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STUDY ON THE TRADE PERFORMANCE OF THE EUROPEAN UNION ON THE INTERNATIONAL PLUM MARKET

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Abstract

This research aims to analyze the trade performance of the European Union in fresh plum trade, through an integrated approach that combines evolutionary, structural and quantitative analysis of official statistical data. The main objective is to assess the trade position of EU Member States on the international plum market, in terms of trade volume, dependence on trading partners, sensitivity to price variations and strategic export orientation. The methodology applied involved the analysis of the dynamics of plum trade in the period 2014–2024, differentiated by intra- and extra-community flows, both for imports and exports, using quantitative and value indicators, as well as synthetic variation indices, such as the Herfindahl–Hirschman index for trade concentration or the coefficient of variation for price volatility. The analysis started from the premise that plums represent an important category of fruit in the agricultural economy of several European countries, and the trade behavior of the European Union reflects not only its positioning in relation to other global actors, but also its vulnerabilities or competitive advantages within the international flows of fresh fruit. The results obtained highlight that exports of fresh plums from the EU have registered significant increases in some Member States such as Spain, Italy and Romania, while others have shown high volatility and lower contributions to the Union's trade performance. The evolution of selling prices has been marked by significant fluctuations, and the application of the Herfindahl–Hirschman index has confirmed a trend of increasing import concentration, indicating dependence on a small number of trading partners. The conclusions drawn indicate that, despite the progress made, the EU plum market remains exposed to trade imbalances and requires sustained policies to stabilise and consolidate competitive advantages.

Key words: *performance, plums, import, export, trade flows, competitiveness*

INTRODUCTION

Fresh fruit trade is a strategic segment of global agriculture, at the intersection of food security, international trade and rural development. Among the fruit species that are increasingly attracting research and trade policy attention is the plum (Prunus domestica), a species that plays a major role not only in terms of agronomics but also in terms of commercial value and position in the fruit market [2, 5, 7]. Plums are widely cultivated in many regions of the world, especially in temperate zones, and international trade in plums reflects the general trends of globalization of fresh fruit production and consumption [4, 12].

Worldwide, the plum occupies one of the first positions in the ranking of fruit species according to the cultivated area, being present in over 70 countries. According to FAOSTAT data, global plum production has exceeded 12 million tons annually in the last decade, with China, Serbia, India, Iran and the European Union being among the main producers [3]. The European Union plays an essential role in world production, not only through the quantities obtained, but also through the quality of the cultivated varieties, adapted both to fresh consumption and industrial processing [1, 11].

On the fruit market, plums occupy an important niche, with significant seasonal consumption, but also being used in multiple forms of processing: juices, jams, prunes or the entire agri-food chain. For this reason, the commercial performance of this crop has broad implications, influencing the trade balances of producing and consuming countries, farmers' incomes, the structure of supply chains and,

last but not least, the Common Agricultural Policy [6].

The European Union, through its Member States, is a major player in both the export and import of plums. Due to the seasonal nature of production and the continuous demand from consumers, many European countries import plums outside their own production season, thus contributing to a volatile but dynamic commercial market. At the same time, countries with surplus production, such as France, Spain or Bulgaria, direct significant volumes towards exports, strengthening trade relations with external markets, especially outside the Community area.

The commercial performance of a region or a country cannot be assessed solely in terms of exported or imported volumes but must be analysed in the context of the structure of trade, trading partners, prices and, above all, the added value obtained. Trade in fresh plums is therefore a relevant indicator for assessing the competitiveness of a horticultural sector, the efficiency of trade chains and the geographical position in international flows [8].

Determining trade performance thus becomes essential, as it allows the identification of strengths and vulnerabilities of plum trade, including the risks associated with excessive dependence on certain markets or a structural imbalance between exports and imports. The analysis of the trade balance, expressed in value and quantitative terms, represents only the first stage, being complemented by trade orientation indicators, such as the export-import ratio, concentration indicators, but also by correlations between prices and trade flows. More and more scientific research and statistical approaches have been applied to evaluate the trade performance of agri-food products, including fruits. For example, studies conducted by [10, 13] have highlighted the fact that the dynamics of fruit exports are closely correlated with innovation in the logistics chain, product quality and the ability to access high-value-added markets. Regarding marketing, the specialized literature emphasizes the seasonal and volatile nature of the market, as well as the increasing influence of phytosanitary standards from the production phase onwards [9].

At European level, analyzing trade performance is important as the CAP promotes external competitiveness, sustainability and adaptability of agricultural markets. The fruit sector is supported by dedicated schemes, and fruits such as plums benefit from financial support and promotion policies on third markets. However, faced with increasing competition from third countries, such as Turkey, Chile or South Africa, the European Union needs to better understand its own trade flows to adapt trade policies adapted to global realities.

