

Potential spatial impacts of the war in Ukraine: A case study from Italy

The impacts of the war in Ukraine will be felt severely within OECD economies, especially in border regions on the front-line of the humanitarian refugee crisis. The economic impacts, in particular those driven by rising energy prices, will also be spatially differentiated, affecting some regions more than others. Italy is no exception, with gas-intensive industries concentrated in northern regions, and wheat-based food and farming prevailing in southern regions and islands. While, overall, Russia accounted for a minor share of Italian exports, some regions and industries are more vulnerable than others to falls in bilateral trade, including destinations popular with high per-capita expenditure Russian tourists.

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This paper focuses on Italy as a case study to illustrate how Russia's invasion of Ukraine is likely to have spatially differentiated impacts within OECD economies, which is the focus of forthcoming CFE work. Building on a preliminary assessment of the economic and social impacts of the war, Section 1 makes a case for spatial analysis by discussing how some Italian industries, which are highly concentrated, may be more vulnerable to the economic disruptions triggered by the war. Section 2 provides empirical evidence on each of the selected industries. Section 3 provides key recommendations for policy makers and suggests how the analysis could expand in future work.

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Executive summary

Whilst the economic and social impacts of Russia’s invasion of Ukraine will be felt most strongly in neighbouring countries, especially those providing emergency humanitarian assistance, shocks are already being felt globally. Estimates suggest that global economic growth could be more than one percentage point lower in 2022 because of the war. Inflation, already high at the start of the year, could rise by about a further 2.5 percentage points on aggregate across the world.

The economic and social impacts of the war are also likely to be spatially differentiated within OECD economies. Notwithstanding differences in underlying general economic conditions, three factors are likely to play a key role in determining the scale of the impact on regions, including their respective (a) reliance on imports of fossil fuels and other commodities for industrial production that have been hit by the price shock, (b) spatial proximity to Ukraine and its refugee flows, and (c) pace of recovery from the economic repercussions of the COVID-19 pandemic. Identifying the regions that are most vulnerable to these shocks will be an essential part of the policy toolkit.

Italy’s highly diversified economy is exposed to the shocks in several ways. Key links include (i) reliance on imports of different commodities from Russia (which, for instance, accounts for 43% of Italy’s imports of natural gas) and, in some cases, Ukraine, (ii) the importance of the Russian market in tourism and exports, and (iii) the primary role played by Ukrainian workers in the care sector, where data gaps currently hinder further analysis in this paper but which is flagged as an area of future work.

Four sectors in Italy well illustrate the potential impacts of soaring prices in commodities. These include manufacturing – where natural gas plays a crucial role and wheat-based food production, crop and livestock farming – which highly depend on imported fertilisers and animal feed. Although price shocks can – and indeed in some cases are already – being passed on to consumers, including through broader inflation, there is likely to be an impact on demand from these core sectors. This is why the paper focuses on firms in these sectors and the related potential employment impacts. Future work could investigate the potential impacts on consumers.

Natural gas-intensive industries are most directly affected by the price shock, and appear to be the most vulnerable sector in Italy, not least because of barriers to diversification of energy supply in the short term. Employment shares of sectors with the greatest gas use – a measure of vulnerability to growing gas prices – are largest in northern regions (particularly so in Lombardy, Veneto, Friuli-Venezia Giulia and Emilia-Romagna). This reflects the spatial concentration of manufacturing in Italy where shares range from 6 to 11% in the five provinces (Italy’s TL3 subdivisions) where that value is the highest. Examples include Taranto (Apulia) and Terni (Umbria), which host major steel production plants. Analysis also shows that gas consumption is higher in most industries in Italy compared to the European average, suggesting that a greater effort might be needed to promote the green transition.

Production of wheat-based food and farming tends to be more prevalent in southern regions and islands. Both jobs and firms in wheat-based food production are strongly concentrated in Italy’s southern regions and islands. Employment shares in wheat-based food production range between 2% to 3% in Italy’s five provinces where that value is the highest. All of these provinces are located in Italy’s island-

regions, i.e. Sardinia and Sicily. Firms in crop farming are more prevalent in islands and the south, where they account for 16% and 14% of all firms respectively, against a national average of 10%. Crop farming is six times more prevalent than livestock farming. The latter follows a unique spatial pattern, concentrating in non-coastal, typically mountainous provinces.

Intermediate regions close to a city display the highest concentration of jobs and firms in sectors most affected by the war in Ukraine. Rural remote regions display the lowest. Proximity to cities plays a major role in all but one of the four sectors thus far examined, especially so in industry. These findings attest to the fact that a rural/urban lens can provide additional insights into how the impact on jobs and firms distributes across space. Going beyond spatial distributions based on administrative subdivisions, urban/rural analysis can further support policy makers in assessing disparities within countries.

Whilst Russia accounted for only 1.7% of all Italian exports in 2019, some sectors and regions are more exposed than others to a likely fall in bilateral trade. In gross terms, the manufacturing, particularly of machinery and food, made up 97% of all Italian exports to Russia in 2019. At a regional level, Russia accounted for almost 3% of all exports from Marche, and slightly more than 2% of total exports from Umbria, Emilia-Romagna, Lazio and Veneto. Machinery exports played the greatest role in northern Italian regions, whereas food exports were more evenly distributed across macro-regions. Lazio stands out for exports of pharmaceutical goods, while clothing plays the greatest role in exporting from other regions in central Italy, i.e. Umbria and Marche. Exports to Russia from Sardinia, Basilicata and Sicily accounted for less than 0.5% of all exports from these southern regions.

Russian tourists accounted for a limited share (i.e. 1.3%) of all foreigners visiting Italy in 2019, but variation across regions is notable, ranging from about 0.5% or less in the bottom five regions to 1.5% or more in top five regions. Five out of 21 of Italy's TL 2 regions (i.e. Veneto, Emilia-Romagna, Lombardy, Lazio and Tuscany) accounted for almost two thirds of all nights spent by Russian visitors in 2019. Moreover, Russian tourists tend to concentrate in a few top destinations within regions. For instance, Rome and Rimini accounted for 95% and 74% of the nights spent by Russian visitors in Emilia-Romagna and Lazio, respectively. Although overall numbers of visitors from Russia were relatively small, in terms of expenditures, they ranked second among non-EU tourists in terms of aggregate tourist expenditure in 2019.

Responses to be adopted by Italian policy makers should account for the potential impacts across regions and, within them, provinces, as well as differences in their underlying resilience. As the state exercises shared power with regions and municipalities in multiple areas, it should be ensured that co-ordination among different levels of government happens smoothly to address asymmetries inherent in shocks and potentially arising from related policy responses. Subsidies for firms in industries affected by rising commodity prices and disruptions in trade could be considered, and earmarked in proportion to their relative weight in local economies, ensuring efficiency in policy intervention. A diversification of source and destination markets reducing dependencies on Russian supply or demand, including through investment in renewable energy sources, should continue to be a priority objective, including with a view to the longer term.

In 2021, Ukrainian nationals made up the fifth-largest foreign community (i.e. around 236 000 people) in Italy. Since the outbreak of the war, tens of thousands of people have fled to Italy, and many more could seek refuge in coming months. Ukrainians make up the second-largest foreign community among domestic workers (e.g. cleaners, caregivers) officially employed in Italy. Four out of Italy's 20 regions (i.e. Lombardy, Campania, Emilia-Romagna and Lazio) host two thirds of all Ukrainians residing in Italy. Data on Ukrainian residents could be a starting point for future analysis on the link between migration and employment, as newcomers are likely to settle in places and work in sectors where Ukrainian communities are larger.

