

# Food commodity production and imports in Spain and the EU: how much external autonomy is there?

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## Rationale

This article analyses European Union (EU) and Spanish production and imports of food commodities. A distinction is drawn between intra- and extra-EU imports, documenting the main non-EU suppliers and their concentration. The article also examines the geopolitical affinity of these non-EU suppliers with Spain and the EU.

## Takeaways

- Products are considered to have high external vulnerability when, in addition to being produced in insufficient quantity to cover domestic consumption, they meet three conditions: (i) extra-EU imports exceed total exports (i.e. exports cannot fully replace such imports); (ii) extra-EU imports account for more than 50% of total imports; and (iii) there is high concentration among non-EU suppliers.
- On these criteria, both the EU and Spain show considerable external autonomy in the 11 food categories analysed, primarily underpinned by domestic production and trade integration within the European single market.
- Spain has strong supply and export capacity in olive oil, meat, fruit and vegetables. The only food commodity group that meets the criteria for high external dependency is oilseeds.
- The geopolitical positioning of the main non-EU suppliers of food commodities does not appear to pose a significant risk to either Spain or other countries in the region.

## Keywords

Food supply, food production, food imports, supplier concentration, geopolitical relationships.

## JEL classification

Q11, Q17, Q18.

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### Introduction

In recent years, the restrictions on international food trade prompted by the COVID-19 pandemic, the increased frequency of adverse natural events and Russia's invasion of Ukraine, among other factors, have rekindled the debate about the food security risks faced by European Union (EU) countries. During the pandemic, 25 countries imposed export restrictions on food and fertilisers that had a significant impact on global imports.<sup>1</sup> Even more stringent restrictions were implemented after Russia's invasion of Ukraine, with 38 countries limiting exports. This situation was comparable to the 2007-08 crisis, when 33 countries imposed such restrictions (Laborde, Mamun and Parent, 2020). Against this background, in 2022 the EU sought to bolster its food autonomy through increased domestic production, further integration of the European single market and fresh trade expansion to secure and diversify supply sources,<sup>2</sup> a strategy that it still pursues today.<sup>3</sup>

Generally speaking, the production of food for human consumption is the combination of “food commodities”,<sup>4</sup> such as cereals, meat and dairy products, and a broad and diverse range of other inputs, such as fertilisers, energy and labour. This article focuses on the main food commodities (hereafter “food”) in Spain and the EU and analyses their domestic production and imports.<sup>5</sup> For imports, the largest supplier countries are identified (distinguishing between the intra-EU and extra-EU markets), along with the level of supplier concentration and the degree of geopolitical affinity<sup>6</sup> with Spain and the rest of the EU.

### Food commodity production and imports

In 2022<sup>7</sup> the EU produced sufficient quantities of cereals, meat, dairy products, vegetables, sugar and olive oil<sup>8</sup> to cover its own consumption needs (see Chart 1.a). Conversely, the bloc was a net

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1 One way of measuring the stringency of these food export restrictions is on the basis of caloric content, i.e. food's energy content. During the pandemic the restrictions affected 9.8% of imported calories globally. After Russia's invasion of Ukraine that figure rose to 19.3%, comparable to the 18.7% observed during the 2007-08 crisis. [Food Trade Policy Tracker](#) (Laborde, Mamun and Parent, 2020).

2 European Parliament (2022/2593(RSP)).

3 See, for example, European Parliament (2024).

4 Broadly speaking, food commodities are products in their natural state, either unprocessed or minimally processed, used as a basis for food production. They may not be fit for human consumption in their natural state, e.g. raw cereal grains or coffee beans that require processing before they can be ingested. Conversely, food refers to products that are ready for human consumption.

5 This article considers the following food groups: cereals, meat, dairy products, fruit, vegetables, fish, olive oil, other vegetable oils, sugar, coffee and oilseeds. Food groups with a low share in overall supply, such as rabbit or horse meat, are not included as data are not available for all countries.

