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Determinants of Competitiveness in Global Agricultural Export Markets: Insights from Soybean and Other Staple Crops

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Abstract: This review examines the determinants of competitiveness in global agricultural export markets, with particular attention to soybeans and other staple crops. Drawing on evidence from 33 empirical studies across major exporting and importing regions, the review synthesizes how competitiveness is shaped by interacting macroeconomic, structural, policy, and firm-level factors rather than by production scale alone. The literature consistently shows that large agricultural scale, high labor and land productivity, and trade openness support strong export performance, especially for net exporters such as Brazil and Argentina. However, these advantages are frequently weakened by structural traps, including concentration in low-value-added products, domestic absorption of surplus, policy misalignment, and reliance on price-based competition. Trade costs, logistics inefficiencies, and non-tariff measures, particularly sanitary and phytosanitary standards and certification requirements, emerge as major constraints for bulk commodities like soybeans and grains. The review also highlights the widespread use of revealed comparative advantage indices, constant market share analysis, and gravity models to assess export performance and disentangle demand-driven growth from genuine competitiveness gains. Findings also underline the importance of regional integration, exchange rate stability, and effective institutional support, while firm- and value-chain-level strategies such as cost control, quality upgrading, processing, and certification are critical for sustaining competitiveness. Overall, the literature points to the need for integrated strategies that combine productivity gains, logistics improvement, coherent policy design, and value-chain upgrading to move staple crop exports from volume-driven growth toward more resilient and high-value competitive positions.

Keywords: Agricultural export competitiveness; Soybean trade; Revealed comparative advantage; Trade costs and logistics; non-tariff measures; Value chain upgrading.

INTRODUCTION

Global agricultural trade has become increasingly central to food security, rural employment, and foreign exchange earnings, particularly for major producers of soybeans and other staple commodities (Hamulczuk and Pawlak, 2022). As demand growth in many developed economies slows, the ability of exporting countries to sustain and expand their positions in world markets depends on two main factors. It depends to a lesser extent on sheer production volume and to a greater extent on a complex bundle of determinants that shape international competitiveness. These include macro-economic conditions, structural characteristics of production, logistics and infrastructure, and policy and institutional environments (Hamulczuk and Pawlak, 2022). Across diverse empirical settings, recent studies converge on the idea that competitiveness is multi-dimensional and dynamic rather than a simple reflection of resource endowments. This has been evident in the fact that trade openness, relative unit labor costs, productivity, and trade-facilitating institutions enhance export performance. On the other hand, poorly targeted public expenditure, weak logistics, and over-reliance on low-value or price-based strategies undermine long-term competitive strength (Hamulczuk and Pawlak, 2022; Zhou and Tong, 2022). For soybeans and staples in particular, this implies that sustaining an edge in global markets requires simultaneous attention to scale and efficiency, trade costs, and structural upgrading along the value chain (Urba *et al.*, 2023).

This literature review synthesizes findings from 33 recent studies on agricultural trade performance and competitiveness, with a focus on extracting insights relevant to soybeans and other staple export commodities. The review insight cuts across a wide set of countries including Brazil, Argentina, Ukraine, India, China, South Africa, Indonesia, Serbia, Vietnam, and members of the EU. The literature review also employs a range of quantitative methods and examines both aggregate agri-food exports and specific products of soybean or other staples. This review offers a rich empirical basis for understanding how different determinants operate, interact, and evolve across time and space. Notwithstanding, important gaps and inconsistencies remain, with several works documenting strong comparative advantages in bulk commodities (Deepika, 2021; Urba *et al.*, 2023). Others reveal policy mismatches, such as agricultural support that does not align with regional endowments, or trade liberalization measures and hence, shift competitiveness in ways

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not anticipated by domestic producers. Soybean-specific analysis are relatively scarce, and the link between national-level trade metrics and micro-level behavior of producers, processors, and exporters is often only indirectly addressed (Zhou and Tong, 2022).