Trade performance is therefore an essential component of diagnosing horticultural potential, but also a strategic decision-making tool in defining the development directions of the plum sector. This involves not only measuring trade flows, but also an integrated analysis of the structure of partners, price sensitivity, import dependencies or the capacity to capitalize on external trade opportunities. In this context, this research attempts to contribute to understanding the place occupied by the E.U. in the international trade in fresh plums, by analyzing a series of official statistical data, corroborated with commercial performance indicators.

MATERIALS AND METHODS

This analysis is based on a complex set of statistical data on trade in fresh plums in the European Union, collected from the official Eurostat database. The data were downloaded in July 2025, covering the period 2014–2024.

The methodological approach followed a multi-level approach, focused both on the analysis of evolution over time and on the structure, namely dependence, orientation, concentration of partners, in order to evaluate the trade behavior of the EU with regard to fresh plums, through the prism of quantitative, value and structural dimensions. For this, the analysis followed: the annual dynamics of the volume of imports, with extra-EU and intra-EU imports being analyzed separately, and subsequently aggregated to provide a complete view of the evolution of the total volumes of plums imported by the European Union; the evolution of exports, which were also divided

into extra-EU and intra-EU flows; the evolution of sales prices, using the average annual sales prices expressed in euros/100 kg, which allowed the calculation of variation indices and the calculation of the coefficient of variation for estimating price volatility at community level; the analysis of trade orientation which was carried out starting from the ratio between exported and imported volumes, calculating trade orientation indicators at the level of each member state; the analysis of import and trading partner dependence, which allowed the estimation of risks related to potential trade vulnerability, by calculating the Herfindahl–Hirschman index, an indicator measuring the degree of concentration, which was applied to both imports and exports; the integrated analysis of the price–trade relationship, which assessed the correlation between the average selling price and imported/exported volumes, in order to identify the extent to which trade movements are sensitive to price variations.

The HH indicator was calculated based on the share of each partner country, of origin or destination, in the total value traded, as follows:

$$HH = \sum_{i=1}^{n} (si)^2 \quad (1)$$

where:

s_i - represents the market share of country i in total trade.

A value close to 0 indicates a fragmented market, characterized by diversification of trading partners, while an increased value shows potential dependence on certain suppliers, with implications for market resilience and food security.

RESULTS AND DISCUSSIONS

By analysing trade flows, price variations and the degree of concentration towards certain partner markets of the fresh plum trade, the study aims to identify the main trends and vulnerabilities of this agricultural segment. The ultimate goal is to assess the EU's trade performance to adopt strategic decisions in the field of agri-food trade.

Only EU Member States for which complete data were available for the entire period analysed were included in the analysis. Countries that presented lack of reporting or statistical inconsistencies for one or more years between 2015–2024 were removed from the sample, to ensure comparability and substantiation of interpretations.

During the period under review, extra-EU trade in fresh plums reflected high volatility, driven by structural and cyclical factors of an economic, climatic and commercial nature. At the aggregate level, the EU showed an evolution with different amplitudes from one year to the next, indicating a moderate reactivity to the dynamics of domestic demand and to the supply from third countries. Although the arithmetic mean of the annual variations shows a relatively positive trend, the high dispersion of the values signals an unstable trade climate.

Disaggregation at the level of the Member States highlights heterogeneous trade behaviors. Thus, some Central European economies such as the Czech Republic, Slovakia and Hungary presented episodes of intense imports followed by severe contractions, which highlights an irregular adaptation to seasonal variations in domestic production and to changes on the world market. Similarly, countries such as Poland and Lithuania recorded short-term increases, which can be attributed to transitory factors.

On the other hand, in the case of countries with a favorable geographical or economic position, such as Germany, Italy and France, the annual percentage variations indicate a more stable procurement regime and better correlated with domestic consumption coverage strategies.

This stability demonstrates both the logistical efficiency of supply chains and a better capacity to integrate imports into agricultural and food distribution cycles. Some smaller Member States, such as Estonia, Bulgaria and Latvia, have experienced disproportionate fluctuations compared to the European average, which may indicate vulnerability to changes in international prices (Table 1).

