



CARTA
INTERNACIONAL

ASSOCIAÇÃO BRASILEIRA DE
RELAÇÕES INTERNACIONAIS

ISSN 2526-9038

The Effect of Food Export Restrictions on Domestic Food Availability Amid Rising International Prices: A Systematic Review¹

*O Efeito das Restrições às Exportações
de Alimentos sobre a Disponibilidade
Interna de Alimentos em Meio
à Alta dos Preços Internacionais:
Uma Revisão Sistemática*

*El Efecto de las Restricciones a las
Exportaciones de Alimentos
sobre la Disponibilidad Interna de
Alimentos en Medio del Aumento
de los Precios Internacionales:
Una Revisión Sistemática*

DOI: 10.21530/ci.v20n2.2025.1587

Atos Dias²

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Abstract

This article analyzes the effects of food export restrictions on domestic production and supply during the global food price spikes of the 21st century. Through a systematic review of the literature, it assesses the effectiveness of these policies across

1 This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001.

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Artigo submetido em 04/06/2025 e aprovado em 05/11/2025.





different country contexts. The results indicate that while export restrictions may enhance domestic supply in major exporting countries, their impact on production is often limited or negative, particularly in smaller exporters. These findings underscore the importance of considering a country's structural position in the international market when evaluating the effectiveness of such measures.

Keywords: Global food price crisis, Food export restrictions, Systematic review.

Resumo

Este artigo analisa os efeitos das restrições às exportações de alimentos sobre a produção e a oferta doméstica durante os picos dos preços globais dos alimentos no século XXI. Por meio de uma revisão sistemática da literatura, avalia a eficácia dessas políticas em diferentes contextos nacionais. Os resultados indicam que, embora as restrições às exportações possam aumentar a oferta interna em grandes países exportadores, seu impacto na produção é frequentemente limitado ou negativo, especialmente em exportadores menores. Esses achados destacam a importância de considerar a posição estrutural do país no mercado internacional ao avaliar a eficácia dessas medidas.

Palavras-chave: Crise global dos preços dos alimentos, Restrições às exportações de alimentos, Revisão sistemática.

Resumen

Este artículo analiza los efectos de las restricciones a las exportaciones de alimentos sobre la producción y oferta interna durante los picos de precios globales en el siglo XXI. A través de una revisión sistemática, evalúa estas políticas en distintos contextos nacionales. Los resultados indican que, si bien las restricciones a las exportaciones pueden aumentar la oferta interna en grandes países exportadores, su impacto en la producción suele ser limitado o negativo, especialmente en exportadores pequeños. Estos hallazgos subrayan la importancia de considerar la posición estructural del país en el mercado internacional al evaluar la efectividad de tales medidas.

Palabras clave: Crisis global de los precios de los alimentos, Restricciones a la exportación de alimentos, Revisión sistemática.





Introduction

Since the early 2000s, global food prices have experienced significant and sustained increases, with sharp spikes occurring in 2008, 2011, and 2022 (Dias et al. 2021; Lima and Dias 2022). These price surges were driven by a combination of structural and cyclical factors affecting both supply and demand. The resulting crisis marked a turning point in the dynamics of the international food market, exposing the vulnerability of global supply systems to market volatility. The consequences have been especially severe for countries heavily reliant on food imports, where access to and availability of food have been most affected.

In this context, the debate around the effectiveness of food export restriction policies as a tool to mitigate the impact of the 21st-century global food crisis has gained prominence. In response to rising food prices, several exporting countries implemented export restrictions to stabilize domestic prices and safeguard local food supplies. These measures are permitted under World Trade Organization (WTO) rules in cases of critical food scarcity (WTO 1947), with the primary aim of curbing food inflation and enhancing food security. While such policies may yield short-term benefits by redirecting supply to domestic markets, the literature also highlights their potential downsides. Export restrictions can further tighten global supply, push international prices even higher, reduce the incomes of local producers who lose access to more lucrative export markets, and increase the vulnerability of importing countries by raising prices and heightening the risk of shortages (Dias et al. 2021).

Although the negative effects of export restrictions are well known, their real effectiveness, especially in improving domestic food supply, remains uncertain (Akter 2022). This article contributes to the debate by examining how such measures, adopted during the 2000s global food price crises, affected food production and supply in exporting countries. The central question is: how do export restrictions during global food crises influence domestic food production and supply? The study hypothesizes that impacts vary by export capacity. Large exporters, able to influence international prices, tend to better stabilize domestic markets, while small exporters usually cannot offset global shocks. In both cases, restrictions may discourage production. Using a systematic literature review, the study synthesizes empirical findings through transparent selection criteria and descriptive statistics to identify common trends. While results provide consistent





answers, further qualitative research is needed to clarify causal mechanisms. The article is organized as follows: section 2 analyzes the 21st-century food price crises and expected policy effects; section 3 presents the methodology; section 4 reports results; and section 5 concludes with key insights and implications.

The Global Rise in Food Prices and the Adoption of Export Restrictions

Following the 2007–2008 crisis, global prices of agricultural commodities surged dramatically – a phenomenon often referred to as “agflation” – mirroring the price shocks of the 1970s. This spike was particularly striking given that it followed three decades of declining prices for staple foods, which had fallen to historic lows (Headey and Fan 2008).

Although the long-term trend had been one of declining prices, largely due to productivity gains (Gilbert 2015), food commodity prices began a steady upward climb in the early 2000s. By 2008, global food prices had risen by 83% compared to the average of the previous three years, with particularly sharp increases in key crops: corn rose by 31%, soybeans by 87%, rice by 74%, and wheat by an astonishing 130%. At the time, analysts from the Food and Agriculture Organization (FAO) and the Organisation for Economic Co-operation and Development (OECD) forecasted a prolonged period of elevated prices – a prediction that ultimately proved accurate (Gallas 2008).

Since that initial spike, two further major price surges have occurred: in 2011 and again in 2022. The 2011 spike was primarily triggered by extreme weather events that disrupted agricultural production in several major regions. Droughts in Russia and Eastern Europe, floods in Pakistan and Canada, frosts in Mexico, and intense rainfall in Australia all contributed to a tightening of global supply (Krugman 2011; McMahan 2013; Soffiantini 2020).

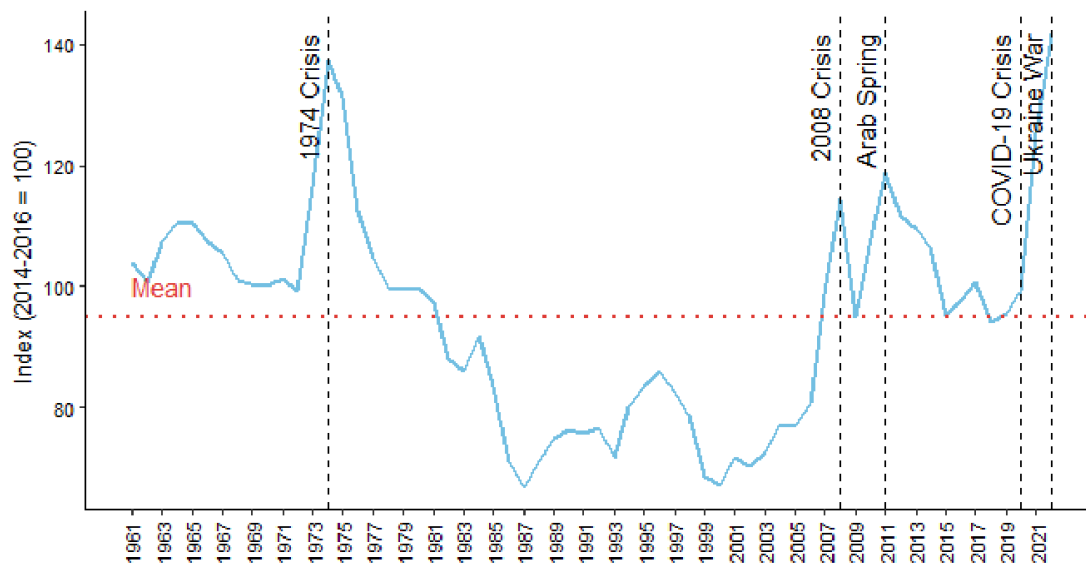
This escalation in food prices coincided with the Arab Spring, a wave of uprisings across the Middle East and North Africa, where high food costs played a key role in fueling public discontent. As Krugman (2011) noted, surging food prices were among the main catalysts for the social unrest that swept through the region.