METHODOLOGY

A systematic literature review was done concerning Determinants of Competitiveness in Global Agricultural Export Markets: Insights from Soybean and Other Staple Crops. This approach was adopted in this study because the subject matter was narrower and more specific to warrant a scoping literature review method. A review protocol was outlined prior to conducting the systematic review, which is in accordance with the review guidelines proposed by Kitchenham *et al*. (2010). The research questions were first defined, after which the keywords identified in this research were input into databases to select the relevant literature materials. The databases used to source literature materials in this study included ScienceDirect, Google Scholar, Web of Science, and ResearchGate. Search Keywords or statements used in this study are as follows:

- Determinants of Competitiveness in Global Agricultural Export Markets: Insights from Soybean and Other Staple Crops
- Determinants OR Factors AND competitiveness AND Agriculture AND Export market AND Soybean OR Crops
- Agribusiness OR Agricultural OR Staples AND Export AND Competitiveness

A selection criterion consisting of "documents within agricultural export, export market, international market, non-review papers, Papers published in English and also published between 2020 - 2025" was used to filter the documents and select relevant literature. A total of 152 literature materials were obtained using the above keywords and criteria for searching literature in the various search engines. Out of this number, only 33 were selected based on the relevance of information they provided after reading the abstract. Relevance focused on the abstract, capturing competitiveness and key factors of competitiveness in the export market. All other pertinent information was gathered from the selected literature materials and subsequently synthesised in accordance with the main theme of the research, emerging trends in agricultural export. A thematic analysis was used to discuss the relevant information captured in the literature section.

FINDINGS

Theoretical and Methodological Basis of Competitiveness

The literature on agricultural export performance largely conceptualizes competitiveness in trade terms, grounding it in observed export and import patterns rather than in purely cost- or productivity-based metrics. Thus, competitiveness is defined as a country's ability to maintain or expand its share in international markets under conditions of open competition while generating sustainable economic returns for the sector (Urba *et al.*, 2023). In this perspective, competitiveness is revealed through trade outcomes. Countries that systematically export more of a given product relative to the world average are regarded as having a comparative advantage, and changes in these indicators over time are interpreted as signals of strengthening or weakening competitive positions (Pawlak, 2022). A central theoretical construct is comparative advantage, rooted in classical and neo-classical trade theory, and operationalized through indices such as Revealed Comparative Advantage (RCA) and its variants. These translate the notion that specialization according to relative costs and factor endowments should, under certain conditions, be reflected in export patterns (Sanny *et al.*, 2021; Novianti *et al.*, 2024). For agricultural commodities including soybeans, cereals, and plantation crops, this trade-based view captures both cost-related factors (such as land availability and productivity) and broader systemic determinants (such as policy, logistics, and institutions that influence actual export performance). Interestingly, several authors distinguish between static comparative advantage and dynamic or structural competitiveness (Deepika, 2021).

Another theoretical strand emphasizes the decomposition of export growth into demand-driven and competitiveness-driven components, where export expansion can occur because (i) world demand for a product is rising, (ii) a country re-allocates exports toward faster-growing markets or products, or (iii) due to genuine improvements in competitiveness that allow the country to gain market share even when global conditions are neutral (Kumar, 2022). This approach highlights that high export growth is not synonymous with strong competitiveness: countries can ride favorable world trends while still losing relative market share or remaining concentrated in low-growth segments (Kumar, 2022). For soybeans and other staples, this distinction is critical, because

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much of the recent expansion has occurred in a context of strong global demand, making it important to disentangle passive from active sources of performance.

Measurement Frameworks for Export Competitiveness

Revealed comparative advantage and related indices

The most widely used empirical tools in the reviewed studies are Revealed Comparative Advantage (RCA)-type indices which compare a country's export share in a particular product or sector with its share in total world exports. Where an RCA value greater than one indicates revealed comparative advantage, values below one suggest a disadvantage (Sanny *et al.,* 2021; Urba *et al.,* 2023; Novianti *et al.,* 2024). Variants such as the Adjusted Revealed Comparative Advantage (ARCA) and Revealed Symmetric Comparative Advantage (RSCA) address statistical limitations of the original RCA, including asymmetry around unity and sensitivity to extreme values (Zhou and Tong, 2022). RCA-type indices feature prominently in assessments of both aggregate agri-food sectors and specific commodities, with studies of Brazil, Argentina, New Zealand, and Ukraine showing high RCA values for agricultural exports. These reflect strong specialization and net-export status in major staples. However, analysis of Serbia and other emerging exporters reveals high RCA in low-processed products alongside declining or fragile competitiveness (Urba *et al.,* 2023). For soybeans and soybean-related value chains, RCA and RSCA provide a straightforward way to benchmark the relative export orientation of different countries and track shifts in specialization over time. The only challenge is that they must be interpreted alongside other indicators of quality, value addition, and market diversification.