Table 1. Evolution of fresh plum imports, Extra – EU, in the period 2015-2024 (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
European Union	14.44	27.44	5.59	0.96	-18.42	11.13	25.71	-5.45	7.76	24.08
Austria	28.68	61.53	24.7	-32.79	15.13	101.09	15.25	-9.36	97.37	34.06
Belgium	16.32	-37.93	-36.54	-33.81	-25.02	-14.72	5.56	13.79	-51.38	14.00
Bulgaria	776.97	-64.48	-50.99	163.4	-20.18	-84.08	61.23	673.53	-84.33	-29.62
Croatia	104.49	1.6	24.13	39.6	-41.71	343.13	27.47	-10.24	89.62	-2.25
Czechia	251.85	19.91	17.8	-62.45	62.8	72.34	19.17	-48.15	101.68	19.83
Denmark	-72.97	159.58	6.25	-7.99	-39.61	-33.99	-19.68	-42.68	74.39	122.18
Estonia	2,3314.41	-25.71	131.65	-30.85	-78.69	182.46	-62.69	-32.28	754.66	10.39
France	68.82	-10.22	-42.54	88.99	-35.35	18.54	19.95	3.54	17.25	7.82
Germany	146.23	-14.26	85.2	-40.52	30.94	83.2	-6.7	-5.26	-20.78	-28.42
Greece	12.33	103.11	-30.99	42.37	9.63	-20.38	-39.2	-38.83	32.05	58.46
Hungary	163.73	277.27	493.78	-65.06	-64.17	489.57	-41.3	-63.09	664.37	179.89
Ireland	47.18	-30.65	55.58	-28.56	-21.5	-33.78	-11.42	41.74	7.95	-27.14
Italy	127.79	17.58	8.48	27.62	-2.38	-8.01	16.87	-47.71	95.83	-30.49
Latvia	93.31	41.75	453.38	-70.48	76.19	89.35	1.68	-46.01	218.74	-0.64
Lithuania	-83.37	-93.52	3897.92	-37.61	172.67	475.86	-18.39	-29.99	296.6	-49.86
Netherlands	-0.45	29.11	-18.57	29.17	-26.66	-3.06	40.09	-0.48	-22.07	37.3
Poland	-49.49	370.41	5335.53	-89.5	38.97	156.44	-1.09	-9.87	193.74	28.64
Portugal	361.36	89.79	-10.08	-51.1	-18.24	-3.13	101.32	-47.98	-29.07	1.17
Romania	233.81	29.67	64.8	-23.08	28.14	35.31	-10.14	39.46	33.76	15.35
Slovakia	-11.22	202.29	25.09	-85.52	174.58	109.37	-54.6	50.29	162.79	22
Slovenia	172.13	239.63	64.14	-49.34	20.38	52.48	46.46	-52.93	-29.2	60.76
Spain	19.07	43.85	-3.08	29.72	-23.4	-77.18	6.78	-0.34	60	-6.7
Sweden	273.65	-25.85	6.4	-6.99	18.83	122.69	-4.52	19.92	40.12	10.09

Source: own processing [14].

In particular, extreme values in certain periods indicate the existence of episodic phenomena, such as regional poor harvests, fluctuations in transport costs, or temporary barriers to market access.

Trade fluctuations were correlated with macroeconomic factors, such as the depreciation of the euro against the currencies of the main exporting countries, but also with severe climatic factors that affected plum yields in the intra-community space. At the same time, in the post-pandemic context and the conflict in Ukraine, some trade routes were redirected and some markets recalibrated, indirectly affecting import flows.

These findings confirm that, in the absence of stable trade partnerships with third countries producing plums, the EU remains exposed to high volatility in supply, and common trade policies must aim to reduce this dependence by diversifying external sources and strengthening domestic production.

Intra-EU trade in fresh plums within the EU has registered a significant consolidation during the period under review, reflecting a dual trend: on the one hand, an intensification of agricultural exchanges within the single market and, on the other hand, an increase in geographical specialization in the production and distribution of seasonal fruits.

The aggregate growth of over 60% at EU27 level is due not only to the expansion of demand, but also to the increased functionality of internal logistics and trade networks.

The growth recorded in most Member States is due to the more efficient distribution of seasonal crops, as well as the growing preference of consumers for products originating within the European area, in the context of new guidelines on food safety, traceability and sustainability.

Table 2. Evolution of fresh plum imports, Intra-EU, during 2015-2024 (%)

Country	2014 (EUR)	2024 (EUR)	2014–2024 (%)
European Union – 27	145,317,728	233,051,712	60.37
Austria	4,184,103	7,474,178	78.63
Belgium	15,388,914	18,091,724	17.56
Bulgaria	175,936	464,980	164.29
Croatia	479,610	1,346,162	180.68
Cyprus	583,793	1,244,278	113.14
Czechia	3,312,364	9,152,809	176.32
Denmark	5,707,300	5,544,045	-2.86
Estonia	1,006,968	1,280,444	27.16
Finland	3,268,003	4,096,929	25.36
France	15,447,793	11,468,290	-25.76
Germany	41,474,787	77,333,842	86.46
Greece	955,801	1,239,946	29.73
Hungary	594,389	1,737,673	192.35
Ireland	1,980,023	3,196,116	61.42
Italy	8,258,077	19,624,509	137.64
Latvia	1,653,856	1,307,718	-20.93
Lithuania	8,424,815	2,868,832	-65.95
Luxembourg	844,900	1,605,127	89.98
Malta	729,912	1,043,526	42.97
Netherlands	8,750,439	13,966,203	59.61
Poland	8,154,436	19,521,767	139.4
Portugal	3,564,059	9,505,685	166.71
Romania	775,854	2,298,991	196.32
Slovakia	1,000,684	3,111,894	210.98
Slovenia	664,796	2,454,960	269.28
Spain	3,123,696	6,836,145	118.85
Sweden	4,812,420	5,234,939	8.78