6 Measured using the index in Bailey, Strezhnev and Voeten (2017), which reflects the extent to which countries vote similarly or differently on human rights issues in the United Nations General Assembly. It is often used in the literature to analyse the “geopolitical distance” between countries.

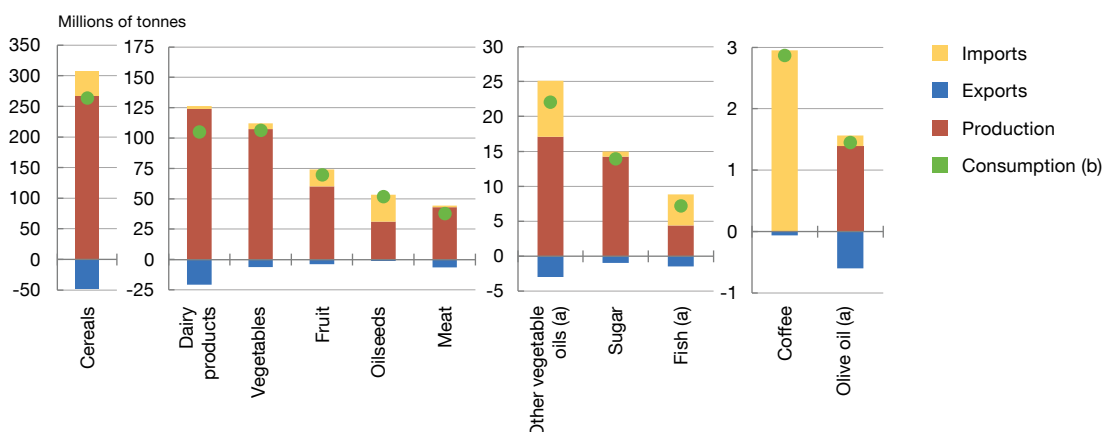
7 When referring to quantities, the year given refers to the calendar year in which the production cycle begins. In this case, 2022 refers to the 2022-23 production cycle and can be considered a representative year. In the case of olive oil, the data for 2021 are used to provide a representative year, given the extreme drought of 2022.

8 Throughout this article, as a general rule quantity data are used when referring to production and consumption measurements. When referring to imports and exports only, value data are used unless explicitly stated otherwise.

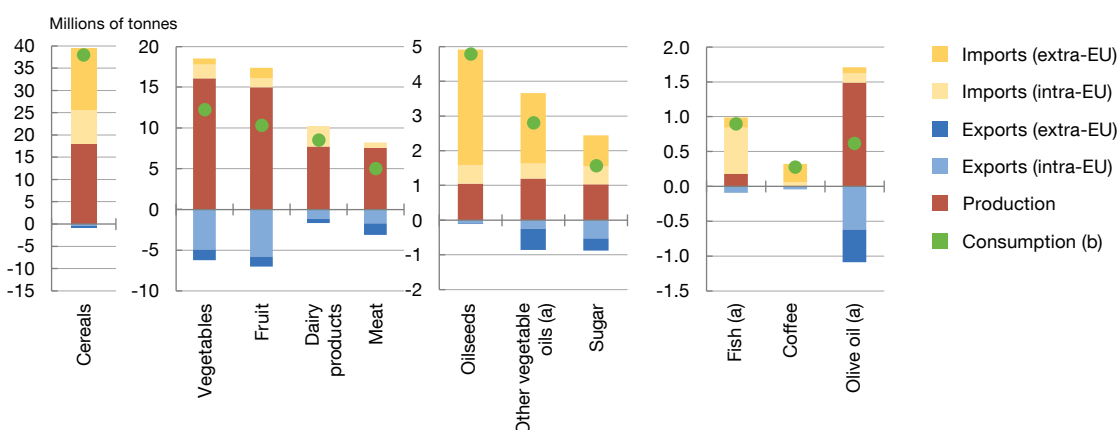
Chart 1

## Food commodity production, consumption, imports and exports in 2022

## 1.a European Union



## 1.b Spain



**SOURCES:** European Commission (DG Agri-food and JRC), FAO and Banco de España.  
**NOTE:** Data in quantities.

- a The data for fish, olive oil and other vegetable oils are for 2021.  
 b Consumption data include changes in inventories.



