Received: 10 January 2018 | Revised: 10 September 2019 | Accepted: 4 October 2019

DOI: 10.1111/agec.12552

AGRICULTURAL ECONOMICS
The Journal of the International Association of Agricultural Economists
IAAE
WILEY

ORIGINAL ARTICLE

The role of institutional quality on the performance in the export of coconut products

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[Correction added on October 21, 2020 after first online publication: Projekt Deal funding statement has been added.]

Abstract

The literature that addresses the role of institutions in bilateral trade is extensive. However, research that links institutional quality to specific products and their different levels of value addition is lacking. In this study, we look into institutional quality, based on three indicators from the World Bank's world governance indicators, and its indicator-specific effects on bilateral coconut trade. In particular, we study coconut products with varying degrees of value addition. We use structural gravity models to measure how institutions affect the trade performance of the top 26 coconut producing countries to the top 15 importing economies over the years 1996–2016. Our results suggest that increased government effectiveness enhances trade of high-value products, whereas better voice and accountability scores decrease trade of coconut products with both levels of value addition. No clear trade effect is observed when two countries are more similar in each of the three indicators. We conclude that each indicator has different trade effects on each of the coconut product categories. We end by giving recommendations that will help to improve the coconut export performance in their respective countries and for future research.

KEYWORDS

coconut trade, gravity model, institutional quality, value-added

JEL CLASSIFICATIONS

F14, Q17, Q18, P48

1 | INTRODUCTION

In the last few decades, agricultural value chains have become more and more internationally integrated due to advancements in technology, reduction in transportation costs, and market liberalization (Degain & Maurer, 2015). These global trends have altered the agricultural industry and increased trade in many countries over the past few decades. This process is supported by a wide range of outward-looking policies, such as a reduction in tariffs, market-determined exchange rate regimes, and more generally, measures to deregulate and facilitate international trade. Together, this has generated opportunities for export sectors, especially in developing and emerging economies (Gulati, Minot, Delgado, & Bora, 2007). In particular, the production and trade of nontraditional and high-value export commodities have increased (Gulati et al., 2007; Maertens, Minten, & Swinnen, 2009; O'Connell, Golub, & Du, 2008). Given that poorer countries often depend heavily on agriculture, improving market access to such high-value chains can be of great relevance for their development paths.

The trade literature has only recently begun to focus on the role of domestic governance and institutional influences on the development of high-value agricultural supply chains.

Studies by Bojnec and Fertő (2009) and de Mendonça, Lirio, Braga, and da Silva (2014) suggest that good governance leads to an increase in agricultural trade as a result of lower transaction costs and thus facilitates access to high-value agricultural markets. In other words, institutions can foster the transformation of countries that traditionally have traded low-value primary products into exporters of high-value food products.

Coconut is an interesting and relevant commodity to study for a number of reasons. For many coconut-producing countries, particularly small Pacific Island countries, the production and trade of this commodity support the livelihoods of large parts of the rural population. International coconut trade used to be driven by the demand for coconut oil (Prades, Salum, & Pioch, 2016), but this has changed in recent decades. Coconuts are increasingly being transformed into high-value products that require more complex processing throughout export-oriented value chains. This move to high-value-added products is in part driven by marketing strategies that brand coconut products as healthy alternatives for hydration and cooking. Because most coconuts are grown by poor farmers who have few resources (Naresh Kumar, & Aggarwal, 2013), and institutional quality tends to be traditionally lower in coconut-producing countries than the predominant importing economies, it is crucial to look at the role of institutions in the different channels that affect coconut trade.

The growing literature on the role of institutions in international trade has not focused on individual high-value commodities and the effects of specific institutional variables. We fill this gap by differentiating between categories of coconut products, characterized by more or less value addition, and how they are affected by different dimensions of institutions in a given institutional setting. This allows us to take into account product-specific heterogeneities when evaluating the effect of each institutional indicator on exports.

We seek to answer the following research questions:

R1. How does the overall institutional environment in exporting countries affect bilateral trade of coconut products?

R2. Do improvements in the exporters' individual indicator scores lead to enhanced trade depending on the exporters' and the importers' overall institutional setting?

R3. What are the effects of institutional similarities for coconut trade and its compositions?

In our empirical analysis, we study the influence of institutions on the export performance of coconut products from the top 26 coconut-producing countries[1] to the top 15 coconut-importing regions. Table A1 shows a list of the countries included in the study. We measure export performance as the actual volume of exports. We utilize the World Bank's world governance indicators developed by Kaufmann, Kraay, and Zoido-Lobaton (1999) as measures of domestic institutions and apply them in a structural gravity model framework. We first look at how the overall institutional structure of a producing country affects coconut trade. In addition, we take three out of the six indicators (voice and accountability, government effectiveness, and control of corruption) to assess the influence of each indicator on trade. We expect that each indicator within the institutional structure will affect coconut trade. For instance, corruption could impede trade due to the reduction of domestic investments (Mauro, 1995), whereas voice and accountability could lower trade due to the increased bargaining power of workers (Berden, Bergstrand, & van Etten, 2014). However, we also expect these effects to vary across high-value and low-value coconut products.

The structure of this paper is as follows: Section 2 reviews past literature on the linkages between institutions in international trade. Section 3 presents the theoretical framework that guides our research. Section 4 details the data collection method and the estimation strategy that we use in this study. Section 5 presents our results followed by a discussion and policy recommendations. Finally, section 6 concludes.

2 | LITERATURE REVIEW

This section gives an overview of existing literature on the linkages between institutional quality and international trade. We define institutions after North (1991, p. 97) as "the humanly devised constraints that structure political, economic and social interactions." We are interested in what North (1991) calls the "formal rules" of institutions, which are constitutions, laws, and property rights. These formal rules affect the transaction costs that arise during the production of goods and economic exchanges across international borders. In this study, we associate domestic institutions to influence the different processes and actors involved from the production to the export of coconut products. Transaction costs affect this supply chain via the transaction effect and the production effect (Belloc, 2006; Berkowitz, Moenius, & Pistor, 2006; Iwanow & Kirkpatrick, 2009).

Although definitions such as North's are widely accepted, measuring institutional quality is a difficult undertaking. We utilize the World Bank's world governance indicators as measures of institutions. There are several other indexes of institutional quality. The Fraser Institute, the Heritage Foundation, and World Economic Forum all publish an index to measure countries' degrees of economic freedom. Transparency International rates countries on their ability to control corruption in their corruption perceptions index. Because none of these indexes fully captures the different dimensions of what we define as "institutions," we find the World Bank's indicators as the most suitable for the purposes of this study.

[1] These 26 countries make up almost the entire global trade at 95% of the total world trade.

TABLE 1 Summary of findings on institutional quality and international trade[a]

References	Indicators utilized	Main findings
Anderson and Marcouiller (1999)	Contract enforcement	Competent institutions can increase trade with contract enforcement by legal systems.
de Groot et al. (2004)	Aggregate of six indicators	High institutional quality decreases transaction costs thus positively influences trade flows.
Meon and Sekkat (2008)	Aggregate of six indicators	Good governance indicators increase exports of manufactured goods, but not in nonmanufactured products.
Bojnec and Fertő (2009)	Importer-exporter-similarity of aggregate of six indicators	Similarities in institutional quality increase agricultural trade due to lower transaction costs.
Francois and Manchin (2013)	Aggregate of six indicators	Domestic institutions can boost exports due to increased international market access.
de Mendonça et al. (2014)	Importer-exporter-similarity of aggregate of six indicators	Differences in institutional environments between trading partners decrease trade flows due to increased transaction costs.
Martínez-Zarzoso and Márquez-Ramos (2018)	Political stability, rule of law, and control of corruption	Increased scores in political stability, rule of law, and control of corruption in exporting countries increase trade.

[a]"Indicators utilized" column specifies the indicators or type of institutions that each authors assessed. Aggregate of six indicators refers to either an average or sum of the six World Bank's world governance indicators. All studies in the table used forms of the gravity model as their methodology.

We follow previous studies by categorizing the six indicators into three dimensions (Berden et al., 2014; Lio & Hu, 2009; Lio & Liu, 2008; Méon & Weill, 2005). Each dimension includes two indicators that measure the same aspects of governance. As outlined in the Methodology section below, we use one indicator from each of the three dimensions as our institutional variables. Table 1 summarizes the main findings of selected studies on the subject.

These studies confirm that governance and institutions contribute to explaining trade flows. We define good institutions after Anderson and Marcouiller (2002) as one with "a legal system capable of enforcing commercial contracts and by transparent and impartial formulation and implementation of government economic policy" (p. 342). The effect of bad institutions can be seen as a tariff that increases the cost of business (Daude & Stein, 2007). In addition, a bad institutional environment raises uncertainty during contract enforcement (de Groot, Linders, Rietveld, & Subramanian, 2004). Anderson and Marcouiller (1999) argue that inadequate contract enforcement can be seen as a form of insecurity that introduces hidden transaction costs in international exchange. With good institutions in place, nations have jurisdiction not only to enforce contracts but also implement trade agreements (Rodrik, 2000). Countries with better institutional quality are able to facilitate long-term contracts and agreements at different stages along the value chain that allows for increased exports in products with more complex processing (Martincus & Gallo, 2009). Amiri, Samadian, Yahoo, and Jamali (2019) find that in countries with both good institutional quality and rich natural endowments, rents can lead to a promotion in the manufacturing sector. de Groot et al. (2004) confirm that increased institutional quality is able to decrease ambiguity regarding contract enforcement and the governance of overall economics.

Institutional similarities between two countries can familiarize stakeholders with the procedures involved during the process of exchange (de Groot et al., 2004). Bojnec and Fertő (2009) confirm that international trade increases as a result of lower transaction costs when institutions are similar. Two countries might score poorly on political freedom, but this may facilitate trade between them because two autocratic regimes might have similar standards and behavior during bilateral exchange (Bojnec & Fertő, 2015). Furthermore, differences in institutional quality between two trading countries can reduce trade due to higher transaction costs between the two sides (de Mendonça et al., 2014).