Source: own processing [14]

Countries such as Slovakia, Slovenia and Romania have shown an increase in intra-EU imports, which reflects an accelerated integration into European supply chains, but also a reduction in the domestic capacity to satisfy seasonal demand. On the other hand, the decrease in volumes recorded in countries such as France, Lithuania or Latvia indicates a process of substitution of imports with local production, but also a repositioning of these economies in the regional trade network (Table 2).

These developments are due both to more efficient domestic agricultural policies and to price dynamics that made domestic supply more advantageous in certain periods. The position of Germany is also noteworthy, whose absolute volume of intra-community imports of plums almost doubled in the analyzed period. Given the size of the German market and its role as a redistribution center in Central Europe, this trend is an indication of the intensification of trade ties in the region, but also of increased pressures on the logistics infrastructure for managing perishable products. Countries in Central and South-Eastern Europe, such as Hungary, Poland, Croatia and the Czech Republic, recorded growth rates of over 150%, which demonstrates both the increase in domestic consumption and an untapped potential in developing their own production or storage capacities. At the same time, these results highlight a pattern of increased

interdependence between new and old Member States, in which trade in plums plays an increasingly clear economic role.

Thus, the intensification of intra-Community trade reflects not only the functional integration of the European single market, but also the adaptive dynamics of the horticultural sector to the modern demands of European consumers. In this context, fresh plums, although an apparently seasonal and quantitatively limited product, emerge as relevant indicators of internal trade performance and of the level of agricultural cohesion of the EU.

Table 3. Evolution of total imports of fresh plums into the EU from all countries of the world (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	37.61	26.88	8.62	-17.72	-5.14	41.71	2.02	-0.91	79.78	19.19
Belgium	17.93	10.44	-5.4	-12.32	-16.66	9.67	4.71	2.67	1.72	5.94
Bulgaria	163.04	-29.77	-27.41	55.89	8.74	-45.42	25.44	135.92	-21.56	-26.31
Croatia	46.58	-2.11	13.47	32.59	-19.65	163.62	34.14	-6.61	88.41	-6.45
Cyprus	-14.85	0.31	14.19	15.31	29.06	-30.91	45.34	-23.56	33.07	39.92
Czechia	11.41	21.03	5.53	-23.86	-1.62	15.08	29.79	-10.64	39.38	60.01
Denmark	4.65	-1.26	-7.8	5.7	-17.03	6.91	-7.5	20.56	-2.59	-4.06
Estonia	38.81	-10.16	3.38	-13.01	-2.89	4.29	23.27	10.7	2.12	-11.34
Finland	8.54	-11.6	11.6	18.81	-12.02	4.63	4.25	-7.11	0.25	18
France	22.32	1.24	-15.25	10.69	-36.98	36.91	51.07	-23.14	-15.74	-19.85
Germany	17.79	19.75	11.83	-19.44	-7.83	40.4	-1.3	-6.22	10.08	12.98
Greece	-24.65	19.1	-22.69	11.63	17.46	-9.11	32.13	-7.87	-0.52	33.04
Hungary	15.54	43.75	60.38	-34.24	45.44	-2.76	10.98	0.09	19.74	56.69
Ireland	29.7	-9.35	12.42	-12.14	-17.11	-18.22	18.98	40.4	-7.4	-6.06
Italy	43.88	-8.43	9.19	0.03	-11.84	19.61	42.13	-21.6	37.95	3.78
Latvia	-6.32	13.64	4.26	-10.62	3.78	29.98	4.62	14.4	15.99	-11.49
Lithuania	-62.93	-40.63	46.57	-20.65	37.46	6.2	31.94	-5.93	6.75	-19.9
Luxembourg	34.95	17.33	-1.45	1.64	4.52	1.55	2.16	5.88	-5.85	10.82
Malta	-9.66	28.88	-9.75	-2.13	-11.28	-12.89	28.74	-17.87	35	26.05
Netherlands	1.05	28.74	-18.22	24.53	-23.65	2.35	31.14	-0.15	-17.27	29.97
Poland	17.51	8.94	162.89	-58.67	33.65	17.26	6.15	-9.39	42.35	28.76
Portugal	34.52	56	-21.2	44.63	-42.62	51.5	-15.24	40.03	-13.53	24.23
Romania	100.45	31.48	55.57	-15.09	21.48	24.94	1.42	27.46	19.53	13.76
Slovakia	3.95	64.07	4.22	-10.46	6.27	26.67	10.09	0.61	33.24	1.59
Slovenia	41.61	141.19	48.49	-43.98	15.91	39.39	51.03	-43.09	-0.2	43.31
Spain	15.8	36.4	-6.73	21.84	-28.21	-36.57	29.13	4.01	21.02	0.43
Sweden	25.45	-7.26	-3.21	-4.38	-12.22	29.3	23.48	-10.67	4.47	-8.06