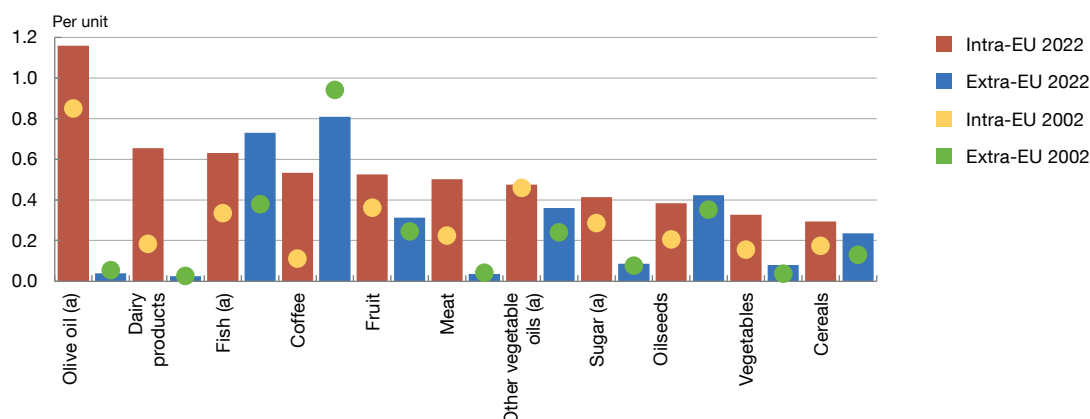
importer of fruit, oilseeds, fish, other vegetable oils (other than olive oil) and coffee. In the same period Spanish domestic production covered the country's own consumption requirements for fruit, vegetables, meat and olive oil (see Chart 1.b), but net imports were needed for cereals, dairy products, oilseeds, other vegetable oils, fish, sugar and coffee.

In any event, since the early 2000s the share of intra-EU trade has been increasing across all the food categories, which has helped strengthen the relative food autonomy of the EU and Spain. Indeed, in the EU as a whole the average percentage of domestic consumption accounted for by intra-EU imports increased between 2002 and 2022 for all 11 of the food commodities analysed (see Chart 2.a). Only in the case of fish, coffee and oilseeds do extra-EU imports have a larger share in domestic consumption than imports from within the European single market.

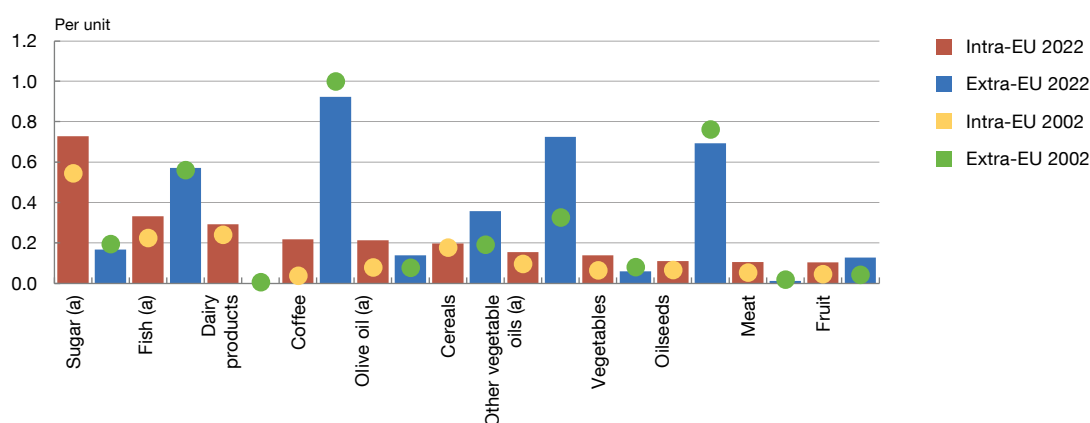
Chart 2

## Ratio of imports to consumption in 2002 and 2022

## 2.a EU average



## 2.b Spain



SOURCES: European Commission and Banco de España.