Many studies have shown that institutional quality is positively associated with trade on an aggregate level (Álvarez, Barbero, Rodríguez-Pose, & Zofío, 2018; Anderson & Marcouiller, 2002; Francois & Manchin, 2013). Studies using different institutional indicators show positive influences on the economy. Meon and Sekkat (2008) find that governance indicators are positively associated with exports of manufactured goods. Yu (2010) finds that democratization can lead to a 3–4% growth in bilateral trade. Abe and Wilson (2008) find that trade in the Asia and Pacific region increases with reductions in corruption and increased transparency. Research by Duc, Lavallée, and Siroën (2008) shows that countries with higher levels of corruption trade less with each other. Martincus and Gallo (2009) find with increased institutional quality, countries have a comparative advantage at trading in sectors that produce more institutional-intensive goods.

Institutions may not affect export performance equally across sectors. For example, corruption may smooth the

export process in sectors such as oil and gas (Meon & Sekkat, 2008). Institutions seem to influence manufactured goods and nonmanufactured goods differently, as Meon and Sekkat (2008) find no significant relationship between nonmanufactured products and governance indicators. Martincus and Gallo (2009) find that better institutional quality leads to increased export of goods with production processes that are of higher complexity. Furthermore, not every aspect of governance is conducive to trade. For example, Berden et al. (2014) find that a rise in pluralism decreases trade flows due to the increasing bargaining power of workers. Aside from the effects of institutions, Yang, Sheng, Wu, and Zhou (2018) note the reliance on social networks and informal relationships in supply chain relationships when formal institutions fail to facilitate contract enforcement.

The studies to date have generated many interesting insights, but they have not specifically addressed the different dimensions of institutions and their effect on the composition of value-added trade within a specific agricultural product group. We intend to fill this gap by analyzing the relationship between various aspects of institutional quality and the trade of different coconut products with differing levels of value addition.

3 | CONCEPTUAL FRAMEWORK

3.1 | Theoretical concepts

Our empirical analyses draw on the World Bank's world governance indicators. We first assess the institutional environment as a whole by averaging the six indicators from the World Bank. We then utilize three out of the six indicators to measure their specific influences. Figure 1 presents the conceptual framework that guides our study. The framework refers to the coconut sector and addresses the actors and steps involved throughout the coconut supply chain.

We assess the production and processing aspects of the coconut supply chain through the lens of the production effect. As coconut products go through value addition, the factors and processes of production involve more steps and higher production costs, as suggested by Berkowitz et al. (2006). In order to produce an export product, the processing stage needs to ensure quality standards, such as product consistency, packaging, and safety. For example, the packaging of coconut water exported to the European Union (EU) must preserve the color and taste of the original product. Furthermore, the product must be free from bacteria and other contamination (Centre for the Promotion of Imports, 2016). Countries with lower institution quality may not be able to fulfill these requirements and end up exporting only primary and raw commodities (Martincus & Gallo, 2009). These countries could also fail to innovate in the production of niche items due to the lack of complementary services and technology to develop them (Martincus & Gallo, 2009).

The production effect influences the production stage of raw coconut materials. It is estimated that around 85% of smallholders across the world still practice traditional nursery methods (Johnson & Bourdeix, 2014). Furthermore, many coconut palms are becoming senile in producing countries (FAO, 2013). Smallholder farmers need institutional support related to replanting strategies and access to seedling varieties to ensure the productivity of the palms.

Institutional quality affects international trade through the "transaction effect," which involves the processes on the retail and export level. International transaction costs can be referred to as any type of cost that is incurred during trade; they include transportation costs, costs to enter and enforce contracts, border efficiency, and delivery time (Nordas & Piermartini, 2004). The gap in legal and political systems increases the chance of cheating during bilateral exchanges (Belloc, 2006). When insecurities arise during the negotiation and enforcement stages of trade, they can act as a price premium on the traded goods, resulting in less trade (Anderson & Marcouiller, 2002; den Butter & Mosch, 2003). During the marketing and exporting stage of the supply chain, adequate infrastructure is crucial to determine the delivery time of the final items.

The described production and transaction effects of varying degrees of institutional quality are embedded into the theoretical assumptions of the gravity model that is chosen for the empirical estimation strategy in the study (see Section 4.2). The gravity model seeks to explain bilateral flows by incorporating demand and supply as well as the different relative trade costs. Following our line of thought above, institutional quality changes translate into supply changes through the production effect and trade cost changes via the transaction effect. Thus, the gravity model fits into our conceptual framework by capturing the aspects of institutional quality along different degrees of value addition with their trade effects.

3.2 | Hypotheses

We define each of the institutional indicators in Table 2, and subsequently, hypothesize their anticipated effects on bilateral trade given our conceptual framework. By looking at these indicators, we answer our research question of the type of institutions that are relevant for different types of coconut products.

Specifically, we test the following hypotheses. H1 seeks to answer R1; H2–H4 correspond with R2; last, R3 is addressed by H5.

***H1*:** A good overall institutional environment in producing countries increases bilateral trade due to its

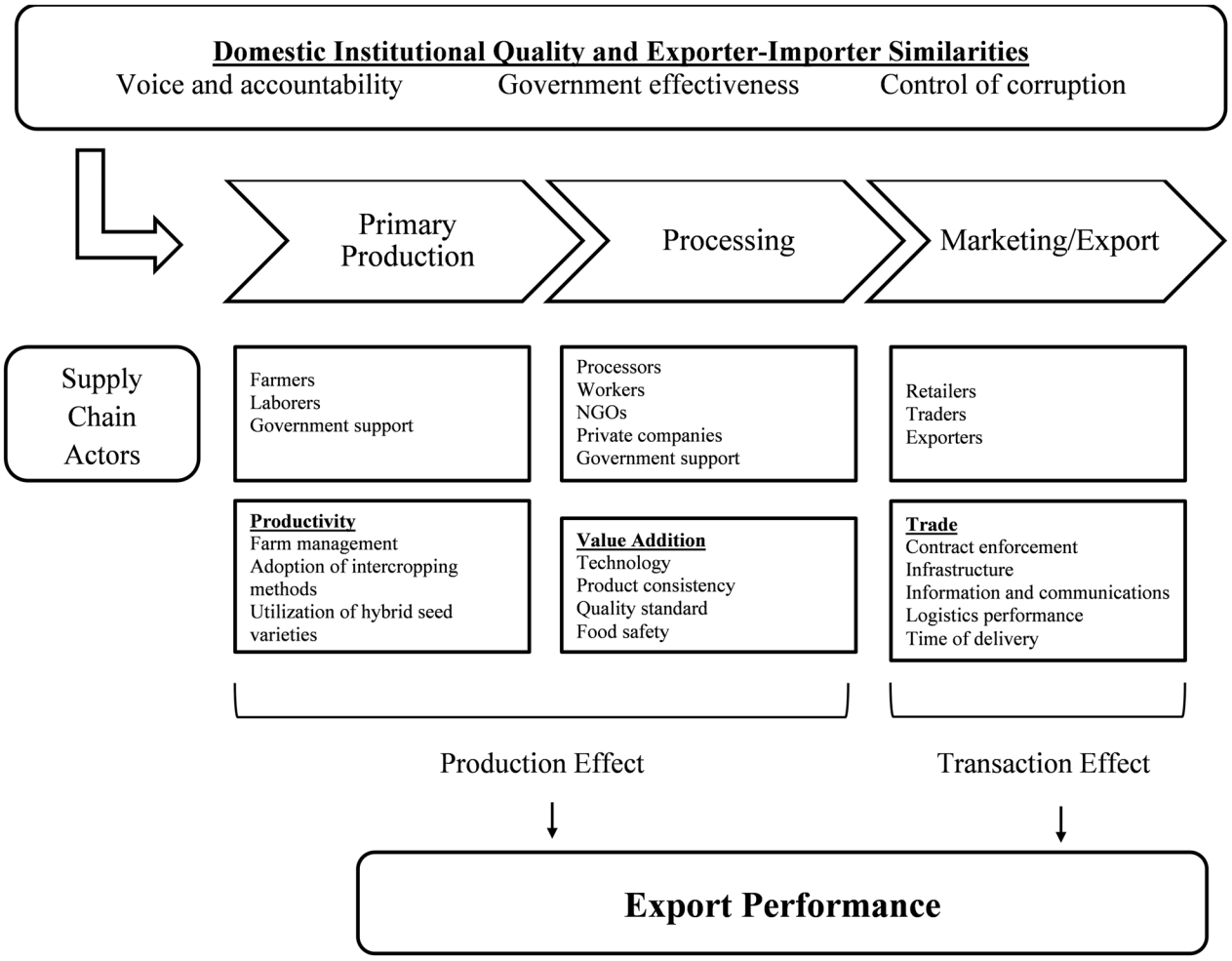

FIGURE 1 Conceptual framework, author's own illustration

TABLE 2 World Bank's world governance index and definitions

Indicator	Definition
Voice and accountability	The extent to which a country's citizens are able to participate in the selection of their government, as well as freedom of expression, freedom of association, and a free media.
Government effectiveness	The quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Control of corruption	It is defined as the extent to which public power is exercised for private gain.

Source. Kaufmann et al. (2009).

ability to shape countries' comparative advantage in goods with different degrees of complexity.

***H2*:** Voice and accountability has a negative effect on bilateral trade flows of high-value coconut products as the increase of bargaining power of workers undermines the level of cooperation needed in complex processing and value-added activities.

The first indicator, "voice and accountability," assesses a country's procedure for selecting a government and keeping it in check (Berden et al., 2014). Berden et al. (2014) contend that voice and accountability is most related to pluralism. Pluralism increases the voice and bargaining power of unskilled laborers, which could lead to a decrease in foreign investment (Berden et al., 2014). Li and Resnick (2003) suggest that pluralism could decrease the degree of cooperation in producing countries. We link this indicator to the production and processing stage in our conceptual framework. Following these authors, we hypothesize that increased voice and accountability negatively affects the international trade of high-value

coconut products as the increase of bargaining power of workers undermines the level of cooperation needed in more complex processing and value addition within the country.

***H3*:** Government effectiveness increases bilateral trade flows of both lower and higher value products due to contract enforcement and monitoring.

The second indicator "government effectiveness" measures the government's ability "to effectively formulate and implement sound policies" (Kaufmann, Kraay, & Mastruzzi, 2009, p. 6). This indicator captures whether institutions are able to deliver complementary services during the production of coconuts and the enforcement of contracts during bilateral exchange. We expect increased government effectiveness to have a positive effect on all three stages of the supply chain. It facilitates the complementary goods and services needed to process coconut products. Furthermore, it can increase exports of all types of coconut products due to increased ability to enforce and monitor the stages of processing. We hypothesize that this indicator will have a bigger effect on high-value products because it is more challenging to enforce contracts during trade of more complex products (Berkowitz et al., 2006).