Relative Trade Advantage and related ratios extend this logic by explicitly incorporating imports, distinguishing between gross export performance and net trade positions. They are also useful in identifying cases where high exports are offset by substantial imports, signaling limited domestic value addition or re-export strategies (Urba *et al.,* 2023). In staple markets, a strong net export position with low imports tends to correlate with high competitiveness, but studies caution that such positions can be heavily price-dependent and vulnerable to volatility and policy shocks (Urba *et al.,* 2023).

Constant market share (CMS) analysis

Constant Market Share (CMS) analysis provides a complementary decomposition framework, breaking down changes in a country's exports into world demand effect, commodity composition effect, market distribution effect, and residual competitiveness effect (Kumar, 2022). The world demand effect captures export growth attributable to overall expansion in global trade. Given unchanged market shares, the commodity composition effect reflects specialization in products with faster or slower world demand growth. The market distribution effect indicates concentration in dynamic or stagnant destinations, and the residual competitiveness effect measures gain or loss beyond global demand and composition (Kumar, 2022). Empirical work applying CMS to agricultural exports shows substantial growth explained by favorable world demand and strategic concentration in fast-growing markets, while the residual competitiveness effect is often negative, implying countries benefit from external conditions rather than intrinsic improvements (Kumar, 2022). For soybeans and staples, CMS identifies whether export expansion reflects structural strengths or riding a commodity boom, highlighting risks of a "commodity composition trap" (Kumar, 2022).

Gravity models of trade

Gravity models model bilateral trade flows as a function of economic size, distance, institutional policy, and structural variables. The extended specifications incorporating exchange rates, common language, trade agreements, and non-tariff measures, often using panel data and estimators like Feasible Generalized Least Squares or Pseudo-Poisson Maximum Likelihood (Sanny *et al.,* 2021). Studies show GDP of trading partners as a strong positive determinant, while physical distance and exchange rate volatility exert negative effects, with membership in regional communities, shared language, and agreements facilitating trade (Sanny *et al.,* 2021; Pawlak, 2022). Product-specific applications demonstrate that domestic GDP and population changes can undermine competitiveness via increased internal consumption (Sanny *et al.,* 2021). For soybeans and other staples, Gravity models quantify market size, logistics, and policy importance in bilateral flows and simulate impacts of agreements or infrastructure (Sanny *et al.,* 2021).

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Other Quantitative Approaches and Composite Frameworks

Beyond RCA, CMS, and Gravity models, panel regressions link trade balances or indices to productivity, agricultural GDP, inputs, and openness (Hamulczuk and Pawlak, 2022; Ohana-Levi and Netzer, 2023; Novianti *et al.*, 2024). These frameworks are relevant for soybeans and other staples, thus, integrating static and dynamic assessments to distinguish deteriorating strong positions from emerging opportunities, and supporting nuanced policy for upgrading, and diversification.

Determinants of Competitiveness: Macroeconomic, Structural, and Productivity-Related Factors

Economic scale and productivity as core drivers

Macro-economic scale and productivity factors form the bedrock of agricultural export competitiveness in the reviewed literature, with empirical evidence consistently linking larger agricultural economies, efficient input use, and labor/land productivity gains to superior trade performance. Hamulczuk and Pawlak (2022) analyzed panel data from 43 countries over 2000-2014 and found that decreasing relative unit labor costs and increasing trade openness exert positive and significant effects on food industry net exports (trade balance). These relationships strengthening in the long run compared to the short run. Relative labor productivity shows an ambiguous impact, suggesting contextual dependencies on how efficiency translates to trade outcomes. Zhou and Tong (2022) provide complementary evidence from China and 58 Belt and Road countries (2001-2019), where agricultural GDP scale, farm inputs (fertilizer and capital per cultivated land), labor productivity (capital per labor), and land productivity (arable land per labor) all positively and significantly influence multi-dimensional competitiveness indices.

