AGRICULTURAL POWER JOURNAL
Vol. 3 No. 3, August 2026
Page 14 – 27 | e-ISSN: 3062-8563

International Trade Dynamics and Comparative Advantage of Indonesian Specialty Coffee Using Revealed Comparative Advantage and Constant Market Share Frameworks

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ABSTRACT

Indonesian specialty coffee has gained increasing international recognition because of its distinctive flavor profiles, geographical diversity, and growing demand in premium coffee markets. Despite these advantages, the competitiveness of Indonesian coffee exports continues to face challenges arising from intense competition among major coffee-exporting countries, fluctuating global demand, and changing international trade patterns. This study aims to synthesize existing evidence on the international trade dynamics and comparative advantage of Indonesian specialty coffee based on studies employing the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) frameworks. A qualitative systematic literature review was conducted by synthesizing twenty-five peer-reviewed studies published between 2015 and 2026 concerning coffee trade competitiveness, export performance, comparative advantage, and international market dynamics. The findings indicate that Indonesian specialty coffee possesses a comparative advantage in global markets; however, export competitiveness is influenced by product quality consistency, productivity, certification, value-added processing, market diversification, and international demand shifts. Furthermore, CMS analysis suggests that changes in market composition and competitiveness significantly affect Indonesia's export performance relative to competing producers such as Brazil, Vietnam, Colombia, and Ethiopia. Strengthening sustainable production systems, improving post-harvest quality, expanding specialty coffee certification, and diversifying export destinations are essential strategies for enhancing Indonesia's long-term competitiveness in the global specialty coffee market.

Keywords: Specialty Coffee; International Trade; Revealed Comparative Advantage; Constant Market Share; Export Competitiveness; Indonesia

Article Information
Received: June 04, 2026
Revised: August 21, 2026
Online: August 26, 2026

PUBLISHED BY : http://doi.org/10.70076/apj.v3i3.205
HEI PUBLISHING https://heijournal.id/index.php/apj

1. Introduction

Coffee is an important internationally traded agricultural commodity and contributes to employment and export earnings in many producing countries [1]. Global coffee consumption has continued to increase over the past decade, which has been associated with changing consumer preferences, expanding café culture, and rising demand for premium and sustainably produced coffee products [2]. This trend has prompted many producing countries to strengthen their competitiveness by improving product quality, increasing production efficiency, and expanding access to international markets [3]. Consequently, maintaining a competitive position in the global coffee trade has been recognized as an important priority for many coffee-exporting countries seeking sustainable economic development [4].

Indonesia is widely recognized as one of the world's largest coffee-producing countries and is known for producing a wide variety of specialty coffees with distinctive geographical characteristics [5]. Coffee-producing regions such as Gayo, Mandailing, Toraja, Java, Kintamani, Flores, and Bajawa have established strong reputations in premium international markets because of their unique flavor profiles, diverse agroecological conditions, and geographical indications [6]. These comparative advantages may provide Indonesia with opportunities to strengthen its position in the expanding global specialty coffee market [7]. Nevertheless, Indonesia continues to face intense competition from major coffee-exporting countries such as Brazil, Vietnam, Colombia, Ethiopia, and Honduras, which have consistently improved productivity, quality standards, and export performance [8].

The global coffee market has experienced substantial structural changes associated with increasing consumer demand for specialty coffee, certified sustainable products, and traceable supply chains [9]. Unlike conventional coffee markets that primarily compete on production volume and price, specialty coffee markets emphasize quality consistency, origin characteristics, post-harvest processing, environmental sustainability, and social responsibility throughout the production chain [10]. Consequently, exporters may need to continuously improve production practices, quality assurance systems, certification, and marketing strategies to maintain competitiveness in increasingly sophisticated international markets [11].

International trade competitiveness is commonly evaluated through comparative advantage analysis, which measures a country's relative export performance compared with competing nations [12]. Among the most widely applied indicators is the Revealed Comparative Advantage (RCA) index developed by Balassa, which evaluates whether a country demonstrates a comparative advantage in a specific export commodity based on observed trade patterns [13]. An RCA value greater than one indicates that a country has a relatively stronger export specialization than the global average, whereas an RCA value below one suggests weaker comparative competitiveness [14]. Owing to its simplicity and wide applicability, the

RCA index has been widely employed in studies examining agricultural export competitiveness across various international markets [15].