The most recent spike, in 2022, was driven by a combination of pandemic-related disruptions and geopolitical conflict. The COVID-19 pandemic severely



impacted global supply chains, and the subsequent Russian invasion of Ukraine further destabilized the market (Dias et al. 2021; Lima and Dias 2022). Both Russia and Ukraine are major exporters of grains and sunflower oil, and the war also affected global fertilizer supplies, especially from Russia and Belarus (Schmidhuber 2020; Lima and Dias 2022; UN 2022). As a result, the FAO's Global Food Price Index reached its highest level since the beginning of the series in 1961, as illustrated in Figure 1.

Figure 1. Increases in the FAO Global Food Price Index (in real terms) (1961-2022)



Source: Own elaboration based on Lima and Dias (2022), FAO (2023), and UN (2022).

Figure 1 also illustrates that, even during the periods of decline following the price peaks of the 2000s, global food prices have remained significantly above historical averages. This persistent upward trend mirrors patterns observed during the 1960s and 1970s. In contrast, after the 1974 crisis, the index declined relative to the average, and this downward trajectory continued until the onset of the 2008 crisis. Between 2005 and 2008 alone, food commodity prices more than doubled in most categories, with sugar being a notable exception (Gilbert 2010).

While the initial moment of the crisis is relatively easy to identify, its underlying causes and broader consequences extend well beyond the first spike in prices. Rather, they reflect deeper structural dynamics inherent to global capitalism. The crisis that began in 2007-2008 stemmed from both supply- and demand-side disruptions (McMahon 2013; Gilbert 2015). Although there is debate over which factors were most influential, scholars generally identify at least five key drivers, though they differ in the relative importance assigned to each.



On the demand side, four main factors are commonly cited in the literature as contributing to the sharp rise in food prices during the early 2000s: the financialization of food, which led to increased speculative investment in agricultural futures markets; the depreciation of the U.S. dollar; rising food demand, particularly in rapidly developing economies; and the growing production of and demand for biofuels.

On the supply side, price volatility was primarily driven by climatic shocks, including extreme weather events that disrupted agricultural output. These supply and demand shocks interacted with broader global financial and energy crises – particularly the surge in oil prices – creating a “perfect storm” that resulted in record highs for food commodity prices (McMahon 2013).

Of these factors, financialization has had perhaps the most far-reaching effects on global food systems. In recent decades, financial actors, markets, and motives have become increasingly dominant in agriculture and food provisioning, reshaping the sector. This shift has opened new avenues for capital accumulation, driven agribusiness strategies toward shareholder value, and altered how food is produced, distributed, and consumed. These transformations raise concerns about the long-term social and ecological sustainability of food systems and their ability to ensure food security and support rural livelihoods (Clapp and Isakson 2018).

The roots of this transformation can be traced back to the volatility of the 1970s. During that period, the weakening U.S. dollar, surging commodity prices, and major harvest failures – particularly in the Soviet Union – contributed to increased global food demand and soaring fertilizer costs. This environment facilitated the entry of financial actors into the food industry, which began to operate more directly in agricultural markets. As a result, food prices became increasingly subject to speculative manipulation, and market uncertainty was reframed as a source of profit. Within this speculative logic, food was effectively transformed into a financial asset (De Paula, Santos, and Pereira 2015).

Since the late 1990s, food commodity prices have shown heightened global volatility, leading to persistent inflationary pressure – especially in developing countries heavily reliant on food imports. Beyond traditional supply and demand dynamics, the integration of financial markets into the food commodity sector has turned food into both a global public good and a speculative asset. This financialization process led to a dramatic rise in speculative trading activity from 2004 onward, peaking in 2008. Even after this peak, the volume and value





of contracts in food markets remained approximately three times higher than pre-2004 levels (Gilbert 2015).

In tracing the roots of recent food price crises, Gilbert (2010) emphasizes that the broad increase in energy and metal prices stimulated investor interest in commodity futures contracts, significantly amplifying food price volatility. McMahon (2013) notes that between 2000 and 2010, the number of open futures and options contracts on global commodity exchanges increased tenfold. Clapp and Isakson (2018) add that investor interest in agricultural land surged during the same period: in 2010, investment in farmland ranged between \$10 and \$25 billion, rising to between \$30 and \$40 billion by 2012.

Another major contributor was the depreciation of the U.S. dollar – the currency in which most agricultural commodities are priced – which led to compensatory price increases (Díaz-Bonilla 2017; McMahon 2013). By 2008, the dollar had lost roughly one-third of its value, prompting investors to view commodities as a hedge against inflation. This trend echoed the dynamics of the 1970s, when the collapse of the Bretton Woods system similarly spurred demand for commodity-based assets (Prates 2007; McMahon 2013; Díaz-Bonilla 2017).

Demand growth also played a central role, particularly in two key groups of countries. The first group comprises populous emerging economies – such as China, India, Indonesia, and Bangladesh – that have achieved relative food self-sufficiency but are now experiencing a shift in dietary preferences driven by rising incomes. This has led to greater consumption of high-value foods, especially animal proteins, fruits, and vegetables (McMahon 2013). In China, for example, rapid urbanization and poverty reduction have driven increased meat consumption, which in turn has boosted demand for feed grains, particularly soybeans (McMahon 2013). China's accession to the World Trade Organization (WTO) in 2001 further liberalized its agricultural trade, significantly increasing its food imports (Prates 2007).

India, having overcome dependence on food aid through the Green Revolution, has become a major grain producer. However, it continues to face agricultural challenges related to climate variability and still relies on imports for certain products (McMahon 2013). Between 1980 and 2020, China's food imports surged – rising 282% by 2000 and 1,767% thereafter – while India, Indonesia, and Bangladesh also saw notable increases (Nascimento 2024). Despite the rapid growth in imports, these countries have simultaneously expanded domestic food production, a trend driven by economic development and demographic pressures.





Collectively, they now account for approximately 75% of global agricultural output (Díaz-Bonilla 2017; McMahon 2013).

Another contributing factor to price volatility was the significant decline in global food stocks between 2000 and 2008, largely due to consumption outpacing production – particularly in China (McMahon 2013; Headey and Fan 2008). While falling stock levels intensified the 2007-2008 crisis, they subsequently recovered and remained high during the COVID-19 pandemic, meaning that stock shortages have not been a major factor in more recent price spikes (Schmidhuber 2020).

The second group of demand-driving countries includes wealthy food-importing nations such as Japan, members of the European Union, Saudi Arabia, and the United Arab Emirates. These countries face land and resource constraints that limit their agricultural capacity, but their high income levels allow them to rely heavily on international markets (McMahon 2013). Japan, for instance, maintains a degree of self-sufficiency in rice but imports a substantial share of other food commodities.

Additionally, speculative investment driven by anticipated future demand – especially from China and the broader Asian region – has contributed to rising food prices (Gilbert 2010).