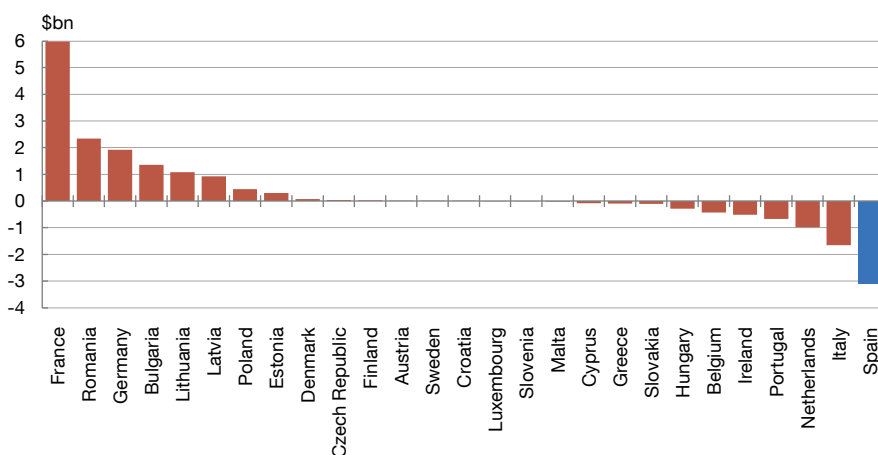
a Due to data unavailability and for comparability with the EU, for olive oil the starting year is 2004 and the end year is 2021, for sugar the starting year is 2017 and the data for other vegetable oils and fish end in 2021.



The pattern in Spain mirrors that of the EU, with the share of intra-EU imports in domestic consumption rising between 2002 and 2022 across all the products considered (see Chart 2.b). However, extra-EU imports predominate in fish, coffee and oilseeds, just as they do for the EU, but also in other vegetable oils, fruit and cereals. Indeed, Spain is the bloc's largest net importer of cereals<sup>9</sup> from outside the EU (see Chart 3). This vulnerability is somewhat mitigated by the fact that the EU as a whole is a net exporter of cereals. Thus, under an extreme hypothetical scenario in which EU borders were closed, Spain's cereal consumption could be met if extra-EU exports from other Member States, e.g. France, were redirected towards Spain.

<sup>9</sup> Cereals include those used for animal feed, which accounts for 60% of domestic cereal consumption across the EU. In Spain that figure rises to 75%.

Chart 3

**Net extra-EU cereal exports in 2022****3.a Breakdown by Member State**

SOURCES: BACI-CEPII and Banco de España.

## Extra-EU suppliers of food commodity imports

In 2022 the EU's main non-EU suppliers were Brazil, Ukraine, Norway and the United States.<sup>10</sup> For Spain they were Brazil, the United States, Morocco and Ukraine. Specifically, Brazil is the EU's largest supplier of oilseeds, coffee and sugar, while it is Spain's main extra-EU supplier of oilseeds, meat, sugar, cereals and coffee.