These patterns hold across diverse settings. Liew *et al*. (2021) demonstrate for Malaysia's 186 agricultural commodities (1988-2014) that capital formation and labor participation rates positively contribute to RCA, helping to offset adverse commodity price effects. In staple-specific contexts, Urba *et al*. (2023) calculated RCA indices for 2020, revealing extreme competitive strengths for net exporters like Argentina (RCA = 5.056), New Zealand (4.378), and Brazil (3.310). This was attributed directly to high agricultural export shares in total exports coupled with low import volumes; a scale-driven dominance less evident in diversified economies like the USA (RCA = 0.006) or EU (0.109).

Critically, comparative analysis exposes nuances: thus, while aggregate scale advantages propel leaders, per capita metrics often reveal traps. Sanny *et al*. (2021) report via Gravity model regressions on Indonesian shrimp exports (2001-2017) that exporting-country GDP and population negatively affect RCA (coefficients: -1.60 and -0.935), as rising domestic purchasing power absorbs surplus supply, reducing exportable volumes. Seti (2023) confirms partner GDP as the strongest positive Gravity determinant for South African agricultural exports to Africa (2000-2020), underscoring the role of market size alongside domestic scale. For soybeans and most other staples, these insights imply that productivity must not only scale production but must also prioritize export surpluses over domestic absorption.

Structural traps and policy mismatches

Structural weaknesses and policy misalignments temper scale benefits, creating vulnerabilities especially in emerging exporters. Zhou and Tong (2022) uncover a paradox where per capita cultivated land and government agricultural spending negatively impact competitiveness, interpreted as resource-finance mismatches (i.e. land-rich but underdeveloped regions receive inadequate support, while scarce-land areas over-allocate funds inefficiently). Kumar (2022) decomposed Indian agricultural export growth (1991-2020) using Constant Market Share (CMS) analysis. They showed that total gains (US$1,792 million in 2011-2020) were driven by positive World Demand Effect (WDE) and Market Distribution Effect (MDE) but were undermined by negative Commodity Composition Effect (CCE)s and Residual Competitiveness Effect (RCE), signaling intrinsic disadvantages exacerbated by import restrictions during COVID-19.

Dimitrijević *et al*. (2023) tried this for Serbia's agri-food sector, where positive RCA/ARCA in staples like corn showed overall decline due to low-value exports and quality deficits associated with unsustainable low-price strategies. Tomashuk (2023) advocates firm-level cost optimization and cooperation to escape such traps in Ukrainian agriculture. In soybean markets, these traps manifest as "big but not strong" paradoxes (Zhou & Tong, 2022), where volume leaders risk erosion without productivity-aligned policies.

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Trade Costs, Logistics, and Non-Tariff Measures

Physical distance and logistics infrastructure as binding constraints

Trade costs, encompassing geographical distance, transportation infrastructure, and logistics efficiency, emerge as persistent negative determinants of agricultural export competitiveness, particularly for low-margin bulk commodities like soybeans, grains, and oilseeds. In the work of Seti (2023) who employed Pseudo-Poisson Maximum Likelihood (PPML) Gravity models on South African agricultural exports to 46 African partners (2000-2020), it was identified that physical distance posed as a significant negative factor that outweighs many traditional drivers. Lei (2024) confirms this for Vietnam's agricultural exports to Regional Comprehensive Economic Partnership (RCEP) markets, by indicating that distance erodes trade values emphasizing infrastructure's role in regional integration gains.

In the case of soybean, Filassi and Oliveira (2022) pinpointed logistics as the sole negative driver for Brazilian soybean exports, attributing vulnerabilities to systemic supply chain bottlenecks like port congestion and inland transport. Padilla *et al*. (2023) contrasts U.S. soybean logistics which is hampered by rail and barge inefficiencies, with Brazil's land expansion advantages, showing how infrastructure gaps amplify competitive pressures in thin-margin markets. Sanny *et al*. (2021) add a counter-intuitive twist via Gravity regressions on Indonesian shrimp (2001-2017), where economic distance positively affects RCA.