***H4*:** Control of corruption increases bilateral trade flows of both product categories as it facilitates economic interactions and increases trust between exporting and importing countries.

The indicator "control of corruption" measures the extent to which the government respects its citizens and the rules of society (Kaufmann et al., 2009). Better control of corruption means that courts within a country are able to exercise impartiality and handle cases without any biased influence in the court's final decision (Berkowitz et al., 2006). High levels of corruption hinder international trade by lowering productivity and especially the quality of customs services (Ben Ali & Mdhillat, 2015). We expect that entry points for corruption occur through the more complex stages of processing coconuts. Furthermore, if a country is known to be corrupt, then importing countries are less certain that products will fulfill the indicated quality and standards. We anticipate that easing corruption leads to better performance in all coconut exports, with the effect to be larger for high-value than for low-value products.

***H5*:** Similarities in all three above indicators lead to increased trade between two countries due to familiar procedures in bureaucratic procedures involved during both the production and transaction process.[2]

[2] H5 intends to address whether institutional similarities positively or negatively affect bilateral trade, but not in the magnitude of trade.

Last, we expect institutional similarities in all three indicators to be positively associated with bilateral trade. Institutional similarity reduces the adjustment costs that arise from dissimilar procedures and insecurities during bilateral trade (Linders, Slangen, de Groot, & Beugelsdijk, 2005). In addition, the nature of doing business in two countries could refer to ethical standards; if bribing officials is considered acceptable in two countries, then bribes might facilitate trade between both (Horsewood & Voicu, 2012).

4 | DATA AND METHODOLOGY

4.1 | Data

To estimate the determinants of bilateral trade flows in coconut products, we gathered trade data and proxies for trade costs from various sources for the years 1996–2016. Reasons for using the specific data in our framework are explained in detail in Section 4.2. We obtain bilateral coconut trade data from the United Nations Commodity Trade (UN Comtrade) database, via the World Integrated Trading System (WITS). We use data on import values by the 15 largest importers of coconut products from the top 26 coconut-producing countries measured in U.S. Dollars. Table A1 shows a list of the exporting and importing economies. Import data are considered more reliable because governments have higher incentives to track imports for tax purposes (Francois & Manchin, 2013). Table 3 shows a list of the top coconut-producing countries in 2016, expressed in metric tons, and their trade value in 1,000 U.S. Dollars.

We consider three categories of coconut products as shown in Table 4. The first category includes high-value coconut products, which we assume are required to meet higher quality expectations of importing countries. These products are likely to be edible items that must fulfill exacting quality and traceability standards. The "low-value" products in the second category do not need to meet such exacting criteria. Finally, coconut oil is in its own category due to its dominance in coconut exports. In the year 2017/2018, the global export volume was around 1.7 million metric tons (USDA, 2018).

Traded items are only published on the UN Comtrade database up to six-digit Harmonized System (HS) codes. Coconut milk, coconut water, and activated carbon from coconuts are all traded in eight-digit HS codes that are not documented in the database. For this reason, we take up six-digit codes reported by UN Comtrade.

As outlined above, we use the World Bank's world governance indicators from the years 1996 to 2016 to measure institutional quality. The World Bank published the indicators biyearly from 1996 to 2002, and annually since then. For the years 1997, 1999, and 2001, we use the values from the previous year. The World Bank's world governance index is one

TABLE 3 Main coconut producing countries in 2016 with production quantity in tons and trade value in 1,000 U.S. dollars

Country	Production (Metric Tons)	Export (in 1,000$)
Indonesia	17,722,429	1,287,991.00
Philippines	13,825,080	1,861,631.00
India	11,127,898	281,608.20
Brazil	2,649,246	72,579.08
Sri Lanka	2,520,095	353,524.00
Vietnam	1,469,960	318,745.30
Papua New Guinea	1,191,438	88,386.06
Mexico	1,157,481	191,344.50
Thailand	815,406	1,069,091.00
Tanzania	555,836	2,359.12
Myanmar	531,730	27,855.91
Malaysia	504,773	473,522.60
Kiribati	437,000	2,106.76
Ghana	380,380	8,751.75
Dominican Republic	374,474	19,920.63
Solomon Islands	341,876	16,908.75
Vanuatu	336,988	15,183.71
China	316,579	732,289.60
Nigeria	283,744	2,068.85
Jamaica	255,411	8,454.77
Mozambique	248,394	6,816.43
Fiji	206,393	5,584.58
Samoa	179,602	555.34
Venezuela	157,391	1,172.44
Cote d'Ivoire	142,923	27,886.03
Marshall Islands	253,06	1,719.99

Source. FAOSTAT.

TABLE 4 Coconut product categories[a]

Categories	Products included
High-value products	Fresh and/or dried coconuts, coconut milk, activated carbon, and coconut water
Low-value products	Copra, coir, and oilcake
Coconut Oil	All types of oil

[a]See Table A4 for detailed product HS codes and their average unit values.

of the most recognized and referenced indicators in research. It is based on hundreds of variables created by 33 international organizations (Kaufmann et al., 2009). The six indicators are scaled from −2.5 to 2.5. Higher values correspond to better governance, and zero is the median score. We then select one indicator from each of the three dimensions mentioned in our conceptual framework—voice and accountability, government effectiveness, and control of corruption—and measured its effects separately in both exporting and importing countries according to their institutional setting. Table 5 shows exporters and importers with either positive or negative average indicator scores, whereas Tables A6 and A7 lists the individual world governance indicators scores of exporters and importers, respectively.

Because the indicators are themselves correlated, each indicator could affect trade directly or indirectly by its influence on the other indicators (Lio & Liu, 2008). For this reason, we choose one from each dimension to avoid the possible correlation between the two indicators.

Despite their great advantage of comparability at the global scale, these indicators do have certain weaknesses. Thomas (2010) asserts that the concepts of each indicator are not clearly defined. Furthermore, the definitions are not based on any theory, nor are they consistent with the existing literature (Thomas, 2010). Langbein and Knack (2010) contend that it is difficult to distinguish one indicator from another because each is represented by different concepts. Nevertheless, the index includes a wide sample of countries including almost all countries of interest in this study. Despite their shortcomings, these indicators are considered to be one of the best existing measurements to assess institutional quality (Kurtz & Schrank, 2007).

Table 6 gives an overview of the three indicators in percentile rank for some selected coconut exporting and importing regions in our study in 1996–2016, and their overall average scores over 20 years. We can observe that some exporting countries, such as China, rank high on good government effectiveness and low on voice and accountability. By contrast, Brazil has improved its ranking in voice and accountability but fallen in government effectiveness and control of corruption.

TABLE 5 Exporters and importers by positive and negative average indicator categories

Country Groups	Positive average indicators	Negative average indicators
Exporters	Brazil, Kiribati, Jamaica, Kiribati, Malaysia, and Vanuatu	China, Côte d'Ivoire, Dominican Republic, Fiji, Ghana, India, Indonesia, Marshall Islands, Mexico, Mozambique, Myanmar, Nigeria, Papua New Guinea, the Philippines, Samoa, Solomon Islands, Sri Lanka, Tanzania, Thailand, Venezuela, and Vietnam
Importers	Australia, Canada, Hong Kong, Japan, Korea, Malaysia, Singapore, United States, and EU 27	China, Indonesia, Laos, the Philippines, Russia, and Thailand

TABLE 6 Percentile rank of voice and accountability (VA), government effectiveness (GE), and control of corruption (CC) for selected exporting countries

	VA	GE	CC	Year
Country	**Percentile rank (1–100)**			
Brazil	58	51	57	1996
	62	48	38	2016
China	12	43	48	1996
	7	68	49	2016
Indonesia	21	23	22	1996
	50	53	43	2016
Jamaica	66	60	62	1996
	70	69	52	2016
Mozambique	41	50	41	1996
	34	19	18	2016
Sri Lanka	41	49	54	1996
	43	45	48	2016
Solomon Isl.	72	N/A	65	1996
	63	15	44	2016

Note. Countries are listed in alphabetic order.
Source. World Bank (2017).

There are different methods to represent these six indicators. Certain bodies of literature on bilateral trade have used the six variables as separate measures (Álvarez et al., 2018; Lio & Hu, 2009; Martínez-Zarzoso & Márquez-Ramos, 2018; Méon & Weill, 2005). Other studies have constructed dummy variables based on whether the institutional measure is positive or negative (i.e., above or below the median for all countries), or by summing or averaging the scores of all six indicators into one overall measure (de Groot et al., 2004; de Groot, Linders, & Rietveld, 2005; Linders et al., 2005). In order to analyze the effects of each indicator, we treat each indicator as a separate variable. For instance, if we take further scrutiny into China's scores on each of the three indicators as shown in Table 6, we can see that its percentile rank in voice and accountability rating is ranked seventh in the year 2016, where government effectiveness is ranked 68.

To better interpret the results of our main variables of interest, we have rescaled the three indicators of the exporting countries to 1–100. To put things into perspective, for example, if Indonesia were to improve their score of government effectiveness from 65 points in 2016 by 10 points, this increase would take them to the same level of effectiveness as China in 2016. We constructed our institutional similarities variables by using the absolute values of the difference of each indicator as follows: $|WGI_i - WGI_j|$ (Bojnec & Fertő, 2015), where WGI refers to each of the three institutional variables, i is the exporting country, and j is the importing country. A correlation matrix of institutional similarities between exporting and importing regions can be found in Table A3.

We obtain coconut production data from FAOSTAT. The remaining gravity model variables, which include the distance between the importing and exporting countries, gross domestic products (GDPs), indicators for common language, common religion, contiguity, and regional agreement come from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The EU is treated as one importing entity in this study because a large portion of coconuts and coconut products is exported to the Netherlands, and then re-exported to other countries within the EU 27. Hence, the Netherlands is considered the destination for measuring bilateral distances. An exporting country is said to share a common official language with the EU 27 if it shares one of its official languages with at least one country in the EU 27. Table 7 shows the summary statistics of our main variables of interest.

4.2 | Empirical specification

We use extended versions of the gravity model (Tinbergn, 1962) for our estimations. The gravity model has been used extensively in the literature to examine the different factors that influence bilateral trade. It has become increasingly popular throughout the last decade for research on trade due to its intuition, theoretical foundations, realistic equilibrium environment, flexible structure, and strong predictions (Yotov, Larch, Monteiro, & Piermartini, 2016). Many recent studies that analyze trade and institutional quality, trade facilitation, and trade costs have utilized variations and extensions of the gravity model.

