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## Cultural Aspects of International Trade

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## *Abstract*

This dissertation looks into how cultural proximity and cultural institutions influence international trade. More specifically, the effect of religious similarity on the extensive margin of international trade is examined using product heterogeneity. While a cultural institution, Islamic banking, is studied in a dual banking system to evaluate its impact on export probability by exploiting the heterogeneity in destination countries. Referring to the heterogeneity in terms of the Muslim population share in the overall population of the destination countries. In the first empirical study of this dissertation, product entry which refers to the extensive margin of international trade is constructed at the 4-digit product level by using Harmonized System (HS)-2002 classification export flow data from World Integrated Trade Solutions (WITS) for the year between 2002 and 2016. The sample is composed of 75 countries that are both exporters and importers. The results indicate that time-varying religious similarity influences positively product entry. As the intensity of relationship-specificity for products increases, the effect of religious-similarity rises. Where relationship-specificity index has been constructed à la Nunn (2007). While, in the second empirical study, employing a city-level dataset for the period 2007 to 2020, the impacts of both Islamic banks' credit share and the share of the Muslim population in the destination country on the export probability of Turkish cities have been investigated. The findings have proven that despite their tiny share of credit, Islamic banks appear to boost Turkish provinces' export probability as the share of the Muslim population increases in the destination market. Moreover, the effect of credit share of Islamic banks is found to be positively related to export probability regardless of destination markets when a city is socio-economically developed. Whereas if a city is socio-economically underdeveloped, the positive effect of share credit of Islamic banks heavily relies on a high percentage of Muslims in the destination country.

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# Introduction

This dissertation is structured into three major chapters, each with its own introduction, with the exception of the conclusion chapter. The first chapter reviews the existing literature related to this dissertation in detail. In particular, international trade, development economics, finance, and more specifically Islamic finance literature are summarized subjectively. Following two chapters which are chapter II and chapter III conduct two different and independent empirical studies. Chapter II argues the role of religious similarity in the extensive margin of international trade and expands the analysis to the country's trade pattern. While chapter III discusses the impact of Islamic banking in Turkish provinces on the extensive margin of international trade. Finally, chapter IV concludes and summarises the findings of the whole dissertation.

## Chapter 1

# Literature Review

This chapter is composed of three sub-sections that aim to review the role of religion and its institutions in the sphere of international trade. The first portion, in particular, discusses the extensive margin of international trade, the trade patterns of countries, and their beneficial effects on economies. The section that follows discusses how culture and/or cultural characteristics influence international trade. While the last section begins with a discussion of the role played by financial intermediaries in international trade, it then moves onto a theoretical foundation and empirical research on an Islamic religious institution, specifically Islamic banking, and its possible link to international trade.

### 1.1 The Extensive Margin and Trade Pattern

This sub-section starts with extensive margin definition, and its importance. Following that, its effect on both trade growth and economic growth are highlighted. In addition to its impact on the macro level, the micro level firm's entry decision is explored. Lastly, trade pattern is explained through previous empirical works.

International trade evolves along two axes which are extensive and intensive margins Felbermayr and Kohler (2006). Traditionally, the intensive margin is known as the "old" margin, and it corresponds to the quantity of traded goods whereas the extensive margin refers to non-traded or less-traded goods. In addition, the extensive margin would also arise in the country dimension, where countries may expand their existing products into new markets.

In the preliminary stages of international trade literature, the extensive margin was neglected while the intensive margin was receiving attention as the main driver of the trade. For example, in the Armington (1969) model, extensive margin has not been included in. Hence, according to this model, export could have only expanded through the intensive margin. Krugman (1981) provided one of the first theoretical models that take into account extensive margin. According to his model, countries could generate a wide variety of products, but their output would be proportional

to their per capita GDP i.e., economies of scale. Following that, Melitz (2003) introduced firm heterogeneity as well as fixed exporting cost in addition to the Krugman model, implying that more productive firms will enter the export market, while less productive firms will exit. In a similar vein, Chaney (2008) extended Krugman's model—which argues a higher elasticity of substitution yields a greater trade barrier—by adding firm heterogeneity and fixed exporting cost, claiming that the impact of the elasticity of substitution between goods is contrary for each margin. In particular, he argued that when the elasticity of substitution is high, the extensive margin will be less vulnerable to changes in trade barriers, while the intensive margin is becoming more sensitive.

Many researchers Kehoe and Ruhl (2013), Evenett and Venables (2002), and Hummels and Klenow (2005) have emphasized extensive margin over intensive margin in recent decades, suggesting that extensive margin is the primary driver of trade growth. To begin with, between 1970 and 1997 years, Evenett and Venables (2002) measured the extensive margin, through the creation of new trade partners. The result showed that extensive margin boosted emerging economies' export growth. Following this, Hummels and Klenow (2005) have decomposed a country's exports into margins that account for differences between export of larger economies and smaller economies. Doing that they have used disaggregated trade data which encompasses 5,000 product categories, The data showed that richer economies export more, a wider variety and higher quality of goods with respect to other countries. Hence, their conclusion was that the impact of the extensive margin is more predominant for larger countries' trade growth. Moreover, Kehoe and Ruhl (2013) has analyzed 1900 country pairs, trade growth was found as mostly driven by extensive margins.

Similarly, Lawless (2010) deconstructed bilateral trade data into extensive margin and intensive margin. She claimed that internal geography, infrastructure, and language are major elements that affect extensive margin when their approach of calculating extensive margin is at the product dimension, utilizing firm-level US export data for 2006.

Tariff reduction, among other things, has been highlighted as an important aspect that contributes to the extensive margin. Arkolakis et al. (2008), for example, showed that trade liberalization in Costa Rica between 1986 and 1992 led to a rise in imported varieties. Similarly, Dutt, Mihov, and Van Zandt (2013) reported, using 6-digit bilateral trade data, that a country's extensive margin -referring to non traded goods- improves by 25% upon joining the WTO/GATT. Moreover, Kehoe and Ruhl (2013) claimed 10 percent of the growth in trade can be attributed to the extensive margin for NAFTA country pairs.

Extensive margin relates to expanding exports through the development of new

goods and/or new trading partners. And also export diversification takes place mostly along the extensive margin, especially early in the development process (Cadot, Carrère, and Strauss-Kahn, 2011). Previously, it has been shown that export expansion was associated with better economic performance for low- and middle-income countries. Therefore, the relationship between extensive margin and economic growth was another interest of both academic scholars and public bodies (Kavoussi, 1984).

A series of recent studies have indicated the role of export diversification on economic growth. For instance, Al-Marhubi (2000) constructed three indexes for export diversification to test the economic growth equation across 91 countries for the years between 1961-1988. He found that export diversification –controlling for other factors that affect economic growth such as human capital, openness to trade, investment, and population growth– has a positive impact on economic growth. Similarly, Hesse et al. (2009) observed that export concentration is negatively associated with economic growth by estimating a dynamic panel for 99 countries over the years 1965 to 2000. In a similar vein, Lederman, Maloney, et al. (2007) estimated a dynamic panel for 65 countries between 1980 and 1999 and demonstrated that export concentration has a detrimental influence on economic growth. Furthermore, Agosin et al. (2007) showed that export diversification promotes economic growth by estimating an empirical growth model for emerging Latin American and Asian nations between 1980 and 2003. He also claimed that less output volatility can be achieved through export diversification since export diversification makes export less volatile.

Theoretical and empirical study in international trade has evolved over time, moving away from the typical concentration on countries and industries toward the firm level (Regis, 2018). A large number of existing studies in the broader literature have examined firms' entry and exit decisions to export as well as sunk costs. Bernard and Jensen (2004) established the presence of sunk costs<sup>1</sup> to exporting by proving that an increase in US exports is largely driven by existing enterprises rather than new entries into the export market using data from US firm-level exports from 1987 to 1992. Similarly, Bernard and Wagner (2001) provide additional evidence on sunk costs to export entry by utilizing German firm-level data from 1978 to 1992. Likewise, Roberts and Tybout (1997) showed that sunk costs are an important factor for entering foreign markets using Colombian firm-level data from 1982 to 1989. Furthermore, they concluded that enterprises with prior export expertise can increase their export probability by 60 percentage points. In a similar vein, Eaton et al. (2007) made crucial contributions by analysing transactional level Colombian firm data from 1996 to 2005 to shed light on firm exporting patterns. They demonstrated that the conditioning of

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<sup>1</sup>for the theoretical background of sunk costs see Dixit (1989b), Dixit (1989a), Baldwin and Krugman (1989), and Baldwin (1988).

surviving, new entrant enterprises account for a large portion of overall export in the long run. Additionally, Bernard et al. (2009) reported that extensive margin drives a large portion of export and import variation across trading partners using detailed ten-digit (HS) US firm-level transaction data from 1995 to 2003.

In more recent works, productivity differences caused by firm heterogeneity and sunk costs have been strongly criticized for failing to capture dynamic patterns of firms' export. The following studies were carried out to exploit dynamic patterns of firms' export by implying the dependency of firms' export to their preceding destination market. To begin with, Albornoz et al. (2012) observed, utilizing distinguished Argentinian data at the firm-destination-year level, that despite sunk costs, many firms cease exporting shortly after they begin. Their criticism is that sunk cost models cannot account for the following scenarios. i) firms that re-export after a brief interruption; ii) firms among others that begin exporting into many markets at the same time; and iii) firms among exporters whose goods are homogeneous. As a result, they suggested "*sequential exports*", in which firms has a high likelihood of exporting to different destinations to expand their operations because their export linked positively across destinations over time. They argued that nearby destinations, referred to as "testing grounds" could serve as a good starting point. In the same light, using moment inequalities and Chilean exporters' data to estimate firms' export dynamics. Morales, Sheu, and Zahler (2014) argued that extended gravity plays a crucial role in a firm's entry cost. In particular, they argued that sunk costs vary across countries and their counterparts depending on whether they have similar GDP per capita, share a border, speak the same language, or are located on the same continent. For instance, they found that if a country's subsequent exports are to the same continent, then, sunk costs would decrease by 19% to 29%. Likewise, Defever, Heid, and Larch (2015) have shown, using Chinese business-level data, that firms have a two-percentage point higher probability to export to a destination that shares a border with the prior export destination. Furthermore, Chaney (2014), using French data at the firm level, demonstrated that firms only export to a destination which they have contact. However, they argued, around 60% of more contacts are established at random rather than through network-based encounters.

