using one explanatory variable leaves a lot of the variation in producer price inflation unexplained. A multivariate regression yields a better result with an R² of 0.79 for the full sample and 0.50 for the pre-Covid-19 period[5].

These results can help in assessing the future evolution of producer price inflation. Based on the multivariate model, one would expect annual producer price inflation of 2.7% if the three explanatory variables are at their long-term average. In the second quarter of this year, the demand factor was very close to its long-term average (respectively 27 and 30) whereas the gap was still considerable for labour and material/equipment as constraints weighing on production (respectively 25 versus 7 and 28 versus 9). This would suggest that supply factors will continue to underpin producer price inflation for some time to come. There is an important caveat however: the R²s show that a significant part of inflation is not explained by the model, so perhaps other factors could act as a disinflationary force. Clearly, this begs the question of what these other factors might be. This all means that in the current environment inflation forecasts are surrounded by a high degree of uncertainty with a clear risk of disinflation being slower than hoped for. Although the analysis for the Eurozone was conducted in terms of producer price inflation, given its close relation with consumer price inflation (HICP)[6] , the conclusions are also relevant for the latter.

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EUROZONE INDUSTRY: FACTORS LIMITING THE PRODUCTION AND PRODUCER PRICE INFLATION

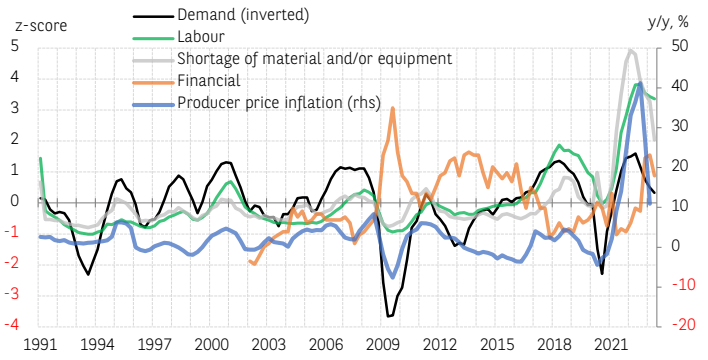

CHART 2

SOURCE: EUROPEAN COMMISSION, EUROSTAT, BNP PARIBAS CALCULATIONS

PRODUCER PRICE INFLATION: UNIVARIATE REGRESSIONS

Data range	1991Q1-2023Q1				1991Q1-2019Q4			
Dependent variable: producer price inflation (y/y)	Factor limiting production							
	demand	labour	material and equipment	financial	demand	labour	material and equipment	financial
R Square	0.21	0.52	0.76	0.04	0.24	0.04	0.34	0.25
coefficient	0.00	0.01	0.01	-0.02	0.00	0.00	0.01	-0.01
t statistic	5.78	11.74	20.20	-1.80	6.04	2.25	7.65	-4.83

TABLE 1

SOURCE : EUROSTAT, EUROPEAN COMMISSION, BNP PARIBAS CALCULATIONS

5 In the multivariate regression the financial factor was left out because it was not significant.
6 Based on monthly data since 1991, a regression of annual consumer price inflation as a function of annual producer price inflation has an R² of 0.75. Based on this equation, when producer price inflation is at its long-term average of 3.0%, consumer price inflation should be a 2.0%.