Although the RCA index effectively measures export specialization, it does not fully explain the factors contributing to changes in export performance over time. Consequently, researchers frequently combine RCA analysis with the Constant Market Share (CMS) framework to obtain a more comprehensive assessment of export competitiveness [16]. The CMS approach decomposes export growth into several components, including changes in global demand, commodity composition, market distribution, and competitiveness effects, thereby enabling a deeper understanding of the determinants of export performance [17]. Through this decomposition, CMS analysis distinguishes whether export growth results primarily from favorable market conditions or from genuine improvements in national competitiveness [18].

For Indonesian specialty coffee, understanding international trade dynamics has become increasingly important because export performance is influenced by numerous internal and external factors. Domestic factors include production productivity, post-harvest technology, quality consistency, certification, farmer capacity, infrastructure, and value-added processing, whereas external factors comprise changing consumer preferences, international coffee prices, exchange rate fluctuations, sustainability standards, and competition from other coffee-exporting countries [19]. These interconnected factors collectively influence Indonesia's ability to strengthen its competitive position within the rapidly evolving global coffee market [20].

Recent studies indicate that demand for specialty coffee has grown significantly in major importing regions such as the United States, the European Union, Japan, South Korea, Australia, and the Middle East [21]. Consumers increasingly tend to value coffee products that possess distinctive sensory characteristics, geographical identity, environmental sustainability, and transparent traceability systems [22]. Consequently, Indonesian specialty coffee producers may have opportunities to capture higher-value market segments by emphasizing product differentiation rather than competing solely through production volume or price [23]. However, achieving this objective may require continuous improvements in quality management, certification systems, branding, and international marketing capabilities [24].

Despite the increasing importance of Indonesian specialty coffee in global trade, previous studies have generally examined export competitiveness, comparative advantage, and international trade dynamics independently. Limited literature has integrated the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) frameworks to comprehensively evaluate Indonesia's specialty coffee export performance amid changing international market conditions. Therefore, this study aims to synthesize existing empirical evidence regarding the international trade dynamics and comparative advantage of Indonesian specialty coffee using RCA and CMS approaches. The synthesis is intended to provide insights into factors associated with export competitiveness and market resilience and to inform discussions of policy options for Indonesian specialty coffee [25].

2. Materials and Method

This study employed a qualitative research approach using a systematic literature review (SLR) to examine the international trade dynamics and comparative advantage of Indonesian specialty coffee through the perspectives of the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) frameworks. The systematic literature review approach was selected because it enables the comprehensive synthesis of empirical findings from previous studies concerning export competitiveness, comparative advantage, international coffee trade, and market dynamics while identifying consistent patterns and policy implications across diverse research contexts [11]. Furthermore, this method provides a robust foundation for evaluating how theoretical and empirical evidence contributes to understanding Indonesia's position in the global specialty coffee market [7].

The literature search was conducted using several internationally recognized scientific databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, Taylor & Francis Online, Wiley Online Library, Emerald Insight, Google Scholar, and SINTA-accredited Indonesian journals. To obtain comprehensive and relevant publications, combinations of keywords such as specialty coffee, Indonesian coffee exports, international trade, revealed comparative advantage, constant market share, export competitiveness, coffee value chain, comparative advantage, and global coffee market were employed using Boolean operators ("AND" and "OR") [3]. These search strategies improved the relevance of the selected literature while ensuring adequate coverage of studies related to international coffee trade and export competitiveness.

The inclusion criteria consisted of peer-reviewed journal articles published between 2015 and 2026 that discussed international coffee trade, comparative advantage, export competitiveness, Revealed Comparative Advantage (RCA), Constant Market Share (CMS), specialty coffee, global coffee value chains, or coffee export performance. Studies addressing agricultural exports without discussing coffee or international competitiveness were excluded from the review. Likewise, conference proceedings, unpublished reports, opinion papers, and publications lacking complete methodological descriptions were omitted to maintain the scientific quality and consistency of the literature synthesis [10]. Only full-text publications written in English or Indonesian were included in the analysis.