Another line of thought in the literature has been that specialization in complex goods would affect economic growth. Nevertheless, numerous studies have also revealed that focusing on complex goods would lead to technological diversification which has link with economic growth performance of countries. More specifically, a country's economic growth can be achieved by focusing on the manufacturing of complex products, where extant literature distinguishes between several definitions of goods' complexity. To begin with, Hidalgo and Hausmann (2009) stated

that a country's development level is determined by the complexity of its economy and also by its production structure. In addition, they claimed that complexity can predict future economic growth. Likewise, Levchenko (2007) maintained that the complexity degree of goods is positively associated with economic development, where institutional differences or human capital could determine the production of complex goods. Similarly, Hausmann, Hwang, and Rodrik (2007), constructing an index that accounts for then "income level of country's exports", suggested that countries would gain more, by specializing in goods that rich countries' export. Even though classical comparative advantage theory suggests otherwise. Furthermore, Rodrik (2006) demonstrated that China's rapid export-led economic growth is linked to its specialization pattern, which is aided by government incentives. This pattern's features included a propensity for more complex goods over labour-intensive goods. Poncet and De Waldemar (2013) stated that economic growth can be achieved by upgrading products, using Chinese city-level data from 1997 to 2009 and the complexity index developed by Hidalgo and Hausmann (2009).

In addition to the previously mentioned body of literature, it has been highlighted that focusing on complex goods could potentially promote economic stability by reducing volatility. Koren and Tenreyro (2013) contended that if countries endogenously embrace a variety of inputs to the production process, their sensitivity to variety-specific shocks would be mitigated. Hence, they argued that technological diversification is a strong factor in explaining the negative link between volatility and development. Similarly, Krishna and Levchenko (2013) revealed that industries using more complex goods, as measured by the number of intermediates, are less volatile in the United States. In the same manner Maggioni, Lo Turco, and Gallegati (2016), using a Turkish firm-level data and the complexity index constructed by Hidalgo and Hausmann (2009), proved that the complexity degree of goods has a substantial negative effect on output volatility.

## 1.2 Culture, Religion and International Trade

Trade has a long history beginning from Stone Age and today, it has a great role to shape the modern world (Bernstein, 2009). Even though the world recently faced a substantial decrease in global trade as a result of the Covid-19 outbreak (Espitia et al., 2022), it is indispensable not to mention the expansion of trade between countries over the previous few decades. The economic dimension is defined as critical in this exchange of goods among different countries. Nonetheless, culture is another important dimension since a person's cultural traits influence how and with whom he or she interacts economically (Helble et al., 2006). Therefore, there is a vast amount

of literature that deals with the question of how religion and/or culture influence the economy<sup>2</sup> <sup>3</sup>. Nonetheless, rather than the former issue, this subsection will provide some evidence on how religious/cultural proximity across countries affects economic outcomes, notably in the field of international trade.

Scholars have developed a plethora of approaches for measuring the impact of culture and cultural differences on trade between countries. They emphasize cultural aspects, that can influence bilateral trade through two main channels: trade cost and preference. As a consequence, some critical cultural variables have been identified, including colonial ties, language, ethnicity, and religion. These are known as non-traditional determinants of international trade.

The role of language similarity in international trade has been investigated by many scholars. To begin with, by generating annual gravity equations for the years 1960-1985, Boisso and Ferrantino (1997) found that cultural distance, as proxied by linguistic distance, had a detrimental impact on international trade at first. But afterwards, its impact started to fade. Subsequently, Hutchinson (2005) argued that the language distance, which quantifies a language's distance from English, is negatively associated with international trade. A meta-analysis performed by Egger and Lassmann (2012) also highlighted that having a common language, whether official or spoken, raises international trade flow by 44 per cent. The language effect has been thoroughly explored by Melitz and Toubal (2014). They argued that direct contact without intermediaries was determined to be far more essential than other aspects of language for bilateral relation, in the context of trade. It has been also examined the effect of language similarity on the extensive margin. Helpman, Melitz, and Rubinstein (2008) pointed out that language similarity has a positive effect on the extensive margin. In a similar vein, Egger and Lassmann (2015), using Swiss data, showed that the influence of common native language had a greater impact on the extensive margin of trade than on the intensive margin.

As the second aspect, colonial links appear to have a contradictory relationship with international trade. On the one hand, Head, Mayer, and Ries (2010) discovered evidence that colonial relationships hinder long-term international trade by 65 percent. On the other hand, Helpman, Melitz, and Rubinstein (2008), stated that the impact of colonial links is favourable for bilateral trade flow. Similarly, Rauch (1999) asserted that colonial ties/Language similarity, matter more for differentiated products than for homogeneous goods. He also confirmed, using Chinese population share statistics,

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<sup>2</sup>See for household participation to religious activities Azzi and Ehrenberg (1975) for religion, scientific knowledge and regimes Bénabou, Ticchi, and Vindigni (2015a), for economic growth and religion McCleary and Barro (2006) and Barro and McCleary (2003), for culture and institution Tabellini (2008), for culture and economic outcomes Guiso, Sapienza, and Zingales (2006)

<sup>3</sup>The origins of the question can be traced back to Max Weber's seminal work "*Protestant Ethics and the Spirit of Capitalism*."

that the influence of ethnicity network is more pronounced for differentiated goods (Rauch and Trindade, 2002).

Ethnicity as another cultural component, argued by different scholars. Its favorable impact on international trade has been discussed. For instance, Aker et al. (2014) stated that having a shared ethnicity lowers transaction costs related to providing credit and communication by analysing agricultural trade data from Niger and Nigeria. Melitz and Toubal (2019) suggested that somatic distance, which evaluates differences in physical appearance, is an important factor for international trade in their study of chosen European Economic Area members for 1996. Similarly, some scholars argued that genetic distance between populations is a significant determinant in per capita income differences (Spolaore and Wacziarg, 2009). This theory was examined in international trade by Bove and Gokmen (2018). They highlighted that bilateral trade is one of the channels through which genetic distance hinders development diffusion.

Religion has received greater attention from early economists while lately there has been little research on this subject relatively (Lewer and Berg, 2007b). It has been discussed as sharing religion or religious culture has a different influence based on the features of each religion (Helble, 2007; Guiso, Sapienza, and Zingales, 2003). Nonetheless, religious similarity across countries is shown to have a positive effect on international trade. The mechanism through which religious similarity promotes trade is lowering information barriers. Because sharing the same religion can foster bilateral trust between contracting parties (Lewer and Berg, 2007b; Guiso, Sapienza, and Zingales, 2003; Lo Turco and Maggioni, 2018). Therefore, it is likely that the firm will select an export destination with lower trade barriers, where religious similarities potentially play an important role. Furthermore, the literature emphasizes that effect of religious similarity is more pronounced for extensive margin rather than intensive margin. To begin with, Lewer and Berg (2007a) claimed that religious similarity promotes bilateral trade by establishing a network effect. By estimating a two-step procedure Helpman, Melitz, and Rubinstein (2008) likewise argued that religion plays an important role in the creation of trade relationships but has no effect on the quantity of trade. Similarly, Lo Turco and Maggioni (2018) provided evidence that Islamic proximity influences Turkish firms' export entry decisions positively. They claimed that a province's higher religiosity would lead to firms entering more religious destinations since religiosity fosters bilateral trust between contracting parties. They further demonstrated that the effect of religiosity is greater for differentiated products.

Furthermore, the impact of religious similarities on international trade in services



got attention and investigated as well. By estimating several gravity equation specifications for the years 2000 to 2007, Lee and Park (2016) found that religious similarity has a beneficial impact on international trade in services.

Existing literature considers cultural variables to be time-invariant. However, in recent years, some attempts have been made to treat cultural variables that change over time. Firstly, Felbermayr and Toubal (2010) measured cultural proximity as points awarded by one country to another in the European Song Contest and their results interestingly revealed that cultural proximity had a positive association with bilateral trade flow. Secondly, Disdier et al. (2010) claimed that current trade in cultural goods can be regarded as the cultural similarity between countries. They found that their time-varying cultural proximity is positively related to bilateral trade. Both papers used country-time fixed effects, pair fixed effects, and control for the other factors that potentially influence bilateral trade and their findings have proven that cultural variables may change over time.

### 1.3 International Trade and Financial Intermediaries

This subsection begins with how financial intermediaries play a role in international trade. Then moves onto Islamic finance and terminology used in the context of Islamic finance, and concludes with specific religious institution known as Islamic banking.

Finance and its institutions such as banks, either as restraints or as opportunities, play a crucial in international trade (Niepmann and Schmidt-Eisenlohr, 2017). Apart from providing a secure payment system to parties of international trade, banks also have a role in financing exporter or non-exporter firms for their activity. Therefore, various researches have established a link between firm financial constraints and export operations. Starting from the comparative advantage of developed financial economies, evolving to the credit constraints and their impact on export e.g. export entry, many scholars have conducted both theoretical and empirical studies to shed light on this factor. Back to the earliest stage of international trade and finance research, Beck (2002) addressed a potential association between financial development and manufacturing trade, presenting evidence for the hypothesis first stated by Kletzer and Bardhan (1987). Beck stated that the development of the financial sector could lead to a comparative advantage in manufacturing industries, based on 30-year panel data for 65 countries. Later on, theoretical studies on trade literature were mainly concentrated on heterogenous firm model (Melitz, 2003 model) with fixed cost to export. Chaney (2016) argued in his theoretical work that financial underdevelopment would impede exporters' ability to access foreign markets. In

another theoretical work, Manova (2013) studied the negative effects of financial market flaws on international trade. Developing a heterogeneous-firm model with countries at various stages of financial development, the author applied her model to aggregate trade data, and the results revealed that financial development enhances countries' exports, and financially advanced economies export to more destinations with a broader range of products.