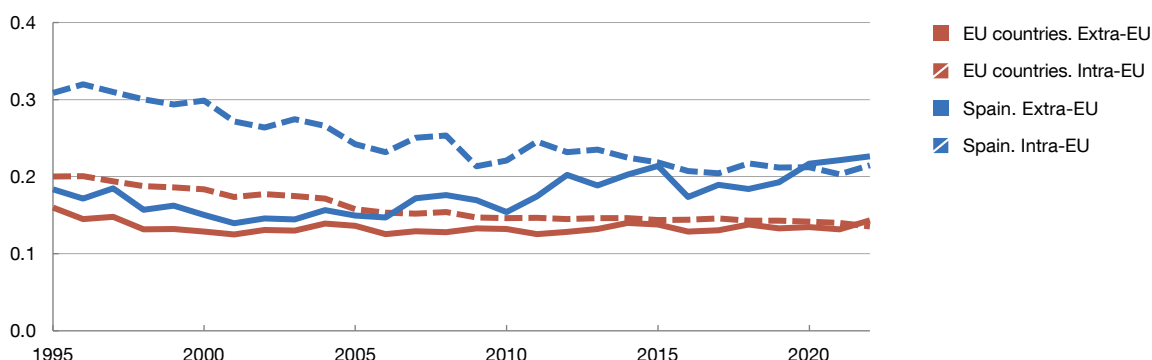
Trade policies are crucial in shaping these flows. Brexit is perhaps the most recent example of this. For instance, between 2019 and 2022 the United Kingdom's market share in EU dairy imports shrank from 70% to 48%. Another example is the EU-Ukraine Association Agreement signed in 2014, which established the EU-Ukraine Deep and Comprehensive Free Trade Area. Largely as a result of this agreement, Ukraine's market share in EU cereal imports rose from an average of 10% in the period 2007-12, when the agreement was negotiated, to 26% in 2021 and 37% in 2022.

It is also important to ascertain whether food commodity imports are concentrated among a small number of suppliers, as this could be a source of vulnerability in the event of supply shocks affecting those suppliers or geopolitical shocks. Following the European Commission (2021), we assess supplier concentration using the Herfindahl-Hirschman index.<sup>11</sup>

<sup>10</sup> Measured by value, drawing on BACI-CEPII. This source partially corrects the import origin distortion found in the Eurostat Comext database, also known as the "Rotterdam effect". By way of example, soybeans imported from Brazil to Spain via the Netherlands are recorded by Eurostat as an extra-EU import from Brazil to the Netherlands and as an intra-EU import from the Netherlands to Spain. The BACI-CEPII database, which reconciles importer and exporter declarations, partially corrects this distortion and is therefore useful for distinguishing between intra- and extra-EU trade by country.

<sup>11</sup> The sum of the market share of each supplier squared. It has a value of 1 if there is a single supplier; the more suppliers there are in the market the closer the value is to zero.

Chart 4

**Concentration of food imports****4.a Herfindahl-Hirschman index (HHI)**

SOURCES: BACI-CEPII and Banco de España.

NOTE: The Herfindahl-Hirschman index is used to measure import concentration. It is calculated, for each food group, using data on bilateral import flows by value. Indexes for different food groups are aggregated for the importing region (EU) or country (Spain) using as weights the value of each food group in their respective total imports.



Based on this methodology, considering total imports and weighting the concentration of each food group by its share of total imports, supplier concentration in the EU overall was low in 2022 (below 0.15). Meanwhile, Spain posted moderate levels of concentration of extra-EU suppliers (between 0.15 and 0.25), below the EU median.

Nevertheless, within that moderate range, the degree of concentration of Spain's extra-EU imports is growing, up from 0.14 in 2011 to 0.23 in 2022, compared with the relative stability observed for the EU overall (see Chart 4).<sup>12</sup> This higher level of concentration is seen in several products, especially in oilseeds (Brazil accounted for 73% of Spanish imports in 2022), cereals (where there is a growing concentration of imports from Brazil and Ukraine), meat (headed again by Brazil, which accounts for 57% of imports) and vegetables (Morocco accounts for 45% of imports).