1 Introduction

War in Ukraine: a first OECD assessment of economic and social impacts

The OECD has provided a rapid response to Russia's invasion of Ukraine. On 24 February 2022, the OECD Council condemned the large-scale aggression by Russia against Ukraine in the strongest possible terms as a clear violation of international law and a serious threat to the rules-based international order.¹ As the war in Ukraine has continued, the OECD has been assessing its economic and social repercussions.²

The war poses major challenges for economic co-operation and development. Estimates issued by the OECD on 17 March 2022 suggest that global economic growth could be more than 1 percentage point lower in 2022 because of the war. Inflation, already high at the start of the year, could rise by about a further 2.5 percentage points on aggregate across the world (OECD, 2022_[1]).

A dramatic humanitarian crisis is unfolding. In addition to thousands of human losses, several million people have fled Ukraine since the beginning of the war, with more waves of refugees expected in the weeks ahead. In Europe, this number is far higher than in wake of the recent Syrian refugee crisis.³

Commodity markets are being greatly affected. Russia and Ukraine together account for about a third of global wheat exports and are important producers of fertilisers and metals used in industry such as nickel and palladium. Disruptions to wheat, maize and fertiliser risk raising hunger and food insecurity across the world. Soaring metals prices could affect a wide range of industries such as aircraft, car and chip manufacturing.

The rise in energy prices is striking. With Russia supplying around 19% of the world's natural gas and 11% of oil, energy prices have jumped alarmingly. Europe in particular is highly dependent on Russian gas and oil. In April 2022, gas spot prices in Europe were more than 4 times higher than a year ago while the cost of oil has increased by about 50% over the same period. The price shock is expected to hurt households and disrupt the production of goods and services worldwide.

Economic and social impacts are geographically uneven

The economic and social impacts of the war in Ukraine are likely to be differentiated across OECD countries, regions and cities. Three key factors are likely to determine the scale of these impacts:

1. **Reliance on imports for fossil fuel and other commodities:** the war has starkly highlighted that many OECD economies are heavily reliant on fossil fuel energy with a high risk of price shocks

¹ For more information, visit: <https://www.oecd.org/newsroom/statement-of-oecd-council-on-the-russian-aggression-against-ukraine.htm>

² For more information, visit: <https://www.oecd.org/newsroom/statement-from-oecd-secretary-general-on-initial-measures-taken-in-response-to-russia-s-large-scale-aggression-against-ukraine.htm>

³ For more information, visit: <https://www.oecd.org/newsroom/oecd-calls-for-well-targeted-support-to-the-vulnerable-as-war-undermines-global-recovery.htm>

and even shortages. In fact, prior to the war, Russia provided over 40% of European natural gas imports, a key source of heating for many households, a similar proportion of coal imports, and around one quarter of oil imports. Gas supply is also a major source of electricity production and an important input for industrial production, including for fertilisers.

2. **Spatial proximity to Ukraine:** the fastest refugee flow in Europe since the end of the Second World War is underway. According to estimates, the provision of accommodation and other services could result in a direct first year cost of at least 0.25% of EU GDP, and much more in the major host economies (OECD, 2022^[1]). Refugees have primarily gone to a small number of countries that share borders with Ukraine, with Hungary, Moldova, Poland, Romania and Slovakia taking in large shares with high concentrations in border areas and capitals.
3. **Different pace in the recovery from the pandemic:** prior to the outbreak of the war, although most global macroeconomic variables pointed to a recovery over 2022-23 following the COVID-19 pandemic, there were signs of imbalances, with lower-income economies at risk of being left further behind. Supply constraints associated with the pandemic and the acceleration of inflation, which the war in Ukraine has just exacerbated, were also spatially differentiated.⁴

Policy responses should be informed by spatial analysis of potential social and economic impacts of the war in Ukraine, in order to identify which places are most exposed to risks.

An assessment of potential impacts across Italian regions

The Italian economy, which is highly spatially diversified, is linked to Russia and Ukraine in several ways. This makes Italy an interesting case study to observe, in order to illustrate how expected economic and social impacts of the war in Ukraine may affect places to different extents within a given country. While the spatial distribution of industries across Italy is widely documented in past OECD work (OECD, 2014^[2]), its economic links to Russia and Ukraine deserve further illustration. To name but a few key statistics, Italy ranks fourth among the 21 EU countries that are also OECD members in terms of dependency on Russia for imports of natural gas, a key input in industrial production.⁵ This link is crucial to Italy, which has the seventh largest workforce and output in manufacturing at the OECD and the global level respectively.⁶ In addition, Italy was Russia's fifth largest import partner in 2022 – the third after Germany and the USA, if only OECD member countries are considered.

The key links between Italy and Russia as well as Ukraine can be grouped as follows:

1. Reliance on imports of different commodities from Russia and, in some cases, Ukraine as a key input in energy-intensive industries, crop and livestock farming and wheat-based food production;
2. The importance of the Russian market in tourism and exports;
3. The importance of Ukrainian workers in the care sector.

This paper focuses on the first two aspects listed above, for which the economic and social impacts across Italian firms and households are already tangible. In particular, the analysis will take into account different types of commodities and the potential impacts on sectors that are strongly reliant on them. The important issue of migration from Ukraine and its potential implications on local employment in the care sector falls outside the scope of this work due to a currently limited evidence base, but is an area that merits further investigation.

⁴ For more information, visit: <https://www.oecd.org/newsroom/oecd-economic-outlook-sees-recovery-continuing-but-warns-of-growing-imbalances-and-risks.htm>

⁵ For more information, visit: <https://aegjs.acer.europa.eu/chest/dataitems/214/view>

⁶ For more information, visit: <https://data.oecd.org/emp/employment-by-activity.htm>

2 Potential impact across the Italian economy

This section provides evidence of how the war in Ukraine could have uneven spatial impact across Italian industries. Italy relies on imports of various important commodities from Russia and, in some cases, Ukraine. Several economic sectors look to these commodities, whose price has been soaring since the outbreak of the war, as a key input for production. This is the case for fossil fuels in manufacturing, wheat in wheat-based food productions, fertilisers in crop farming and crops for animal feeding in livestock farming. In addition, the Russian market plays a meaningful role in Italian tourism and exports.

Employment and firm⁷ shares in the affected sectors are used as a general measure of vulnerability of sectors and regions, without suggesting that all, or a meaningful share, of jobs in the sectors examined are necessarily at risk. Other sectors, in particular downstream sectors, are likely to be impacted as well, depending on how price rises feed through production chains. However, given the considerable uncertainty at this stage, these impacts are not considered in this paper.

Energy-intensive industries

Background

Russia accounts for 43% of Italy's imports of natural gas.⁸ Italy heavily relies on external suppliers to cover its domestic natural gas demand, as its internal production is limited. In 2020, domestic natural gas production amounted to about 4 billion cubic metres,⁹ far outweighed by imports of 66 billion cubic metres (with 29 billion from Russia alone). Several industrial clusters in Italy are highly sensitive to price variations in gas.¹⁰ Famous examples include Murano glassmakers and Sassuolo pottery manufacturers, which have already seen a growing number of suspensions and shutdowns of production due to rising energy bills.¹¹ The crisis in Ukraine has in fact accelerated an upward trend in the price of natural gas, which had been under way since 2021, with spill-over effects on prices of other fossil fuels.¹² In 2020, industry accounted

⁷ Data limitations prevent the analysis of potential impacts on employment in farming.