Referring the empirical studies in literature, Muûls (2015) constructed a dataset of firm-level Belgian trade transaction data, decomposing trade into extensive and intensive margins. Using the data years between 1999 and 2007, the study revealed that manufacturing enterprises were more prone to be exporting or importing if they faced less financing constraints. The author argued that credit constraints affect the extensive margin of international trade, in particular, the firms that have higher credit scores export to more countries, and their exports contain a wide range of products. Minetti and Zhu (2011) investigated the link between credit rationing and business export activity using micro-level collected data from 4680 Italian firms in 2001. Their findings demonstrated that loan rationing affects the likelihood of exporting by 39%. Furthermore, the results revealed that credit rationing affects firm exports, particularly in industries with high external financing dependence, and credit frictions appear to impede firm exports, particularly in high-tech sectors. Aiming to assess the role of internal firm resources in mitigating sunk entry expenses involved with export, Forlani (2010) used a data collection of small and medium-sized Italian firms (SMEs) to analyze. The findings indicated that when enterprises are credit-limited, new exporters must rely on internal liquidity to cover sunk costs; additionally, their findings revealed that entrance chance in the export market is influenced by the low of capital stock for constrained firms. While they found no indication that entering the export market improves a firm's financial health, they reported that increasing the number of destinations increases exporters' liquidity. In another study conducted by Greenaway, Guariglia, and Kneller (2007) financial health and export market participation have been examined using panel data from 9292 UK manufacturing enterprises for the period over 1993 to 2003. According to their findings, exporters have better financial condition than non-exporters. Although there is strong evidence that participation in export markets improves enterprises' financial condition, no evidence has been shown that firms with superior ex-ante financial condition are more likely to begin exporting. While, Bellone et al. (2010) employing French firm data, investigated financial constraints and firm export patterns from 1993 to 2005. The findings demonstrated that export participation enhances firm financial condition. Financial restrictions operated as a deterrent to export participation. Better availability of external available capital improved the likelihood of beginning to

export.

Employing a Chinese firm-level data set that corresponds to a Census of all firms within the period of 2001–2005 Egger and Kesina (2013) constructed four financial constraint measures: the long-run debt–capital ratio, the financial cost–liquid funds ratio, the liquid asset–capital ratio, and the profit surplus over long-run debts to total assets ratio. According to the research evidences, the negative association between exports and credit constraint enterprises has been found.

In a more specific context referring banking sector, Lo Turco and Maggioni (2017) using a sample of Turkish manufacturing firms, investigated the impact of banking sector development on the first-time export entry of small enterprises (SEs) in the manufacturing sector. They revealed data on the necessity of credit facilities in mitigating heavy export entry sunk costs. Furthermore, their findings suggested that SEs gain from the banks' destination-specific knowledge rather than generic export information, and they provided evidence—via local banking development—of the impact of foreign bank branches on SEs' export entry. This study has addressed an important research gap in the literature given the economic feature of Turkey as an emerging economy.

Taking the arguments stated above into consideration, it should be anticipated that when the number of banks increases, credit devoted to exporters will increase regardless of the type of bank. Because new opening banks could reduce exporters' credit constraints by providing capital. Similarly, Islamic banks could improve the efficiency of the financial sector by entering new markets and competing with traditional banks. Nonetheless, the effect of Islamic banking may differ from that of conventional banking in that Islamic banks may have a selective influence on exports in favor of Muslim-abundant countries.

### 1.3.1 Islamic Finance and Its Impact on Economy

The Islamic finance is defined by Warde (2000) as “*Islamic financial institutions are those that are based, in their objectives and operations, on Koranic<sup>4</sup> principles.*” In particular, Sharia is the Islamic law that govern Islamic finance aiming to eliminate malpractice and exploitation of trade (Islam, 2017). Islamic finance is constituted of several institutions such as commercial and investment banks, mutual insurance, and investment firms. Nonetheless, Islamic banks retain to be backbone of the Islamic finance (Errico and Sundararajan, 2002). In history, it has been always a debate about the relationship between providers of money and people who are in need of money (Olechnowicz, 2011). There would be an intersection between them if conditions are met. Of course, the core point of the condition is what we call today “*interest rate*”. Then, the question

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<sup>4</sup>It is the sacred book of Muslims. It is known also as Quran or Qur'an.

would be is it possible to supply money without an interest rate? To answer that there is exists an alternative methodology as known as Islamic banking where their operation is based on the notion of “interest-free”. Islamic banking differs from traditional banking in that it does not charge interest (Salman and Nawaz, 2018). It follows a different set of rules and has a different risk profile than conventional banking. Because of the Islamic principles, establishing a “ interest-free” banking environment is a major priority for Muslims (Khan, 2010).

Risk, according to Islamic law and its principles, should be shared between the lender and the borrower rather than being passed to simply one side (Al Maddah, 2017). Although risk-sharing between the lender and the bank or between the borrower and the bank is not well defined, the risk-sharing principal is yet another fundamental characteristic of Islamic finance (Kuran, 1995). In this concepts, rather than guaranteed interest rate to lender, Islamic finance offers profit-loss sharing (henceforth PLS) mechanism. PLS which is known as *mudarabah* In Arabic, is suitable to Koran and Islamic law (Warde, 2000). This mechanism is important given the Koran, the shariah, makes numerous statements<sup>5</sup> to the prohibition of *riba*<sup>6</sup> in transactions which is called as interest rate, today. Islamic finance’s resilient to shocks is also claimed due to this characteristics which is emphasis on risk sharing and its limits on excessive risk taking (Hussain, Shahmoradi, and Turk, 2016).

Furthermore, *gharar*, gambling and trading of haram goods are some of the forbidden activities according to Islamic law. Koran states<sup>7</sup> that any wealth derives by chance is not allowed (Uddin, 2015). Nevertheless, any speculative activities in capital market or derivatives instruments are not subject to Islamic banking since *Gharar* means fraud, delusion, deception or lack of information (Uddin, 2015; Warde, 2000) and Even though unlike interest rate, there is nothing about *gharar* in Koran; It is mentioned several times in *Hadiths*<sup>8</sup> (Warde, 2000). Last but not least, trading some goods such as pork and alcoholic products are *haram*<sup>9</sup> and not permitted in Islamic finance (Warde, 2000). As a consequence, any profits derived from *riba* (interest rate), *gharar* (fraud) , *maysir* (gambling), and haram (prohibited goods) are forbidden in Islam. Since the early days of Islam, trading has been the primary source of wealth. Furthermore, it was crucial because traders played a critical role in the spread of Islam throughout Africa and the Far East (Warde, 2000). However, trading was only permitted provided it complied with the requirements of the Islamic laws as

<sup>5</sup>Koran 3:130, 4:161, 30:39 and 2:275-2:280

<sup>6</sup>In English, there is no equivalent. It’s an Arabic word that signifies usury or exploitation (Warde, 2000). The *riba* conversation is still going on. Warde (2000) pointed out the debate that rational interest rates, as maintained by some Islamic scholars, could be acceptable.

<sup>7</sup>As cited in Uddin, 2015

<sup>8</sup>Hadiths refer to actions and words of Prophet Muhammad

<sup>9</sup>Haram intends forbidden act.

aforementioned.

Despite the large number of theoretical works on Islamic finance, empirical research on the relationship between economic performance and Islamic finance is limited. The existing literature emphasizes the positive impact of Islamic finance development on economic growth. For instance, Kassim (2016) and Furqani and Mulyany (2009) claimed that there is a positive relationship between Islamic bank deposits and real economy in Malaysia. Financial development in Islamic banks, according to Zarrouk, El Ghak, and Al Haija (2017), encourages economic growth in the United Arab Emirates. Similarly, Nawaz et al. (2019) asserted that an effective Islamic finance system promotes economic growth in Pakistan. Finally, by estimating a dynamic panel of 52 countries, Imam and Kpodar (2016) found that Islamic finance development has a positive impact on economic growth.

Another reason for the appeal of Islamic banking is that it includes qualities that encourage actual economic activity while limiting speculative activity through risk-sharing structures. Subsequently, following the recent financial crisis, the question of whether Islamic financing can prevent a crisis has been raised (Kayed and Hassan, 2011; Derbel, Bouraoui, and Dammak, 2011; Ahmed, 2010). Likewise, Furqani and Mulyany (2009) investigated the impact of the Islamic financial system on many economic variables, including trade, by using Vector Error Correction Model on Malaysian data from 1997 to 2005. They defined trade as the sum of exports and imports. They contended that trade and the Islamic finance system have no long-term relationship. Their conclusion is that the proportion of the Islamic financial system is still very low as compared to the conventional system.

A closer look at the empirical literature on international trade and Islamic finance, however, reveals a number of gaps and shortcomings. Using statistics from the Gulf Cooperation Council from 1995 to 2011, Alandejani, Kutan, and Samargandi (2017) asserted that Islamic banks are more likely to fail, and so have a shorter life span than traditional banks. Likewise, Hussain, Shahmoradi, and Turk (2016) argued that Islamic banks are subjected to the same risks as their conventional counterparts and in addition to that they possess idiosyncratic risks. They also claimed that the following characteristics restrict the growth of Islamic financing; i) inability to use short-term treasury securities in the traditional banking system, which results in storing surplus money ii) a lack of standardized regulatory and oversight agencies; and iii) an absence of research on the use of Islamic finance instruments in monetary policy.

## Chapter 2

# Religious Similarity and Exports

### 2.1 Introduction

Religion has influenced communities in a variety of ways since the early time of humankind. It operates as a pervasive network that has an impact on economic performance at the individual, group, and national levels (Noland, 2003; Lee and Park, 2016).