The model in its basic form takes into consideration the geographical distance between the exporting and importing countries, and the GDPs of both countries to represent the trade costs between the two (Shepherd, 2012). The intuition behind the theory is that countries with larger GDPs or countries that are closer to each other have a bigger gravity force that pulls them together (Feenstra & Taylor, 2004), leading to larger volumes of trade. Our approach takes after Álvarez et al. (2018) with the foundations on the new trade theory, characterized by the Dixit–Stiglitz–Krugman assumptions by taking into account the "love for variety" preferences, increasing returns to scale technologies, and iceberg transportation costs.

In a survey of gravity models, Kabir, Salim, and Al-Mawali (2017) discussed the importance of modeling differentiated products. We address this by estimating the gravity model in its structural form at different levels of product aggregation: the trade effect of institutions is estimated (a) at the product level, (b) at the aggregate coconut sector level, and (c) at the aggregate agricultural-sector level. We compare the coconut product level with the aggregate coconut level to see whether institutional quality affects aggregate trade in coconut products differently than it affects individual subcategories of coconut products with different levels of

TABLE 7 Summary statistics

	Mean	Standard deviation	Minimum	Maximum
Trade (1,000$)	734.49	8,901.70	0	611,810.6
Distance (km)	8,641.16	4,762.39	505.54	19,146.71
GDP (US$ millions)	1,900,000	3,600,000	1,290	18,624,475
Production (Metric tons)	2,112,673	4,352,028	4,080	196,000
Contiguity	0.04	0.21	0	1
Common off. lang.	0.27	0.44	0	1
Common religion	0.08	0.13	0	0.81
Regional trade agreement	0.14	0.35	0	1
Voice & accountability *i*	−0.13	0.76	−2.23	1.26
Government Effectiveness *i*	−0.36	0.56	−2.27	1.27
Control of Corruption *i*	−0.43	0.46	−1.67	0.66
Voice & accountability *j*	0.19	0.98	−1.78	1.67
Government Effectiveness *j*	0.81	0.93	−1.21	2.44
Control of Corruption *j*	0.57	1.14	−1.31	2.33
Voice & accountability *ij*	1.06	0.74	0.0000562	3.79
Government Effectiveness *ij*	1.34	0.87	0.0002905	4.26
Control of Corruption *ij*	1.30	0.92	0.0007986	3.97
Observations	88,935			

value addition. Given that institutional quality indicators are not specifically designed for the coconut industry, other agricultural sectors might even benefit more than the coconut industry if institutions improve. This may even induce a shift away from coconut production and trade due to relative price changes in favor of other sectors. To consider these relative advantages in our analysis, we estimate the effect of the three institutional quality indicators on the remaining agricultural sector (defined as total agricultural exports minus exports of coconut products).

Before we derive the concrete equations for each aggregation level, we explain some gravity-specific estimation issues that need to be accounted for in order to obtain valid results. We use panel data for the estimates of our gravity model in order to capture the institutional changes that occur in coconut producing countries from 1996 to 2016. The data generating process of the gravity equation has a micro-theoretical foundation. Thus, we take into account multilateral trade resistance (MTR), which refers to the fact that bilateral trade flows do not only depend on trade barriers between the respective exporting and importing country, but also on barriers that the exporting and importing country encounters with all of their trading partners (Adam & Cobham, 2007).

In our structural gravity models, we address MTR with the Bonus–Vetus method, proposed by Baier and Bergstrand (2009). This approach addresses MTR by applying a first-order log-linear Taylor series approximation to the nonlinear MTR terms to account for exogenous variables that influence trade costs (Shepherd, 2012).

Each trade cost variable is transformed as follows, which we illustrate for the example of the variable "distance":

$$\ln Dist_{MTRij} = \ln Dist_{ij} - \frac{1}{N}\sum_{j=1}^{N}\ln Dist_{ij} - \frac{1}{2}\frac{1}{N^2}\sum_{i=1}^{N_k}\sum_{j=1}^{N}\ln Dist_{ij}, \quad (1)$$

where i is the exporting country, j is the importing country, k is the coconut-product, and t represents year.

This method is preferred for the purpose of this study because the three main institutional variables of interest are country-time specific or country-pair specific (in the case of institutional similarities), respectively. Therefore, country-time and country-pair fixed effects are collinear with the institutional variables of interest, which would lead to their exclusion from the model (Shepherd, 2012). The alternative approach of using the multiplicative form of exporter-time (-product) and importer-time (-product) fixed effects is also not viable due to the occurrence of many singletons during estimation. Hence, we follow Berger et al. (2013) and include importer and time fixed effects to limit omitted variable biases, which might result from import regimes and the increasing role of nontariff barriers that are specific to the importing country and traded product. Product fixed effects are also applied, but only in the aggregate coconut and agricultural sector estimations.

Because many coconut producing countries are small economies and have limited trading partners, zero trade values

are frequent in our datasets, especially for the rarer coconut products. Traditional gravity estimations convert the dependent variables as logarithms, which omits zero trade data to include only positive trade flows (Martin & Pham, 2015). In our sample, we have a total of seven coconut traded products, resulting in large portions of zeroes. This poses a problem when measuring bilateral trade as it could lead to selection bias. Different methods have been proposed to deal with zero trade. We adopt the Poisson pseudo-maximum likelihood (PPML) estimation method proposed by Santos Silva and Tenreyro (2006). It includes zero trade flows without any data transformation and provides unbiased estimates in the presence of heteroscedasticity.

We take our transformed right-hand-side variables from Equation (1) and estimate their trade effects with the PPML method, first, with aggregated indicator scores. This gives us the following gravity equation per coconut product category:

$$\begin{aligned} X^{k}_{i,j,t} = \exp[&\beta_0 + \beta_1 \ln DIST_{ij} + \beta_2 \ln Production_{it} \\ &+ \beta_3 \ln GDP_{jt} + \beta_4 LANG_{ij} + \beta_5 RTA_{ijt} \\ &+ \beta_6 Religion_{ij} + \beta_7 Contig_{ij} \\ &+ \beta_8 INST_{it} + \beta_9 VA_{ijt} + \beta_{10} GE_{ijt} \\ &+ \beta_{11} CC_{ijt} + \mu_j + \delta_t] \in_{ijt}, \end{aligned} \tag{2}$$

where k is the product, which means that we estimate each trade effect separately for each of the mentioned coconut products.

We then estimated the three indicators based on whether the exporting and importing countries score positive or negative on average:

$$\begin{aligned} X^{k}_{i,j,t} = \exp[&\beta_0 + \beta_1 \ln DIST_{ij} + \beta_2 \ln Production_{it} \\ &+ \beta_3 \ln GDP_{jt} + \beta_4 LANG_{ij} + \beta_5 RTA_{ijt} \\ &+ \beta_6 Religion_{ij} + \beta_7 Contig_{ij} + \beta_8 VA_{it} \\ &+ \beta_9 GE_{it} + \beta_{10} CC_{it} + \beta_{17} VA_{ijt} \\ &+ \beta_{18} GE_{ijt} + \beta_{19} CC_{ijt} + \mu_j + \delta_t] \in_{ijt}. \end{aligned} \tag{3}$$

For the aggregate coconut sector, we estimate the following gravity equation:

$$\begin{aligned} X_{i,j,k,t} = \exp[&\beta_0 + \beta_1 \ln DIST_{ij} + \beta_2 \ln Production_{it} \\ &+ \beta_3 \ln GDP_{jt} + \beta_4 LANG_{ij} + \beta_5 RTA_{ijt} \\ &+ \beta_6 Religion_{ij} + \beta_7 Contig_{ij} + \beta_8 VA_{it} \\ &+ \beta_9 GE_{it} + \beta_{10} CC_{it} + \beta_{17} VA_{ijt} \\ &+ \beta_{18} GE_{ijt} + \beta_{19} CC_{ijt} + \mu_j + \upsilon_k + \delta_t] \in_{ijt}, \end{aligned} \tag{4}$$

where k is the coconut product, but all products are estimated within one equation, thus we only obtain one coefficient estimate for the entire industry and control for product fixed effects.

For the remaining agricultural sector we, estimate the following gravity equation:

$$\begin{aligned} X_{i,j,t} = \exp[&\beta_0 + \beta_1 \ln DIST_{ij} + \beta_2 \ln Production_{it} \\ &+ \beta_3 \ln GDP_{jt} + \beta_4 LANG_{ij} + \beta_5 RTA_{ijt} \\ &+ \beta_6 Religion_{ij} + \beta_7 Contig_{ij} + \beta_8 VA_{it} \\ &+ \beta_9 GE_{it} + \beta_{10} CC_{it} + \beta_{17} VA_{ijt} \\ &+ \beta_{18} GE_{ijt} + \beta_{19} CC_{ijt} + \mu_j + \delta_t]. \end{aligned} \tag{5}$$

Here, no product dimensions are included.

Table 8 describes each of the variables and their definitions as specified in our models.

Some authors, such as Eicher and Leukert (2009), have expressed concerns of endogeneity in this framework. International trade can also potentially lead to better institutions as countries might see the improvements in institutional quality as a form of comparative advantage (Levchenko, 2013). In the same manner, a larger export value could increase or decrease costs incurred during trade (Djankov, Freund, & Pham, 2010). We agree that trade, in general, can affect institutional quality, but trade in a relatively specific product, such as coconuts, is unlikely to do so.

5 | RESULTS

Table 9 presents the results of our PPML Bonus–Vetus estimations with aggregate indicators. Columns (1) to (7) specify the results of each of the coconut product categories. These are then compared to results to all the aggregate coconut products in column (8). Column (9) shows results from all her agricultural products (excluding coconut products) in the same 26 coconut exporting countries. Figures in brackets below the coefficients represent standard errors.