The analysis by product group reveals a moderate concentration of EU suppliers in the two categories with the highest import volumes relative to consumption: oilseeds and coffee (see Table 1.a). For all other products that depend on extra-EU imports to meet domestic consumption – fish, other vegetable oils and fruit – supplier concentration is low. The highest concentration of imports occurs in dairy products and olive oil, groups in which the EU is self-sufficient.

To assess the degree of external dependency in the case of products that a country does not produce in sufficient quantity, we use the European Commission (2021) methodology which

<sup>12</sup> Comparisons between Spain and the EU, and between single products and broader categories, must be interpreted with caution since the concentration index used is sensitive to the number of products included in each category, and to the size of the regions considered. For example, concentration in olive oil, sugar and coffee will tend to be higher than in items that include more products in their composition, such as cereals, dairy products or meat, because the greater product variability allows for a higher number of suppliers. Likewise, considering larger regions, such as the EU versus Spain, leads to lower concentration ratios owing to the greater opportunities for diversification.

Table 1  
Production and extra-EU import ratios

### 1.a European Union

	Production	Extra-EU imports			
	Production / Consumption (volume) (b)	Extra-EU imports / Total exports (value) (c)	Extra-EU imports / Total imports (value) (c)	Concentration (value) (d)	Extra-EU imports / Consumption (volume) (b)
Olive oil (a)	1.42	0.08	0.13	0.51	0.09
Dairy products	1.17	0.03	0.04	0.32	0.02
Meat	1.13	0.09	0.11	0.14	0.04
Cereals	1.03	0.32	0.38	0.18	0.15
Sugar	1.02	0.36	0.30	0.17	0.05
Vegetables	1.01	0.20	0.21	0.11	0.05
Fruit	0.86	0.66	0.45	0.06	0.20
Other vegetable oils (a)	0.69	0.71	0.49	0.14	0.42
Oilseeds	0.60	1.59	0.65	0.17	0.43
Fish (a)	0.60	0.90	0.54	0.14	0.60
Coffee	0.00	6.58	0.89	0.19	1.02

### 1.b Spain

	Production	Extra-EU imports				
	Production / Consumption (volume) (b)	Extra-EU imports / Total exports (value) (c)	Extra-EU imports / Total imports (value) (c)	Concentration (value) (d)	Concentration by geopolitical distance (value) (d)	Extra-EU imports / Consumption (volume) (b)
Olive oil (a)	2.41	0.09	0.43	0.39	0.42	0.14
Meat	1.51	0.02	0.12	0.36	0.34	0.01
Fruit	1.45	0.23	0.64	0.13	0.13	0.13
Vegetables	1.31	0.09	0.45	0.23	0.23	0.06
Dairy products	0.90	0.03	0.02	0.46	0.39	0.00
Fish (a)	0.66	1.32	0.66	0.06	0.06	0.57
Cereals	0.47	5.23	0.57	0.27	0.24	0.36
Other vegetable oils (a)	0.43	1.23	0.59	0.19	0.20	0.73
Oilseeds	0.22	11.58	0.85	0.56	0.53	0.69
Sugar	0.20	3.71	0.34	0.21	0.20	0.17
Coffee	0.00	8.14	0.93	0.20	0.21	0.92

SOURCE: Banco de España.

- a Consumption data are 2021 data.  
b Production and import volumes shown are relative to consumption. For example, in 2022 the EU produced 1.03 times the volume of cereals it consumed, while in that same year Spain produced 47% of the cereals it consumed. The blue shading denotes foods whose production does not cover consumption.  
c The orange shading denotes a high dependency based on the European Commission (2021) methodology. For a group of foods to be considered high dependency, the ratio of extra-EU imports to total exports must be greater than 1 and the ratio of extra-EU imports to total imports must be greater than 0.5.  
d The orange shading denotes concentration (HH index) over 0.25, a high level based on the commonly used threshold employed by the European Commission (2023) for agricultural products. Note that there are no benchmark thresholds for the concentration by geopolitical distance variable. We use the same ones as the European Commission uses to illustrate how the results change if geopolitical relations between countries are taken into account. The red shading denotes high levels.

