

Box I.2.2: Member States' vulnerability matrix

Reflecting geographical proximity and important trade links, the war in Ukraine weighs on the European economy more severely than on other major economies, such as the US or China. In turn, within the EU, Member States have different degrees of exposure to some of the channels of transmission of the impact of the war described in Chapter 1 and Table I.1.1 – namely, the channels for trade, commodities and financial markets. By ranking Member States by degree of exposure to 13 dimensions of vulnerability, the matrix presented in this analysis has supported the assessments of the economic outlook for the EU Member States that are presented in this forecast. An *unweighted* average of the 13 rankings provides a rough indication of the overall position of a Member State vis-à-vis the others.

The energy part of the matrix includes energy intensities (total, for gas and for Russian gas) as well as a measure of dependency on Russian gas and two indicators of household budgets' exposure to energy prices. The total energy intensity of an economy refers to the amount of all energy (oil, gas, coal and other), expressed in *TeraJoules*, that is used in the generation of value added. It reflects the structure of the economy, most notably the prevalence of energy-intensive services and industries, such as air transport, manufacturing of petroleum products or basic metals. The other two intensity metrics focus on, respectively, the use of gas and of Russian gas only. The trade and value chains part of the matrix looks at various measures of trade linkages with Russia, Ukraine and Belarus. This includes exposure through direct trade shares in gross goods and services exports (to all three countries), as well as exports of travel services (to Russia only), or more complex value-chains links from the exports and non-energy imports based on the most recent input-output tables (for Russia only). Finally, the asset part looks at two types of asset exposure.

The Baltic and Eastern and Central European countries emerge as the most vulnerable Member States, largely due to the high energy intensity of their economies and the importance of Russia in trade, particularly for imports of gas. Cyprus also appears significantly exposed to the fallout from the war, due to the high share of its services' exports to Russia and the high value of Russian assets held by its residents. Among the large EU

Member States, Poland appears most vulnerable, largely reflecting its relatively high trade exposure and the importance of energy in the households' consumption basket. Netherlands, Germany and Italy follow, with an exposure that is broadly in line with the EU average. For the Netherlands, the vulnerability largely relates to assets and households' vulnerability to high energy prices, while for Italy and Germany it reflects a combination of the importance of Russian gas imports in gross available energy, asset exposure and households' vulnerability. Finally, France and Spain emerge, on average, as the least exposed large EU Member States. Portugal and Malta close the ranking.

Methodology and sources:

1) Total energy/gas/Russian gas intensity (columns 1-3) is defined as the ratio of total energy/gas/Russian gas to GVA that is embodied in the global value chains of products purchased by residents for final use (i.e. consumption, investment and inventories), including through intermediate inputs, independently of where they were produced. The ranking for Russian gas intensity (column 3) may differ from that based on the share of Russian gas in total available gas (column 4) because (i) the former includes a range of intermediate goods for which Russian gas may not be so relevant along the value chain of the final use product, and (ii) even high values of the latter may not translate into high intensity if gas is less important for generation of the value added compared to other energy sources. Source: *JRC calculations based on World Input-Output Database Environmental Accounts. Update 2000-2016 and Eurostat 2019 FIGARO EU inter-country supply, use and input-output tables*

2) The ratio of Russian gas imports to total available gas reflects the extent to which Member States rely on gas imported from Russia. Total available gas is calculated as imports + domestic production – exports + stock changes. A ratio above 100% indicates that the country re-exports part of the Russian gas it imports, as is the case for e.g. Hungary. Data refer to 2020. For the countries that do not report imports from Russia in their gas statistics or import Russian gas from other Member States, the following assumptions are made by the Eurostat:

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Box (continued)