⁸ For more information, visit: <https://dgsaie.mise.gov.it/importazioni-gas-naturale>

⁹ For more information, visit: <https://www.statista.com/statistics/800396/natural-gas-production-by-region-in-italy/#:~:text=Italy%27s%20domestic%20natural%20gas%20production,This%20is%20true%20for%20both>

¹⁰ For more information, visit: <http://www.cgiamestre.com/caro-energia-nei-primi-6-mesi-del-2022-a-rischio-almeno-500-mila-posti-di-lavoro/>

¹¹ For more information, visit: https://www.corriere.it/economia/aziende/22_gennaio_17/caro-energia-piastrelle-vetrai-murano-se-continua-cosi-spegneremo-forni-storie-crisi-1920139c-7540-11ec-9e58-ba8db45e0e20.shtml

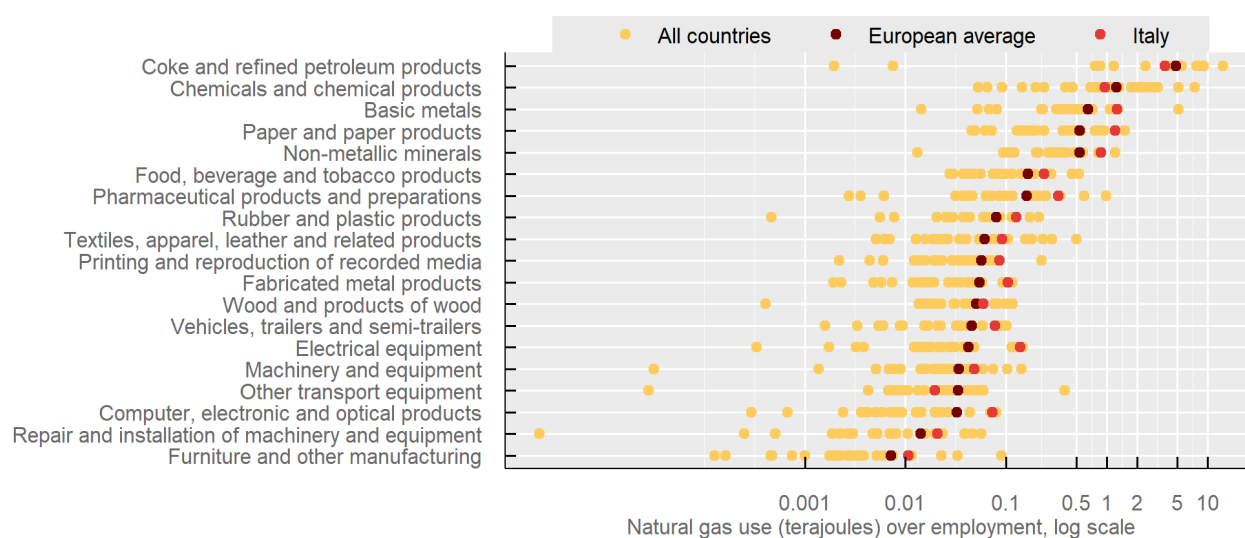
¹² In December 2021, the Ministry of Ecological Transition issued a decree providing financial support to companies with high natural gas consumption. For more information, visit:

for one out of four jobs in Italy, which has the sixth largest worker population in this sector (around 6 million people) among OECD member countries.¹³

Measures

Figure 2.1. Natural gas intensity is higher in Italy in most industries, compared to Europe

Average natural gas intensity by sector across 38 European countries, 2019



Note: Natural gas intensity includes the natural gas share in electricity. The highlighted dots for each sector represent the simple average across European countries (brown) and in Italy (red). The non-highlighted dots represent a country for each sector. The identification of sectors builds on OECD work on the implications of the energy transition for sectors and regions (OECD, 2019^[3]).

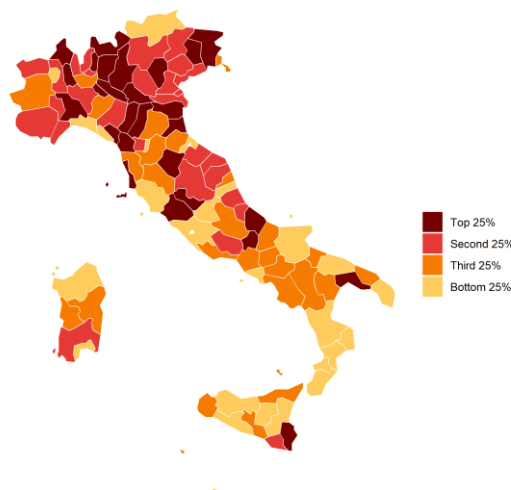
Source: OECD calculations based on Eurostat tables env_ac_pegasu, sbs_r_TL06_r2, nama_10_a64, and nama_10r_3empers, all 2019. IEA, Electricity generation by source, 2019.

https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2022-01-08&atto.codiceRedazionale=21A07795&elenco30giorni=false

¹³ For more information, visit: OECD employment statistics at <https://stats.oecd.org/>.

Figure 2.2. Employment shares in the sectors with the highest gas use is largest in northern and central regions

Combined regional employment share of the five sectors with the highest use of natural gas in Italy by quartiles



Note: The combined regional employment share of the five sectors with the largest use of natural gas in Italy, including the share of natural gas that is used in electricity, i.e. coke and refined petroleum products, basic metals, paper and paper products, chemicals and chemical products, and non-metallic minerals.

Source: OECD calculations based on Eurostat tables env_ac_pefasu, sbs_r_TL06_r2, and nama_10r_3empers, all 2019. IEA, Electricity generation by source, 2019 and OECD Statistics, Regional economy, Regional Employment by Industry.

Main findings

- Natural gas intensity is higher in most sectors in Italy compared to the European average, pointing to a comparatively greater effort needed to promote the green transition.
- Natural gas intensity is highest in natural resource manufacturing sectors in Italy – like elsewhere in Europe. The five sectors with the largest use of natural gas in Italy are coke and refined petroleum products, basic metals, paper and paper products, chemicals and chemical products, and non-metallic minerals.
- Employment shares of the highest gas use sectors – a measure of vulnerability to soaring natural gas prices – are largest in northern regions (particularly so in Lombardy, Veneto, Friuli-Venezia Giulia and Emilia-Romagna), reflecting the spatial concentration of manufacturing in Italy.
- Umbria, home to a major steel production site, displays particularly high values of respective employment shares in central Italy.
- Employment shares of the highest gas use sectors range from 6 to 11% in the five provinces (Italy's TL3-level subdivisions) where that value is the highest. These are, in ascending order of relevant employment share, the provinces of Modena (Emilia-Romagna), Terni (Umbria), Lucca (Tuscany), Cremona (Lombardy) and Taranto (Apulia). The latter hosts Italy's largest steel production plant. Terni and Cremona also host major steel production plant.

Crop farming

Background

Italian farmers have to cope with soaring prices of fertilisers. Russia is the world's top exporter of nitrogen fertilizers and the second leading supplier of both potassic and phosphorous fertilisers (FAO, 2022^[4]). Prices of fertilisers have been increasing since 2021 because of the rising costs of fossil fuels used in its production and the disruptions of international trade due to the COVID-19 pandemic. The outbreak of the war in Ukraine has exacerbated this trend. Prices of all fertilisers, including those that could act as substitutes for Russian productions, are growing. In April 2022, the Fertilizers Price Index was at a level of 237.60, up from 104.17 one year ago.¹⁴ Crop farmers in Italy significantly rely on imports for this commodity, and Italy is the fourth largest buyer of Russian fertilisers at global level.^{15 16} Fertilisers and fossil fuels represent a major input for production in farming. As in any commodity-based production, soaring input costs may be offset by raising output prices (especially in those crops where demand is less price-elastic or shifting production to crops with less price-elastic demand), but this may not always be possible, especially not in the short term. Because of an exceptionally low rainfall winter in 2021-22, droughts may add further pressure on Italian farmers.¹⁷ The combination of rising input costs and uncertain returns could lead some farmers to reduce production (an occurrence that has already been reported in several press articles), with potential effects on employment and more generally global food security, which is already suffering from reduced agricultural production in Ukraine (and indeed exports of agricultural products), with expectations that this is likely to continue in the short-term given the current inability to seed new crops.