The growth of biofuel production since the early 2000s has also played a significant role in reshaping food commodity markets. Motivated by rising fossil fuel prices, energy security concerns, and climate change mitigation efforts, many countries expanded the production of first-generation biofuels, which rely on food crops such as corn, soybeans, wheat, sugarcane, and vegetable oils. This shift created new competition for agricultural land and resources, pushing food prices higher (Baffes 2013; Mitchell 2008).

Rising oil prices not only made biofuels more economically viable but also increased input costs for agriculture – such as fertilizers and transportation – exacerbating the overall pressure on food prices (Baffes 2013; Headey and Fan 2008). Moreover, certain commodities like corn and palm oil have come to behave as “petro-commodities,” with their prices closely tied to fluctuations in global oil markets (Baffes 2013; Gilbert 2010).

The United States and Brazil are the world’s two largest biofuel producers, together accounting for 82% of global ethanol output in 2021 (USA 2023a). In the U.S., approximately 40% of the corn harvest is allocated to ethanol production, and ethanol prices increased tenfold between 2002 and 2019 (Gewin 2022; Baffes and Haniotis 2010). From 2006 to 2013, U.S. corn exports declined as more of the crop was diverted to domestic biofuel production (McMahon 2013). This shift





was largely driven by the Renewable Fuel Standard (RFS) program, introduced in 2005, which mandated increasing the share of biofuels in the national energy mix (USA 2023b).

On the supply side, climate-related shocks are widely recognized as key drivers of rising global food prices (Krugman 2011). Since 2008, nearly every year has witnessed extreme weather events that have disrupted the global food supply chain (McMahon 2013). For example, a prolonged drought in Australia between 2003 and 2008 led to a 4% reduction in global wheat supply (Mitchell 2008; Gilbert 2010; McMahon 2013). Similarly, poor harvests in Europe in 2007, along with a cascade of climate events between 2010 and 2011 – including devastating floods in Pakistan, heavy rains in Thailand, and widespread droughts across the Americas – further diminished global crop yields. These disruptions not only contributed to food price volatility but also intensified social unrest, playing a role in sparking uprisings during the Arab Spring (Krugman 2011; McMahon 2013). More recently, in 2020, the COVID-19 pandemic combined with extreme weather to exacerbate food insecurity in African countries already facing droughts and floods (Schmidhuber 2020).

In addition to short-term weather shocks, structural limitations in global agricultural systems also contribute to supply-side vulnerabilities. McMahon (2013) warns of natural constraints on productivity growth: many high-yield crop varieties are nearing their biological performance ceilings, while resistance to pesticides among pests and diseases is rising. Agricultural expansion is also limited in several regions due to urbanization and land degradation. In parts of Asia and Western Europe, arable land is shrinking significantly – Japan, Taiwan, and South Korea have each lost about one-third of their farmland since World War II, and China saw a 6% reduction in arable land between 2003 and 2013 (McMahon 2013).

In the face of escalating global food prices, states are confronted with the urgent challenge of maintaining domestic food supply stability. This raises a crucial policy question: how have countries responded to mitigate the effects of rising prices on domestic availability and, by extension, on the food security of their populations.

One of the most common short-term policy responses has been the imposition of food export restrictions. Governments often adopt such measures as emergency interventions to shield domestic consumers from the negative effects of global price shocks and to prevent social unrest linked to food insecurity.

Export restrictions can take three main forms: export taxes; export bans (embargoes); and export quotas. Each of these instruments functions differently in controlling the outflow of food products.



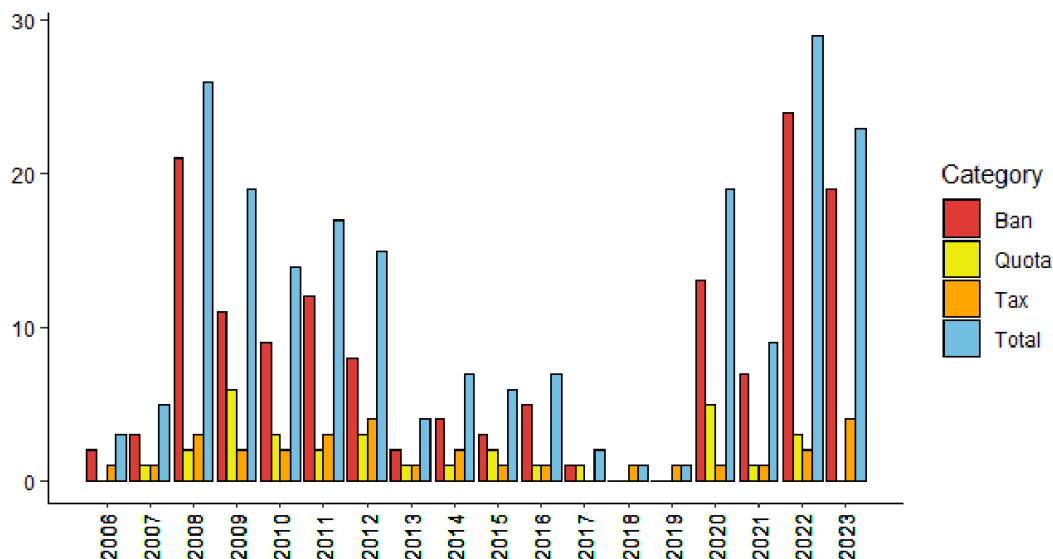


Export taxes are typically used to make exports less attractive and include three basic models: *ad valorem* taxes, which are calculated as a percentage of the product’s export value; fixed fees, which apply a set amount per unit exported; progressive taxes, which vary in response to international price changes, increasing when prices rise and decreasing when they fall (Piermartini 2004; Mitra and Josling 2009; Sharma 2011).

Export bans, by contrast, prohibit the export of certain products altogether, aiming to ensure their availability within the domestic market – particularly during crises affecting national food security. Export quotas function by limiting the volume of goods that can be exported. These are generally managed through a licensing system, in which export licenses are issued only up to the quota’s established ceiling (Piermartini 2004; Mitra and Josling 2009; Sharma 2011).

Beginning in the mid-2000s, as food commodity prices began to climb sharply on international markets, there was a noticeable surge in the adoption of export restrictions by national governments. Figure 2 illustrates the annual trend in the number of agricultural and food export restrictions implemented globally, reflecting the intensification of this policy approach during periods of heightened price volatility.

Figure 2. Total number of agricultural/food export restriction measures adopted by countries per year (2006–2023)³



Source: Own elaboration based on data from FAPDA (2024).

In 2008, a sharp uptick in all three types of export restrictions became clearly visible, with export bans showing the most pronounced increase. This trend

³ The data panel in Figure 2 consists of 199 countries.





suggests that such measures were a direct policy response to the global food price surge. When examining the trajectory of combined restrictions – represented by the blue bars – it becomes evident that their use declined in subsequent years. Between 2013 and 2019, the number of implemented restrictions remained relatively low, coinciding with a period of price stabilization albeit at levels higher than historical averages (as shown in Figure 1).

However, beginning in 2020, the number of export restrictions began to rise once again, particularly in the form of export bans. By 2020, these restrictions had reached levels comparable to those observed in 2009. This increase was closely linked to the disruptions caused by the COVID-19 pandemic, which impaired global food supply chains (Dias et al. 2021). In 2022, the upward trend intensified even further due to the war in Ukraine, which created additional uncertainty in global agricultural markets (Lima and Dias 2022). The data show that the total number of restrictions implemented in 2022 surpassed the 2008 peak, marking a new record in the time series.

These patterns suggest that export restrictions are a common government response to rising global food prices. Such policies are often intended to prevent domestic shortages and shield internal markets from the volatility of international prices. However, their effectiveness and impact vary significantly depending on the characteristics of the country implementing them.

The economic literature highlights that the effects of food export restrictions differ between large and small exporters, and also between exporters and importers, particularly in relation to domestic production and market supply.