Table 1:
Vulnerability matrix

AREA OF EXPOSURE	ENERGY						TRADE AND VALUE CHAINS					ASSETS	
	Total energy intensity ¹	Total gas intensity ¹	RU Gas intensity ¹	Ratio of RU gas in gross available gas ²	Energy weight in the HICP consumption basket ³	Contribution of energy to annual HICP inflation ³	Direct goods exports to RU, UA and BY ⁴	Direct services exports to RU, UA and BY ⁴	Travel services exports to RU ⁵	Domestic VA embodied in exports to RU ⁶	Non-energy RU import content in final demand ⁷	Total exposure to RU assets ⁸	Banks' consolidated exposure to RU assets ⁹
	as % of GVA (TJ/EURm)	as % of GVA (TJ/EURm)	as % of GVA (TJ/EURm)	RU gas imports as % of total gross available gas	% of total expenditures	pps., 2022-Q1 average	as % of GDP					as % of GDP	
LV	8.1	2.1	1.7	100.1	16.2	3.4	7.8	2.2	0.1	1.0	2.6	2.7	-
EE	10.4	1.5	1.1	86.5	15.9	5.8	3.5	1.8	0.1	0.8	2.3	3.7	-
BG	13.1	2.0	1.2	72.8	13.4	3.1	1.4	1.4	0.1	0.7	1.4	1.0	-
LT	6.8	1.7	1.0	50.5	12.8	5.3	12.5	3.9	0.1	1.0	1.8	0.9	-
CZ	8.0	1.4	0.9	86.0	11.7	3.2	2.3	0.8	0.0	0.7	0.8	1.0	-
SK	9.0	1.8	1.2	75.2	15.1	2.5	2.3	0.7	0.0	0.7	1.0	0.4	-
HU	7.3	1.8	1.4	110.4	11.3	1.2	3.3	0.5	0.0	0.6	0.7	1.3	-
PL	8.4	1.3	0.6	45.5	14.5	2.8	3.0	0.9	0.0	0.6	0.8	0.3	-
SI	7.2	1.1	0.5	81.0	13.2	2.3	2.4	0.3	0.0	1.2	0.6	1.6	-
CY	8.0	1.0	0.4	0.0	9.7	2.5	0.3	12.6	1.9	2.8	2.2	713.3	-
FI	6.6	0.9	0.6	92.4	9.5	2.5	1.7	0.5	0.0	0.9	0.9	2.1	0.0
HR	6.6	1.2	0.6	55.0	13.2	1.7	0.5	0.5	0.1	0.5	0.6	0.1	-
EL	7.9	1.1	0.4	38.9	11.5	3.9	0.3	0.6	0.1	0.3	0.6	0.0	0.1
NL	4.2	1.2	0.4	35.8	11.3	5.8	1.2	0.3	0.0	0.4	0.3	11.6	0.7
EU	5.1	1.0	0.4	41.1	11.3	3.3	0.9	0.3	0.0	0.4	0.4	3.4	-
DE	4.3	0.9	0.4	58.9	12.1	3.0	1.0	0.1	0.0	0.5	0.4	1.0	0.2
IT	4.4	1.1	0.4	40.4	9.7	4.0	0.6	0.1	0.0	0.4	0.4	1.2	1.2
AT	4.3	0.9	0.4	58.6	8.7	2.3	0.7	0.3	0.0	0.5	0.4	3.0	3.7
BE	5.2	1.4	0.3	7.9	10.7	6.2	1.1	0.1	0.0	0.4	0.4	0.5	0.0
RO	7.6	1.7	0.4	15.5	12.1	2.7	0.8	0.1	0.0	0.3	0.6	0.0	-
LU	2.3	0.6	0.1	27.2	12.7	4.1	0.3	0.5	-	0.6	0.1	85.3	-
IE	4.5	1.0	0.1	0.0	8.9	2.8	0.2	0.9	0.0	0.9	0.3	10.8	0.0
FR	5.4	0.7	0.2	20.0	10.3	2.2	0.3	0.2	0.0	0.3	0.3	1.1	0.9
SE	5.2	0.5	0.2	13.9	9.6	2.2	0.6	0.2	0.0	0.3	0.4	1.2	0.0
ES	4.3	0.8	0.1	10.5	11.7	4.9	0.2	0.1	0.0	0.3	0.2	0.2	0.1
DK	3.6	0.5	0.2	52.4	8.9	2.7	0.5	0.3	0.0	0.3	0.3	1.0	-
PT	5.1	0.9	0.1	9.6	8.0	1.3	0.1	0.1	0.0	0.1	0.2	0.0	0.1
MT	5.0	0.6	0.1	0.0	6.7	0.0	0.1	1.0	0.0	0.4	0.4	0.2	-

Notes: Blank cells – no data available. Countries sorted by the average (unweighted) rank in the thirteen exposure dimensions (columns 1 – 13).

Colour coding (separate within each exposure dimension):

intense red – top 10% most exposed countries;

intense yellow – median exposed countries;

intense green – bottom 10% exposed countries.