Following the identification, screening, and eligibility assessment processes, twenty-five journal articles satisfying the inclusion criteria were selected for detailed analysis. The selected studies represented both Indonesia and major coffee-exporting countries, including Brazil, Vietnam, Colombia, Ethiopia, Honduras, and Peru. Including multiple exporting countries enabled comparative evaluation of international competitiveness, export specialization, and market performance under different institutional, production, and trade environments [20]. The selected literature also covered various importing regions such as the European Union, the United States, Japan, South Korea, and emerging Asian markets, thereby providing broader insights into global specialty coffee trade dynamics [22].

The reviewed literature was analyzed using thematic content analysis to identify recurring concepts, empirical relationships, and strategic issues associated with international coffee competitiveness. Each article was systematically examined according to several analytical dimensions, including research objectives, methodology, export destination markets, coffee products analyzed, indicators of comparative advantage, application of RCA or CMS frameworks, determinants of export competitiveness, and principal findings. The extracted information was subsequently synthesized into three major analytical themes, namely international trade dynamics of Indonesian specialty coffee, comparative advantage based on the Revealed Comparative Advantage (RCA) framework, and export competitiveness analyzed through the Constant Market Share (CMS) approach. This analytical procedure enabled a comprehensive interpretation of previous empirical evidence while identifying common determinants influencing Indonesia's competitive position within the global specialty coffee market [12].

The synthesis also incorporated conceptual interpretations of the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) frameworks as analytical foundations for evaluating export performance. The RCA framework was used to assess the relative export specialization of Indonesian specialty coffee compared with global export patterns, while the CMS framework was utilized to explain changes in export performance resulting from market growth, commodity composition, destination market distribution, and competitiveness effects [13]. Integrating these two analytical perspectives provides a more comprehensive understanding of Indonesia's competitive position because RCA measures comparative export specialization, whereas CMS identifies the underlying factors driving export growth and market performance over time [14].

3. Result

The synthesis of the twenty-five selected studies indicates that Indonesian specialty coffee possesses a relatively strong comparative advantage in international markets; however, its export performance remains highly influenced by changing global trade dynamics, increasing competition among coffee-exporting countries, and evolving consumer preferences. The reviewed literature consistently demonstrates that Indonesia has maintained an important position in the global coffee market due to the uniqueness of its specialty coffee varieties, geographical diversity, and expanding international recognition [5]. Nevertheless, export competitiveness is determined not only by production capacity but also by the country's ability to respond to market changes, improve product quality, strengthen branding, and maintain consistency throughout the coffee value chain [9].

The literature further reveals that international coffee trade has experienced significant structural transformation during the last decade. Demand has gradually shifted from conventional coffee toward premium and specialty coffee characterized by superior quality, traceability, sustainability certification, and unique geographical origin [21]. This transition has created new market opportunities for Indonesian specialty coffee while simultaneously increasing competition among major producing countries such as Brazil, Vietnam, Colombia, Ethiopia, and Honduras [22]. Consequently, countries capable of continuously improving quality standards and market responsiveness generally exhibit stronger export performance than countries relying solely on production expansion [16].

International Trade Dynamics of Indonesian Specialty Coffee

The reviewed studies consistently indicate that global coffee consumption continues to increase, particularly in premium market segments where consumers place greater emphasis on quality, sustainability, and product authenticity [2]. Importing regions including the European Union, the United States, Japan, South Korea, Australia, and the Middle East have experienced substantial growth in specialty coffee demand because consumers increasingly prefer distinctive flavor profiles, environmentally sustainable production systems, and transparent supply chains [19]. This changing market structure creates significant export opportunities for Indonesian specialty coffee, particularly products possessing geographical indications and internationally recognized quality characteristics [23].

Indonesia benefits from considerable product diversity because specialty coffees are cultivated across numerous regions with distinct agroecological conditions. Coffee varieties originating from Gayo, Mandailing, Toraja, Kintamani, Java, Flores, and Bajawa possess unique sensory attributes that differentiate Indonesian coffee from competing products in international markets [6]. These geographical characteristics strengthen Indonesia's competitive positioning within the premium coffee segment while providing opportunities for product differentiation beyond price competition [20].