For large exporting countries, export restrictions can yield short-term benefits by diverting supply from international markets to the domestic economy, thereby increasing local food availability and helping to stabilize domestic prices (Bouet and Debucquet 2010; Baltzer 2015). Additionally, by limiting global supply, these countries may inadvertently raise international prices, thereby improving their terms of trade and securing higher revenues per unit exported (Piermartini 2004). Through this mechanism, a portion of the exporters' profits can be effectively redistributed to domestic consumers, as producers are compelled to sell at lower domestic prices instead of benefiting from higher international rates (Mitra and Josling 2009). However, over the medium and long term, such policies may discourage production, as they reduce incentives for producers who lose access to more profitable export markets (Abbott 2011; Sharma 2011).





In contrast, small exporters typically lack the market influence required to affect global prices. Consequently, even when they impose export restrictions, they are generally unable to alter their terms of trade or global food prices meaningfully (Piermartini 2004). As a result, they often incur revenue losses from reduced exports without achieving significant improvements in domestic availability or price stability. Moreover, restricting exports may reduce the motivation for local producers to maintain or expand output, negatively impacting future production capacity (Bouet and Debucquet 2010).

Importing countries are directly and often severely affected by export restrictions imposed by their trading partners. For large importers that are deeply integrated into global food markets, such restrictions can lead to substantial domestic price increases, undermining both food security and social stability (Baltzer 2015; Bouet and Debucquet 2012). If domestic production is insufficient or inefficient, these countries may struggle to replace lost imports, resulting in shortages and inflationary pressures. Small importers, particularly low-income countries with high dependence on external food sources, face similar challenges. These nations often experience deteriorating terms of trade, as rising food import costs are not offset by export gains (Headey 2011; Piermartini 2004).

At the international level, the widespread use of export restrictions often sets off a domino effect, in which affected countries respond by implementing their own trade barriers. This reactive cycle reduces global cooperation, exacerbates price volatility, and diminishes the overall efficiency of food trade (Headey 2011). As a result, the fragmentation of international markets undermines the role of trade as a stabilizing mechanism for global food supply (Díaz-Bonilla 2017).

Based on this analysis, the present article advances the central hypothesis that the effects of export restrictions on domestic production and supply vary significantly according to a country's export capacity, which is directly related to its position in international trade and its ability to influence global markets. Consumers in large exporting countries may benefit from such measures, as these countries, due to their power to influence international prices, are able to protect domestic supply and stabilize internal prices through export restrictions. In contrast, these restrictions tend to be ineffective – and even detrimental – for small exporters, which lack the capacity to influence global prices and, therefore, cannot shield domestic consumption from rising international prices. In both cases, however, the adoption of restrictive measures tends to discourage and undermine domestic production.





Method and Data

As outlined in the previous section, the effects of export restriction policies on domestic food availability are varied and context-dependent. The outcomes differ based on the type of restriction implemented and the economic profile of the country in question – whether it is a major or minor food exporter or importer. Preliminary literature reviews and empirical studies reveal conflicting findings, with evidence pointing to both beneficial and detrimental impacts (Akter 2022).

Given this lack of consensus, I conducted a review to systematically and reliably synthesize the current state of knowledge on this issue. The goal of the systematic review is to compare key findings across studies and provide an integrated, quantitative overview of the empirical research addressing the effects of food export restrictions on domestic food production and supply.

The systematic literature review (SLR) is a research method aimed at mapping, organizing, and critically analyzing the body of knowledge produced on a given topic through the application of rigorous and transparent protocols for the search, selection, and analysis of scientific publications. Unlike traditional or narrative reviews, the SLR adopts predefined criteria to ensure the representativeness, reproducibility, and reliability of the results, minimizing analytical bias and enabling the replication of the study by other researchers (Alves et al. 2022).

Following this approach, the present study uses descriptive statistical techniques to examine data drawn from a set of empirical studies, with the goal of generating an integrated synthesis of their findings. In doing so, the study contributes to resolving the ongoing debate about the effectiveness of export restrictions in ensuring domestic food availability. Conducting a systematic review is especially relevant in this context due to the limited number of systematic evaluations currently available. Most of the literature in this field remains scattered and underdeveloped. For example, one of the few review efforts – Akter (2022) – was not conducted systematically and lacked sufficient methodological transparency, raising concerns about reproducibility, potential selection bias, and the reliability of its conclusions (Alves et al. 2022).

To ensure methodological transparency and replicability, Table 1 provides a detailed summary of the procedures used to collect the sample of studies included in the systematic review. Data were sourced from SCOPUS, a multidisciplinary database with extensive coverage of peer-reviewed scientific literature. The search strategy involved applying ten specific criteria, which are outlined in Table 1. The





choice of SCOPUS over other databases, such as Web of Science (WoS), is justified by its broader coverage of journals, particularly in the fields of social sciences, economics, and public policy studies, which are highly relevant to the topic of this review. Furthermore, SCOPUS offers a more comprehensive geographic representation, including studies originating from developing countries. These characteristics make SCOPUS especially suitable for capturing a more diverse and representative body of literature.

Table 1. Procedures for Collecting the Systematic Review Sample

Information	Criteria	Search Results
Descriptors – terms in title, abstract, or keywords	“food export restriction”	6
	“food” AND “exportrestriction”	66
	“food” AND “exportban”	34
	“food” AND “exporttax”	19
	“food” AND “export quota”	10
	“grainexportrestriction”	3
	“grain” AND “exportrestriction”	20
	“grain” AND “exportban”	13
	“grain” AND “exporttax”	12
	“grain” AND “export quota”	1
Search platform	SCOPUS	
Search date	07/23/2024	
Language	English	
Parameters	Inclusion of articles addressing causality related to the research question	
	Inclusion of articles published in peer-reviewed academic journals	
	Inclusion of articles published between 2007 and 2024	
	Exclusion of literature reviews and/or articles not related to the research question and/or duplicates and/or articles not available in full text	

Source: Author’s elaboration based on Alves et al. (2022).

As illustrated in Table 1, the selected descriptors were those directly related to the topic of this study – namely, the effects of food export restrictions on domestic production and supply in exporting countries during periods of price





spikes. Although the price increases affected most food commodities, grains were chosen as one of the main keywords (as opposed to others such as meat, for example), since, as demonstrated in the arguments presented in Section 2, grains – particularly wheat, maize, soybeans, and rice – were the group of commodities most affected by the price surge. Moreover, these staple foods form the foundation of the diet for the majority of the global population, which raises greater concern regarding the adoption of national policies aimed at ensuring domestic supply by exporting countries.

Given that the research problem addressed in this article is explanatory in nature and establishes a causal relationship between variables, the article sample was selected with a focus on publications that specifically examine this central relationship, thereby ensuring greater thematic relevance. Given that the temporal scope of the analysis is linked to the global rise in food prices, which began with the 2007-2008 financial crisis, the year 2007 was chosen as the starting point for the collection of publications. This decision aimed to concentrate the review on studies that directly explored the central research question.

After removing duplicate records, the initial search produced 144 documents, of which 72 addressed export restrictions as a central theme. Applying the selection criteria outlined in Table 1, I arrived at a final sample of 17 peer-reviewed articles.

To validate the robustness of this sample, I compared it to that of Akter (2022), which is the only known literature review specifically focused on the effects of export restrictions. Akter's sample comprises 13 documents, of which 69.2% are also present in the current study's sample. It is worth noting that Akter's dataset includes several sources that do not meet the inclusion criteria of this research – specifically, three institutional reports and one unreferenced document that are not peer-reviewed academic articles. These were excluded from the present analysis to ensure methodological rigor and consistency.