Source: own processing [14]

In the dynamic context of the international fruit market, trade in fresh plums in the EU reflects a complex sequence of fluctuations determined by climatic factors, changes in consumer preferences, seasonality, reorganisation of supply chains and imbalances between supply and demand. The analysis of the evolution of total imports reflects significant volatility in the case of many Member States, without a unitary trend at the level of the Community block (Table 3). In some cases, such as Austria, Poland or Slovenia, an alternation of significant increases and corrections is observed, which indicates a heightened sensitivity of bilateral trade to seasonality, but also to trade policies and reorientations of supply sources. High values, followed by declines or vice versa, demonstrate the existence of temporary imbalances or transitions to alternative trade partnerships,

depending on the regional availability of the product. For large importing countries, such as Germany, Italy and France, the trajectories differ visibly. Thus, Germany presents a relative stability of flows, with a recent recovery. In contrast, France has recorded a steady decline in imports in the last years of the period under review, an aspect that is due to the resizing of domestic plum consumption as a result of changes in consumer preferences. The Baltic countries, such as Latvia, Lithuania, Estonia, present contradictory developments, due on the one hand to instability in supply, and on the other hand to the fragmentation of national markets. In countries such as Greece, Portugal or Romania, a sharp increase in imports is observed, with clear episodes of consolidation, but also of withdrawal. Romania had a relatively constant increase trend, due to the structural deficit of domestic production correlated with an increase in demand. On the other hand, certain Nordic countries, such as Sweden, show stagnation or even a gradual reduction in imports, signaling a reorientation of consumption towards other categories of fruit. Denmark and Finland are mature markets, where the level of imports is already stabilized and adapted to a constant level of demand (Table 3).

It is important to note that, in many cases, import dynamics follow a cyclical or periodic adjustment pattern rather than a clear trend of expansion or contraction. Thus, the plum market in the European Union proves to be extremely sensitive to external disturbances, such as climatic phenomena in exporting countries, transport costs or phytosanitary restrictions, but also to structural transformations within national markets.

Table 4. Evolution of extra-EU27 fresh plum exports in the period 2014–2024 (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	4,777.70	102.35	-13.04	-57.38	-49.9	-35.89	-42.04	382.35	-91.34	1,233.85
Belgium	-68.08	4.42	32.51	181	-33.64	24.81	-19.36	-6.37	15.07	-13.41
Bulgaria	-90.89	608.34	14.27	-85.7	514.25	-22.4	-31.25	31.91	-45.52	-2.53
Denmark	10.58	3.06	1.59	-9.92	24.14	-21.61	5.95	-2.79	4.26	45.11
Germany	124.00	19.98	32.81	-78.88	187.76	-1.66	157.34	-66.61	190.73	-79.06

Source: own processing [14, 15].

The choice of a limited sample of countries to analyze the evolution of the value of fresh plum exports from EU Member States to third countries, during the period 2014–2024, is not accidental (Table 4).

On the one hand, it reflects the reality of a market in which only a few EU Member States have a significant export capacity to countries outside the EU, and on the other hand, it is based on the criterion of the availability of continuous and comparable data for the entire period analyzed.

The percentage approach highlights trade phenomena with high explanatory potential, such as external shocks, changes in global demand for fresh fruit, the competitiveness of European products, tariff and non-tariff barriers or the strategic redirection of trade flows depending on market opportunities.

What can be observed is a high volatility and a lack of structural coherence in the trade behavior of most of the analyzed Member States. With the exception of a few episodes of growth, these developments are marked by a conjunctural nature rather than a consolidated and predictable export strategy. The significant fluctuations recorded in the case of Germany or Bulgaria, for example, demonstrate a high degree of vulnerability to external factors, such as seasonal demand, tariff changes or changes in logistics networks.

The analyzed data highlight a heterogeneous configuration of trade performance between EU Member States. Domestic plum exports, carried out between countries, reflect not only seasonal demand fluctuations and national production capacities, but also the degree of integration into regional fresh fruit supply chains, essential elements for assessing the

functionality of the single agri-food market. Countries such as Romania, Bulgaria and Croatia record high percentage variations, which are due to low initial volumes, but also to the lack of a constant trade infrastructure (Table 5).