Despite these comparative advantages, several reviewed studies identify persistent structural constraints affecting export performance. Productivity among smallholder farmers remains relatively lower than that of major competing countries because production systems continue to rely heavily on traditional cultivation practices and limited technological adoption

[24]. Furthermore, inconsistent harvesting methods, post-harvest processing, and quality control frequently reduce product uniformity, thereby limiting Indonesia's ability to consistently satisfy premium export market requirements [17]. These production-related constraints reduce export efficiency despite increasing global demand for specialty coffee [10].

The literature also highlights that fluctuations in international coffee prices, exchange rates, climate variability, and global economic uncertainty significantly influence Indonesia's coffee export performance. Changes in international demand caused by economic recessions or supply disruptions frequently alter trade flows and export destinations [4]. Consequently, maintaining export resilience requires continuous adaptation to changing international market conditions while strengthening long-term relationships with importing countries [1].

Comparative Advantage Based on the Revealed Comparative Advantage (RCA) Framework

The reviewed studies consistently demonstrate that Indonesia possesses a revealed comparative advantage in coffee exports, indicating that coffee remains one of the country's internationally competitive agricultural commodities [7]. The RCA framework evaluates export specialization by comparing the proportion of coffee exports within Indonesia's export structure against the corresponding proportion in global exports [14]. Most empirical studies report RCA values exceeding one, suggesting that Indonesian coffee maintains stronger export specialization than the global average despite increasing international competition [11].

Several studies indicate that Indonesia's comparative advantage is primarily derived from product differentiation rather than production volume. Compared with major producers such as Brazil and Vietnam, Indonesia's coffee export profile is more strongly associated in the reviewed literature with product differentiation, geographical origin, and specialty-market positioning [16]. These characteristics increase consumer willingness to pay premium prices while strengthening Indonesia's competitive position within higher-value coffee market segments [20].

However, the reviewed literature also indicates that comparative advantage alone does not guarantee sustainable export growth. Several empirical studies reveal that declining productivity, inconsistent quality standards, limited certification coverage, and inadequate marketing strategies reduce Indonesia's ability to fully capitalize on its comparative advantages [18]. Consequently, strengthening competitiveness requires continuous improvements in production efficiency, quality management, farmer capacity, and value-added processing to transform comparative advantage into sustained competitive advantage [9].

Export Performance Based on the Constant Market Share (CMS) Framework

The Constant Market Share (CMS) framework provides additional insights regarding factors influencing Indonesia's coffee export performance beyond comparative advantage alone. The reviewed studies demonstrate that export growth is affected by multiple components, including changes in global coffee demand, destination market composition, commodity specialization, and competitiveness effects [12]. This analytical framework enables researchers to distinguish whether export growth results primarily from favorable market expansion or from genuine improvements in export competitiveness [13].

Several reviewed studies indicate that increasing global demand for specialty coffee has contributed positively to Indonesia's export growth, particularly within premium coffee markets emphasizing product quality and sustainability [21]. However, the competitiveness component varies considerably across export destinations because Indonesia faces different levels of competition from Brazil, Colombia, Ethiopia, Vietnam, and other producing countries depending on market characteristics [22]. In markets emphasizing premium quality and geographical origin, Indonesian specialty coffee generally demonstrates stronger competitiveness than in markets dominated by price competition [16].

The literature further reveals that market diversification plays an important role in strengthening export resilience. Heavy dependence on a limited number of importing countries increases vulnerability to economic fluctuations, changes in trade policies, and shifting consumer preferences [3]. Several studies therefore recommend expanding exports toward emerging markets while maintaining strong relationships with traditional trading partners to reduce market concentration risks and improve long-term export stability [19].

Another important finding concerns the role of value-added processing in improving export competitiveness. Rather than exporting predominantly green coffee beans, increasing domestic processing into roasted coffee, specialty blends, and branded premium products enables Indonesia to capture greater value within international coffee value chains [23]. Strengthening branding strategies, geographical indication protection, sustainability certification, and digital marketing also contributes to improving international recognition of Indonesian specialty coffee while increasing competitiveness in premium market segments [24].

Overall, the reviewed studies demonstrate that Indonesian specialty coffee possesses a favorable comparative advantage according to the RCA framework while exhibiting promising export growth potential under the CMS framework. Nevertheless, maintaining long-term competitiveness requires integrated strategies involving productivity improvement, quality consistency, sustainability certification, technological innovation, market diversification, and stronger institutional support throughout the coffee value chain [25]. These findings indicate that export competitiveness should be understood as a dynamic process influenced by both internal production capabilities and continuously evolving international market conditions rather than by comparative advantage alone [8].