¹⁴ For more information, visit:

https://ycharts.com/indicators/fertilizers_index_world_bank#:~:text=Fertilizers%20Price%20Index%20is%20at,128.1%25%20from%20one%20year%20ago

¹⁵ For more information, visit: https://fscluster.org/sites/default/files/documents/fao_information_note.pdf

¹⁶ For more information, visit:

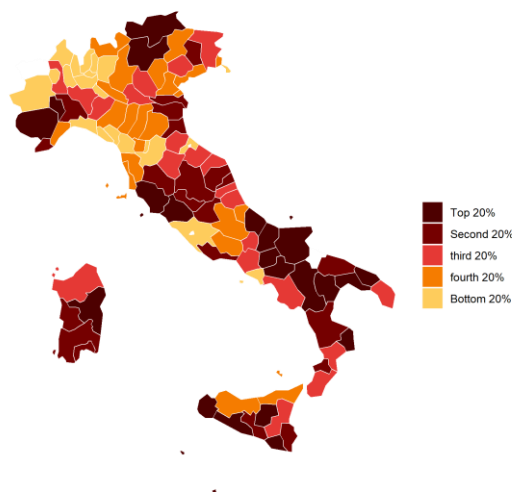
<https://tradingeconomics.com/russia/exports-of-fertilizer-potassium-cmlv#:~:text=Exports%20of%20Fertilizer%2C%20Potassium%20CMLV%20in%20Russia%20averaged%20811.87%20USD,Million%20in%20January%20of%202018.>

¹⁷ For more information, visit: <https://www.copernicus.eu/en/media/image-day-gallery/drought-grips-northern-italy>

Measures

Figure 2.3. Firms in crop farming are more prevalent in southern regions and islands

Share of firms in crop farming over all firms by Italian province in 2019



Note: The spatial distribution of firms in farming draws from national Business Register 2019 data, whereas the split between firms in crop and livestock farming across TL 3 subdivisions draws from a 2010 census survey on farming. Data for Cagliari, Oristano and South Sardinia are based on estimations.

Source: <https://www.infocamere.it/en/movimprese> and <http://dati.istat.it/>

Main findings

- Firms in crop farming are more prevalent in islands and southern regions, where they account for 15.83% and 14.39% of all firms respectively. In north-eastern regions, such a share is slightly lower (i.e. 11.24%), whereas in central and north-western regions it drops to 7.89% and 5.04% respectively. In Italy as a whole, firms in crop farming make up 10.06% of all firms.
- Eight out of the ten provinces reporting the highest rate of firms in land farming over all firms are located in southern or island regions, as further proof of their agricultural vocation as opposed to historically more industrialised and wealthier northern regions.
- The share of firms in crop farming over all firms is higher than 20% in the top three regions (i.e. Basilicata, Molise and Trentino), whereas it is lower than 6% in the bottom three regions (i.e. Lazio, Liguria and Lombardy). Spatial differentiation is extremely marked when the analysis focuses on the provincial level. Here, the top five provinces report shares that are higher than 27%, whereas the bottom five are lower than 1.6%.

Livestock farming

Background

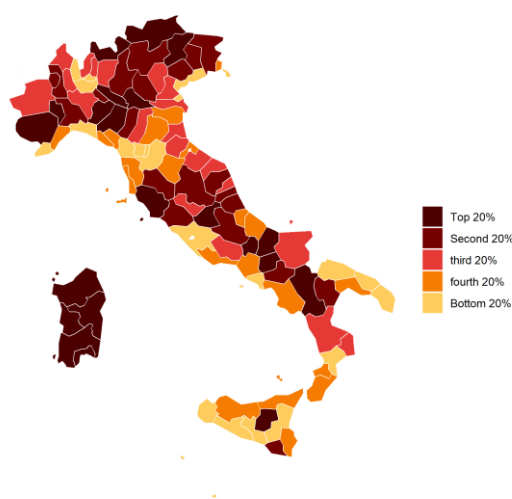
Italian livestock farmers have to cope with rising prices of animal feeds. Russia and Ukraine are key global exporters of maize and other grains used for animal feeding, but are highly unlikely to be able to keep up their standards in next year's harvest due to the ongoing war, disruption to trade, and sanctions (FAO, 2022^[4]). A global run on the maize price had already been under way since 2021, driven by surging

import demand from China and droughts in South America.¹⁸ Recently, mostly driven by Russia's invasion of Ukraine, maize prices reached a record high, marking the highest value since 1990.¹⁹ In the last couple of decades, the domestic production of maize has been shrinking in Italy, with farmers increasingly relying on imports to feed their livestock.²⁰ Although Italy is not a major importer of maize from Russia and Ukraine,²¹ farmers will be clearly affected by persistently rising inflation in this commodity. Similar to agriculture, soaring costs may be offset by raising output prices, but this cannot happen overnight and not for all farmers. Shifting to price-elastic productions is less of an option for livestock farming. Droughts are expected to hinder domestic production of maize, adding further pressure on farmers, who may opt to constrain production and employment.

Measures

Figure 2.4. Firms in livestock farming tend to be more prevalent in non-coastal provinces

Share of firms in livestock farming over all firms by Italian province in 2019



Note: The spatial distribution of firms in farming draws from national Business Register 2019 data, whereas the split between firms in crop and livestock farming across TL 3 subdivisions draws from a 2010 census survey on farming. Data for Cagliari, Oristano and South Sardinia are based on estimations.

Source: <https://www.infocamere.it/en/movimprese> and <http://dati.istat.it/>

Main findings

- Firms in the livestock sector tend to be more prevalent in non-coastal provinces, which are typically hilly or mountainous. This is the case in the Alpine provinces at the northern end of the country and in the Apennine provinces along the inner belt of central and southern Italy.
- Among the 20 provinces reporting the highest rates of firms in livestock farming over all firms, four are located in the north-west, five in the north-east, four in the centre, four in the south, and three

¹⁸ For more information, visit:

<https://www.reuters.com/markets/asia/chinas-grain-pork-sugar-imports-december-2022-01-18/>

¹⁹ For more information, visit: <https://www.fao.org/worldfoodsituation/foodpricesindex/en/>

²⁰ For more information, visit: <https://www.informatoreagrario.it/>

²¹ For more information, visit: <https://www.coeweb.istat.it/>

in islands, attesting that distribution across these larger areas is fairly homogeneous. In addition, 13 out of these 20 provinces are non-coastal, and four more have only short coastal stretches and run inland – a remarkable fact for the narrow Italian peninsula.

- In the three regions where the share of firms in livestock farming over all firms is the highest, i.e. alpine South Tyrol, Sardinia (a mostly hilly island whose inner areas have a deep-rooted tradition in sheep breeding) and mostly mountainous Molise, it ranges from 7.85% to 3.96%. Conversely, in the three regions where it is the lowest, i.e. coastal Liguria, prevalently flat Apulia and Lazio, it is lower than 1.0%. The national average is 1.47%, and deviation from this value is lower than one percentage point in all macro areas.
- Overall, firms in crop farming are six times more numerous than those in livestock farming.²² Hence, it can be argued that farming as a whole (i.e. crop *and* livestock) tends to concentrate in southern and island regions, mostly as a result of the spatial distribution of firms in crop farming.

Wheat-based food production

Background

Italian firms in wheat-based food production have to cope with rising prices in their key commodity.

Russia and Ukraine, i.e. key global exporters of wheat, may not be able to maintain their standards in next year's harvest due to the ongoing war, related and pre-existing disruption to international trade, and sanctions (FAO, 2022^[4]). While a global run in wheat price had already been under way since 2021,²³ the war in Ukraine exacerbated this trend. For example, during the first week of March 2022, US wheat futures climbed past their record highs reached in 2008. Due to shrinking domestic production of wheat, Italian producers of bakery and farinaceous products such pasta have been growingly relying on imports in recent years.²⁴ Although Italy imports most of its wheat from Canada,²⁵ persistently rising inflation in this commodity will clearly affect wheat-based food producers. Raising output prices to compensate for higher input prices may not be an option in more price-elastic (and remunerative) high-end productions, including those aimed at export. Shrinking demand, including due to ongoing challenges to trade, may encourage some firms to constrain production and employment.

²² Annex B provides more information on the number and output value of agricultural firms by technical and economic orientation and Italian region.