Among the remaining nine documents from Akter's review that meet this study's inclusion standards, all are incorporated into the final sample, indicating a 100% convergence between the two reviews for this subset. This overlap underscores the comprehensiveness and validity of the sample assembled for this systematic review.

The final sample of 17 studies was then examined using the variables and coding criteria described in Table 2.



**Table 2. Variables for Article Sample Analysis**

Variable	Code	Explanation	Categorization
Sample	amost	What is the comparison strategy?	1 – Single Case Study 2 – Large N 3 – Small N
Methodology	met	What methodology is used?	1 – Quantitative 2 – Qualitative 3 – Mixed
Influence	inf	What is the article's influence? (The ratio between the number of citations (cit) and the age of the article (temp))	Continuous
Type of export restriction	tip_res	What type of export restriction is analyzed in the study?	1 – Tax 2 – Quota 3 – Ban 4 – Tax and Quota 5 – Tax and Ban 6 – Quota and Ban 7 – All
Type of effect on domestic supply	tip_ef_cons	What is the effect found on domestic market supply?	1 – Significant and Positive 2 – Significant and Negative 3 – Not Significant 4 – Mixed 5 – N/A
Type of effect on domestic production	tip_ef_prod	What is the effect found on domestic production?	1 – Significant and Positive 2 – Significant and Negative 3 – Not Significant 4 – Mixed 5 – N/A
Type of country	tip_pais	Does the sample include large or small exporters/importers of the restricted commodity?	1 – Large Exporter(s) 2 – Small Exporter(s) 3 – Large Importer(s) 4 – Small Importer(s) 5 – Mixed

Source: Author's elaboration.

The variable *amost* refers to the comparison strategy adopted in each study, classified as either a single case study, small-N (samples ranging from 2 to 29 countries), or large-N (samples comprising 30 countries or more). The variable





met refers to the methodological approach employed, categorized as quantitative, qualitative, or mixed.

I also analyzed the influence of each article through the variable *inf*, defined as the ratio between the number of citations (*cit*) and the age of the article (*temp*). Influence is a continuous variable with values greater than or equal to zero. Citation counts were obtained directly from the SCOPUS database, and article age was used to normalize the values in order to avoid temporal bias, since older publications tend to accumulate more citations.

Given the theoretical relationship of interest – the influence of export restrictions on domestic food availability – the analysis also included the types of export restrictions adopted (*tip_res*), the type of effect on domestic supply (*tip_ef_cons*) and production (*tip_ef_prod*), and the type of country (*tip_pais*) that implemented the restriction.

Specifically, *tip_res* refers to one or more of the three main types of export restrictions examined in the literature: export taxes, export quotas, or outright export bans – including both single and combined forms. The variable *tip_ef_cons* indicates the effect of export restrictions on domestic food supply, with four possible values: significant and positive, significant and negative, not significant, or mixed. Similarly, *tip_ef_prod* reflects the impact of restrictions on domestic production, using the same classification. If a study does not analyze the effect of export restrictions on either domestic supply or production, the corresponding variable is coded as Not Applicable (N/A).

Finally, the *tip_pais* variable indicates whether the country adopting the export restriction is a large or small exporter or importer of the commodity in question. As discussed in Section 2, the theoretical effects of export restrictions on internal supply and production vary significantly depending on the country's trade profile.

All data processing was performed using R software (version 4.4.2). To ensure transparency and reproducibility, both the dataset and the R scripts used for the analysis are available on the Open Science Framework⁴ platform.

⁴ The dataset and the code used in the analysis can be accessed via the following link: https://osf.io/b9w8e/?view_only=37f0805202a04fed86540727183686d9





Results

As detailed in the previous section, the final sample comprised 17 scholarly articles, reflecting a relatively small body of research focused specifically on this topic. This limitation becomes even more apparent when the sample is compared to the total number of studies that address export restrictions as an explanatory variable. The initial search identified 72 documents that, in some capacity, analyzed export restriction policies – whether descriptively, causally, or through literature reviews. Thus, the final sample represents approximately 23.61 % of these studies.

This finding supports Akter's (2022) observation about the scarcity of research examining the effects of export restrictions during the food price spikes of the 2000s on the domestic economies of exporting countries. The majority of the 72 studies focus primarily on the impacts of export restrictions on international markets and broader issues of global food security.

Regarding the analyzed sample, Table 3 presents the distribution of articles by journal.

Table 3. Frequency of Articles in the Sample by Journal

Journal	N	%
China Agricultural Economic Review	1	5,88
Development Policy Review	1	5,88
Food Policy	5	29,41
Food Security	3	17,65
Frontiers of Sustainable Food Systems	1	5,88
Journal of Agricultural Economics	2	11,76
Outlook on Agriculture	1	5,88
Review of World Economics	1	5,88
World Development	1	5,88
World Trade Review	1	5,88

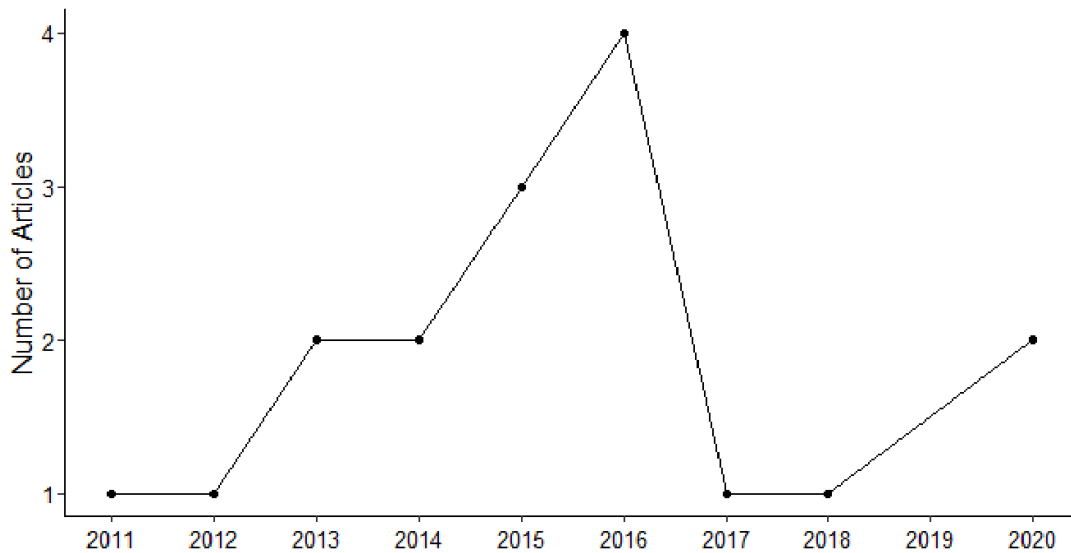
Source: Author's elaboration.

The sample is distributed across 10 journals, with a notable concentration of articles in Food Policy, which accounts for 29.41 % of the sample. Following



this, Food Security and the Journal of Agricultural Economics host 17.65% and 11.76% of the articles, respectively. The remaining journals each contain only one article. Figure 3 illustrates the distribution of the number of articles in the sample over the years.