Although there are many religions around the world, only a few of them such as Christianity, Islam, Hinduism, Buddhism and Judaism are considered as world religions since they represent the largest and most widely practised religious movements. The distinctions between these religious groups have been proven to predict a variety of moral codes, personality traits, and economic preferences (White, Muthukrishna, and Norenzayan, 2021). Therefore, in this study combining The World Values Survey (WVS)'s data derives from a national sample survey in 75 countries with variable religion, and World Integrated Trade Solution (WITS) data, has been examined the effect of proportional religious similarity across countries on the extensive margin of international trade. Furthermore, when the goods are relationship-specific, the extent to which the impact of religious similarity changes on extensive margin is investigated. Where relationship-specificity had been constructed à la Nunn (2007). The disaggregated trade data is gathered from WITS database, at a 4-digit Harmonized system 2002 classification for the years between 2002 and 2016.

The linear probability model (LPM) was used to quantify the impact of religious similarity on export probability when the exported good had not previously been exported any place else in the preceding two years. Because it allows the use of high-dimensional fixed effects, LPM is the only option for model setting. The model is similar to the theoretically established Gravity model, with the sole difference being that it uses the probability of exporting as a dependent variable rather than the quantity of exports.

This chapter investigates whether, as a non-traditional trade cost, time-variant religious similarity between exporter and importer could play a role in the extensive

margin, where extensive margin refers to beginning to export a good that has not been exported in the previous two years. The research question is based on the notion that religious similarity could increase bilateral trust between contracting parties (Lewer and Berg, 2007b; Guiso, Sapienza, and Zingales, 2003; Lo Turco and Maggioni, 2018). Increased trust, in particular, would diminish uncertainty and information barriers between exporter and importer. Nonetheless, this chapter is also motivated by the fact that the effect of religious proximity is found to be more predominant in the extensive margin -referring to trading partners- rather than the intensive margin (Helpman, Melitz, and Rubinstein, 2008). More precisely, religion is far more important when it comes to establishing a new trade partner. This suggests that religion has a detrimental effect on fixed trade costs (Helpman, Melitz, and Rubinstein, 2008). Therefore, a positive association between extensive margin and religious similarity could be expected in this paper.

Moreover, this chapter expands on the study of whether the influence of time-variant religious similarity changes depending on how relationship-specific goods are. By building more confidence and encouraging more bilateral investments to produce intermediate goods, there is a transmission mechanism wherein religious similarity may encourage to trade more relationship-specific products.

By examining how religious similarity changes over time, this study discovered that religious similarity has a positive effect on extensive margin of international trade. Furthermore, as the degree of relationship-specificity increases, the effect of religious similarity becomes larger.

This chapter contributes to the literature in two ways. First, to the best of the author's knowledge, it is the first time religious similarity has been attributed as a time-variant. Second, the impact of religious similarity on relationship-specific products has been addressed, where relationship-specificity can be regarded as a source of comparative advantage (Nunn, 2007).

The remainder of this chapter is organized as follows. The next section provides information about data, sample and variable construction strategies. Section 2.3 contends that the empirical model has both advantages and limitations. Section 2.4 discusses the results of this chapter and performs robustness checks. Section 2.5 concludes by taking into account prior works.

## 2.2 Empirical Strategy

Firstly, the extensive margin of international trade is determined in this chapter in a novel approach, using bilateral trade statistics at the country level. The approach used to calculate extensive margin distinguishes this work apart from the rest of the

literature. For example, Helpman, Melitz, and Rubinstein (2008) estimated extensive margin with country level bilateral trade data, where extensive margin refers to trading partner -trade value greater than 0 for the given year-. This chapter exploits the product heterogeneity of countries in the international market. Therefore, the term “extensive margin” refers to newly introduced goods to the international market that have not been exported in the previous two years, where exported goods statistics are gathered using the Harmonized System (HS) 2002 classification at 4 digit.

Second, no work in the literature, to the best of the author’s knowledge, attributes religious similarity as time-variant. Using the World Values Survey (WVS) to obtain a share of each religion in every available country over a 15-year period, this chapter employs the religious similarity variable as a time-variant for the first time in the existing literature. This novel approach should enable for both the collection of further evidence on the importance of religious similarity in extensive margin of international trade, as well as its varied effect over time. Yet, in the international trade literature, Felbermayr and Toubal (2010) and Disdier et al. (2010) have adopted a similar approach, treating cultural similarity as time-varying. The former, in instance, used points awarded by one country to another in the European Song Contest as a proxy for cultural similarity, whilst the latter proxied cultural similarity as ongoing bilateral trade in cultural goods.

### 2.2.1 The Data & Sample Construction

The sample used in this paper is composed of three different sources. Firstly, bilateral trade data was downloaded from World Integrated Trade Solution (WITS) <sup>1</sup>. The trade data is disaggregated at the 4-digit product level and classified as HS-2002. The data begins in 2002 and continues until 2016. The study will now be extended to the product level thanks to the disaggregated bilateral trade data. Notably, the use of disaggregated data allows this study to shed light on the mechanism through which religious similarity influences countries’ trade patterns. In this work, the term “disaggregated bilateral trade” refers to bilateral trade data in which an additional column defines the type of product at 4 digit according to the Harmonised system-2002 classification. Commodities are excluded from the analysis for the purposes of this study, which shrinks product categories to 916 at 4 digits. The sample includes seventy-five exporter and importer countries. The countries are listed in the appendix.

Second, some control variables are included in the model, such as Linder<sup>2</sup>, which is the natural logarithm of the difference in GDP per capita between the origin and destination countries. GDP per capita data for exporter and importer countries were

<sup>1</sup><https://wits.worldbank.org/>

<sup>2</sup>It is based on the notion that countries should trade more with those who have similar demand structures (Linder, 1961).



downloaded from CEPII (French Centre d'Etudes Prospectives et d'Informations Internationales)<sup>3</sup>.

Third, WVS provided information on religious affiliation in the sample nations. Every five years, WVS conducts and publishes a survey on religious affiliations, among other topics. The sample data in this paper is composed of wave 4 (Inglehart et al., 2018b), wave 5 (Inglehart et al., 2018a), and wave 6 (Inglehart et al., 2018c). Note that Wave 7 had not yet been published when this study began. Indeed, wave 7 was released in May 2022.<sup>4</sup> As a consequence, the survey data cover the years 1999 to 2014. The bilateral trade data was collapsed into three periods in order to have the same time span. The first period comprises the years 2002-2006, the second encompasses the years 2007-2011, and the third covers the years 2012-2016. It should be noted that the survey data does not cover every countries in the sample for each time. Therefore, a country may or may not enter for all periods.

One may notice that the survey data does not correspond to the exact period of the trade data. The trade data was purposefully chosen to begin in 2002. There are a number of reasons behind this. To begin with, the Asian economic crisis occurred in 1997, affecting various nations like Thailand, South Korea, Indonesia, Malaysia, and the Philippines (Higgott, 1998). The aftermath of the crisis persisted long into the 2000s. Secondly, two heavily populated trade actors, India<sup>5</sup>, and China<sup>6</sup> entered WTO end of the '90s and the beginning of the 2000s. The former is joined in 1995, while the latter is joined in 2001. Therefore, trade data following China's accession should be more stable. Third, as previously stated, this study expands the research to the product level and investigates if religious similarity encourages more trade for relationship-specific products. Therefore, the relationship-specific index was utilized, and it is generated using the HS 2002 categorization. In order to have the same classification with product level relationship-specific index, bilateral trade data starts from 2002 using HS 2002 classification. A few years' difference between trade data and survey data should not be a cause for concern in this empirical study.

Finally, time-varying Regional Trade Agreements (RTA) are inserted as an additional control that is developed by Egger and Larch (2008).

<sup>3</sup>[http://www.cepii.fr/CEPII/en/bdd\\_modele/presentation.asp?id=8](http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=8)

<sup>4</sup><https://www.worldvaluessurvey.org/WVSContents.jsp>

<sup>5</sup>[https://www.wto.org/english/thewto\\_e/countries\\_e/india\\_e.htm#:~:text=India%20has%20been%20a%20WTO,GATT%20since%208%20July%201948.](https://www.wto.org/english/thewto_e/countries_e/india_e.htm#:~:text=India%20has%20been%20a%20WTO,GATT%20since%208%20July%201948.)

<sup>6</sup>[https://www.wto.org/english/thewto\\_e/countries\\_e/china\\_e.htm](https://www.wto.org/english/thewto_e/countries_e/china_e.htm)

### 2.2.2 Variable Construction

Two variables, *start\_new* and *rel\_sim*, have been constructed for the scope of this study. Firstly, variable *start\_new<sub>odpt</sub>* has been generated in which it is a dummy variable that takes value 1 when country *O* start to export a new product *P* to country *D* in time *T*. Following that, two further conditions, in addition to the previous one, were imposed, under which the product was not be exported to other countries last year and the year before last year. In other words, if product *P* is being exported from country *O* to country *D* for the first time, but it was already exported from country *O* to any other country either previous year or the year before the last year, then, *start\_new* would be equal to 0. Nonetheless, when the dataset is divided into three periods, *startnew* is distinguished by exporter country, importer country, and product level at four digits. As a result, when *startnew* is collapsed, it takes the maximum value since it can have a value of 1 repeatedly over the course of 5 years. In other words, if a country introduces more than one product onto the export market with the same four-digit product code, the value of *startnew* will be equal to one, which is the maximum value. Similarly, if a country introduces a new product onto the export market after three years of initially introducing the product, the value of *startnew* would be equal to one for that specific period and product.

To give a generic example, suppose Italy began exporting *radar apparatus* (product code 8526)<sup>7</sup> to Spain in 2005. Then, *start new* would be one if Italy had not exported radiators to any country in the previous two years. This approach makes the dependent variable very restrictive.