When taking into account aggregate measures of the six indicators, bilateral trade increases only for oilcake, where a one-point increase in the average institutional indicators leads to an 8.7% but decreases in fresh or dried coconuts by nearly 7%. Trade in all other agricultural sectors rises by almost 5%. Similarities in voice and accountability increase trade of copra, but decreases exports of milk/water, activated carbon, and in the remaining agricultural sector. The opposite result hold for similarities in government effectiveness as trade increases in all three categories of high-value-added products and the rest of agricultural products. The result is less clear cut when two countries share similar levels of control of

TABLE 8 List of variables in the gravity model and their definitions

Variables	Definitions
$X^{k}_{i,j,t}$	Bilateral trade of product k between countries i and j
β_0	Unknown intercept
$\ln DIST_{ij}$	Log of distance between the capital city of countries i and j
$\ln Production_{it}$	Log of coconut production in metric tons of country i
$\ln GDP_{jt}$	Log of GDP of country j
$LANG_{ij}$	Dummy variable to indicate whether countries i and j share a common official language
RTA_{ijt}	Dummy variable to indicate whether countries i and j is part of a regional trade agreement
$Religion_{ij}$	Dummy variable to indicate whether country i and j share a common religion
$Contig_{ij}$	Whether countries i and j share a border
$INST_i$	Average of the WB's six world governance indicators
VA_i	Voice and accountability indicator in country i
GE_i	Government effectiveness indicator in country i
$textitCC_i$	Control of corruption indicator in country i
VA_{ij}	Voice and accountability similarity between countries i and j
GE_{ij}	Government effectiveness similarity between countries i and j
CC_{ij}	Control of corruption similarity between countries i and j
μ_j	Importer fixed effects
υ_k	Product fixed effects
δ_t	Time fixed effects
$\in_{ijt}$	Error term, unobserved factors that change over time

corruption. It appears to increase trade of coir but decreases trade of oilcake and the rest of the agricultural sector.

Table 10 shows results with the three separate indicators from exporters with positive average indicators. These results are compared to Table 11 with exporters with average institutional scores that are less than zero to disentangle the effects of each indicator in different institutional settings. From here on, the two categories are referred to as *positive exporters* and *negative exporters*. The indicator, voice and accountability, shows similar trade effects across almost all categories of coconut products in both positive and negative exporters but differs in effect sizes. In positive exporting countries, a one-point increase in voice and accountability decreases trade in all products except for copra and activated carbon with the largest effect size in oilcake at 43.5% and 14.5% in coconut oil. In negative exporting countries, the results show no effect on coconut oil and copra but decrease all other coconut categories from 5% to around 10%.

We observe a difference between the effect of government effectiveness on low-value and high-value products in both categories of exporters. Trade is decreased in copra and oilcake but increases in all categories that we consider as high-value plus coconut oil. Yet, in negative exporting countries, the effect on coconut oil is neutral along with copra and coir while trade increases in the high-value categories and on an aggregate level. An increase in control of corruption shows contrasting results by product and exporter category. Trade of lower value coconut products is increased, whereas trade of fresh or dried coconuts and on an aggregate level is decreased in positive exporting countries. In negative exporting countries, results do not vary by product categories. Export of coir and activated carbon is increased, whereas that of coconut oil is decreased. Trade is increased in the remaining agricultural sector in both exporter categories.

For positive exporters, similarities in voice and accountability increase exports of coir and oilcake while decreasing trade flows of activated carbon. In negative exporting countries, trade is increased in copra, coir, and fresh or dried. Two countries that are more similar in government effectiveness trade more only in oilcake and export less of coconut oil and activated carbon in positive exporting countries. Exports in all other agricultural products are increased in both exporter categories. Last, similarities in the control of corruption reduce trade in the low-value products of copra and oilcake and increase exports of fresh or dried coconuts in positive exporting countries. It also increases bilateral trade in the remaining agricultural products. Two countries similar in levels of control of corruption in negative exporting countries increase trade of coconut oil and fresh or dried categories, but trade decreases in the remaining agricultural sector.

Tables 12 and 13 show results from importers with positive aggregate indicators and those with negative indicators, respectively. We refer to them as *positive* and *negative importers* hereafter. The results closely resemble each

TABLE 9 Institutional quality and exports with average institutional indicator scores

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variables	**Copra**	**Coir**	**Coconut oil**	**Oilcake**	**Milk/Water**	**Activated carbon**	**Fresh or dried**	**Aggregate**	**Remaining agricultural sector (excl. coconuts)**
ln *Distance*	−0.426	0.663	1.090***	−2.266***	−0.738**	−1.057***	0.071	−0.170	−0.599***
	(0.704)	(0.425)	(0.365)	(0.619)	(0.289)	(0.255)	(0.376)	(0.363)	(0.140)
ln *GDP*	6.330***	2.095***	0.230	1.268***	1.358***	0.395*	1.374***	0.569***	0.784***
	(1.110)	(0.622)	(0.159)	(0.408)	(0.319)	(0.211)	(0.271)	(0.176)	(0.104)
ln *Production*	0.573***	0.626***	1.270***	2.270***	0.339***	0.740***	0.802***	0.785***	0.627***
	(0.120)	(0.114)	(0.127)	(0.367)	(0.099)	(0.123)	(0.111)	(0.082)	(0.042)
Contiguity	1.398	2.084*	0.560	−1.307	1.707***	−1.309	0.820	1.067	0.498
	(1.013)	(1.169)	(0.770)	(1.091)	(0.529)	(0.993)	(0.765)	(0.755)	(0.339)
Language	0.624	−0.570	−0.083	−1.003	0.739**	−0.274	−0.530	0.425	0.515**
	(0.697)	(1.027)	(0.642)	(0.905)	(0.350)	(0.664)	(0.731)	(0.406)	(0.234)
RTA	0.394	2.307**	0.280	0.630	−0.647	−0.587	0.156	−0.320	0.334
	(0.985)	(1.057)	(0.319)	(0.522)	(0.394)	(0.371)	(0.438)	(0.494)	(0.221)
Religion	0.371	−9.023***	5.511***	4.207	−0.470	0.873	4.219**	3.450***	−0.781
	(1.287)	(3.088)	(2.129)	(3.562)	(1.640)	(2.321)	(1.870)	(1.181)	(1.203)
Average indicator *i*	−0.038	−0.033	0.033	0.087*	0.004	−0.021	−0.069***	−0.009	0.049***
	(0.030)	(0.046)	(0.026)	(0.046)	(0.021)	(0.020)	(0.024)	(0.018)	(0.008)
Voice & accountability *ij*	−2.180***	−0.365	0.219	1.101	1.620***	1.874***	−0.173	1.122***	0.462***
	(0.608)	(0.468)	(0.239)	(0.674)	(0.297)	(0.300)	(0.445)	(0.303)	(0.120)
Government effectiveness *ij*	1.400**	0.932	−0.319	1.383	−1.708***	−1.729***	−1.443***	−1.465***	−0.447*
	(0.613)	(0.578)	(0.638)	(0.954)	(0.471)	(0.417)	(0.405)	(0.329)	(0.238)
Control of corruption *ij*	0.751	−2.999***	0.784	2.003**	0.354	−0.475	−0.516	0.244	0.557**
	(0.821)	(1.149)	(0.589)	(1.005)	(0.320)	(0.417)	(0.686)	(0.330)	(0.276)
Importer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Product FE	NO	NO	NO	NO	NO	NO	NO	YES	NO
Observations	8,085	12,206	16,170	8,085	16,170	8,085	16,170	88,935	7,469
R-squared	.275	.413	.559	.798	.318	.673	.347	.399	.761

Note. Clustered standard errors by country pair in parentheses; $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$. Dependent variables are trade values in 1,000 USD; Voice & accountability *ij*, government effectiveness *ij*, and control of corruption *ij* mean dissimilarity of institutional quality, thus a negative sign should be interpreted as a trade increasing effect if two countries are more similar; coefficients are interpreted as elasticities; production refers to coconut production in the coconut sectors, and total agricultural production (minus coconut production) in the remaining agricultural sector.

TABLE 10 Institutional quality and exports: exporters with positive aggregate indicators

Dependent variables	(1) Copra	(2) Coir	(3) Coconut oil	(4) Oilcake	(5) Milk/Water	(6) Activated carbon	(7) Fresh or dried	(8) Aggregate	(9) Remaining agricultural sector (excl. coconuts)
ln *DIST*	0.962	−0.348	1.187**	−1.596*	−1.323***	−0.047	−0.552*	0.014	−0.592***
	(0.694)	(0.351)	(0.477)	(0.817)	(0.330)	(0.384)	(0.312)	(0.288)	(0.087)
ln *GDP*	8.708***	0.942	1.105***	2.646	1.415**	1.415***	1.305***	1.201***	1.541***
	(2.058)	(0.582)	(0.318)	(1.889)	(0.577)	(0.296)	(0.444)	(0.244)	(0.118)
ln *Production*	0.291	1.424***	1.239***	1.419***	0.674***	1.507***	0.677***	0.863***	0.743***
	(0.300)	(0.244)	(0.178)	(0.314)	(0.151)	(0.185)	(0.122)	(0.097)	(0.029)
Contig	3.661	1.824***	4.066***	−1.163	0.316	0.017	0.410	1.643	0.897***
	(2.230)	(0.627)	(1.017)	(6.174)	(0.441)	(0.791)	(0.417)	(1.065)	(0.145)
LANG	−0.630	−0.104	−0.252	−2.215	1.052***	0.477	0.016	0.228	0.640***
	(1.215)	(0.796)	(0.837)	(1.350)	(0.391)	(0.839)	(0.676)	(0.572)	(0.089)
RTA	2.327	1.916**	−0.380	−4.122	−0.684*	0.194	0.440	−0.130	−0.446***
	(1.545)	(0.848)	(0.714)	(3.444)	(0.349)	(0.311)	(0.456)	(0.387)	(0.142)
Religion	−1.430	−9.556***	4.514**	5.235	−3.229	−0.615	2.082	2.165	−0.688*
	(3.433)	(2.650)	(2.162)	(5.085)	(2.304)	(2.803)	(2.489)	(1.334)	(0.415)
Voice & accountability *i*	−0.000	−0.089***	−0.145***	−0.435***	−0.058***	−0.015	−0.044***	−0.102***	0.005
	(0.032)	(0.021)	(0.026)	(0.148)	(0.021)	(0.024)	(0.007)	(0.013)	(0.004)
Government effectiveness *i*	−0.084***	−0.036	0.029*	−0.216***	0.065***	0.188***	0.048**	0.030	0.029***
	(0.028)	(0.033)	(0.017)	(0.055)	(0.014)	(0.034)	(0.021)	(0.019)	(0.005)
Control of corruption *i*	0.065***	0.096***	−0.032	0.081**	0.014	−0.017	−0.048***	−0.063***	0.011**
	(0.024)	(0.037)	(0.023)	(0.040)	(0.013)	(0.016)	(0.014)	(0.018)	(0.006)
Voice & accountability *ij*	0.541	−0.684**	−0.302	−7.734*	0.569	0.870**	−0.269	−0.117	0.185**
	(0.942)	(0.346)	(0.470)	(3.985)	(0.576)	(0.357)	(0.276)	(0.409)	(0.087)
Government effectiveness *ij*	−0.122	1.230	0.632**	−2.721**	0.281	1.473***	0.145	0.019	−0.278***
	(0.733)	(0.879)	(0.319)	(1.281)	(0.287)	(0.283)	(0.437)	(0.287)	(0.077)
Control of corruption *ij*	2.258***	−1.311	−0.333	3.451**	0.291	0.192	−1.967***	−0.076	0.683***
	(0.752)	(0.896)	(0.457)	(1.704)	(0.273)	(0.293)	(0.463)	(0.365)	(0.166)
Importer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Product FE	NO	NO	NO	NO	NO	NO	NO	YES	NO
Observations	1,298	7,186	3,742	1,350	10,092	1,871	10,092	22,077	2,592
R-squared	.352	.630	.577	.894	.532	.877	.355	.360	.931

Note. Clustered standard errors by country pair in parentheses; $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$. Dependent variables are trade values in 1,000 USD; Voice & accountability *ij*, government effectiveness *ij*, and control of corruption *ij* mean dissimilarity of institutional quality, thus a negative sign should be interpreted as a trade increasing effect if two countries are more similar; coefficients are interpreted as elasticities; production refers to coconut production in the coconut sectors, and total agricultural production (minus coconut production) in the remaining agricultural sector.