²³ For more information, visit:

<https://www.reuters.com/markets/asia/chinas-grain-pork-sugar-imports-december-2022-01-18/>

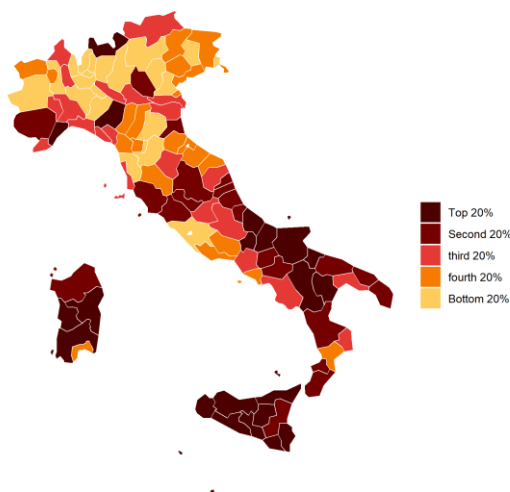
²⁴ For more information, visit: <https://www.informatoreagrario.it/>

²⁵ For more information, visit: <https://www.coeweb.istat.it/>

Measures

Figure 2.5. Employment in wheat-based food production is highest in southern Italy and islands

Share of employment in wheat-based food production by Italian region, 2019, in quintiles

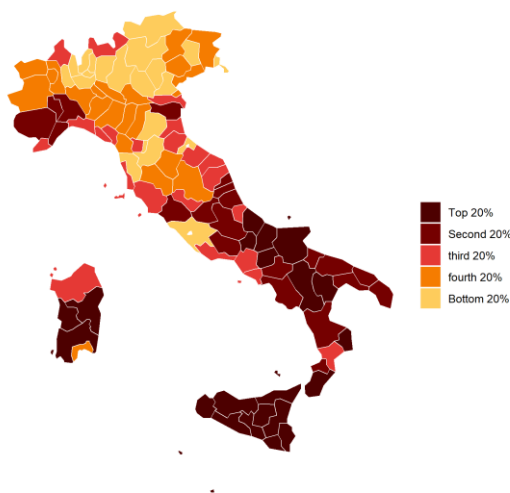


Note: Wheat-based food production includes manufacturing of all bakery and farinaceous products.

Source: <http://dati.istat.it/>

Figure 2.6. Firms in wheat-based food production are concentrated in southern Italy and islands

Share of firms in wheat-based food production by Italian region, 2019, in quintiles



Note: Wheat-based food production includes manufacturing of all bakery and farinaceous products

Source: <http://dati.istat.it/>

Main findings

- Wheat-based food production is strongly concentrated in Italy's southern regions and islands. In origin, this may have been due to proximity to wheat crops.

- Both employment and firms' spatial distribution confirm this overarching trend.
- The distribution of employment is only slightly more spatially dispersed than firms'.
- Employment shares in wheat-based food production range between 2.09% to 3.01% in Italy's five TL3-level subdivisions where that value is the highest. They are, in increasing order of employment share in this sector, the provinces of Oristano, Agrigento, Enna, South Sardinia, and Nuoro. All of these provinces are located in Italy's island-regions, i.e. Sardinia and Sicily.

Tourism

Background

Russians play a disproportionately greater role in terms of per-capita expenditure compared to their size among all foreign tourists. Tourism makes an important contribution to the Italian economy (OECD, 2020^[5]). Although Russia ranked tenth among the countries of origin of foreign visitors to Italy in 2019, the number of Russian tourists is minor compared to top-ranking nationalities, such as Germans.²⁶ However, Russian tourists typically have high spending patterns with more concentrated destinations. Overall, Russian tourists in Italy ranked fifth on spending (EUR 167 per day, against an average of EUR 113 for other countries) in 2016.²⁷ The total expenditure of Russian tourists in Italy in 2019 amounted to EUR 1 billion, i.e. 2% of total foreign expenditure (the second-largest non-EU country, after the US, in this ranking).²⁸ The temporary suspension of air transport routes between Russia and the EU, including Italy, is likely to affect dramatically bilateral business relations in tourism.²⁹ Similarly, Russian citizens face difficulties in completing transactions abroad and international payments online due to payment sanctions.³⁰

Measures

Table 2.1. Russians account for a marginal share of international tourism in Italy, but variation across regions is significant

Number of nights spent for tourists from Russia, all tourists and share of Russian tourists over all tourists, 2019

Region	Russia	World	%
Lazio	730 010	39 029 255	1.87
Emilia-Romagna	733 062	40 360 042	1.82
Sicily	273 195	15 114 931	1.81
Lombardy	730 517	40 482 939	1.80
Liguria	229 618	15 074 888	1.52
Calabria	138 797	9 509 423	1.46
Friuli-Venezia Giulia	129 092	9 052 850	1.43

²⁶ For more information, visit: <http://dati.istat.it/> (tourism section)

²⁷ For more information, visit: https://www.infomercatiesteri.it/turismo_out.php?id_paesi=88

²⁸ For more information, visit: <https://www.strategieamministrative.it/dettaglio-news/2022311190-conflitto-russia-ucraina-qual-impatto-sul-turismo-italiano/>

²⁹ For more information, visit: <https://www.tourism-review.com/italian-tourism-to-feel-the-impact-of-the-current-war-news12437>

³⁰ For more information, visit: <https://www.theguardian.com/business/2022/mar/06/russians-visa-mastercard-ban-domestic-purchases-mir>

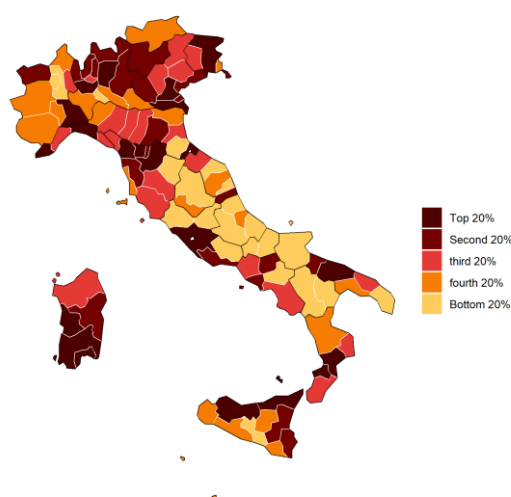
Region	Russia	World	%
Veneto	1 010 863	71 236 630	1.42
Sardinia	205 122	15 145 885	1.35
Tuscany	623 543	48 077 301	1.30
Campania	286 265	22 013 245	1.30
Aosta Valley	43 739	3 625 616	1.21
Trentino	190 661	18 431 051	1.03
Apulia	106 429	15 441 469	0.69
Piedmont	99 771	14 889 951	0.67
Marche	65 754	10 370 800	0.63
South Tyrol	175 793	33 643 455	0.52
Umbria	22 827	5 889 224	0.39
Abruzzo	17 532	6 176 702	0.28
Basilicata	6 775	2 733 969	0.25
Molise	79	439 645	0.02
Italy	5 819 444	436 739 271	1.33

Note: Nights spent by tourists and residents.

Source: <http://dati.istat.it/>

Figure 2.7. Russian tourists tend to concentrate in a few top destinations within regions

Share of Russian tourists over all tourists by Italian TL3 subdivision, 2019, in quintiles



Source: <http://dati.istat.it/>

Main findings

- Russians accounted for a marginal share (i.e. 1.33%) of nights spent by foreign visitors in Italy in 2019.
- However, spatial variation is significant, ranging from about 0.5% or less in bottom five regions to three times as much or more in top five regions. This trend is even more prominent at the provincial level. While Russian nationals accounted for 2.8% or more of all foreign visitors in top five provinces (i.e. Messina, Rimini, Pistoia, Catanzaro, Cagliari), such a share was equal to or lower than 0.19% in bottom five destinations.
- Russians' preferred destinations in terms of absolute number of nights spent are located either in northern (i.e. Veneto, Emilia-Romagna, Lombardy) or central Italy (i.e. Lazio, Tuscany). These five

regions accounted for about two thirds of all nights spent by foreign tourists visiting in Italy in 2019 (Italy has 21 TL2 regions).