Table 5. Evolution of intra-EU27 fresh plum exports in the period 2014–2024 (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	19.62	65.21	50.65	-36.33	23.47	57.93	-5.97	-6.75	104.83	45.36
Belgium	16.17	-3.91	16.46	-72.36	1.17	24.95	-1.59	0.40	6.78	-2.35
Bulgaria	-20.97	73.82	367.08	-69.57	-1.49	22.69	160.30	-86.80	-25.15	906.31
Croatia	100.71	18.88	146.24	-60.15	-10.75	332.02	46.36	-24.59	135.56	-10.82
France	27.30	8.61	1.00	-33.28	-19.00	15.59	-33.08	17.24	14.24	18.72
Germany	35.21	20.18	3.56	23.37	-18.32	9.85	27.69	5.38	-29.86	2.77
Italy	12.65	8.98	12.27	-16.59	-14.72	-30.05	51.33	15.15	-1.62	39.76
Netherlands	24.88	20.83	8.50	10.48	-19.11	11.36	23.58	-2.65	-13.47	18.44
Romania	2,012.54	17.09	42.81	-80.25	-20.23	27.82	338.54	253.73	116.65	-43.04
Spain	15.91	1.38	-4.79	-10.16	-7.59	61.43	6.85	-20.48	22.89	-4.57

Source: own processing [14].

Cumulative increases of over 2000% in Romania in 2015 or over 900% in the case of Bulgaria in 2024, do not reflect a consolidation of competitiveness, but a structural fragility of the presence of these countries on the domestic plum market, which is still in its early stages of development. On the other hand, countries with a tradition in fruit production and marketing, such as Germany, France, Italy or Spain, demonstrate a more stable dynamic, but not without disruptions. Although these economies have a mature agricultural infrastructure, the data show an inability to maintain a constant upward trend, which is due not only to changes in consumer preferences, but also to strong competition from products imported from outside the EU or from neighboring countries. Italy and France in particular show recurrent episodes of export contraction, indicating a reassessment of the positioning on the European internal market for fresh plums. The case of Germany is significant from the perspective of a major economic actor: although it records a high degree of stability, the relatively constant evolution and moderate variations indicate a saturation of export capacity in the region, associated with an increase in domestic consumption, but also a redirection of flows to extra-EU markets. As for the Netherlands and Spain, the data show an efficient functioning of trade channels, but also a sensitivity to economic and agricultural cycles, which determine variations in exports.

Overall, intra-EU trade does not show a uniform pattern of growth or consolidation. Instead, we are witnessing a fragmented dynamic, influenced by multiple factors, from storage and transport capacities to access to large consumer markets and the influence of phytosanitary regulations. This reality justifies the need for constant monitoring of trade performance, through aggregated and seasonally adjusted indicators, in order to be able to substantiate coherent strategies for the development of the European internal market for plums.

It is also necessary to stimulate interstate cooperation and common trade platforms, which would facilitate the predictability of flows and reduce the trade imbalances reported.

The data analysed highlight the significant differences in the export capacity of fresh plums between the Member States, highlighting a clear concentration around three major exporters: Spain, the Netherlands and Italy, which dominate the intra- and extra-EU market, indicating the existence of consolidated competitive advantages, based on specialized production, logistics infrastructure and access to markets (Table 6).

Table 6. Evolution of EU fresh plum exports in the period 2014–2024

An	Spain	Netherlands	Italy	France	Romania	Austria	Germany	Poland
2014	99,801,991	36,607,708	44,782,146	16,417,987	121,808	1,799,600	3,312,422	6,119,868
2015	107,381,999	48,285,081	48,318,971	20,694,812	305,533	2,179,503	4,908,967	4,449,122
2016	111,952,407	55,340,642	51,104,421	22,431,062	358,137	3,610,920	5,897,492	4,759,422
2017	99,883,897	60,599,159	53,873,370	22,488,257	547,202	5,404,237	6,488,110	3,213,683
2018	88,266,995	62,019,710	49,067,028	15,070,046	101,505	3,430,455	6,236,144	4,594,419
2019	92,205,842	51,470,378	45,229,874	13,675,266	83,372	4,220,471	5,846,295	4,472,742
2020	107,899,289	57,266,215	30,382,226	15,074,829	132,107	6,655,701	6,301,277	6,557,548
2021	135,706,347	68,042,515	45,683,761	12,473,966	470,657	6,256,062	9,385,844	6,356,098
2022	125,425,833	68,672,892	54,523,180	13,873,489	1,587,744	5,848,751	7,976,120	8,580,030
2023	140,683,333	60,614,072	51,195,282	14,905,711	3,447,366	11,943,796	7,553,252	7,434,056
2024	127,258,394	71,627,918	68,924,299	17,398,313	1,981,465	17,380,833	5,650,123	3,927,246

Source: own processing [14, 15]

Spain consistently remains the European leader in the export of fresh plums, with annual values that frequently exceed 100 million euros, a performance that is due not only to high production, but also to logistical capacity, favorable seasonal synchronization and superior product valorization.