Non-tariff measures (NTMs): certification, SPS, and quality standards

Non-tariff measures (NTMs), particularly sanitary and phytosanitary (SPS) standards, certifications, and labeling requirements, act as critical filters for market access, often retarding competitiveness more than does duties in processed or high-value staples. Deepika (2021) analyzes Indian plantation commodities (coffee, tea, cashew, pepper) using unit export price ratios as competitiveness proxies. It was shown that cashew succeeds via policy-promoted processing, but coffee/tea lag due to sustainability certification gaps. On the other hand, pepper exporters face SPS confusion from inconsistent importer rules, necessitating international standardization.

Prasanna *et al*. (2021) demonstrate NTM benefits for Indonesian rubber, where compliance signals commodity quality and bolsters RCA, contrasting non-compliant peers. Pawlak (2022) frames EU agri-food exports to the U.S. (2010-2020) via Widodo's product mapping, positioning NTMs (SPS, geographical indications) as EU differentiation tools against U.S. scale efficiencies. For most staples, Urba *et al*. (2023) iterates that Ukraine's price-based grain competitiveness risks NTM exclusion without technological upgrades in storage and quality.

Policy, Institutional, and Integration Factors

Trade openness, fiscal policy, and support efficiency

Policy frameworks, encompassing trade openness, fiscal allocations, and support mechanisms, profoundly shaped agricultural export competitiveness, with empirical evidence highlighting both enabling effects and critical misalignments. Hamulczuk and Pawlak (2022) established via panel models across 43 countries (2000-2014) that increasing trade openness positively impacts food industry net exports, reinforcing classical arguments that reduced barriers enhance revealed comparative advantages in agri-food sectors. Zhou and Tong (2022) iterates this finding indicating that government agricultural financial inputs negatively affect competitiveness indices (RSCA, TC) for China and other export-import partners (2001-2019). Zhou and Tong (2022) further argued that this stems from mismatches where land-abundant regions receive insufficient support, while scarce areas over-allocate financial resources.

Integration policies amplify openness gains. According to Seti (2023), Regional Economic Community (REC) membership significantly boosts South African agricultural exports to Africa (2000-2020) by harmonizing standards and cutting barriers associated with NTMs. Lei (2024) mirrors this for Vietnam's RCEP agricultural flows, where agreements mitigate distance penalties. Pawlak (2022) advocates regulatory convergence (e.g., TTIP-style) for EU-U.S. agri-food trade (2010-2020). For staples, Urba *et al*. (2023) prescribe a four-pillar framework (institutional-regulating, organizational-economic, manufacturing-technological, informational-communicating) to elevate Ukraine's grains beyond price-based RCA, contrasting Argentina and Brazil's scale-driven policy synergies.

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Exchange rates, volatility, and macroeconomic stability

Exchange rate dynamics emerge as pivotal policy-sensitive determinants, with depreciation aiding competitiveness but volatility eroding it. Sanny *et al*. (2021) report on Indonesian shrimp (2001-2017) that Rupiah depreciation against the US Dollar positively impacts RCA, aligning with theory by cheapening exports for U.S. buyers. However, Seti (2023) argues that exchange rate volatility has significant negative effect on South African exports by introducing pricing uncertainty that hampers contracts in volatile African markets. Whereas rising GDP and population dampens surpluses via consumption traps (Sanny *et al.*, 2021), COVID-era import restrictions by partners damaged India's Residual Competitiveness Effect (RCE) in CMS decompositions (Kumar, 2022). Ambroziak *et al*. (2024) document Ukraine-EU liberalization flooding Polish staple markets with price shocks, illustrating liberalization's asymmetric domestic disruptions. Similarly, Padilla *et al*. (2023) reported that depreciation sustained Brazil and Argentina soybean edges amid yield races, whereas volatility exposed Ukraine's grains to geopolitical swings (Urba *et al.,* 2023). Policies stabilizing currencies and buffers (e.g., India's cotton stocks per Kumar, 2022) prove essential yet have been underexplored in soybean contexts.