TABLE 11 Institutional quality and exports: Exporters with negative aggregate indicators

Dependent variables	(1) Copra	(2) Coir	(3) Coconut oil	(4) Oilcake	(5) Milk/Water	(6) Activated carbon	(7) Fresh or dried	(8) Aggregate	(9) Remaining agricultural sector (excl. coconuts)
ln *DIST*	−0.568	−0.074	0.650	−2.797***	−0.852***	−1.144***	−0.443	−0.466	−0.630***
	(0.764)	(0.349)	(0.479)	(0.631)	(0.317)	(0.231)	(0.307)	(0.322)	(0.042)
ln *GDP*	6.257***	2.107***	0.303	1.740***	1.792***	1.206***	1.143***	0.669***	0.711***
	(1.054)	(0.659)	(0.213)	(0.377)	(0.372)	(0.211)	(0.310)	(0.171)	(0.065)
ln *Production*	0.675***	1.552***	1.793***	2.552***	0.468***	0.976***	1.141***	1.039***	0.524***
	(0.150)	(0.221)	(0.248)	(0.405)	(0.144)	(0.104)	(0.145)	(0.117)	(0.027)
Contig	1.128	1.043*	0.092	−0.623	1.185**	−1.411*	0.299	0.647	0.456***
	(0.940)	(0.630)	(0.634)	(1.114)	(0.505)	(0.834)	(0.463)	(0.645)	(0.104)
LANG	0.703	−0.717	0.011	−0.636	0.711**	−0.160	−0.398	0.243	0.365***
	(0.767)	(0.741)	(0.748)	(0.972)	(0.361)	(0.632)	(0.769)	(0.458)	(0.096)
RTA	0.439	2.742***	0.564**	0.650	−0.463	−0.548*	0.048	−0.285	0.324***
	(0.828)	(0.796)	(0.229)	(0.626)	(0.371)	(0.311)	(0.430)	(0.419)	(0.078)
Religion	0.574	−7.392***	6.585***	5.510	−1.545	−0.206	4.775***	3.960***	−0.875**
	(1.471)	(2.349)	(2.095)	(3.446)	(1.834)	(2.317)	(1.830)	(1.188)	(0.341)
Voice & accountability *i*	−0.015	−0.099***	−0.018	−0.048**	−0.062***	−0.074***	−0.057***	−0.052***	−0.002
	(0.033)	(0.016)	(0.016)	(0.024)	(0.009)	(0.009)	(0.009)	(0.009)	(0.003)
Government effectiveness *i*	−0.050	−0.043	−0.005	0.091**	0.072***	0.084***	0.040**	0.079***	0.011
	(0.036)	(0.032)	(0.022)	(0.041)	(0.022)	(0.019)	(0.019)	(0.012)	(0.008)
Control of corruption *i*	−0.056	0.139***	−0.036**	−0.029	−0.016	0.053***	−0.011	−0.017	0.034***
	(0.051)	(0.029)	(0.017)	(0.024)	(0.018)	(0.013)	(0.017)	(0.012)	(0.007)
Voice & accountability *ij*	−2.771***	−0.890***	0.083	−0.471	0.080	0.225	−0.437*	0.270	0.247***
	(1.008)	(0.288)	(0.235)	(0.300)	(0.208)	(0.266)	(0.257)	(0.254)	(0.079)
Government effectiveness *ij*	0.279	1.031	0.353	3.592***	−0.155	−0.047	0.227	0.391	−0.658***
	(0.769)	(0.748)	(0.408)	(1.321)	(0.502)	(0.430)	(0.359)	(0.338)	(0.140)
Control of corruption *ij*	0.061	−0.536	−1.172***	−0.227	−0.313	0.356	−0.781**	−0.829***	0.923***
	(1.965)	(0.634)	(0.413)	(1.180)	(0.373)	(0.336)	(0.395)	(0.314)	(0.218)
Importer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Product FE	NO	NO	NO	NO	NO	NO	NO	YES	NO
Observations	6,078	10,681	12,156	6,078	14,163	6,078	14,163	66,858	4,875
R-squared	0.439	0.600	0.582	0.832	0.308	0.712	0.376	0.427	0.726

Note. Clustered standard errors by country pair in parentheses; $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$. Dependent variables are trade values in 1,000 USD; Voice & accountability *ij*, government effectiveness *ij*, and control of corruption *ij* mean dissimilarity of institutional quality, thus a negative sign should be interpreted as a trade increasing effect if two countries are more similar; coefficients are interpreted as elasticities; production refers to coconut production in the coconut sectors, and total agricultural production (minus coconut production) in the remaining agricultural sector.

TABLE 12 Institutional quality and coconut exports: Importers with positive aggregate indicators

Dependent variables	(1) Copra	(2) Coir	(3) Coconut oil	(4) Oilcake	(5) Milk/Water	(6) Activated carbon	(7) Fresh or dried	(8) Aggregate	(9) Remaining agricultural sector (excl. coconuts)
ln *DIST*	−0.247	−0.219	−0.380	−0.231	−0.283	−0.240	−0.267	−0.216	−0.699**
	(0.354)	(0.345)	(0.324)	(0.346)	(0.338)	(0.343)	(0.343)	(0.347)	(0.350)
ln *GDP*	0.958***	0.809***	0.479**	0.889***	1.061***	0.925***	0.940***	0.913***	0.820***
	(0.246)	(0.256)	(0.195)	(0.244)	(0.266)	(0.229)	(0.218)	(0.254)	(0.107)
ln *Production*	0.928***	0.928***	1.033***	0.935***	0.947***	0.938***	0.962***	0.927***	0.870***
	(0.091)	(0.095)	(0.108)	(0.096)	(0.091)	(0.095)	(0.096)	(0.096)	(0.099)
Contig	2.031***	1.984***	0.988	1.932***	1.671***	1.861***	1.664***	2.012***	−0.419
	(0.668)	(0.662)	(0.649)	(0.662)	(0.631)	(0.636)	(0.605)	(0.670)	(0.355)
LANG	0.116	−0.027	0.171	−0.015	0.151	−0.003	0.027	−0.030	1.300***
	(0.370)	(0.381)	(0.389)	(0.382)	(0.373)	(0.381)	(0.380)	(0.383)	(0.417)
RTA	−0.910**	−0.881**	−0.393	−0.853**	−0.736*	−0.814**	−0.695*	−0.892**	0.902***
	(0.394)	(0.390)	(0.448)	(0.390)	(0.384)	(0.390)	(0.400)	(0.392)	(0.320)
Religion	3.774***	4.403***	4.378***	4.368***	3.938***	4.377***	4.396***	4.394***	−3.028*
	(1.106)	(1.292)	(1.325)	(1.287)	(1.191)	(1.285)	(1.305)	(1.291)	(1.699)
Voice & accountability *i*	−0.052***	−0.053***	−0.045***	−0.050***	−0.055***	−0.050***	−0.055***	−0.052***	−0.001
	(0.009)	(0.009)	(0.010)	(0.009)	(0.008)	(0.008)	(0.009)	(0.010)	(0.004)
Government effectiveness *i*	0.069***	0.075***	0.082***	0.076***	0.079***	0.070***	0.071***	0.076***	−0.015
	(0.014)	(0.016)	(0.014)	(0.016)	(0.013)	(0.014)	(0.013)	(0.016)	(0.010)
Control of corruption *i*	−0.007	−0.007	−0.017	−0.008	−0.012	−0.007	−0.011	−0.007	0.044***
	(0.014)	(0.014)	(0.012)	(0.014)	(0.012)	(0.013)	(0.014)	(0.014)	(0.012)
Voice & accountability *ij*	0.075	0.051	0.446	0.141	0.043	0.147	0.037	0.077	−0.039
	(0.317)	(0.293)	(0.285)	(0.288)	(0.260)	(0.266)	(0.246)	(0.328)	(0.185)
Government effectiveness *ij*	0.510	0.637	0.605*	0.639*	0.628*	0.470	0.460	0.677*	0.229
	(0.374)	(0.390)	(0.365)	(0.387)	(0.327)	(0.347)	(0.332)	(0.396)	(0.339)
Control of corruption *ij*	−0.315	−0.311	−0.694**	−0.351	−0.432	−0.295	−0.487	−0.321	−0.900*
	(0.395)	(0.389)	(0.346)	(0.383)	(0.339)	(0.365)	(0.380)	(0.386)	(0.472)
Importer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Product FE	NO	NO	NO	NO	NO	NO	NO	YES	NO
Observations	9,722	10,186	5,093	13,228	5,093	13,228	56,023	9,722	2,502
R-squared	.681	.573	.863	.352	.664	.394	.442	.681	.832

Note. Clustered standard errors by country pair in parentheses; $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$. Dependent variables are trade values in 1000 USD; Voice & accountability *ij*, government effectiveness *ij*, and control of corruption *ij* mean dissimilarity of institutional quality, thus a negative sign should be interpreted as a trade increasing effect if two countries are more similar; coefficients are interpreted as elasticities; production refers to coconut production in the coconut sectors, and total agricultural production (minus coconut production) in the remaining agricultural sector.