Modern agricultural practices, integration into commercial chains and the active role of cooperatives contribute significantly to consolidating this position.

The Netherlands is not distinguished by extensive agricultural production of plums, but export values reflect a dominant role as a commercial and logistical intermediary.

With a developed port network and a tradition in re-exports, the Netherlands acts as a redistribution hub for products originating from other member states, which justifies the high value of exports compared to its productive capacity.

Italy ranks third in the ranking of European plum exporters, registering moderate fluctuations until 2020 and an increase in recent years, reaching 68 million euros in 2024, as a result of the diversification of varieties, adaptation to foreign market requirements and the strategic reorientation of exports to more profitable regions.

Among the countries with an average share in exports, France presents constant values, ranging between 13 and 22 million euros. French exports are oriented towards regional markets, given that a considerable part of production is directed towards processing.

A special case is Romania, which, although starting from a low level in 2014, manages to reach a maximum of over 3.4 million euros in 2023, as a result of the emergence of competitive commercial initiatives.

Poland had an oscillating evolution, marked by unstable agricultural and commercial factors, in turn being affected by climatic problems.

Based on the data in Table 7, we analyzed the volatility of the selling price of plums in the EU Member States during the period 2015–2024, which highlights a market marked by instability. Most states record significant price oscillations, without a clear upward or downward trend in the long term.

Prominent examples are Germany and Poland, which experience years of sharp increases (over +60%) followed by decreases due to the rapid adaptation of the domestic market to the level of supply.

Countries such as Hungary, Lithuania and Malta show the greatest fluctuations, including extreme variations of +586% in Hungary in 2018 or +230% in Lithuania in 2024, indicating small, vulnerable and highly reactive markets to annual variations in production.

Central and Southeastern European countries, such as Romania, Bulgaria, Slovenia, are characterized by a moderate and relatively constant price increase in most years, signaling a gradual consolidation of demand.

Table 7. Evolution of the selling price of plums in the EU, 2015–2024 (%)

Country	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	4.55	9.46	32.66	-4.74	13.98	1.95	8.98	16.51	-9.67
Belgium	-2.15	13.08	18.97	-22.9	173.18	-18.07	-12.8	-	-
Bulgaria	-15.25	-0.34	9.78	-4.5	-0.47	0.47	14.09	2.45	1.64
Croatia	-11.65	42.86	6.99	-7.81	17.59	7.34	10.53	25.83	-13.25
Cyprus	-16.96	16.81	-9.54	26.77	-8.01	5.63	3.13	2.39	7.98
Czechia	-3.79	37.33	-37.24	14.82	6.14	21.02	7.01	12.73	11.53
Denmark	-11.12	16.53	-25.84	3.51	0	68.54	-8.24	26.17	3.71
Germany	5.88	63.39	-52.3	30.91	25.94	-4.95	2.00	-17.42	9.86
Hungary	-9.96	-84.16	586.23	11.72	66.01	-13.87	7.56	22.76	-10.85
Latvia	7.35	19.05	8.74	3.74	9.31	-1.45	8.83	-10.1	21.98
Lithuania	7.64	-	-23.65	31.83	-13.64	-	11.76	-39.54	230.12
Luxembourg	13.64	4.00	-3.85	4.00	11.54	1.72	-	1.69	66.67
Malta	76.25	-6.51	15.15	-17.59	-8.99	0	-20.55	96.73	28.48
Poland	-25.17	110.36	-64.91	68.78	10.84	10.62	-12.54	68.22	18.64
Portugal	-3.33	-34.13	75.06	23.47	-0.46	4.79	6.57	6.51	21.04
Romania	-10.19	33.94	-23.94	20.97	0.53	17.48	17.26	-12.43	-3.65
Slovakia	4.30	18.05	2.30	1.27	17.55	0.17	9.74	45.22	-9.10
Slovenia	-4.52	-14.14	6.46	-8.81	9.25	41.52	-15.66	36.38	5.18
Spain	-10.57	-10.79	26.58	-30.10	9.20	2.48	15.31	14.77	9.56

Source: own processing [15].

However, these developments are often interrupted by episodes of regression.

In Western Europe, countries such as Spain and France have a more stable but still volatile model, in which price fluctuations are less pronounced compared to the rest of the countries, as a result of the larger size of the internal market, the integration into efficient distribution chains and the capacity to absorb production in variable contexts.

Therefore, the price of plums in the EU proves unstable and heterogeneous between countries, without a clear convergence, reflecting national specificities, market structure and exogenous influences.

This high variability requires increased attention from producers and traders to market risk management tools, as well as the need for agricultural policies that mitigate the impact of annual imbalances.

The data in Table 8 highlight a pronounced structural diversity in the evolution and volatility of plum prices at EU level over the period 2015–2024.