Figure 3. Number of articles published in the sample by year (2011–2020)



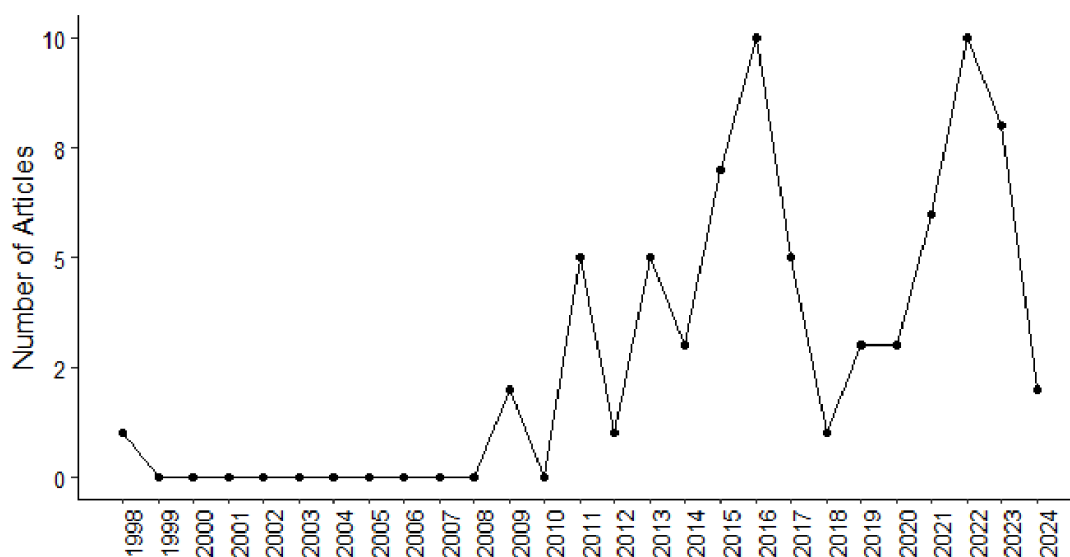
Source: Author's elaboration.

The data show that the oldest article in the sample was published in 2011, four years after the onset of the global food price spike. The sample displays a peak in 2016, with four articles published that year, followed by a decline in 2017 and 2018, and then an increase in 2019 and 2020, coinciding with the onset of the COVID-19 pandemic.

Although the earliest publication in the sample dates from 2011, there are records of broader publications on food export restriction policies from earlier years, as illustrated in Figure 4.



Figure 4. Publication of Articles on Food Export Restrictions by Year (1998–2024)



Source: Author's elaboration.

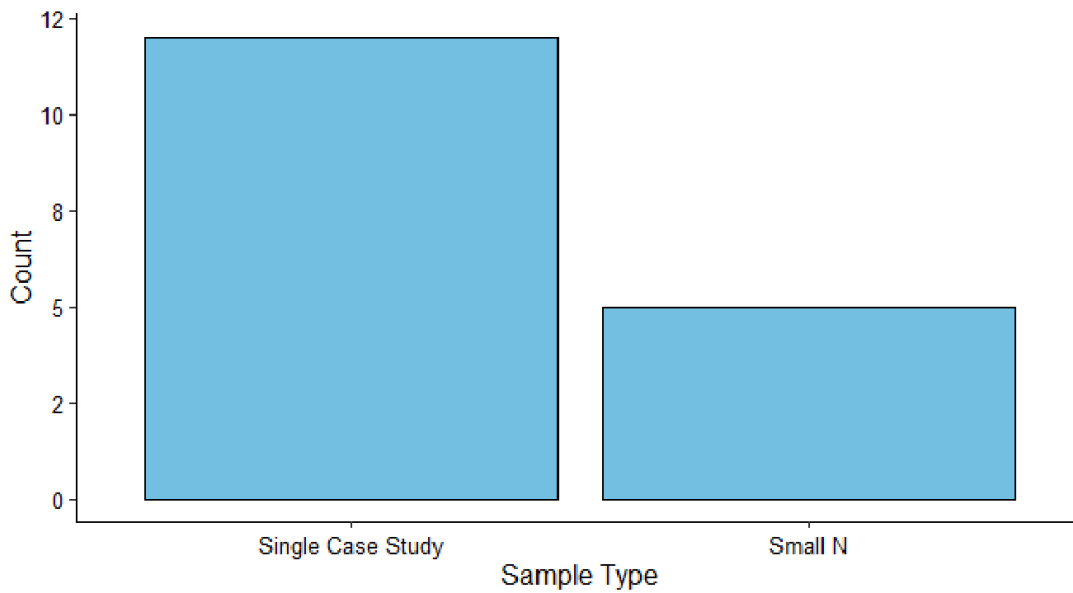
It is evident that prior to the rise in global food prices during the 2000s, only a single article on the subject was published – in 1998. From 2009 onward, there is a clear increase in publications addressing food export restrictions, with notable peaks in 2016 and 2022, each year featuring 10 publications. These trends suggest that the surge in global food prices and the subsequent implementation of export restrictions stimulated scholarly interest in analyzing these policies within the context of the crisis.

However, studies specifically examining the effects of food export restrictions on domestic food security remain scarce and tend to appear later in the timeline, as illustrated in Figure 3. This indicates a gap in the literature, highlighting an open research agenda and presenting opportunities for further investigation.

Regarding the comparative strategies employed in the articles within the sample, Figure 5 reveals a predominance of single case studies, totaling 12 articles. These are followed by small-N studies, comprising 5 articles. Notably, no studies in the sample utilized a large-N comparative approach.



Figure 5. Comparative Strategies Employed in the Sampled Articles



Source: Author's elaboration.

The absence of large-N and the limited number of small-N studies, contrasted with the predominance of single-case analyses, may reflect the difficulty of generalizing the effects of food export restriction policies on domestic food availability across adopting countries. Consequently, the findings derived from this sample cannot be extrapolated beyond the specific cases examined, given the inherent limitations of case studies in producing broad generalizations (Figueiredo Filho et al. 2014). This outcome underscores the challenge of developing generalized conclusions about the population of countries concerning the impact of export restrictions on domestic food availability, while simultaneously highlighting the value of case studies in uncovering internal factors or country-specific characteristics that may shape policy outcomes.

Regarding the influence of articles in the sample, measured by the ratio of citations to publication age, Figure 6 displays the values for the six most influential ones.





Figure 6. Influence Scores of the Most Cited Articles in the Sample



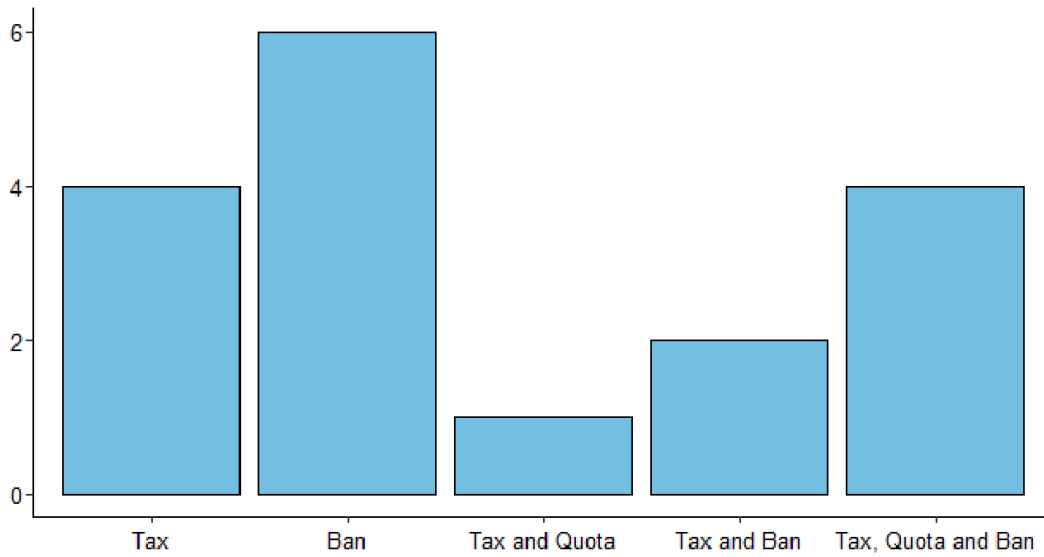
Source: Author’s elaboration.