TABLE 13 Institutional quality and coconut exports: Importers with negative aggregate indicators

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variables	**Copra**	**Coir**	**Coconut oil**	**Oilcake**	**Milk/Water**	**Activated carbon**	**Fresh or dried**	**Aggregate**	**Remaining agricultural sector**
ln *DIST*	−9.110***	−0.354	1.167	−16.582**	−1.267***	−0.550	−0.730**	−1.131	−0.448***
	(1.943)	(0.332)	(0.875)	(8.272)	(0.328)	(0.561)	(0.330)	(0.702)	(0.150)
ln *GDP*	−9.640***	1.911***	0.182	−1.564	1.702**	1.323***	1.231***	0.638	1.086***
	(2.335)	(0.683)	(0.202)	(2.325)	(0.681)	(0.251)	(0.426)	(0.458)	(0.113)
ln *Production*	0.808**	1.345***	2.178***	4.913***	0.634***	0.836***	0.710***	1.113***	0.584***
	(0.350)	(0.248)	(0.373)	(1.173)	(0.148)	(0.105)	(0.137)	(0.150)	(0.047)
Contig	−0.538	0.718	−2.209	−12.631*	−0.124	−0.156	0.300	−0.205	1.346***
	(4.053)	(0.642)	(1.488)	(7.439)	(0.452)	(0.492)	(0.440)	(0.474)	(0.322)
LANG	3.009*	−0.344	−0.826	6.012	1.091***	−1.647***	0.032	1.471*	0.147
	(1.557)	(0.776)	(0.695)	(3.952)	(0.411)	(0.557)	(0.678)	(0.846)	(0.287)
RTA	1.312	1.790**	0.333	2.770**	−0.576*	0.939	0.448	0.521	−0.124
	(1.417)	(0.775)	(0.787)	(1.394)	(0.335)	(0.782)	(0.450)	(0.638)	(0.238)
Religion	−4.385*	−5.840**	14.103***	22.137	−2.965	5.619***	1.329	4.366***	1.193
	(2.463)	(2.712)	(5.102)	(14.359)	(2.258)	(2.087)	(2.527)	(1.336)	(1.462)
Voice & accountability *i*	0.032	−0.086***	−0.054***	−0.053	−0.068***	−0.078***	−0.042***	−0.040***	−0.000
	(0.020)	(0.020)	(0.020)	(0.072)	(0.012)	(0.009)	(0.008)	(0.013)	(0.005)
Government effectiveness *i*	−0.099***	−0.031	0.096***	−0.103*	0.088***	0.075***	0.039**	0.060***	−0.016
	(0.030)	(0.034)	(0.030)	(0.053)	(0.014)	(0.025)	(0.018)	(0.018)	(0.013)
Control of corruption *i*	0.002	0.104***	0.013	0.195***	−0.010	0.036	−0.031**	−0.024	0.010
	(0.018)	(0.036)	(0.032)	(0.057)	(0.013)	(0.029)	(0.013)	(0.017)	(0.013)
Voice & accountability *ij*	−2.342***	−0.723***	0.170	−2.259*	0.201	0.985***	−0.173	0.067	0.220
	(0.751)	(0.280)	(0.558)	(1.333)	(0.279)	(0.299)	(0.268)	(0.284)	(0.198)
Government effectiveness *ij*	−0.267	0.885	1.232*	−1.108	0.750**	−1.007*	−0.127	0.945*	−1.172**
	(1.074)	(0.833)	(0.689)	(0.760)	(0.345)	(0.579)	(0.440)	(0.490)	(0.476)
Control of corruption *ij*	4.149***	−0.840	0.132	3.675***	−0.446*	−0.798	−1.438***	−0.627*	0.029
	(0.760)	(0.798)	(0.511)	(1.261)	(0.258)	(0.877)	(0.370)	(0.368)	(0.608)
Importer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Product FE	NO	NO	NO	NO	NO	NO	NO	YES	NO
Observations	2,942	7,995	5,884	2,942	11,027	2,942	11,027	32,362	4,967
R-squared	.862	.513	.660	.965	.455	.592	.244	.248	.833

Note. Clustered standard errors by country pair in parentheses; $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$. Dependent variables are trade values in 1,000 USD; Voice & accountability *ij*, government effectiveness *ij*, and control of corruption *ij* mean dissimilarity of institutional quality, thus a negative sign should be interpreted as a trade increasing effect if two countries are more similar; coefficients are interpreted as elasticities; production refers to coconut production in the coconut sectors, and total agricultural production (minus coconut production) in the remaining agricultural sector.

other in the voice and accountability indicator. Exports decrease by around 5% across coconut products, whereas no effect is observed in the remaining agricultural products in positive importing countries. For negative importers, trade is decreased with more variations in effect size in all coconut products except for copra and oilcake. Government effectiveness increases trade for positive importers in all categories of coconut products where a one-point increase leads to a 7–8% increase in exports. In contrast, the same indicator for negative importers, trade is either decreased or has no effect on low-value products and increases exports in high-value products. No effect is observed in the trade of remaining agricultural products.

Control of corruption appears to have no influence on the export of coconut products in positive importing countries. A one-point increase in this indicator increases trade by 4.4% in all other agricultural products. Results are more varied with negative importers, where exports of coir and oilcake are increased while fresh or dried coconut is reduced.

Results differ more between the two categories of importers when assessing institutional similarities. They do not appear to matter much with positive importers. There is no effect on any of the product categories when two countries are more similar in voice and accountability. Trade is decreased when two countries share similarities in government effectiveness in the products of oil, oilcake, milk/water, plus on an aggregate coconut product level, although with a *p*-value of .1. Similarities in control of corruption increase trade in coconut oil and in all remaining agricultural sector.

In the negative importer category, similarities in voice and accountability stimulate trade of copra, coir, and oilcake, but exports of activated carbon decrease. Two countries more alike in government effectiveness reduce bilateral trade for coconut oil, milk/water, and on an aggregate level. Exports are increased for activated carbon and in the remaining agricultural sector. The effect size is also larger in the negative importer's category. Similarities in control of corruption have a positive effect on the trade of coconut oil and in the rest of the agricultural sector in positive importing countries. In negative importing countries, trade of copra and oilcake is decreased and export of milk/water and fresh or dried coconuts is increased.

5.1 | Discussion

Our first baseline results show that the overall institutional environment, as measured by an averaging the six governance indicators, does not have a concrete influence on the trade of coconut products. This finding fails to confirm H1. It, however, does better facilitate trade in all other agricultural products. By averaging the six indicators, we assume that each indicator has the same weights. Hence, each indicator in H2, H3, and H4 is tested under a given setting of whether countries have aggregate positive or negative average scores.

Our results reveal some patterns. Voice and accountability have mostly a diminishing effect on trade flows and government effectiveness increases trade aside from low-value-added products. The results for control of corruption are less clear-cut. Consistent with our hypothesis, not every indicator has the same effect on each of the product categories. The findings are also similar to those of Meon and Sekkat (2008), who suggest that the different features of institutions yield dissimilar influences on trade.

H2 of this study states that voice and accountability decrease trade of coconut products. Our results confirm this hypothesis for almost all of the products assessed in both categories of exporters and importers. This is consistent with the findings of Berden et al. (2014) who find that higher levels of voice and accountability negatively affect trade flows and levels of foreign direct investment and Martinez-Zarzoso and Ramos (2018), whose findings show lower levels of exports in the Middle East and North African countries. In positive exporters, the effect size is quite noteworthy for coconut oil at 14.5% as coconut oil is the most traded coconut product globally. Yet, in negative exporting countries, there is no effect. We conclude that more voice and rights to laborers and farmers disrupt the processing and export of coconut products in producing countries that have a better overall institutional setting. Low-value-added products are just as affected perhaps due to the labor-intensive procedures involved, for example, the drying of copra and the weaving of coir products. We observe that this indicator has no effect on the trade of all other agricultural products across the board.

H3 asserts that government effectiveness increases bilateral trade of, especially, high-value products. This is confirmed by our results across all high-value product categories. We infer from this result that further processing of coconuts is facilitated by the provision of complementary services and contract enforcement. Although we expected that government effectiveness would also increase trade in low-value products, albeit to a lesser extent than for high-value products, our results show that this is not the case. Trade of some low-value-added products is decreased in the positive exporter and negative importer category. It is possible that countries having better average scores export more high-value products at the expense of those with lesser value. More than half of the negative importing countries are also coconut exporters. It is probable that countries like the Philippines and Indonesia need their copra to extract oil and have no need to export them to countries in this category.

H4 states that better control of corruption increases trade of all coconut categories. Here, the results are less obvious. Notably, in importing countries with positive scores, it has no effect on any of the product categories, yet trade of the remaining agricultural sector benefits. The

literature is also mixed in this regard. Although some of the estimated coefficients are statistically significant, there is no clear pattern in its effects according to product categories among the exporter categories. Our results confirm that the effects of corruption in coconut trade are complex and we cannot conclude whether it fits the "*grease the wheel*" or "*sand the wheel*" argument discussed by Ben Ali and Mdhillat (2015).

H5 states that institutional similarities would increase trade flows. This is not supported by our results. First, similarities in government effectiveness show mostly decreasing effects for coconut products, yet it increases the trade of all other agricultural products in the same countries, except in positive importing countries. This suggests that similarities in this indicator, in fact, redirect trade away from coconut products toward all other categories of agricultural commodities. A second reason could be that most of the coconut-producing countries score generally lower in government effectiveness than the most important importing countries. This, together with the producing countries' natural endowments of coconut trees, may serve as an explanation of the negative trade effect of similarities. With this argument, we shadow Meon and Sekkat (2008) who suggest that when nations have natural endowments of a commodity that determine their comparative advantage, in this case, coconuts, then the influence of institutions might be of subordinate importance, or in our case even negative due to limited alternatives. Another possibility could be that government effectiveness in most importing countries has improved from 1996 to 2016, whereas for some exporting countries, scores have decreased, increasing the distance of similarities in this indicator. One further explanation could be the role of informal institutions. Many of coconut-producing countries are emerging markets whose exchange relationships could often rely on informal and network-based norms (Yang et al., 2018). Furthermore, social networks could weaken the effect of formal institution's legal enforceability (Yang et al., 2018).