identifies high dependency when the following three conditions are met: (i) the value of extra-EU imports is greater than the value of total exports of that product; (ii) extra-EU imports account for more than 50% of total imports; and (iii) extra-EU imports are highly concentrated. The European

Commission (2021) report uses a high level of disaggregation by product type, and thus a higher threshold for import concentration. This article uses data aggregated by food group, which makes it easier to diversify between different suppliers. We therefore use the commonly employed standard, in line with the European Commission (2023) report: a Herfindahl-Hirschman index of 0.25 or more denotes high concentration.

Table 1.a highlights in orange the values that exceed each of the three criteria indicated for a food group to be considered to have high external dependency. As the table shows, in the case of the EU none of the eleven food groups analysed have high external dependency. Among the products that are not produced in sufficient quantity to meet consumption needs (highlighted in blue in the first column of Table 1.a), the proportion of imports over exports, and the fact that these are extra-EU imports, would class oilseeds and coffee as high dependency products, but the moderate supplier concentration levels mean that dependency is not high according to all three of the above criteria. Interestingly, the proportion of consumption covered by these imports varies, ranging from 20% in the case of fruit to 100% in the case of coffee.

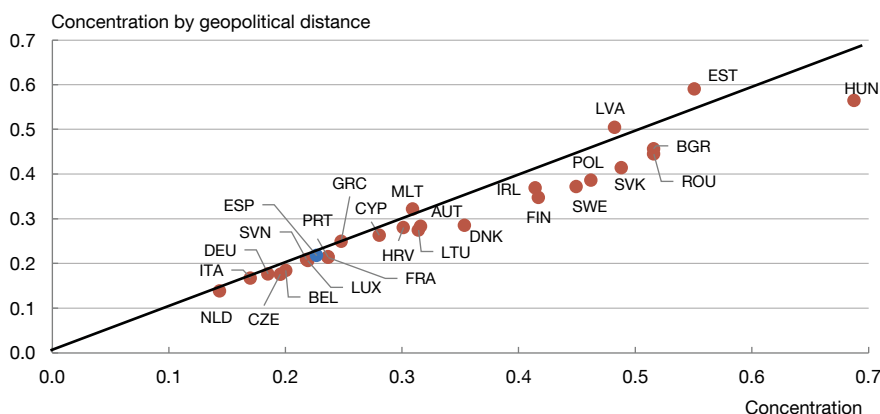
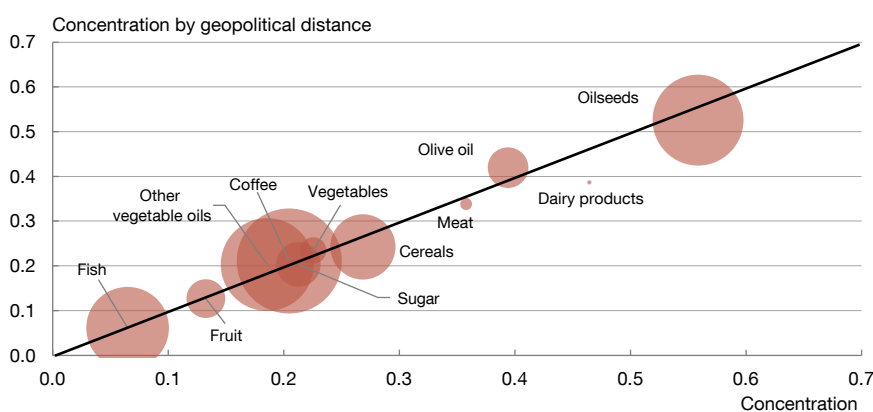
In Spain, only oilseeds have high external dependency (see Table 1.b). For food groups where there is insufficient production to meet domestic consumption (highlighted in blue in the first column of Table 1.b), the ratio of extra-EU imports to Spain's total exports is high for almost all groups except dairy products. Adding in the second criterion – the ratio of extra-EU imports to total imports – excludes sugar as a potential high dependency group as it falls below the threshold (0.5). Once the third criterion – supplier concentration – is included, only oilseeds and cereals remain on the list of food products with high external dependency. In the case of cereals, the EU has sufficient capacity to meet Member States' consumption needs, so Spain could potentially replace its extra-EU imports of cereals with EU imports. Moreover, as we see below, considering the geopolitical relationship with the extra-EU countries that supply cereals to Spain, the concentration ratio lies just below the high dependency threshold. However, unlike imports of cereals, imports of oilseeds cannot be replaced in this way. In consequence, Spain's external dependence risk is limited to oilseeds. By way of illustration, the ratio of extra-EU imports to consumption (the last column of Table 1.b) does not denote high dependency using the European Commission methodology since, for example, the proportion of consumption covered by extra-EU imports in the case of coffee and vegetable oils other than olive oil is higher than in the case of oilseeds and, once again, supplier diversity mitigates the risk of high dependency as suppliers may be replaced by others.