TABLE 2.1: Mean of dependent variable by period

Period	1	2	3	Total	Observation
	2002-2006	2006-2011	2011-2016		
<i>start_new</i>	0.022	0.05	0.05	0.044	1,590,871

As shown in table 2.1, the mean of the *start\_new* is approximately 4%, indicating that the sample countries' average probability of exporting a product to a new country that has not been exported anywhere in the previous two years is 4%. However, even though the change is very small, there is a growing trend over time.

The religious similarity variable is generated by taking the percentage of religious affiliation in each country into consideration. Therefore, The religious similarity variable represents the degree to which exporter and importer countries are religiously

<sup>7</sup>Since product codes are aggregated at the 4-digit level in this context, radar apparatus have the following meaning: Radar apparatus, radio navigational aid apparatus and radio remote control apparatus

similar. To calculate the religious similarity variable, the percentage of each religion denomination in the sample countries must first be determined. The data is obtained from the WVS by asking the following question:

*Do you belong to a religion or religious denomination? If yes, which one?*

There are more than a hundred religions or religious denominations reported in the survey. For scope of this study only a few of them were taken into consideration for the sample. However, they represent the higher shares among other religions. The religions represented in the sample are as follows: Buddhist, Hindus, Muslims, Christians, Judaists, Non-belongings. Firstly, Protestants, Catholics, Orthodox and many of their denominations i.e. Evangelicals, Lutherans, Anglicans, and greek Catholics etc. were grouped as Christians. Similarly, Shias and Sunnis were grouped as Muslims<sup>8</sup>.

As one might expect, the data employed in this work is at the individual level. Thus, the mean for each religion has been taken in order to make the data country level while accounting for the survey organizer's assigned weight<sup>9</sup>. Finally, for each available period, the share of each religious denomination is obtained for the exporter and importer countries.

The religious similarity<sup>10,11</sup> is calculated by given formula below. Nevertheless, another religious similarity indicator is provided as a further control in accordance with the formula established by Guiso, Sapienza, and Zingales (2009)<sup>12</sup>.

$$Rel\_Sim_{odt} = 1 - \frac{\sum_{i=1}^R \left| \frac{RelAff_{oit}}{100} - \frac{RelAff_{dit}}{100} \right|}{2} \quad (2.1)$$

R = Total number of religious affiliations

$RelAff_{o/d,t}$  = Share of affiliates to religion i in o/d in time t

<sup>8</sup>WVS has documented 97 religious affiliations. In addition, the appendix contains a complete list of religious affiliations and categorization strategy for this study.

<sup>9</sup>According to survey organizer, the weights assigned to each country are determined by the censuses conducted in that country.

<sup>10</sup>In this paper, religious denominations that have few adherents are grouped in the category Other by the Author. However, it is excluded the mentioned category and rest of the religious denominations were normalized since aim of this study is to measure religious similarity. In the paper, category Other represents only 2.5% of the sample.

<sup>11</sup>An error in Albania's religious denomination share was discovered. In particular, the statistics shows that Muslims account for 0% of the population, whereas Christians account for 76%. This, however, is incorrect. After examining the WVS official website, the data for Albania is manually corrected as follows: Muslims 58%, Christians 28%, Non-belonging 12.9 percent, Hindus 0%, Buddhists 0%, and Jews 0%.

<sup>12</sup>Their formula gives the traditional probability of two randomly chosen individual share the same religion. However, the estimates indicate that there is no difference between two formula in terms of significance, as appendix A section A.4 demonstrates.

Note that *Rel\_Sim* is calculated for three period since this work uses panel data structure. Thus, religious similarity is attributed as time-variant between pairs despite to main literature. In particular, Lewer and Berg (2007b), Helpman, Melitz, and Rubinstein (2008), Guiso, Sapienza, and Zingales (2009), Lee and Park (2016) and Helble (2007) have considered religious similarity as time-invariant in their study.

TABLE 2.2: Mean of religious similarity by period

Period	1	2	3	Total	Observation
religious similarity	0.393	0.445	0.435	0.430	1,590,871

As table 2.2 illustrates, religious similarity rises by 5.2 percentage points from period 1 to period 2. While it decreases by one percentage point from period 2 to period 3.

The religious similarity variable lies between 0 and 1. Where 0 refers to exporter and importer countries do not share same religious denomination at all. Whereas, value 1 indicates maximum similarity. In other words, if contracting countries share the same portion of religion composition in time *t* then the value for the similarity would be 1. In our sample, as a pair, Algeria and Morocco have the value for similarity index equal to 1 for the first period. Likewise, Tunisia and Yemen have a similarity value equal to 1 for the third period. However, as table 2.3 illustrates, there are numerous pairs where the religious similarity variable has value of 0.

TABLE 2.3: Pairs with a religious similarity of zero

Pair	Period
Argentina & Algeria	1
Argentina & Morocco	1
Chile & Algeria	1
Chile & Morocco	1
Algeria & Japan	1
Algeria & Mexico	1
Japan & Morocco	1
Morocco & Moldova	1
Marocco & Mexico	1
Moldova & Algeria	1
Moldova & Pakistan	1
Chile & Tunisia	3
Chile & Yemen	3
Japan & Tunisia	3
Japan & Yemen	3
Mexico & Tunisia	3
Mexico & Yemen	3
Poland & Tunisia	3
Poland & Yemen	3
Tunisia & Japan	3
Tunisia & Uruguay	3
Uruguay & Yemen	3

## 2.3 Empirical Model

The empirical model that is used in this paper is in the same line with the traditional gravity estimates. However, on the left hand side, this study has extensive margin of international trade which is the probability of starting to export a new product, rather than intensive margin. There are two critical points for the empirical model that set it apart from the rest of the models in the literature. Firstly, the construction strategy of extensive margin of international trade is unique. Because the extensive margin is examined at country level rather than firm-level. The macro level data has several advantages. To begin with, it allows to analyse trade pattern of a countries. Similarly, countries' comparative advantages can be obtained by using macro level data. The majority of the time, acquiring firm-level data is challenging, although country level data is widely available. Country-level data often referred as "*big picture*" since it

investigates global international trade issues by taking into account as many countries as possible.

Second important point of this model is that religion affiliations for each country change over time despite to traditional estimates. Hence, the religious similarity variable varies over time. The foundation of this research is that a person's religious affiliation might change over time for a variety of reasons. For instance, secularization hypothesis emphasizes that developed countries tend to transform their institutions from religious-oriented to non religious institutions. On the contrast, it is found that the world as a whole become more religious. Because religious people replace themselves at a higher rate than non-religious people, the world as a whole becomes more religious (Norris and Inglehart, 2011). Furthermore, countries' regulations on religion and religious organizations may have an impact on people's religion. In a similar vein, McCleary and Barro (2006) stated that certain countries, such as Turkey, France, and China, regulate religion even though they do not have an official state religion. Nevertheless, some countries e.g. Colombia, Denmark and Pakistan, despite having an official state religion, do not regulate religion. It should be noted that this work does not address the issue of what influences people's religious beliefs. Rather, this study looks into how religious similarities between two countries influence international trade. One may think, endogeneity may arise due to policy changes in a country that could affect a country's religion. The model, on the other hand, has a country-time fixed effect, which accounts for a country's characteristics and their change through time. Another important issue in empirical approach is that sampling in the World Values Survey (WVS) changes with each wave. However, in order to address sampling concerns, survey organizers allocate weight to each individual based on a census of that country. By doing so, average answers in a given country should not change due to conducting surveys with different persons. Indeed, many studies in the literature rely on WVS.

Given the 15-years sample length, the data is thought to reflect changes in religious affiliation in both countries exporter and importer. The empirical model is given below as equation 2.2 demonstrates.

$$\begin{aligned} \Pr(\text{start\_new})_{odtp} = & \beta_0 + \beta_1 \text{rel\_sim}_{odt} + \beta_2 \text{sim}_{odt} * r_{sp} + \gamma X_{odt} \\ & + \delta_{opt} + \zeta_{dpt} + \theta_{od} + \epsilon_{odpt} \end{aligned} \quad (2.2)$$

The variable  $\text{start\_new}_{odtp}$  takes value 1 if county  $O$  starts to export a new good that is not exported in last two years to another country. It is 0 otherwise.  $\beta_0$  is the

constant.  $rel\_sim_{odt}$  expresses religious similarity between country pairs that varies over time. Subsequently, X matrix refers to two control variable for the empirical model. The first component of X is the natural logarithm of the total number of products exported to a destination country that is  $ln\_tot_{odtp}$ . The motivation here is that if a country exports a high number of different products then it is more likely that the country will export new products since it has ability to do so. The second component of the X matrix is the time variant RTA. It derives from database that is constructed by Egger and Larch (2008) and It takes value equal to 1 if exporter and importer countries are part of RTA <sup>13</sup>. Because the sample is divided into three periods of five years each, the variable RTA is also separated into three periods where it takes a value of one for a given period if two countries reach an agreement or create a union. More specifically, RTA variable takes value equal to 1 if two country reach an agreement or create a union for at least one year within the period. The last control variables that the model has is  $linder_{odt}$  term, where it is the distance of logarithms of per capita GDP between the exporter and the importer <sup>14</sup>. Similarly,  $Linder_{odt}$  is determined for each period in which per capita GDPs are collapsed into three periods by using the mean GDP per capita for both the exporter and the importer.