- In four out of these five regions the share of Russians over all foreign tourists is higher than the national average (in Tuscany, it is equal), implying that their incidence tends to be higher where they are most numerous in absolute terms.
- Russian tourists tend to concentrate in few top destinations within regions. For instance, Rimini and Rome accounted for 74.3% and 95.1% of nights spent by Russian visitors in Emilia-Romagna and Lazio respectively.

Exports

Background

Russia represented the twelfth largest market of destination for Italian exports in 2019. However, it accounted for a marginal share (i.e. 1.64%) of all exports in the same year (OECD, 2022^[6]). Their decline, because of EU trade and payment sanctions against Russia, is likely to have limited impact on total export. However, it might still meaningfully affect some spatially concentrated industrial clusters with higher exposure to the Russian market.³¹ The figures provided in this section refer to gross, and not value-added trade, implying that some care is needed in the interpretation of impacts.

Measures

Table 2.2. Russia accounts for almost 3% of all exports from Marche, whereas its role is negligible in many southern regions

Value in EUR of all exported goods to Russia and all exports by Italian region in 2019

Region	Russia	World	%
Marche	351 525 961	12 235 788 500	2.87
Umbria	99 459 363	4 315 251 011	2.30
Emilia-Romagna	1 499 999 185	66 620 610 370	2.25
Lazio	587 540 284	27 701 325 832	2.12
Veneto	1 307 504 882	65 142 117 376	2.01
Lombardy	2 260 042 534	127 487 880 784	1.77
Liguria	102 543 171	7 103 291 155	1.44
Piedmont	650 664 030	46 903 240 205	1.39
Friuli-Venezia Giulia	214 849 998	15 495 462 607	1.39
Trentino	46 019 683	3 996 368 481	1.15
Tuscany	425 638 863	43 242 302 355	0.98
Abruzzo	85 206 622	8 712 361 446	0.98
Calabria	4 259 263	479 813 878	0.89
South Tyrol	40 852 949	5 098 652 770	0.80
Apulia	65 925 891	8 961 751 779	0.74
Molise	4 861 661	754 639 447	0.64
Campania	78 056 214	12 344 555 936	0.63
Aosta Valley	4 278 576	701 252 008	0.61
Sicily	17 834 759	9 498 394 597	0.19
Basilicata	4 844 109	3 445 142 681	0.14

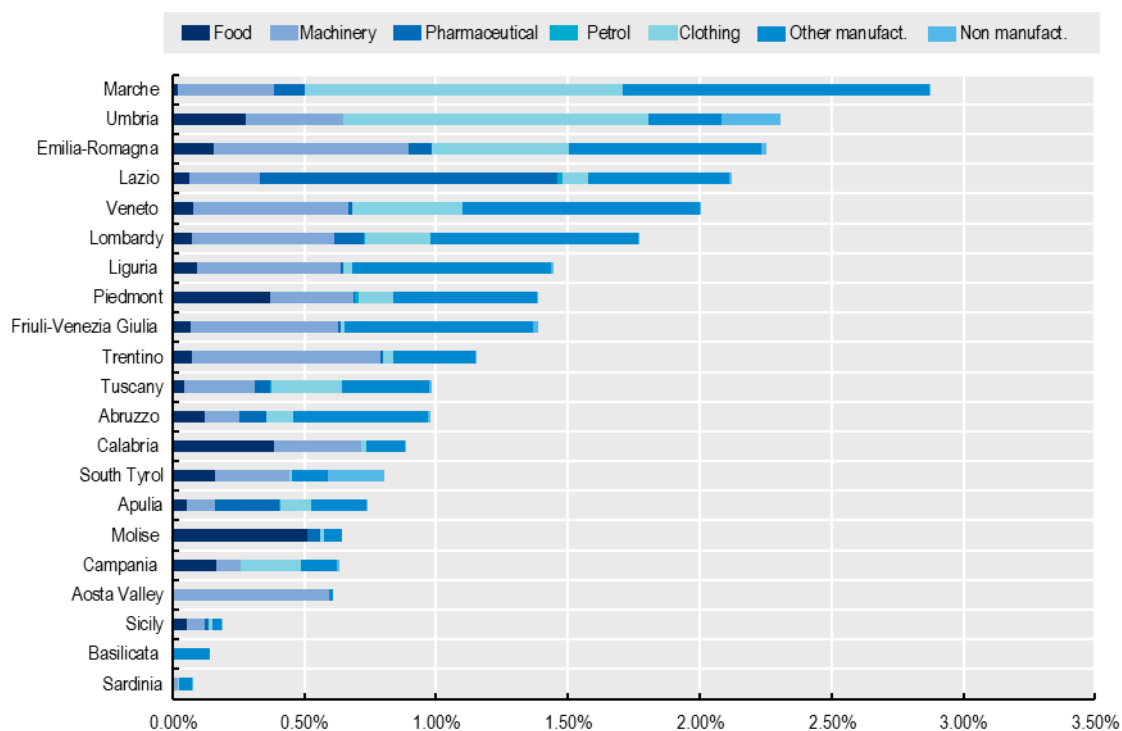
³¹ For more information, visit: <https://news.italianfood.net/2021/01/28/russia-30-of-fb-products-on-the-shelves-come-from-italy/>

Region	Russia	World	%
Sardinia	4 209 791	5 659 355 057	0.07
Italy	7 856 117 789	475 899 558 275	1.65

Source: <https://www.coeweb.istat.it/>

Figure 2.8. Regional exports to Russia reflect local industrial specialisations, such as clothing in Marche and Umbria and pharmaceutical in Lazio

Exports to Russia by type of good as a share of all exports in 2019



Note: "Food" includes food beverages and tobacco. "Pharmaceutical" includes pharmaceutical, medicinal chemical and botanical. "Machinery" includes machinery and equipment. "Petrol" includes coke and refined petroleum products. "Clothing" includes textiles, clothing leather and accessories. "Other manufact." and "Non-manufact." stand for other manufacturing and non-manufacturing exports.

Source: <https://www.coeweb.istat.it/>

Main findings

- Russia accounted only for 1.65% of all Italian exports in 2019. However, some sectors and regions are more exposed to shrinking exports to Russia.
- Manufacturing, particularly of machinery and food, took the lion's share, accounting for 96.85% of all Italian exports to Russia.
- Russia accounts for almost 3% of all exports from Marche, and slightly more than 2% of all exports from Umbria, Emilia-Romagna, Lazio and Veneto.

- Exports of machinery plays the greatest role in northern Italian regions, whereas food is more evenly distributed across macro-regions.³²
- Lazio is a positive outlier in exports of pharmaceutical goods, whereas clothing plays the greatest role in exports from Umbria and Marche.³³
- Exports to Russia from Sardinia, Basilicata and Sicily are marginal, accounting for less than 0.50% of all exports from these regions.

Analysis by urban/rural type

Analysis based on urban/rural types can provide further insights into how jobs and firms distribute across space. In particular, it can support policy makers in assessing disparities within countries (OECD, 2018^[7]), going beyond the above spatial distributions based on administrative subdivisions. Traditionally, the OECD has classified TL3 regions based on population density in each local unit, combined with the existence of urban centres where at least one-quarter of the regional population reside. Recently, an extended typology has been adopted to distinguish between rural regions that are located close to larger urban centres and those that are not. As a result, TL3 regions are classified into: predominantly urban, intermediate regions close to a city, intermediate regions remote, predominantly rural regions close to a city and predominantly rural remote regions (OECD, 2018, p. 137^[7]). The sectors analysed in the following paragraphs range from agriculture (i.e. crop and livestock farming) to industry (i.e. energy-intensive industries and wheat-based food production). Prevalence is measured by observing firms and jobs in agricultural and industrial sectors respectively.