## Geopolitical risk

In this section we add the geopolitical affinity dimension to our analysis of food commodity suppliers. For this purpose we use an import concentration index that takes into account the geopolitical relationship with each of the trading partners from which food commodities are imported. Specifically, the geopolitical distance index proposed by Bailey, Strezhnev and Voeten (2017), which shows to what extent two countries tend to vote similarly in the UN General Assembly on human rights issues. The greater the distance in geopolitical positioning between two countries, the higher the index.



Chart 5

**Concentration of extra-EU imports in 2022 weighted by geopolitical distance****5.a Breakdown by EU Member State (a)****5.b Breakdown by product group in Spain (b)**

**SOURCES:** BACI-CEPII; Bailey, Strezhnev and Voeten (2017); and Banco de España.

- a** The geopolitical distance index is calculated such that the mean value of the 27 EU Member States and all trading partners in 2022 is equal to 1. See Balteanu, Schmidt and Viani (2024) for more details.
- b** The bubble size denotes the volume of extra-EU imports relative to production, so that the bigger the bubble the higher the volume of imports relative to domestic production.



Chart 5.a shows that in almost all EU countries, including Spain, import concentration ratios weighted by countries' geopolitical affinity with their suppliers (vertical axis) are similar to or even lower than the ratios discussed above (horizontal axis). Only imports from Estonia and Latvia, in addition to having a relatively high level of concentration, are moderately biased towards suppliers more geopolitically distant from the EU than the average of all potential trading partners, making them more vulnerable.

When this same analysis is conducted for the Spanish economy by product group, the lack of geopolitical affinity with external suppliers is not identified as a potentially serious problem for any of the food commodities considered (see Chart 5.b and Table 1.b ("Concentration by geopolitical distance" column)).

## Final considerations

In addition to the points presented in the previous sections, there are also three key aspects of food security that have not been addressed here. First, as we have seen in certain recent episodes, the degree of geopolitical affinity with some of our chief extra-EU trading partners may change relatively abruptly over time. Second, regardless of what happens with food commodities, food security both in the EU and Spain could also be sharply affected by possible domestic production/consumption imbalances in some critical inputs for food production, such as fertilisers.

Lastly, the academic literature identifies climate change as a major risk to food production. In this respect, in a study on Europe, Naumann, Cammalleri, Mentaschi and Feyen (2021) estimate that if actions are not taken to mitigate climate change, the biggest losses would be concentrated in the agricultural sector in the Mediterranean and Atlantic countries. In the same vein, the Banco de España (2022) identifies an increased risk of wildfires and desertification in southern European countries, also related to climate change. More recently, Pieralli and Pérez-Domínguez (2024) illustrate the potential effects of extreme weather events in the EU and find that they may negatively affect food supply and trade, undermining the resilience of EU agricultural markets.

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