The article by Götz, Glauben, and Brümmer (2013) holds the highest influence score within the sample. This study examines the impact of wheat export controls imposed by Russia and Ukraine during the 2007–2008 price spike on their domestic markets. Its primary objective was to assess whether these restrictions effectively mitigated the influence of global prices on domestic wheat prices. The remaining articles investigate the potential effects of export restrictions on various food products across different countries.

Regarding the types of food export restrictions analyzed in the sample, Figure 7 illustrates that export bans are the most frequently studied, compared to export tariffs and quotas. Notably, quotas are not analyzed in isolation in any of the reviewed articles.



Figure 7. Distribution of Types of Export Restrictions Examined in the Sampled Articles



Source: Author's elaboration.

It is important to note that export bans were the most widely adopted measure during the global food price surge, as demonstrated in Figure 2. This prevalence partially explains the greater number of analyses focusing on this type of restriction within the sample.

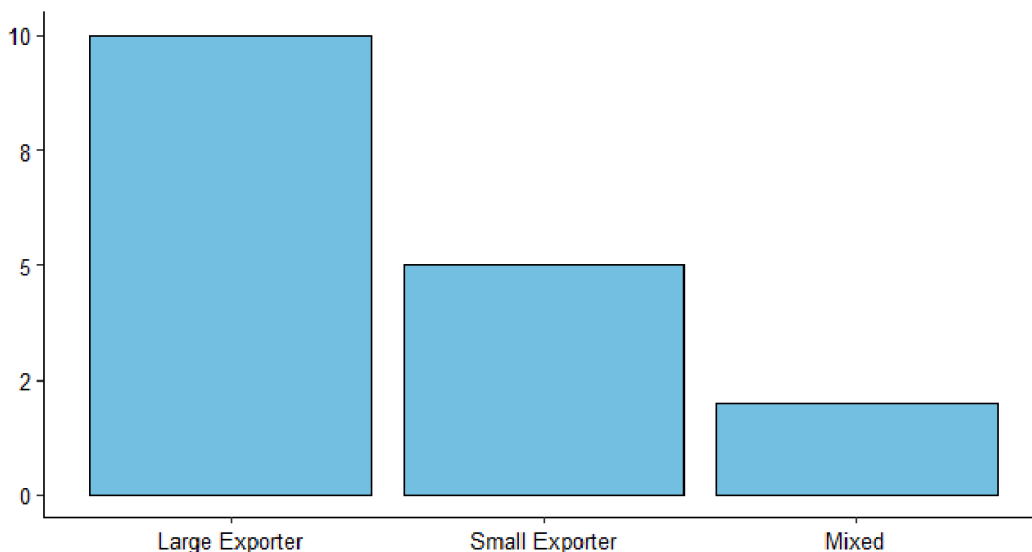
Among studies examining combined restrictions, tariffs appear most frequently across all combinations, followed by bans and quotas.

With respect to the country profiles analyzed – categorized as large or small exporters or importers – Figure 8 presents the distribution of these categories within the sample articles.





Figure 8. Types of Countries Analyzed in the Sampled Articles



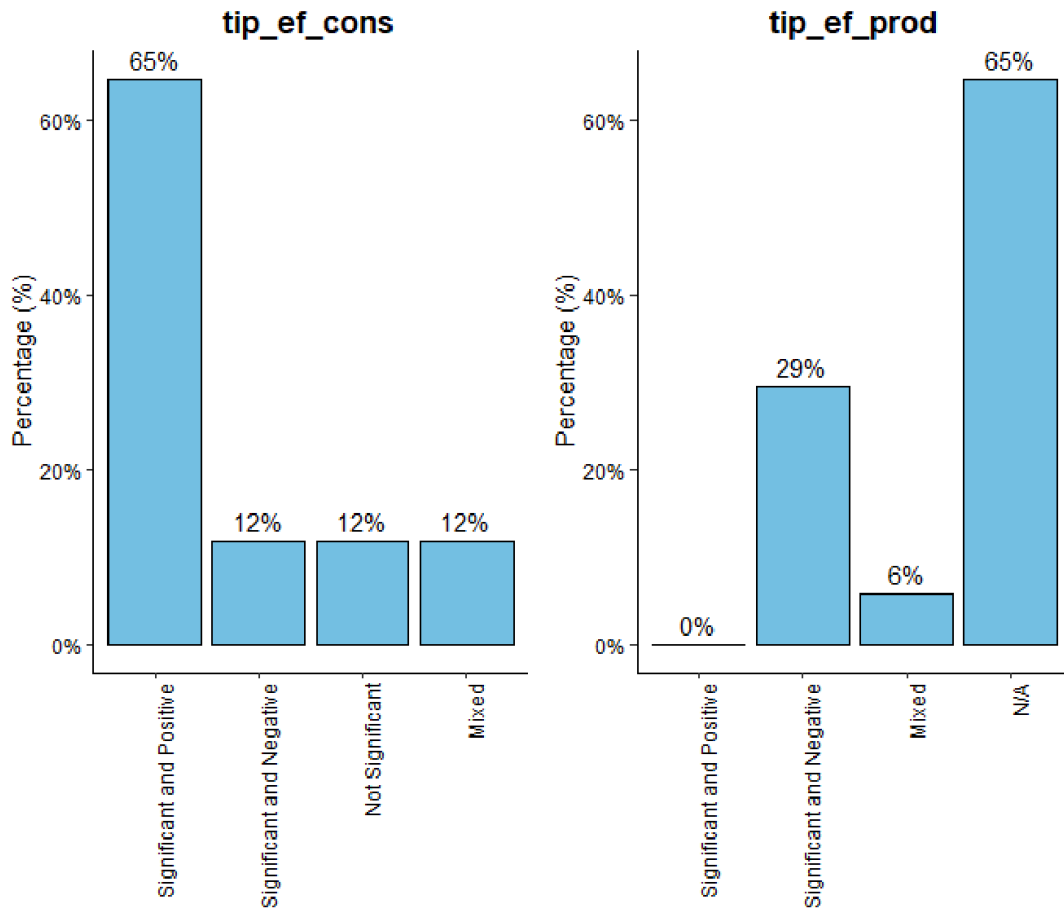
Source: Author’s elaboration.

It is observed that analyses focusing on large exporters predominate, followed by those examining small exporters. None of the studies in the sample address large or small importers. The category “mixed” refers to two articles: Yu and Jensen (2014) and Hansen, Tuan, and Somwaru (2011). Both investigate export restriction measures adopted by China across various food crops, treating the country as both a large exporter and a large importer.

Figure 9 presents the percentage of articles in the sample that report different types of effects of the independent variable – food export restrictions – on the dependent variables: domestic supply (*tip_ef_cons*) and domestic production of the restricted food crop (*tip_ef_prod*).



Figure 9. Types of Effects of Food Export Restrictions on Domestic Supply and Production



Source: Author's elaboration.