Overall, the prevalence of jobs and firms in four commodity-based sectors across urban and rural areas follows a similar pattern. The ranking of urban/rural types from the most to the least prevalent is identical in all the sectors in question. Intermediate regions close to a city and predominantly rural remote regions report by far the highest and lowest concentrations respectively, and variation in concentrations across urban/rural types is generally limited. However, some differences arise when looking at distributions more closely.

Proximity to cities plays a prominent role in all the sectors examined, more so in industry, whereas farming is relatively more prevalent in rural areas. In particular, predominantly rural regions close to a city are more prominent in agriculture compared to industry, whereas the opposite occurs in intermediate regions close to a city (particularly so in energy-intensive industries) and predominantly urban regions (especially in wheat-based food productions).

³² Italy's five macro-regions for statistical purposes include North-West (Aosta Valley, Liguria, Lombardy, Piedmont), North-East (Emilia-Romagna, Friuli-Venezia Giulia, Trentino, South Tyrol, Veneto), Centre (Lazio, Marche, Tuscany, Umbria), South (Abruzzo, Apulia, Basilicata, Calabria, Campania, Molise) and Islands (Sardinia, Sicily).

³³ The table provided in 3Annex A illustrates the value in EUR of all exported goods to Russia by Italian region in 2019.

Table 2.3. Proximity to cities plays a prominent role in all sectors examined, more so in industry, whereas farming is relatively more prevalent in rural areas

Share of jobs/firms in four commodity-based industries by urban/rural type in Italy, 2019

Urban/rural type	Energy (%)	Crop (%)	Livestock (%)	Wheat (%)
<i>Intermediate TL3 region close to a city</i>	54.56	43.52	43.47	46.21
<i>Predominantly urban TL3 region</i>	27.82	26.08	25.19	33.99
<i>Predominantly rural TL3 region close to a city</i>	10.21	20.08	21.22	10.44
<i>Intermediate TL3 region remote</i>	5.42	8.46	8.18	6.54
<i>Predominantly rural TL3 region remote</i>	1.99	1.86	1.94	2.82

Note: Energy (%): share of jobs in energy-intensive industries. Crop (%): share of firms in crop farming. Livestock (%): share of firms in livestock farming. Wheat (%): share of jobs in wheat-based food productions.

Source: Authors' own elaborations based on Istat data used in previous subsections.

3 The way forward

Box 3.1. What are the key considerations for policy makers?

- Responses to the economic repercussions of the war in Ukraine to be adopted by Italian policy makers should account for the potential impacts across regions and, within them, provinces, as well as differences in their underlying resilience. As the state exercises concurrent legislative and fiscal power with the regions in areas such as trade, energy and labour, the issue of multi-level governance is of particular importance. Municipalities (individually or collectively) can also play a role in economic development matters (e.g. tourism, SME support), according to the national constitution. Hence, it is crucial that coordination among different levels of government happens smoothly to address asymmetries inherent in shocks and potentially arising from related policy responses.
- Spatial analysis should inform planning and budgeting in policy areas where both national and subnational administrations hold a stake. Active labour market policies, for instance, involve all levels of government: namely, a central agency is in charge of setting standards, regions take care of tailoring actions to local needs, and job centres in cities offer front-office services. Under the current circumstances, this may mean devoting larger human and financial resources to job centres in places at greater risk of growing unemployment rates as well as to reskilling programmes for those losing their job. These are the places where industries most exposed to the economic repercussions of the war account for a larger share of employment.
- On a similar note, subsidies for firms in industries hit by rising commodity prices and disruptions in trade – one of various policy options available to EU member states under the new Temporary Crisis Framework – should be allocated in proportion to their relative contribution to regional and local economies, in order to ensure efficiency in policy intervention.
- Diversifying source and destination markets can reduce dependencies on Russian supply or demand. This can be achieved by investment in renewable energy sources, which has longer term benefits too and thus should continue to be a priority objective. At the same time, spatial analysis can help prioritise interventions and channel efforts by different levels of government towards export-oriented industries that are likely to suffer the most from a likely erosion of the Russian market. Similarly for the tourism sector, the focus of intervention should be on regions where Russian visitors are proportionally more numerous.
- Spatial analysis of the potential impacts of the war in Ukraine could be repeated in other OECD member countries and regions, if data on industrial composition, i.e. the distribution of firms and jobs across different economic sectors, is granular enough from a spatial point of view (ideally, ensuring statistical representativeness both at NUTS 2 and NUTS 3 level).

Further analysis of the economic and social impacts of the war in Ukraine in Italian regions could encompass the important issue of refugees and migration. Already before the war, Ukrainian nationals made up the fifth-largest foreign community in Italy (i.e. around 236 000 people, 78% of which are

female).³⁴ According to Italian Ministry of Interior reports, 141 562 Ukrainian refugees had entered the country by 28 June 2022, with women accounting for 77.2% of the adult population (which in turn makes up 68.4% of the total).³⁵ Arrivals are expected to rise in the coming months. Ukrainians already make up the second largest foreign community (i.e. 90 000 people) among domestic workers (i.e. cleaners, caregivers, etc.) officially employed in Italy. Experts believe this figure would be twice as large if people working off the book were included in calculations (Osservatorio Laboratorio Domestico, 2022^[8]). Whilst the risks at this stage appear marginal given the scale of the refugee crisis there is some evidence that the sector may be affected by bottlenecks to labour supply through humanitarian return migration.³⁶ . More generally, however, Ukrainian refugees are more likely to settle in places and work in industries where Ukrainian communities are larger. The top four regions (i.e. Lombardy Campania Emilia-Romagna and Lazio) out of 20 account for two thirds of Ukrainian nationals residing in Italy, which raises additional challenges not just for the ability of the labour market to absorb them, even if only for the short term, but also for the provision of housing and social services. Longer-term implications will become clearer as the situation stabilises and the evidence base improves.

Future research could also investigate the impacts of the war in Ukraine on consumers in Italian regions. Rising commodity prices are likely affect consumers both in a direct way, e.g. as users of imported natural gas to heat their homes, and in an indirect way, i.e. as buyers of goods whose production largely relies on commodities as a key input (e.g. wheat in bread and pasta). Forthcoming OECD work warns that soaring energy prices are likely to exacerbate pre-existing energy poverty challenges and call for greater energy efficiency efforts in urban and rural areas (OECD, Forthcoming^[9]). Similar to impacts on firms, impacts on consumers might be diversified across places as well, depending on local circumstances. For example, levels of household consumption of natural gas vary greatly across regions, as illustrated in Table 3.1. This could be due to differences in, amongst other, average winter temperatures, heating systems and energy infrastructure. Gas consumption is generally higher in colder regions in northern Italy (the seven top regions in the table are located in the north). Aosta Valley, also located in the north but nearing warmer southern regions in terms of its natural gas consumption, displays an exceptionally high use of other fossil fuels for heating.³⁷ Sardinia is currently not connected to any existing natural gas pipeline.