Firm- and Value-Chain-Level Determinants

Cost strategies, cooperation, and micro-level competitiveness

At the firm and value-chain level, competitiveness hinges on operational strategies that translate macro advantages into sustainable export performance, with empirical evidence emphasizing cost control, inter-firm cooperation, and quality management as critical levers for agricultural enterprises. Tomashuk (2023) examines Ukrainian agricultural firms amid turbulent markets, advocating a paradigm shift toward "competition for the future" via strategic analysis of external/internal environments. Key recommendations made by Tomashuk (2023) include cost optimization to meet production needs while maintaining continuous control, alongside production cooperation to pool resources and enhance scale efficiencies in a globalized context. This micro-focus complements macro-scale findings, as firm-level cost discipline directly lowers unit labor costs, as indicated by Hamulczuk and Pawlak (2022).

Dimitrijević *et al*. (2023) provide regression-based evidence for Serbia's agri-food sector, linking declining ARCA/RCA to reliance on low-price strategies and inadequate product quality. Despite initial advantages in staples like frozen raspberries, fresh apples, and corn, overall export performance suffers from a structure dominated by low-value-added raw materials. The study prescribes investments in modern equipment, innovation (e.g., organic production), and strict quality standards to shift toward high-value final products.

Quality upgrading, certification, and value addition

Quality and certification emerge as non-price determinants that elevate firm competitiveness, particularly in navigating NTMs and accessing premium market segments. Deepika (2021) reports the success of Indian cashew yielding strong unit export price performance, with failures in coffee, tea, and pepper, which are attributed to low value addition, poor quality relative to competitors, and certification barriers. Recommendations include ISO, GMP, and HACCP attainment for cashew processors and SPS standardization negotiations for spices. Prasanna *et al*. (2021) affirm the advantage of certification for Indonesian rubber, where NTM compliance enhances RCA by signaling quality to importers, integrating Linear Approximation of the Almost Ideal Demand System (LA-AIDS) demand analysis to link farmer socioeconomics (e.g., green-picking due to cash needs) to national competitiveness declines. Dimitrijević *et al*. (2023) reinforce the value-addition imperative, noting that Serbia's export structure fails to maximize earnings despite raw advantages.

Thematic Analysis of Determinants of Agricultural Export Competitiveness from 33 Studies

Theme	Core Analytical Focus	Key Empirical Insights from the Narrative	Articles / Studies Covered
1. Macroeconomic Scale and Productivity	Role of economic size, labor/land productivity, and capital intensity	Larger agricultural economies with high labor and land productivity consistently achieve stronger RCA/RSCA and trade balances; scale	Hamulczuk & Pawlak (2022); Zhou & Tong (2022); Liew *et al*. (2021); Urba *et al*.

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		advantages are strongest when surplus production is export-oriented rather than domestically absorbed	(2023); Sanny *et al*. (2021); Seti (2023)
2. Structural Traps and Policy Mismatches	Limits of scale due to composition bias, fiscal misallocation, and low-value focus	Export growth is undermined when driven by slow-growing commodities, low-quality outputs, or mismatched government spending; "big but not strong" paradox evident in several exporters	Zhou & Tong (2022); Kumar (2022); Dimitrijević *et al*. (2023); Tomashuk (2023); Urba *et al*. (2023)
3. Trade Costs and Logistics Constraints	Impact of distance, transport infrastructure, and logistics efficiency	Physical distance and logistics bottlenecks significantly reduce competitiveness in bulk commodities; logistics is identified as the dominant negative factor even for top producers like Brazil	Seti (2023); Lei (2024); Filassi & Oliveira (2022); Padilla *et al*. (2023); Sanny *et al*. (2021)
4. Non-Tariff Measures (NTMs) and Standards	SPS measures, certification, labeling, and quality compliance	NTMs act as decisive market access filters; certification enhances competitiveness in some cases, while lack of harmonization and compliance erodes RCA in others	Deepika (2021); Prasanna *et al*. (2021); Pawlak (2022); Urba *et al*. (2023)
5. Trade Openness and Regional Integration	Effects of liberalization, REC membership, and regulatory convergence	Trade openness and regional integration amplify export performance by reducing transaction costs and harmonizing standards, but benefits depend on policy alignment	Hamulczuk & Pawlak (2022); Seti (2023); Lei (2024); Pawlak (2022); Urba *et al*. (2023)
6. Exchange Rates and Macroeconomic Stability	Currency depreciation, volatility, and crisis shocks	Depreciation supports price competitiveness, but volatility and external shocks (COVID-19, liberalization surges) destabilize export performance and residual competitiveness	Sanny *et al*. (2021); Seti (2023); Kumar (2022); Ambroziak *et al*. (2024); Padilla *et al*. (2023); Urba *et al*. (2023)
7. Firm-Level Cost Strategies and Cooperation	Micro-level efficiency, cooperation, and cost control	Sustainable competitiveness requires cost optimization, inter-firm cooperation, and moving beyond low-price strategies that erode long-term advantages	Tomashuk (2023); Dimitrijević *et al*. (2023); Hamulczuk & Pawlak (2022)
8. Quality Upgrading, Value Addition, and Innovation	Certification, processing, innovation, and value-chain governance	Quality upgrading, processing, and certification enable shifts from raw exports to higher-value segments, strengthening resilience against NTMs and price competition	Deepika (2021); Prasanna *et al*. (2021); Dimitrijević *et al*. (2023); Tomashuk (2023); Novianti *et al*. (2024)
9. Commodity-Specific Evidence: Soybeans and Staples	Integrated effects in soybean and grain markets	Soybean and grain competitiveness reflects interactions between scale, logistics, exchange rates, quality, and policy; leaders combine scale with governance, while price-based exporters remain vulnerable	Filassi & Oliveira (2022); Padilla *et al*. (2023); Urba *et al*. (2023); Dimitrijević *et al*. (2023); Kumar (2022); Ambroziak *et al*. (2024)