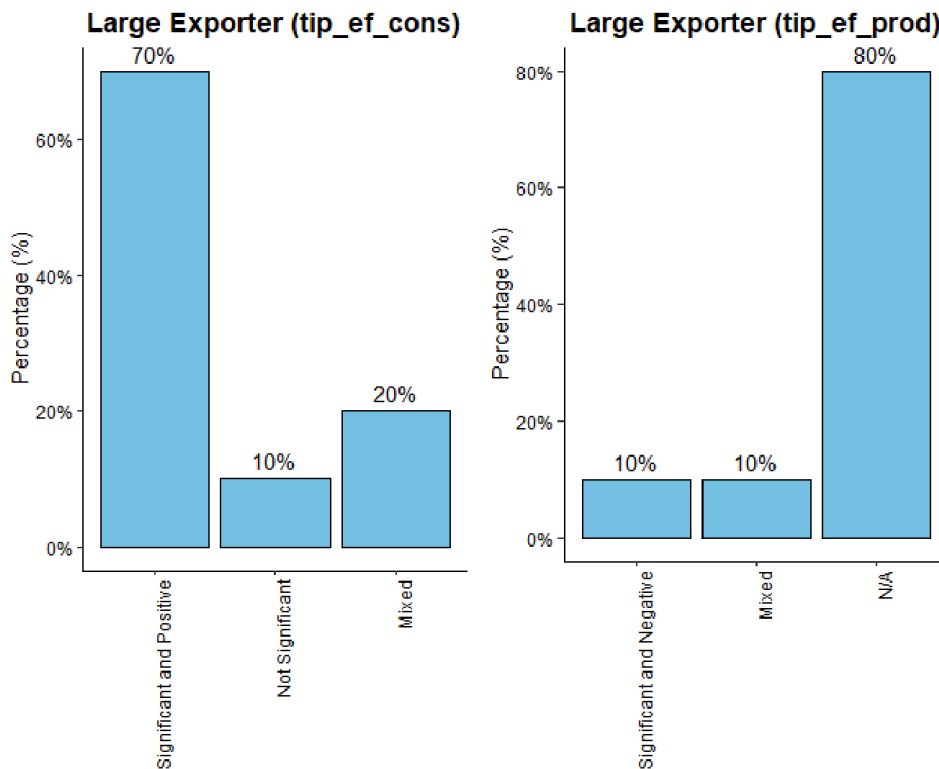
It is observed that, regarding domestic supply, 65% of the articles identify a significant and positive effect. In contrast, 65% of the articles do not analyze the dependent variable *tip_ef_prod*, indicating a notable gap in the literature concerning the impact of food export restrictions on domestic production, particularly in the context of the global food price surge. Among the studies that do consider *tip_ef_prod*, 29% report significant and negative effects, suggesting that export restrictions tend to reduce domestic production of the embargoed crop. The remaining 6% of the articles find mixed results.

To provide a more nuanced understanding of these effects, the sample was divided into two groups: articles focusing on large exporters and those examining small exporters. The detailed results for each group are presented in Figures 10 and 11.



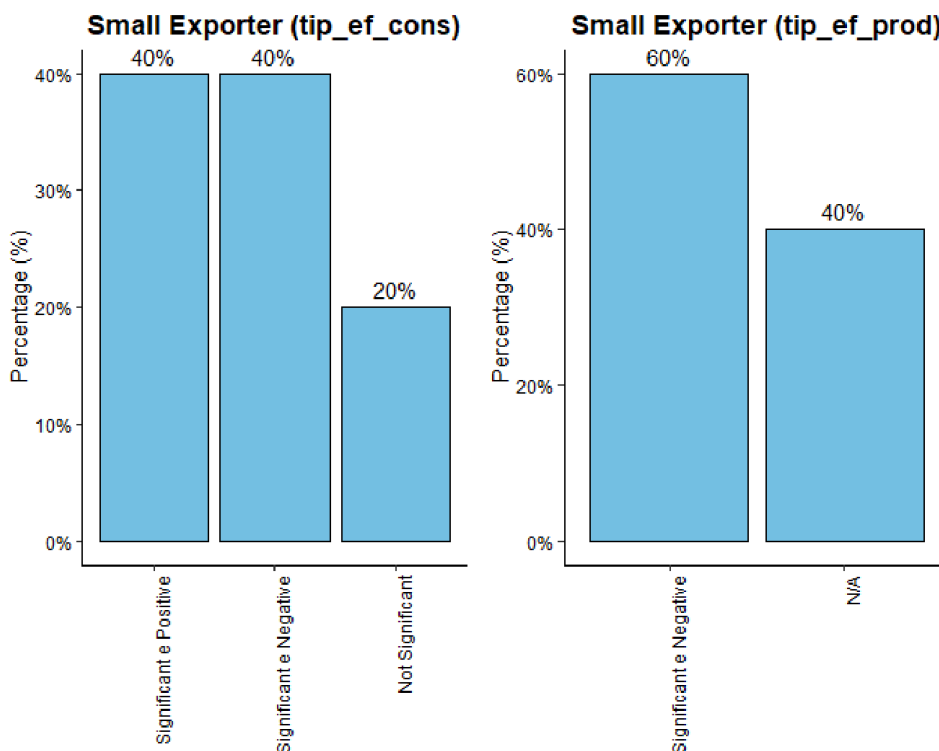


Figure 10. Types of Effects of Food Export Restrictions on Domestic Supply and Production in Large Exporters



Source: Author's elaboration.

Figure 11. Types of Effects of Food Export Restrictions on Domestic Supply and Production in Small Exporters



Source: Author's elaboration.





A clear distinction emerges between the two groups analyzed. Regarding the variable *tip_ef_cons*, 70% of the articles focusing on large exporters report a significant and positive effect, whereas only 40% of the studies on small exporters identify the same. Among large exporters, there is a marked difference between significant positive effects (70%) and significant negative effects (10%). In contrast, for small exporters, no single effect predominates, reflecting less consistent findings.

These findings support the theoretical argument presented in the second section: for large exporters, who have the ability to influence international price formation, export restrictions can indeed increase domestic food supply. In contrast, for small exporters, who are price takers, such measures tend to be ineffective in improving domestic welfare, particularly when it comes to expanding internal supply in the face of rising international prices. As previously discussed, small exporters exert little to no influence over global prices. Therefore, by imposing export restrictions, they incur losses in export revenues without achieving meaningful gains in price stability or domestic availability, rendering the policy both costly and ineffective (Piermartini, 2004).

Regarding the variable *tip_ef_prod*, it is notable that 80% of the studies on large exporters do not analyze the effects on production. In contrast, among small exporters, a significant and negative effect predominates, aligning with theoretical expectations.

In summary, approximately 65% of the articles in the sample identify a significant and positive effect of export restrictions on the domestic supply of affected crops. This effect is more pronounced for large exporters, whereas for small exporters the significant positive and negative effects occur with comparable frequency. Furthermore, there is a pronounced gap in the literature regarding the impact of export restrictions on domestic production. Among the studies that do investigate this issue, the significant negative effect predominates, with no evidence of meaningful positive effects.

Conclusions

As discussed in Section 2, countries facing food security challenges amid rising global food prices, particularly since the 2007-2008 crisis, have often adopted export restrictions as emergency measures. The sharp increase in international





prices pressured domestic markets, prompting such policies to protect consumers and ensure national food security. Their main goal has been to increase domestic food availability and insulate prices from global volatility. However, effectiveness varies: large exporters, able to influence international prices, tend to benefit more, while small exporters generally face higher costs and limited gains (Piermartini 2004; Bouet and Debucquet 2010; Abbott 2011).

The systematic review confirms this asymmetry. Most studies on large exporters report positive effects on domestic supply, whereas for small exporters results are mixed, aligning with theoretical expectations. These findings underscore the uneven impacts of export restrictions during the food price surges of the 21st century – large exporters could better protect consumers, while small exporters suffered revenue losses and limited policy effectiveness.

From a theoretical standpoint, export restrictions may also reduce production incentives in both groups by discouraging efficient producers (Piermartini 2004; Bouet and Debucquet 2010). The review revealed a scarcity of studies on production effects: evidence is inconclusive for large exporters and predominantly negative for small ones. Thus, while such policies may temporarily increase domestic availability, they often distort markets and weaken long-term resilience, particularly in less adaptive economies.

Although dominated by single case studies, the literature suggests that export restrictions can buffer short-term shocks but undermine production and stability over time. Future comparative and qualitative research should further investigate causal mechanisms and explore ways to enhance policy effectiveness amid global price volatility.

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