Table 3.1. Household consumption of natural gas is generally higher in northern Italian regions

Gas distributed for household consumption by Italian region in 2019 (million m3 per 1 000 population)

Region	Household distributed gas
Emilia-Romagna	0.92
Lombardy	0.84
Veneto	0.82
Piedmont	0.80
Trentino	0.69
Friuli-Venezia Giulia	0.68
South Tyrol	0.61
Tuscany	0.60
Liguria	0.57

³⁴ For more information, visit: <http://dati.istat.it/> (resident foreigners on 1 January 2021 by citizenship)

³⁵ For more information, visit: <https://www.interno.gov.it/it/notizie/ucraina-141562-i-profughi-giunti-finora-italia>

³⁶ For more information, visit: <https://apnews.com/article/russia-ukraine-europe-poland-migration-8de0893dfcf7db46e6a6acf9911104a4>

³⁷ For more information, visit: <https://www.lignacolor.it/index.php/it/lignacolor-news-alta-badia/128-fonti-di-riscaldamento-in-italia.html>

Umbria	0.57
Marche	0.57
Abruzzo	0.54
Molise	0.48
Basilicata	0.38
Lazio	0.37
Aosta Valley	0.33
Apulia	0.29
Campania	0.21
Calabria	0.16
Sicily	0.15
Sardinia	0.00
Italy	0.54

Note: Volumes in M Sm³; gas from 10.57275 25-15 kWh/Sm³

Source: Italian Ministry of Ecological Transition: <https://dgsaie.mise.gov.it/consumi-regionali-gas-naturale>

The regions where natural gas price increases are likely to affect the largest share of firms are the same whose consumers are likely to pay the highest heating bills. This exemplifies the importance of future spatial analysis that accounts for potential repercussions of the ongoing war on both employment and consumption.

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Annex A.

Table A.1. Manufacturing, particularly of machinery and clothing, take the lions' share in Italian exports to Russia

Share of exports to Russia by type of good and Italian region, 2020

Region	Food	Pharma	Machinery	Petrol	Clothing	Other man.	Non-man.
Piedmont	174 540 577	2 004 752	147 787 050	5 977 329	61 755 021	257 437 829	1 161 472
Aosta Valley	0	0	4 163 748	0	0	114 828	0
Lombardy	93 298 965	144 308 475	690 290 831	1 303 774	319 949 902	1 003 241 461	7 649 126
Trentino	2 939 488	312 240	28 586 443	0	1 562 187	12 603 667	15 658
South Tyrol	8 134 996		14 588 623	0	306 724	6 915 054	10 907 552
Veneto	51 118 036	10 336 922	383 363 521	73 552	271 524 753	587 009 107	4 078 991
Friuli Ven. Giulia	10 924 644	1 463 394	86 603 738	0	1 839 666	110 752 603	3 265 953
Liguria	6 675 568	809 469	38 588 776	58 120	2 464 007	53 531 118	416 113
Emilia-Romagna	104 220 633	57 675 344	494 131 167	253 579	345 716 846	486 376 494	11 625 122
Tuscany	19 837 601	25 281 517	115 864 630	2 184 554	114 698 294	142 976 560	4 795 707
Umbria	11 958 687	4 298	15 935 154	0	49 923 756	11 994 618	9 642 850
Marche	2 418 105	14 269 563	44 480 970	1 116	147 850 551	142 081 825	423 831
Lazio	17 793 869	312 720 386	74 075 029	5 920 732	26 230 106	148 760 645	2 039 517
Abruzzo	10 636 247	8 567 442	11 617 456	0	9 306 135	44 393 829	685 513
Molise	3 852 274	373 008	0	0	101 281	535 098	0
Campania	20 365 259	228 845	11 443 125	0	28 157 402	16 783 506	1 078 077
Apulia	4 775 791	22 080 339	9 590 584	194 673	10 494 668	18 767 964	21 872
Basilicata	21 713	0	56 951	0	13 281	4 752 164	0
Calabria	1 840 362	0	1 595 390	0	87 224	707 707	28 580
Sicily	5 146 226	1 442 531	6 653 024	0	1 208 291	3 371 445	13 242
Sardinia	246 327	2 004 752	815 656	5 977 329	317 449	2 829 186	1 173
Italy	550 745 368	601 878 525	2 180 231 866	15 967 429	1 393 507 544	3 055 936 708	57 850 349

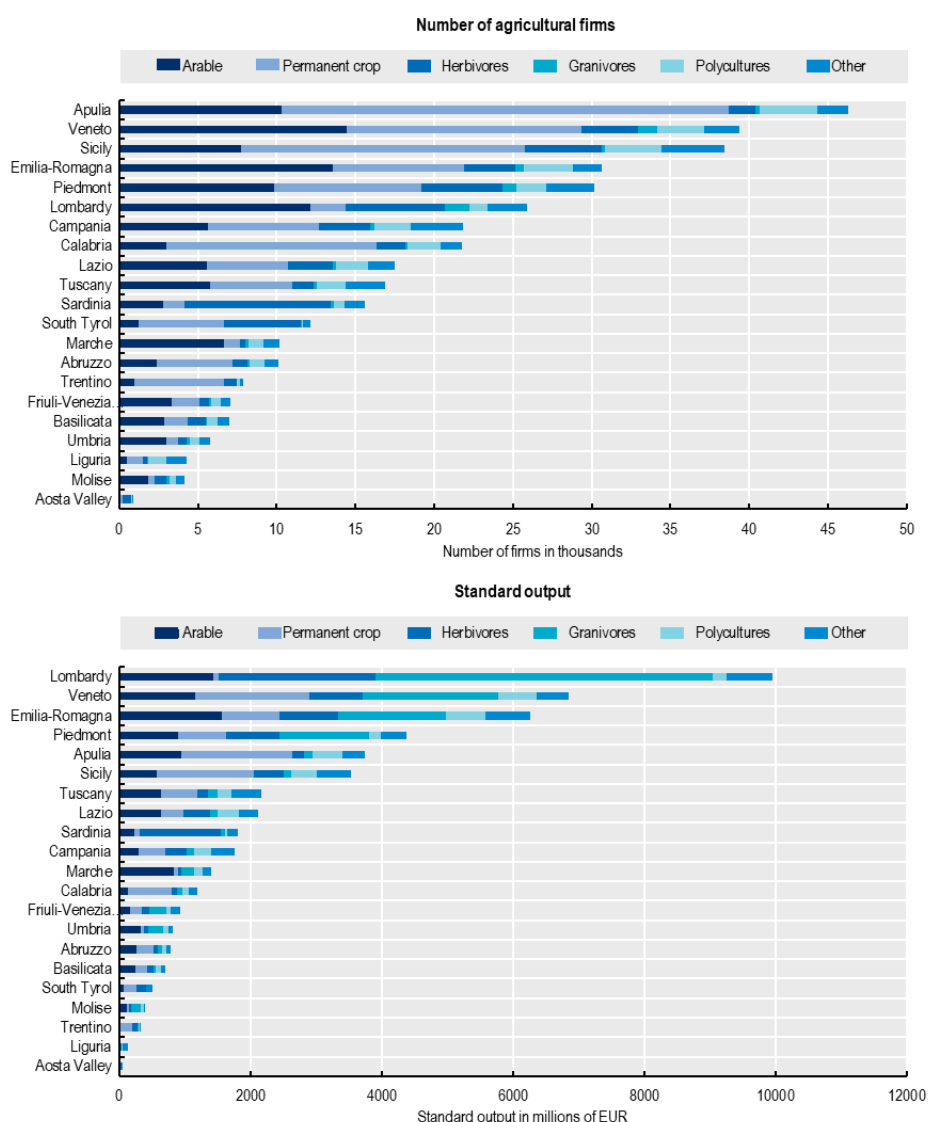
Note: "Food" includes food, beverages and tobacco. "Pharma" includes pharmaceutical, medicinal chemical and botanical. "Machinery" includes machinery and equipment. "Petrol" includes coke and refined petroleum products. "Clothing" includes textiles, clothing, leather and accessories". "Other man." and "Non-man." stand for other manufacturing and non-manufacturing exports.

Source: <https://www.coeweb.istat.it/>

Annex B.

Figure B.1. Firms in crop farming are more numerous than those in livestock farming in all regions but Sardinia. However, in some regions their gross output value is comparatively lower

Number of agricultural firms (thousands) and standard output (millions of EUR) by technical and economic orientation and Italian region, 2019



Note: "Other" includes horticulture (1, 2), mixed farming (2, 1) and multi-species grazing (3, 3). Numbers indicate the ranking from largest shares to lowest inside "Other" in firm numbers and production.

Source: <https://www.coeweb.istat.it/>