Similarities in voice and accountability and control of corruption show mixed trade effects across different categories of exporters and importers. It differs considerably depending on the exporter/importer categories. Even though control of corruption does not make a pronounced effect on coconut trade itself, we do see that similarities in this indicator with negative exporter and importer categories lead to an increase in aggregate coconut products. Because this result holds for countries with negative aggregate scores, this could suggest that two countries with equally bad levels of corruption trade more with each other. As Ben Ali and Mdhillat (2015) and Horsewood and Voicu (2012) suggest, if two states think that bribery in business transactions is tolerated, then this could increase their trade transactions with each other. Our results are mostly consistent with the literature on the effect of traditional gravity variables.

6 | CONCLUSIONS

Studies to date suggest that institutional quality is a determinant of bilateral trade. This is due to effects such as a reduction in transaction costs and better contract enforcement. We add to the literature by studying the effect and influence of institutions on the international trade performance of coconuts by using an extended structural gravity model. We first assess how the overall institutional environment, as measured by an average of the six World Bank's world governance indicators, influences the export performance of coconut products. Our results do not show that the overall institutional environment leads to an increase in the export of coconut products. We then measure the effects of three indicators according to categories of positive and negative exporting and importing countries.

We hypothesize an increase in government effectiveness and control of corruption indicators to increase bilateral trade flows of coconut products. At the same time, we expect that better performance in voice and accountability would have negative trade effects. Last, we argue that trade would increase between the two countries when they share similarities in the three respective indicators. Our results support some, but not all of these hypotheses. We confirm that institutional quality matters for the trade of coconut products with variations in different institutional environments. Government effectiveness plays a bigger role in enhancing trade of high-value products, whereas voice and accountability decrease trade of both high-value and low-value-added coconut products. The effect size of these findings is comparable in importing countries with negative aggregate indicator scores. Contrary to the findings of Bojnec and Fertő (2009), we fail to confirm the hypothesis that two countries similar in institutions lead to an increase in bilateral trade. We should note that while some indicators show negative effects in certain categories of coconut products, the effects on the export performance in the remaining agricultural sectors are either positive or statistically insignificant.

Existing literature on institutional quality on export performance only assessed trade in general, or in certain aggregate sectors. Product and institutional indicator-specific studies are lacking. Our study is a first attempt to close this literature gap by considering institutional and product heterogeneities. Although our results provide evidence that government effectiveness is more important than voice and accountability and control of corruption in fostering trade of high-value coconut products, country-specific case studies for different coconut producing regions are needed that may complement our findings.

One limitation of our study is that the institutional indicators do not allow us to assess specifically to individual product categories. We have in part addressed this by showing the trade effect for the entire agricultural sector. However, in

a macro-level study, we are unable to identify winners and losers individually with institutional indicators that assess the entire economy. Our study focuses exclusively on coconut exports; therefore, our findings should not be seen as transferrable to other crops and commodities. Further research is needed in other agricultural products with various levels of value addition to study the influence of institutions and governance on international market integration. This would allow for more general conclusions, while our results are sector specific.

Our results produce a number of policy implications. Many countries in our study vary in their individual indicators. Although aggregating the scores gives an impression of the institutional environment of the country, it is still difficult to assess whether a country scoring high on government effectiveness and low on control of corruption says about their overall institutional setting. We address this in our study by looking at indicators individually.

Improving government effectiveness is crucial for strengthening exports in coconuts, which is a sector of major economic relevance in many of our exporting nations. Despite findings that show a decrease in coconut trade when there is an increase in voice and accountability, it also has a neutral effect on the entire agricultural sector, hinting that countries with higher levels of voice and accountability do not necessarily suffer on an aggregate level, only the coconut sector. Furthermore, it would not be unreasonable to predict that voice and accountability could have an effect similar to the Kuznet's (1955) curve. As this indicator first increases, it disrupts the coconut processing stage. However, once it reaches a certain turning point, the effect it has on coconut exports will become positive.

ACKNOWLEDGEMENTS

Open access funding enabled and organized by Projekt DEAL.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

How to cite this article: Lin J, Flachsbarth I, von Cramon-Taubadel S. The role of institutional quality on the performance in the export of coconut products. *Agricultural Economics*. 2020;51:237–258. https://doi.org/10.1111/agec.12552

APPENDIX: NUT PRODUCTION

With the exception of Cote d'Ivoire, Mozambique, Nigeria, Tanzania, and Vietnam, all other coconut-producing countries listed in this study almost exclusively only produce coconuts. Thus, HS Code 200819 is used to represent coconut milk. Table A5 shows the share of coconut to total nut production in these respective countries.

TABLE A1 Exporting and importing economies

Country groups	Members
Exporters	Brazil, China, Cote d'Ivoire, Dominican Republic, Fiji, Ghana, India, Indonesia, Jamaica, Kiribati, Malaysia, Marshall Islands, Mexico, Mozambique, Myanmar, Nigeria, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Tanzania, Thailand, Vanuatu, Venezuela, and Vietnam
Importers	Australia, Canada, China, EU27, Hong Kong, Indonesia, Japan, Korea, Laos, Malaysia, Philippines, Russia, Singapore, Thailand, and United States

TABLE A2 Correlation table of the three governance indicators in exporting countries

	VA	GE	CC
VA	1.0000		
GE	0.1859	1.0000	
CC	0.5493	0.5824	1.0000

TABLE A3 Correlation table of institutional similarities between exporting and importing regions

	VA *ij*	GE *ij*	CC *ij*
VA *ij*	1.0000		
GE *ij*	0.1723	1.0000	
CC *ij*	0.2772	0.8243	1.0000

TABLE A4 Harmonized system (HS) codes and average unit values

HS Code	Product	Average unit value
1203	Copra	0.403
080111	Fresh or dried, desiccated	1.416
080119	Fresh or dried, other than desiccated	0.409
151311	Coconut oil and its fractions, crude	0.833
151319	Coconut oil and its fractions, other than crude	1.097
200819	Nut milk, including coconut	3.062
220290	Plant-based water, including coconut	0.808
230650	Oil-cake and other residues, from the extraction of copra	0.145
380210	Activated carbon	1.34
530511	Coconut coir, raw	0.261
530519	Coconut coir, other	0.263

Source. UN Comtrade.

TABLE A5 Share of coconut to total nut production in five countries

Country	Share of coconut to total nut production
Cote d'Ivoire	49.42%
Mozambique	81.54%
Nigeria	28.9%
Tanzania	81.17%
Vietnam	60.33%

TABLE A6 World governance indicator scores in exporting countries in 1996 and 2016

Exporter	VA 1996	VA 2016	GE 1996	GE 2016	CC 1996	CC 2016	Average
Brazil	0.24	0.47	–0.14	–0.18	–0.02	–0.44	0.01
China	–1.36	–1.62	–0.35	0.36	–0.27	–0.25	–0.53
Côte d'Ivoire	–0.58	–0.28	–0.26	–0.67	–0.26	–0.54	–0.98
Dominican Republic	0.06	0.19	–0.22	–0.25	–0.42	–0.78	–0.32
Fiji	0.15	–0.03	–0.12	–0.26	0.66	0.13	–0.21
Ghana	–0.21	0.64	–0.12	–0.20	–0.34	–0.17	–0.01
India	0.48	0.41	–0.11	0.10	–0.38	–0.30	–0.25
Indonesia	–0.92	0.14	–0.71	0.01	–0.86	–0.39	–0.56
Jamaica	0.59	0.69	0.14	0.41	0.19	–0.16	0.05
Kiribati	1.15	1.03		–0.45		0.25	0.10
Malaysia	–0.18	–0.47	0.54	0.88	0.38	0.11	0.35
Marshall Islands	1.23	1.20		–1.56		–0.06	–0.07
Mexico	–0.04	–0.09	0.23	0.14	–0.51	–0.77	–0.13
Mozambique	–0.28	–0.39	–0.14	–0.85	–0.42	–0.87	–0.39
Myanmar	–1.89	–0.85	–1.21	–0.98	–1.50	–0.65	–1.52
Nigeria	–1.55	–0.30	–0.92	–1.09	–1.19	–1.04	–1.13
Papua New Guinea	0.08	0.19	–0.34	–0.73	–0.43	–0.92	–0.61
Philippines	0.26	0.14	–0.31	–0.01	–0.36	–0.53	–0.37
Samoa	0.74	0.76	0.39	0.54	–0.03	0.28	–0.51
Solomon Islands	0.81	0.49		–0.99	0.34	–0.34	–0.48
Sri Lanka	–0.27	–0.11	–0.18	–0.21	–0.06	–0.28	–0.31
Tanzania	–0.64	–0.18	–0.69	–0.55	–0.70	–0.51	–0.43
Thailand	0.31	–1.10	0.18	0.34	–0.36	–0.40	–0.12
Vanuatu	0.63	0.69		–0.88	0.22	–0.10	0.16
Vietnam	–1.09	–1.41	–0.58	0.01	–0.49	–0.40	–1.11

TABLE A7 World governance indicator scores in importing countries in 1996 and 2016

Importer	VA 1996	VA 2016	GE 1996	GE 2016	CC 1996	CC 2016	Average
Australia	1.44	1.30	1.80	1.58	1.88	1.77	1.59
Canada	1.57	1.38	1.74	1.80	2.03	1.98	1.63
China	–1.36	–1.62	–0.35	0.36	–0.27	–0.25	–0.52
Hong Kong	0.33	0.27	1.04	1.86	1.44	1.58	1.31
Indonesia	–0.92	0.14	–0.71	0.01	–0.86	–0.39	–0.60
Japan	1.07	1.00	0.91	1.83	1.19	1.51	1.19
Korea	0.67	0.63	0.47	1.07	0.38	0.37	0.69
Lao PDR	–1.13	–1.73	–0.64	–0.39	–0.72	–0.93	–0.92
Malaysia	–0.18	–0.47	0.54	0.88	0.38	0.11	0.35
Philippines	0.26	0.14	–0.31	–0.01	–0.36	–0.53	–0.34
Russian Federation	–0.22	–1.21	–0.45	–0.22	–1.05	–0.86	–0.73
Singapore	0.14	–0.28	1.99	2.21	2.11	2.07	1.50
Thailand	0.31	–1.10	0.18	0.34	–0.36	–0.40	–0.07
United States	1.35	1.10	1.52	1.48	1.57	1.33	1.33
EU27	1.13	1.07	1.13	1.12	1.04	1.04	1.08