The model possesses three fixed effect. Firstly,  $\delta_{opt}$  stands for anything that accounts for origin-product-time. In the similar manner,  $\zeta_{dpt}$  is the same but for destination country. These two fixed effects are combination of countries' characteristics, time, and characteristics of exported products. Therefore, they are designed to account for a country's unique traits, as well as the country's idiosyncratic 4-digit exported products and their variation over time. Exporter-time and importer-time fixed effects are widely used in gravity structure. Firstly, they take into account size variables such as importer expenditure and exporter output, as well as their variation throughout time. Second, it considers other features of a country that influence international trade, such as GDP, per capita GDP, and population, as well as how they evolve over time. Thirdly, exporter-time and importer-time fixed effects also take into account observed or unobserved countries' policies, exchange rates and institutions (Yotov, Piermartini, Larch, et al., 2016; Heid, Larch, and Yotov, 2015). Finally, and perhaps most crucially, country-time fixed effects control for multilateral

<sup>13</sup>RTA refers to Regional Trade agreement and it takes value equal to 1 if exporter and importer countries are part of any following agreement/Union : Custom Union, Free trade Agreement, Partial Scope Agreement, Economic Integration Agreement, Custom Union & Economic Integration Agreement, Free Trade & Economic Integration Agreement, Partial Scope & Economic Integration Agreement. Otherwise it is equal to 0

<sup>14</sup>As a robustness check, an alternative linder term was created and examined in the model. There is no substantial change in the variables of interest. The outcome can be found in Appendix A.5.

resistance term<sup>15</sup>. Last fixed effect is  $\theta_{od}$ . It is called country-pair fixed effects and accounts for everything between origin and destination countries that are time invariant. The rationale behind its usage is to account for the trade costs between countries. Scholars used a variety of approaches to account for trade costs, such as common language, colonial tie, contiguity, physical distance, somatic distance, genetic distance etc<sup>16</sup>. Nonetheless, recent researches (Egger and Nigai, 2015; Agnosteva, Anderson, and Yotov, 2014) have demonstrated that in terms of capturing bilateral trade costs, pair-fixed effects outperform when it is modelled using the usual set of gravity variables.

### 2.3.1 Estimation Issues

The dependent variable can have a value of 0 or 1. Due to an incidental parameter problem, Maximum Likelihood Estimators (MLE) such as probit and logit were excluded since T (time) does not grow as N (number of observation) approaches to infinity (Arellano, Hahn, et al., 2007; Timoneda, 2021). As previously stated, the dependent variable refers to the exportation of a new product, which is a highly rare event. Hence, taking other possibilities into account for model setting, linear probability model (LPM) was chosen. The main reason is that LPM allows inclusion of high dimensional fixed effects. Furthermore, LPM does not require any distributional assumption and mostly, it makes good estimate of partial effects on the response probability. LPM, on the other hand, has two major disadvantages. To begin with, LPM suffers from heteroscedasticity. White (1980)'s robust standard errors were employed to address the problem of heteroscedasticity. Additionally, there might be time-variant serial correlation within Fixed Effects groups. In order to handle this problem, the standard errors are clustered by country pair and 3-digit product level. Secondly, predicted probabilities may not be between zero and one. Nevertheless, even some predicted probabilities are outside of unit interval, may not be very important as Wooldridge (2002) suggests. In spite of that, this study uses LPM since the model possesses high-dimensional fixed effects, therefore, no alternative model could estimate consistently due to incidental parameter problem. In addition, Timoneda (2021) carried out Monte Carlo simulation in order to choose best estimator for discrete dependent variables with group fixed effects. He concludes that LPM

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<sup>15</sup>Multilateral resistance term refers to bias in which two countries trade with each-other more if they are isolated from the rest of the world. First attempt to account for multilateral resistance term has been carried out by Anderson and Van Wincoop (2003). They constructed remoteness index. However, recent advancements in the literature have outlined the importance of country-time fixed effects and why they should be used (Yotov, Piermartini, Larch, et al., 2016)

<sup>16</sup>Also regional trade agreements can be considered as time invariant. It is true if there is no variation during the course of sample. However, because this study covers a wide range of countries and the sample spans 15 years, there is some variation in the RTA.



performs better for the rare event data where mean of dependent variable is lower than 25 percent. Consequently, mean of the dependent variable is equal to 4 as previously stated.

## 2.4 Results

As table 2.5 demonstrates, the baseline specification, time-variant religious similarity variable is significant at 1% and it is positively related to extensive margin of international trade which is introducing new product into destination market. In other words, religious similarity makes it easier for a country to introduce a new product into the export market for the first time.

From quantitative point of view, if variable *rel\_sim* (which measures proportionate religious similarity between pairs ranging from 0 to 1) rises by one standard deviation (.3513487) between a country pair, then, the probability of introducing a new export product from origin to destination country increases by .00797562, *ceteris paribus*.

It is worthwhile to analyze control variables before delving into the results. To begin with, *ln\_tot* is positively associated to a dependent variable, implying that exporting a wide range of products boosts the probability of starting to export a new product. Second, the *linder* term is positively related to the dependent variable, indicating that the Linder hypothesis does not apply to the model's extensive margin specification. Indeed, Hallak (2010) argued that the Linder hypothesis does not hold in many empirical scenarios since product quality is not considered in trade. Alternatively, in this model setting, countries with different levels of development trade more with each other, implying that Heckscher-hypothesis Ohlin's holds true, which argues that factor endowments are the primary driver of trade between countries. Heckscher-Ohlin's theory, in particular, suggests that countries whose production is concentrated on capital-intensive goods are developed, whereas countries whose production is concentrated on labor-intensive goods are underdeveloped, and trade will occur between the two due to differences in production factor endowments. The last control variable is the RTA (Regional Trade Agreements). RTA has a negative relationship with the dependent variable, which may appear ambiguous. Because, existing literature emphasize that tariff reduction is positively related with extensive margin of international trade (Foster, Poeschl, and Stehrer, 2011; Arkolakis et al., 2008; Dutt, Mihov, and Van Zandt, 2013; Kehoe and Ruhl, 2013). However, the approach used to define the extensive margin in this chapter differs from that of the other research cited. In this chapter, extensive margin does not refer to a diversity of goods or the number of countries traded. One probable explanation is that establishing a new export product is a tough process, thus countries seek to enhance either the

range of exported products or the number of trade partners when they participate into RTA.

Subsequently, this work sheds light on whether religious similarity can affect a country's trade pattern through the channel which increases trust between contracting parties and promotes trust-related goods. In order to test this hypothesis, the interaction of religious similarity and an indicator which defines relationship specificity is included to the estimation. Mentioned variable refers to relationship-specific products that are sold in the organized exchanged and have no reference prices. In the international trade literature, Nunn (2007) argued that a specific institution: contract enforcement, is a crucial component influencing a country's trade pattern. By combining several datasets, including the input-output table for the United States, he claimed that having the ability to enforce contracts in international trade would alter countries' comparative advantage. Because, he asserts, countries that lack the ability to enforce contracts are underinvested. Countries with the ability to enforce contracts, on the other hand, receive more investment in order to produce intermediate goods from the final good producing country. He refers to this channel as "relationship-specific". The "relationship-specific" variable is a product level indicator with a Harmonized System (HS) 2002 classification of 4 digits. The mentioned variable, in particular, determines how intense goods are in terms of relationship specificity. Nunn, 2007 claimed that the five most intense relationship-specific industries, for example, are photographic & photocopying equipment manufacturing, air & gas compressor manufacturing, analytical laboratory manufacturing, other engine equipment manufacturing, and other electronic component manufacturing, while the five least intense industries are poultry processing, flour milling, petroleum refineries, wet corn milling, and aluminum sheet, plate, & foil manufacturing. The variable *rs* is a continuous variable and its summary statistics is described below as table 2.4 demonstrates.

TABLE 2.4: Summary statistics of relationship specificity

relationship specificity (mean)				
Percentiles	Smallest			
1%	0.092	0.036		
5%	0.18	0.036		
10%	0.206	0.036	Obs	1,590,871
25%	0.274		Sum of Wgt.	1,590,871
50%	0.397		Mean	0.434
		Largest	Std. Dev.	0.202
75%	0.607	0.934		
90%	0.74	0.934	Variance	0.041
95%	0.787	0.934	Skewness	0.423
99%	0.87	0.934	Kurtosis	2.051

Furthermore, Nunn (2007) claimed that countries have comparative advantage

in some goods in which they require relationship-specific investment<sup>17</sup>. This study tests this hypothesis, as table 2.5 shows, the interaction of religious similarity and *rs* is positive and significant at 1%. Moreover, by including the interaction term, religious similarity variable is still significant at 1% and it is positive. Nevertheless, as the interaction term included coefficient of variable *rel\_sim* diminishes by 0.003. The result indicates that, religious similarity an important factor in particular, when it comes to relationship-specific products. As a result, religious similarity may be a source of comparative advantage through the channel which countries attract investments to produce intermediate goods in which they do not have a cost advantage. In other words, countries may receive investment to produce goods where their producing cost is not the cheapest one.

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<sup>17</sup>He also stated that relationship-specific products explain a larger variation than physical capital and skilled labor together.

TABLE 2.5: LPM estimation on start\_new

	Base	Interaction
rel_sim	0.0227*** (0.00609)	0.0197*** (0.00618)
linder	0.00481*** (0.00166)	0.00481*** (0.00166)
ln_tot	0.00519*** (0.000516)	0.00518*** (0.000516)
rta	-0.0206*** (0.00217)	-0.0206*** (0.00217)
rel_sim × rs		0.00708*** (0.00255)
_cons	0.0102* (0.00525)	0.0102* (0.00525)
Origin-Product-Time FE	Yes	Yes
Destination-Product-Time FE	Yes	Yes
Origin-Destination FE	Yes	Yes
Observations	1590871	1590871
$R^2$	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

One of the most important aspects of this finding is that, religious similarity plays role in the international trade even it is attributed as time-variant despite to existing literature. This study, however, does not distinguish or compare the effects of time-variant and time-invariant religious similarities. Nevertheless, as main literature suggests, if religious similarity is attributed as time invariant then it would be captured by pair fixed effects. However, this study demonstrates that people's religious beliefs can alter with time, even if the shift is minor. Therefore, the results presented above, support this perspective which indicate there is positive and highly significant relationship.