4. Discussion

The findings of this systematic literature review indicate that Indonesian specialty coffee possesses a strong comparative advantage in international markets; however, maintaining long-term competitiveness requires continuous adaptation to evolving global trade dynamics. The reviewed studies consistently demonstrate that comparative advantage alone is insufficient to sustain export growth because international competitiveness increasingly depends on product differentiation, innovation, sustainability, quality consistency, and responsiveness to changing consumer preferences [9]. This finding supports Porter's competitiveness theory, which argues that sustainable competitive advantage is created through productivity improvements and innovation rather than reliance solely on natural resource endowments [9].

One of the principal findings of this review concerns the strategic role of specialty coffee within Indonesia's agricultural export sector. Unlike conventional coffee commodities that primarily compete through production volume and low prices, specialty coffee creates competitive value through distinctive flavor characteristics, geographical indications, processing quality, and traceable production systems [16]. Coffee-producing regions such as Gayo, Toraja, Kintamani, Mandailing, Flores, and Java have successfully established strong international reputations because each region offers unique sensory attributes influenced by local environmental conditions and traditional cultivation practices [6]. These unique characteristics provide Indonesia with opportunities to occupy premium market segments where consumers are willing to pay higher prices for quality, authenticity, and sustainability [21].

The review further demonstrates that the Revealed Comparative Advantage (RCA) framework remains an effective analytical tool for evaluating Indonesia's export specialization in international coffee markets. Most of the reviewed studies report RCA values exceeding one, indicating that Indonesian coffee maintains a comparative advantage relative to the global average [7]. Nevertheless, comparative advantage should not be interpreted as a guarantee of continuous export growth because RCA reflects relative export specialization rather than future competitiveness [14]. Countries possessing high RCA values may still experience declining export performance if they fail to improve productivity, maintain product quality, or respond effectively to changing international market conditions [11]. Therefore, RCA should be complemented by broader analyses that evaluate market dynamics and competitiveness over time.

The Constant Market Share (CMS) framework provides additional insights into the determinants of Indonesia's coffee export performance by decomposing export growth into market growth effects, commodity composition effects, market distribution effects, and competitiveness effects [12]. The reviewed literature indicates that changes in international demand for specialty coffee have positively influenced Indonesia's export performance during recent years, particularly within premium markets emphasizing quality and sustainability [19]. However, the competitiveness effect varies across destination markets because Indonesian exporters face different competitive pressures from Brazil, Vietnam, Colombia, Ethiopia, and Honduras depending on market characteristics and consumer preferences [20]. Consequently, sustaining export growth requires strategies that extend beyond production expansion and focus on strengthening market positioning and value creation.

Another important finding relates to the increasing importance of sustainability certification and quality assurance in determining export competitiveness. International consumers are placing greater emphasis on environmentally responsible production, ethical sourcing, and transparent supply chains when purchasing specialty coffee [22]. Certification schemes such as Fairtrade, Organic, Rainforest Alliance, UTZ, and geographical indication protection have therefore become important mechanisms for improving market access while enhancing consumer confidence [18]. Several reviewed studies demonstrate that certified coffee products generally achieve higher export prices and experience greater acceptance in premium international markets than uncertified products [23]. Consequently, expanding certification coverage among Indonesian coffee producers represents an important strategy for strengthening long-term export competitiveness.

The literature also highlights the central role of post-harvest management in determining specialty coffee quality. Harvesting methods, fermentation techniques, drying processes, storage conditions, grading systems, and quality control significantly influence the final sensory characteristics of coffee exported to international buyers [17]. Inconsistent post-harvest handling frequently reduces product quality and weakens Indonesia's reputation within specialty coffee markets despite favorable production potential [24]. Therefore, investments in post-harvest technology, producer training, and quality assurance systems are essential to maintain product consistency and satisfy increasingly demanding international buyers.