Countries with small or isolated markets, such as Malta, Lithuania and Luxembourg, have recorded price increases accompanied by high volatility, which signals imbalances between supply and demand and increased exposure to external shocks.

On the other hand, countries such as Bulgaria, Spain and Romania show a lower degree of price instability, but also a low average annual growth rate, indicating a mature market with slow adjustments.

The highest average values are found in economies with constant demand and high income levels, such as Austria and Denmark.

To assess the degree of concentration of the fresh plum import market in the EU, we used the Herfindahl–Hirschman index, an indicator established in competitive analysis and market structure studies, which allows quantifying the relative distribution of import values between partner countries, reflecting the level of market dominance by a small number of suppliers (Table 9).

The application of the index is justified in this context because imports of fresh plums are influenced by seasonal, geographical and economic factors, which can lead to an

excessive concentration of supply from a limited number of external sources.

Table 8. Evolution and volatility of plum prices in the European Union, 2015–2024

Country	Average price (€/100kg)	Average annual growth rate (%)	Volatility (€/100kg)	Index (2015=100)
Austria	217.58	8.19	54.22	192.76
Belgium	138.63	16.59	61.83	-
Bulgaria	22.67	0.88	1.93	105.21
Croatia	50.1	8.72	13.77	189.6
Cyprus	108.9	3.13	12.94	123.24
Czechia	51.72	7.73	11.63	164.56
Denmark	220.41	8.14	60.92	160.89
Germany	87.62	7.04	18.22	119.67
Hungary	37.97	63.94	17.01	184.02
Latvia	152.23	7.49	27.96	185.34
Lithuania	85.83	22.72	34.21	208.7
Luxembourg	146	11.05	38.77	227.27
Malta	181.62	18.11	59.69	285.77
Poland	41.65	20.54	15.97	199.52
Portugal	109.23	11.06	32.07	197.24
Romania	62.44	4.44	10.83	129.34
Slovakia	57.32	9.95	17.6	217.59
Slovenia	102.7	6.18	24.25	148.86
Spain	55.43	2.94	8.64	114.53

Source: own processing [15].

Table 9. Evolution of the concentration index of plum imports in the EU in the period 2020–2024

Year	HHI Index Imports (E.U.)	HHI Index Exports (E.U.)
2020	0.198	0.103
2021	0.205	0.112
2022	0.217	0.127
2023	0.228	0.135
2024	0.235	0.143

Source: own processing

In the case of EU plum exports, the HH index recorded values between 0.10 and 0.14 during the analyzed period, oscillating slightly from one year to another, indicating a moderately diversified distribution of sales markets, without a critical dependence on 1–2 destinations. The values close to 0.14 are due to the countries that absorbed a significant share of total exports, indicating an incipient trend of concentration. This slight vulnerability is due to the trade dynamics with traditional partners, such as Germany, but also countries in Central Europe, which have a constant demand and a well-connected trade infrastructure with producers in southern Europe. As for plum imports, the HH index is at significantly higher values, between 0.18 and 0.27. This level of concentration reflects a strong dependence of the EU on a few major external suppliers. Countries with significant shares of imported volumes face commercial and logistical risk in the event of supply disruptions, political tensions or tariff barriers. The E.U. market is thus in a position of relative vulnerability in relation to supplies from outside the E.U.

Comparing the two sets of HH values highlights a strategic asymmetry between export orientation and import dependence. While the EU benefits from greater diversification in its exports, the dependence on a few key suppliers for plum imports represents a weak point in the supply chain.

CONCLUSIONS

The integrated analysis of data on trade in fresh plums in the EU for the period 2014–2024 highlights a complex evolution, marked by significant structural transformations and a diversity of trade behaviours between Member States. In the context of constantly changing

markets, the dynamics of exports and imports, both intra- and extra-EU, reflect not only economic and logistical pressures, but also the differentiated capacity of countries to adapt to international market requirements. The significant fluctuations in sales prices, together with the heightened volatility identified in many Member States, prove the existence of vulnerabilities in terms of the stability of supply chains, the level of competitiveness and the efficiency of the adopted trade strategies.

Against this backdrop, synthetic indicators such as the HH index provide an additional picture of the degree of market concentration, highlighting a slight but constant trend of increasing dependence on a small number of suppliers or trade destinations. This increased concentration may raise questions about trade resilience and competitive balance within the EU. At the same time, the data highlight the fact that Member States do not react uniformly to market changes, and national policies play a significant role in shaping trade performance. Thus, the results obtained confirm the need for an integrated approach to the development of the European fresh fruit market, combining rigorous statistical analysis with coherent trade, agricultural and logistics policies, adapted to both global challenges and regional specificities. This direction is essential to ensure the economic sustainability of the sector, the diversification of trade sources and the competitiveness of European players on international markets.

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