Subsequently, partial effect of religious similarity have been estimated since

interaction term involved<sup>18</sup>. As it is given below, partial effect will be simply, partial derivative of dependent variable with respect to variable religious similarity. The empirical model is recalled below in order to take partial derivative.

$$\begin{aligned} \text{PR}(\text{start\_new})_{\text{odtp}} = & \beta_0 + \beta_1 \text{rel\_sim}_{\text{odt}} + \beta_2 \text{rel\_sim}_{\text{odt}} * rs_p + \gamma X_{\text{odt}} \quad (2.3) \\ & + \delta_{\text{opt}} + \zeta_{\text{dpt}} + \theta_{\text{od}} + \epsilon_{\text{odpt}} \end{aligned}$$

After that, partial derivative of *start\_new* has been taken with respect to *rel\_sim*.

$$\frac{\partial \text{Pr}(\text{start\_new})}{\partial (\text{rel\_sim})} = \beta_1 + \beta_2 rs_p \quad (2.4)$$

Table 2.6 illustrates marginal effect of religious similarity. As it was stated previously, partial effect of religious similarity depends on value of *rs*. In other words, the impact of religious similarity will be dependent on how intense relationship-specific products are. Thus, as table 2.6 demonstrates, percentiles starting from bottom 10 up to top 10 percentile. Furthermore, the effect of religious similarity for each percentile is positive and significant at 1% significance level. Moreover, as intensity of relationship-specificity increases partial effect of religious similarity rises. Meaning that, the effect of religious similarity is higher for intense product in terms of relationship-specificity. Therefore, religiously similar countries gain more from trade with respect to dissimilar countries.

<sup>18</sup>Graph of partial effect can be found in the appendix

TABLE 2.6: Marginal effect of religious similarity on the dependent variable

	(1)
	start_new
P10	0.0211*** (0.00611)
P25	0.0216*** (0.00610)
P50	0.0225*** (0.00609)
P75	0.0240*** (0.00611)
P90	0.0249*** (0.00615)
<i>N</i>	1590871

Standard errors in parentheses

Fixed effects as follows: origin-product-time, destination-product-time, pair,

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Where P10 represents first 10 percentile in terms of relationship-specificity

Whereas P90 refers to top 10 percentile.

As table 2.6 demonstrates above, quantitatively speaking, the impact of variable *rel\_sim* (religious similarity) varies and it gives rise to probability of introducing new export product by 0.0211, 0.0225, 0.0249 respectively, for the first 10 percentile, for the first 50 percentile and for the top 10 percentile. Where percentiles refer to the intensity of relationship specificity. Moreover, marginal effect of religious similarity increases gradually, as intensity of products rises in terms of relationship-specificity.

Although religious similarity appears to have a minor impact, it actually has a significant impact. To put it another way, to interpret the economic meaning of the estimate on the interaction, it has been taking the country pairs at the 25th and 75th percentiles of the distribution of the religious similarity - China-Kyrgyzstan pair and Ghana and Trinidad & Tobago pair, respectively - and the products at the 25th and 75th percentiles of the distribution of the relationship specificity - Woven fabrics<sup>19</sup>

<sup>19</sup>Its product code is 5111 and it has a following definition: Woven fabrics containing  $\geq 85\%$  carded wool or carded fine animal hair by weight and weighing  $\leq 300$  g/m<sup>2</sup>

and Glass envelopes<sup>20</sup>, respectively - and calculate the differential probability of starting to export glass envelopes compared to woven fabrics for China-Kyrgyzstan pair compared to Ghana-Trinidad & Tobago pair explained by the two significant factors under analysis.

The estimate on the coefficient of  $rel\_sim \times rs$  predicts that, In comparison to the China-Kyrgyzstan pair, the probability of Ghana and Trinidad and Tobago starting to export one to another glass envelop rather than woven fabrics will be higher by .1635 percentage point<sup>21</sup>.

Furthermore, in order to provide further clarity, this study expands its findings to subsamples by categorizing relationship-specificity goods into the 50th and 75th percentiles.

TABLE 2.7: LPM percentiles of relationship-specificity

	50th Percentile		75th percentile	
	rs_high	rs_low	rs_high	rs_low
rel_sim	0.0312*** (0.00887)	0.0151* (0.00797)	0.0526*** (0.0127)	0.0123* (0.00679)
linder	0.00629*** (0.00237)	0.00346 (0.00227)	0.00569* (0.00319)	0.00437** (0.00191)
ln_tot	0.00580*** (0.000780)	0.00459*** (0.000642)	0.00661*** (0.00114)	0.00474*** (0.000562)
rta	-0.0233*** (0.00313)	-0.0176*** (0.00283)	-0.0240*** (0.00466)	-0.0193*** (0.00240)
_cons	0.0117 (0.00773)	0.00768 (0.00684)	0.00544 (0.0110)	0.0119** (0.00586)
Origin-Product-Time FE	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes
Pair FE	Yes	Yes	Yes	Yes
Observations	804005	786866	412253	1178603
R <sup>2</sup>	0.614	0.529	0.638	0.551

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3-digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.7 illustrates, coefficient of religious similarity is 0.0151 and 0.0312 respectively, for the the first 50th percentile and the top 50th percentile. The difference is even higher when it comes to 75th percentile. It is 0.0123 and 0.0526 for the first 75th

<sup>20</sup>Glass envelopes have the product number 7011 and the following definition: Glass envelopes, including open bulbs and tubes, and glass parts thereof, without fittings, for electric illumination.

<sup>21</sup>The formula for the computation as follows:  
 $\partial Pr(start\_new) = \beta_2 \times \Delta rs_p \Delta Country\ pair_{od} \times 100$

percentile and top 25th percentile, respectively. Moreover, where religious similarity is significant at 1% for the top 50th percentile and the top 25th percentile. Whereas, it is significant only at 10% for the first 50th percentile and first 75th percentile. Likewise, R-square is nearly 10% higher for the first 50th percentile and first 75th percentile.

Furthermore, as table 2.8 illustrates, it has been estimated following model in order to test the hypothesis whether top 25th percentile relationship specific products are different than 0. However, this examination is equal to Wald test. Firstly, the a dummy variable has been generated in which takes value equal to 1 for the top 25th percentile of relationship-specific products. Then, the dummy variable has been interacted with each independent variables including religious similarity. Lastly, in addition to baseline fixed effects, the model includes exactly the same set of fixed effects by taking into account the dummy that indicates the top 25th percentile relationship specific products. The variable religious similarity is statistically significant at 10% whereas, interaction term which is religious similarity times the top 25th percentile dummy is statistically significant at 1%. The model points out that our interest of variable which is religious similarity has a robust effect on introducing a new export product for the products that are relationship-specific intense.



TABLE 2.8: LPM similarity significance test

	rs_75
rel_sim	0.0123* (0.00682)
linder	0.00437** (0.00192)
ln_tot	0.00474*** (0.000564)
rta	-0.0193*** (0.00241)
rel_sim × dummy_high_rs	0.0403*** (0.0142)
linder × dummy_high_rs	0.00132 (0.00368)
ln_tot × dummy_high_rs	0.00188 (0.00125)
rta × dummy_high_rs	-0.00469 (0.00515)
_cons	0.0102* (0.00525)
Origin-Product-Time FE	Yes
Destination-Product-Time FE	Yes
Pair FE	Yes
Origin-Product-Time-Rs_75 FE	Yes
Destination-Product-Time-Rs_75 FE	Yes
Pair-Rs_75 FE	Yes
Observations	1590856
$R^2$	0.581

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3-digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 2.4.1 Further Robustness Check

This part performs a slew of estimations in order to control out any omitted variable bias. Culture; Institutions; Foreign direct investment; Migration; and level of religiosity, in particular, have been investigated and discussed below. It would be beneficial to give a correlation matrix among proximity/distance variables before beginning. A correlation matrix with a significance level of 0.01 was constructed for the variables cultural distance, institutional quality distance, and religious similarity.

The computation approach for the variables stated will be explained in detailed in the following subsections.

TABLE 2.9: Correlation matrix among proximity/distance variables

	Religious similarity	Institutional distance	Cultural distance
Religious similarity	1		
Institutional distance	-0.0758*	1	
Cultural distance	-0.0642*	0.2935*	1

\*  $p < 0.01$

As table 2.9 demonstrates, correlation of all variables statistically significant at 1%. Religious similarity is negatively related to institutional distance and cultural distance. While cultural and institutional distances are favorably associated and have a significantly larger correlation coefficient.

#### 2.4.1.1 Culture

First and foremost, as previously stated, religion is one of the important component that constitutes culture. Hence, cultural distance measurement has been constructed by following the paper of Tabellini (2010) as a further control for the model. He asserted that an average level of trust, control, respect and obedience explain a large variation of the culture for given country<sup>22</sup>. Therefore, this paper follows his methodology to calculate cultural distance between country pairs. The data for trust, control, respect and obedience is available in WVS for the same period of the sample. Survey organizer asks following question for trust : *“Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”* There are two options to the question these are: *“Most people can be trusted”* and *“Need to be very careful”*. Subsequently, average level of trust for each country has been calculated by multiplying with the weight that is assigned by survey organizer. For the variable control the following question was asked to individuals : *“Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them.”* The respond composed of ten alternatives where first alternative is *“No choice at all”* whereas the last option is *“A great deal of choice”*. The answers were then separated into two groups: the first five alternatives and the second five options. Hence, if replies are supplied to any of the following options: 6th, 7th, 8th, 9th, and 10th, the variable named control is

<sup>22</sup>Tabellini extracted principal component claiming that trust, control, and respect positively related to economic development whereas obedience is negatively related.

set to 1. Afterwards, the mean of variable *control* for each country by taking into consideration the weights. In the same manner, *respect* and *obedience* are extracted from the same question that is asked in the survey. The question as follows: “Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?”. Among many alternatives, share of respondent who chose the option “Tolerance and respect for other people” refers to the variable “respect”, whereas share of individuals who choose the option “Obedience” refers to the variable *obedience*. In the same line with other variables, the mean value of “respect” and “Obedience” have been calculated for each country. Finally, following formula have been imposed for the Cultural distance variable:

$$Cult\_dist_{odt} = \sqrt{\sum_{i=1}^R (Cult\_var_{oit} - Cult\_var_{dit})^2} \quad (2.5)$$

R = Total number of cultural variables

$Cult\_var_{o/d,t}$  = Mean of cultural component i in o/d in time t

The variable “*Cult\_dist*” is time-variant and represents the Euclidean distance of mentioned variables between pair countries that is calculated by following Tabellini (2010)’s methodology.