Supply chain efficiency emerged as another important determinant of export competitiveness. The reviewed studies indicate that transportation infrastructure, logistics performance, warehousing systems, digital traceability, and export facilitation substantially affect Indonesia's ability to compete in international coffee markets [3]. Efficient logistics reduce transportation costs, preserve product quality, and shorten delivery times, thereby improving exporter reliability and buyer satisfaction [4]. Moreover, digital technologies supporting traceability and supply chain transparency increasingly influence purchasing decisions among specialty coffee importers seeking greater accountability throughout production and distribution processes [19].

The findings further emphasize the importance of empowering smallholder farmers because they account for the majority of Indonesia's coffee production. Many farmers continue to experience challenges associated with limited access to finance, modern cultivation technology, extension services, quality certification, and international market information [24]. Strengthening farmer organizations, expanding technical assistance, improving access to sustainable farming practices, and facilitating participation in global value chains can substantially enhance production efficiency and export quality [18]. Such interventions not only improve farmer incomes but also strengthen Indonesia's overall competitiveness within the international specialty coffee industry.

Another significant implication concerns export market diversification. Several reviewed studies indicate that excessive dependence on a limited number of destination countries increases vulnerability to fluctuations in international prices, exchange rates, geopolitical uncertainty, and changing import regulations [2]. Expanding exports toward emerging markets in Asia, the Middle East, and Eastern Europe while maintaining strong relationships with traditional markets in North America and Europe would improve export resilience and reduce commercial risks [20]. Simultaneously, strengthening national branding initiatives emphasizing Indonesia's diverse specialty coffee origins can further increase international recognition and improve market penetration [21].

Despite providing comprehensive insights, this study has several limitations. First, the analysis is based entirely on secondary literature and therefore does not incorporate primary export statistics or firm-level competitiveness data [8]. Second, methodological differences among the reviewed studies may influence the comparability of reported findings [11]. Third, this review qualitatively synthesizes previous research without statistically measuring the relative contribution of individual competitiveness determinants. Future studies are therefore encouraged to combine RCA and CMS analyses with gravity trade models, panel data regression, stochastic frontier analysis, or structural equation modeling to provide stronger quantitative evidence regarding Indonesia's specialty coffee export performance [13].

Overall, the reviewed literature demonstrates that Indonesia possesses a favorable comparative advantage in global specialty coffee markets, yet sustaining long-term competitiveness requires integrated improvements in productivity, quality assurance, certification, value-added processing, logistics efficiency, branding, market diversification, and institutional support. Combining the RCA and CMS frameworks provides a more comprehensive understanding of export competitiveness because the two approaches jointly evaluate comparative specialization and dynamic changes in international market performance [12].

5. Conclusions

This systematic literature review demonstrates that Indonesian specialty coffee maintains a significant comparative advantage in international trade, as reflected by findings from studies employing the Revealed Comparative Advantage (RCA) framework. Indonesia's competitiveness is supported by its diverse specialty coffee varieties, favorable agroecological conditions, distinctive geographical indications, and increasing global demand for premium coffee products. Nevertheless, sustaining this comparative advantage requires continuous improvements in productivity, quality consistency, certification, and value-added processing to respond effectively to evolving international market conditions [7].

The review also indicates that the Constant Market Share (CMS) framework provides valuable insights into the dynamics of export performance by distinguishing the effects of market growth, commodity composition, destination market distribution, and competitiveness. The findings suggest that Indonesia's export performance is influenced not only by expanding global demand for specialty coffee but also by the country's ability to strengthen competitiveness through innovation, efficient supply chains, sustainability practices, and strategic market diversification [12].

From a policy perspective, strengthening Indonesia's specialty coffee exports requires integrated collaboration among government institutions, producer organizations, exporters, research institutions, and private-sector stakeholders. Investments in post-harvest technology, quality assurance, sustainability certification, digital traceability systems, logistics infrastructure, and farmer capacity development are essential for improving export competitiveness while enhancing resilience against changing international trade dynamics [24].

Future research is recommended to integrate qualitative literature synthesis with quantitative analytical methods, including Revealed Comparative Advantage (RCA), Constant Market Share (CMS), gravity trade models, panel data econometrics, and competitiveness indices based on international trade statistics. Such approaches are expected to generate stronger empirical evidence for formulating policies that strengthen the long-term competitiveness of Indonesian specialty coffee within the increasingly competitive global coffee market.

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