Denmark: 50% of net imports from Germany are assumed to be from Russia

Estonia: 80% of imports from Latvia are assumed to be from Russia

Croatia: 80% of net imports are assumed to be from Russia

Austria: 80% of net imports are assumed to be from Russia

Romania: 80% of imports from Hungary are assumed to be from Russia

Slovenia: 80% of imports from Austria are assumed to be from Russia

Finland: 80% of imports from Estonia are assumed to be from Russia

Source: Eurostat, EU energy mix and import dependency

3) Share of energy in the HICP basket in 2022, and average contribution of annual energy

inflation to headline HICP in the first three months of 2022. Source: Own calculations based on the Eurostat data

4) Sum of exports to Russia, Ukraine and Belarus, as % of GDP in 2021 (goods) and 2019 (services). Source: Eurostat

5) Share of exports of travel services to Russia (BoP statistics) in 2021, as % of GDP. For DE, data on travel services exports to Russia are not available and the indicator is therefore proxied by the share of tourist nights spent by Russians to total tourist nights spent (assuming that the ratio of RU tourist nights in total nights to the share of Russia in travel services exports is the same as for FR. Source: Eurostat

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Box (continued)

6) The indicator is defined as the domestic value added embodied in total country's exports to Russia as % of GDP. The indicator includes both direct exports of goods for intermediate and final uses as well as intermediate goods exported to third countries and eventually purchased by residents in Russia (embodied in a different good for its final use). Source: *JRC calculations based on the Eurostat 2019 FIGARO EU inter-country supply, use and input-output tables*

7) The Russian non-energy imports content to satisfy Member States' final demand includes: i) direct non-energy imports by a reporting Member State of intermediate and final goods and services from Russia, ii) intermediate non-energy imports from Russia via another EU

Member States to produce final products consumer in a reporting Member States, and iii) intermediate non-energy imports from Russia via non-EU countries (e.g. US, China) to produce final products purchased by residents in a reporting Member State. Source: *JRC calculations based on the Eurostat 2019 FIGARO EU inter-country supply, use and input-output tables*

8) Total stock of Russian assets held by EU countries in the form of stocks, bonds, FDI and other investment. Source: *FinFlows database updated and maintained by JRC and ECFIN, 2022*

9) Total stock of RU assets on banks' balance sheets in 2021-Q3, as % of 2019 GDP. Source: *BIS*

Recovery in hours worked lagged behind headcount employment, suggesting remaining underutilisation of labour.

With economic activity dampened by a new wave of the pandemic, the use of job retention schemes increased again in the fourth quarter of last year.⁽¹⁵⁾ Total hours worked increased by less than headcount employment, by 0.2% in the fourth quarter 2021. Average hours worked per employed person thus decreased after three quarters of growth, closing the year at 1.1% below the pre-pandemic level. This was the case in all major economic sectors except agriculture and financial and insurance activities. While during the pandemic job retention schemes played a crucial role in protecting jobs and incomes, they may have contributed to the drop in hours worked and to a muted responsiveness of labour supply to changing sectoral patterns of demand.⁽¹⁶⁾

The strong labour market rebound resulted in unmet labour demand.

The strong and sudden recovery of labour demand

was reflected in higher vacancy rates and survey data throughout last year. All major sectors reported increasing vacancy rates since the trough in the second quarter 2020. With unemployment rates at record-low levels, and a rapid and substantial increase in unfilled vacancies, labour markets in the EU tightened considerably by the end of last year. The Commission's surveys confirm strong broad-based labour demand. While job creation was widespread across sectors in the fourth quarter of 2021, the share of managers reporting labour shortages as a factor limiting their production increased in industry, services as well as construction. The share increased further in the first quarter of this year and broadly stabilised in the second. Labour shortages were particularly pronounced in several service sectors, such as computer programming, employment activities and land and air transport.⁽¹⁷⁾

The composition of employment growth reflects the structure of the demand rebound and trends accelerated by the pandemic.

Employment was created especially in occupations that are more easily

⁽¹⁵⁾ Workers covered by job retention schemes accounted for 1.6% of the extended labour force in December last year, according to the estimates of the ECB. The share was estimated to fall to 1.3% in February 2022.

⁽¹⁶⁾ Jean-Benoît Eyméoud, Nicolas Petrosky-Nadeau, Raül Santaeulària-Llopis, and Etienne Wasmer, 2021, "Contrasting U.S. and European Job Markets during COVID-19." FRBSF Economic Letter 2021-05.

⁽¹⁷⁾ Codes J62, N78, H49 and H51 of NACE rev. 2 classification. For more details, see Box 1.1. in European Commission (2022), "European Economic Forecast: Winter 2022", Institutional Paper 169.