Key Insights from Literature

The reviewed studies converge on a multi-dimensional understanding of the determinants of competition in global agricultural export markets, particularly for soybeans and other staples, revealing consistent patterns across macro-structural, trade cost, policy-institutional, and firm-value-chain levels. Economic scale, productivity enhancements (e.g., labor/land efficiency, capital inputs), and trade openness emerge as primary

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enablers, propelling net exporters like Brazil and Argentina to top RCA positions (Urba *et al.*, 2023; Zhou & Tong, 2022; Hamulczuk & Pawlak, 2022). However, these are tempered by structural traps (such as domestic consumption absorption, commodity composition biases, and fiscal mismatches) that undermine residual competitiveness even amid export growth (Sanny *et al.*, 2021; Kumar, 2022; Zhou & Tong, 2022).

Trade costs and NTMs amplify vulnerabilities, with logistics bottlenecks and certification barriers disproportionately hitting bulk staples. Brazil's soybean dominance persists despite supply chain flaws, but U.S. inefficiencies and Indian plantation shortfalls illustrate how distance and SPS can erode achieved impact (Filassi & Oliveira, 2022; Seti, 2023; Deepika, 2021). Regional Economic Community and integration boost flows (Seti, 2023; Lei, 2024), depreciation aids pricing (Sanny *et al.*, 2021), yet volatility, liberalization shocks, and misallocated support create fragility (Ambroziak *et al.*, 2024; Zhou & Tong, 2022). Firm-level strategies (i.e. cost cooperation, quality upgrading, value addition) bridge gaps, enabling shifts from price reliance to sustainable premiums, as in cashew processing or rubber certification (Prasanna *et al.*, 2021; Tomashuk, 2023; Dimitrijević *et al.*, 2023).

CONCLUSION

In synthesizing findings from 33 empirical studies on determinants of competitiveness in global agricultural export markets, with particular insights for soybeans and other staples, this review reveals that sustainable success demands an integrated strategy transcending mere scale or endowments to encompassing productivity enhancements, logistics, NTM mitigation, policy alignment, and firm-level value-chain upgrading. Leaders like Brazil and Argentina leverage macro-economic scale and net-export dominance alongside chain governance to maintain RCA advantages, yet vulnerabilities persist in price-dependent emerging exporters (e.g., Ukraine grains and Indian plantations) trapped by consumption biases, certification gaps, and crisis shocks. Critical gaps in soybean-specific empirics, micro-to-macro linkages, and resilience modeling underscore the need for future research employing multi-method frameworks (RCA-CMS-Gravity integrations) and targeted policies, such as infrastructure investments, certification cooperatives, and endowment-synced support, to elevate staples from passive volume growth to resilient, high-value competitiveness, directly informing strategies for global market leadership.

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