Country Israel is excluded from estimation since it has a missing value for cultural variables

TABLE 2.10: LPM robustness cultural distance

	Baseline_1	Baseline_2	Interaction_1	Interaction_2
rel_sim	0.0225*** (0.00609)	0.0212*** (0.00606)	0.0195*** (0.00618)	0.0185*** (0.00615)
linder	0.00485*** (0.00166)	0.00753*** (0.00169)	0.00486*** (0.00166)	0.00758*** (0.00169)
ln_tot	0.00518*** (0.000516)	0.00526*** (0.000517)	0.00518*** (0.000516)	0.00525*** (0.000517)
rta	-0.0207*** (0.00217)	-0.0209*** (0.00216)	-0.0207*** (0.00217)	-0.0209*** (0.00216)
Cult_dist		0.000375*** (0.0000395)		0.000590*** (0.0000474)
rel_sim × rs			0.00699*** (0.00255)	0.00564** (0.00255)
Cult_dist × rs				-0.000508*** (0.0000637)
_cons	0.0105** (0.00526)	-0.00841 (0.00586)	0.0105** (0.00526)	-0.00811 (0.00586)
Origin-Product-Time FE	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes
Observations	1574934	1574934	1574934	1574934
R <sup>2</sup>	0.580	0.580	0.580	0.580

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 2 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.10 illustrates, inclusion of cultural distance reduces coefficient of religious similarity by 0.0013 percentage point however, religious similarity is still significant at 1%. In the same manner, when the model includes the interaction term which is cultural distance times relationship specific products, the interaction term of variable of interest decreases by 0.00135. When the interaction term of the cultural distance variable is included, the significance level of the interaction term of religious similarity drops somewhat. The variable of interest, however, is still significant at 5%.

Cultural distance, according to the model's preferred specification, is positively and significantly associated to extensive margin of international trade. There is no study that focuses exclusively on the impact of cultural distance on the extensive margin of international trade. One of the possible explanation for positive relationship between two that countries may prefer to trade more with distant countries rather than opening a production plant in host country (Linders et al., 2005).

### 2.4.1.2 Foreign Direct Investment

Foreign Direct Investments (FDI) may facilitate a country's growth process. Hence, many countries tend to attract FDI inflows in order to speed up their economic growth. Along with trade, FDI is one of the channels through which technology can spread (Xu and Wang, 2000). In a similar vein, FDI also could play such a role for the trade pattern of developing countries by influencing export quality. For instance Javorcik, Lo Turco, and Maggioni (2018) demonstrated that firms whose supply is concentrated in foreign affiliates are more likely to upgrade their products. Therefore, the model has been estimated by including FDI and the interaction term which is FDI times relationship specific products. The FDI data derives from United Nation Conference on Trade and Development (UNCTAD) webpage<sup>23</sup>. The data is FDI inward stock data and it starts from 2001 up to 2012. Thus, the years 2001, 2005, and 2010 were referred to as period 1, period 2, and period 3, respectively.

As table 2.11 demonstrates, inclusion of fdi<sup>24</sup> stock and the interaction term does not cause a major change either on the religious similarity or on the religious similarity times relationship specific products. In fact, the coefficients of variables of interest slightly improve.

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<sup>23</sup><https://unctad.org/topic/investment/world-investment-report>

<sup>24</sup>It has been done log transformation to the variable in order to facilitate its interpretation. The formula that is applied as follows  $\ln(1+fdi)$

TABLE 2.11: LPM robustness FDI

	Baseline_1	Baseline_2	Interaction_1	Interaction_2
rel_sim	0.0227*** (0.00609)	0.0245*** (0.00606)	0.0197*** (0.00618)	0.0206*** (0.00615)
linder	0.00481*** (0.00166)	0.00543*** (0.00167)	0.00481*** (0.00166)	0.00543*** (0.00167)
ln_tot	0.00519*** (0.000516)	0.00466*** (0.000504)	0.00518*** (0.000516)	0.00465*** (0.000504)
rta	-0.0206*** (0.00217)	-0.0215*** (0.00214)	-0.0206*** (0.00217)	-0.0215*** (0.00214)
L.l_fdi		-0.0000830 (0.000413)		-0.000730 (0.000553)
rel_sim × rs			0.00708*** (0.00255)	0.00898*** (0.00266)
L.l_fdi × rs				0.00153* (0.000874)
_cons	0.0102* (0.00525)	0.00916* (0.00520)	0.0102* (0.00525)	0.00919* (0.00520)
Origin-Product-Time FE	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes
Observations	1590871	1484014	1590871	1484014
R <sup>2</sup>	0.579	0.593	0.579	0.593

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.11 demonstrates, inclusion of fdi<sup>25</sup> stock and the interaction term with relationship-specific index does not cause a major change either on the religious similarity or on the religious similarity times relationship specific products. In fact, the coefficients of variables of interest slightly improve. As table 2.11 columns [2] and [4] illustrate, FDI is negatively associated to the model's preferred definition of extensive margin. Nevertheless, the coefficient of FDI is not statistically significant in both columns. The interaction term of FDI with the relationship-specific index, on the other hand, is statistically significant at 10% , as table 2.11 column [4] demonstrate. This means that introducing FDI has a positive influence on relationship-specific intense products while having no direct effect on extensive margins. Result is similar to work of Javorcik, Lo Turco, and Maggioni (2018), in the sense that FDI/foreign affiliates could influence a country's trade pattern.

<sup>25</sup>It has been done log transformation to the variable in order to facilitate its interpretation. The formula that is applied as follows  $l\_fdi = \ln(1+fdi)$

### 2.4.1.3 Migration

Migration may have an effect on estimation through the channel of influencing a country's religious composition. It may also have an impact on a country's production structure. For instance, Bahar and Rapoport (2018) investigated the dynamic of innovation and international migration flows. They argued that the probability of becoming technology producers is higher for the countries those who has the larger stock of immigrants from a comparatively developed country. In other words, migration facilitates producing technology intensive goods in less-developed country through knowledge diffusion of immigrants. By taking into account this view, further robustness check has been carried out. The migration data was downloaded from United Nation Network on Migration webpage<sup>26</sup>. The data has a long range starting from 1932 up to 2011. Unfortunately, the data does not cover 3 period of our sample. Hence, it is used lag of migration<sup>27</sup> variable for the estimation. Due to the fact that the data does not correspond to the sample of this study, an additional robustness check has been performed in accordance with Felbermayr and Toubal (2010) for addressing possible omitted variable bias. To begin, due to the wars in Syria and Iraq, there has been a migrant flow to Europe. However, the sample does not include these countries. Secondly, as demonstrated in the appendix A.6, some pair nations were removed from the estimation due to potential migration flows that can affect religious similarity. These pair countries have been chosen by the author. Nonetheless, according to a United Nations report<sup>28</sup> from 2013, the most populous immigrant countries in Germany are Turkey, Poland, the Russian Federation, Kazakhstan, and Italy, respectively. Therefore, the pairings of these countries with Germany are excluded from the estimation. Furthermore, the pairs United States-Mexico and Mexico-United States are also excluded. As shown in Appendix A.6, the finding is quite robust in each case. Likewise, as table A.7 in appendix demonstrates, this study provide a further robustness check by excluding all pairs mentioned above from the estimation. Notably, excluded pairs are as follows: Turkey-Germany, Germany-Turkey, Germany-Poland, Poland-Germany, Germany-Italy, Italy-Germany, Germany-Russia, Russia-Germany, Germany-Kazakhstan, Kazakhstan-Germany, United State-Mexico, and Mexico-United State. As table A.7 in appendix illustrates, in each scenario, the coefficient of interest and its interaction with the relationship-specific index remain to be statistically significant.

<sup>26</sup><https://migrationnetwork.un.org/projects/demig-project-determinants-international-migration>

<sup>27</sup>Log transformation has been applied to the variable. The formula that is used as follows :  $migration = \ln(1 + migration)$ .

<sup>28</sup><https://esa.un.org/migmgmprofiles/indicators/files/Germany.pdf>

TABLE 2.12: LPM robustness migration

	Baseline_1	Baseline_2	Interaction_1	Interaction_2
rel_sim	0.0227*** (0.00609)	0.0736*** (0.0214)	0.0197*** (0.00618)	0.0502** (0.0231)
linder	0.00481*** (0.00166)	-0.00599 (0.00635)	0.00481*** (0.00166)	-0.00609 (0.00635)
ln_tot	0.00519*** (0.000516)	0.00924*** (0.00217)	0.00518*** (0.000516)	0.00929*** (0.00217)
rta	-0.0206*** (0.00217)	-0.0166*** (0.00518)	-0.0206*** (0.00217)	-0.0164*** (0.00518)
l_migration		0.00281* (0.00157)		-0.000199 (0.00170)
rel_sim × rs			0.00708*** (0.00255)	0.0546** (0.0226)
l_migration × rs				0.00721*** (0.00153)
_cons	0.0102* (0.00525)	-0.0222 (0.0238)	0.0102* (0.00525)	-0.0231 (0.0238)
Origin-Product-Time FE	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes
Observations	1590871	304497	1590871	304497
R <sup>2</sup>	0.579	0.621	0.579	0.621

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.12 demonstrates, the variable of lag of migration flow is positive and it is significant at 10% for the baseline model. It is consistent with the study of Bahar and Rapoport (2018) migration in the sense that migration flow has a positive significant impact on extensive margin in the long run. The coefficient of migration flow variable, on the other hand, comes out to be negative but statistically insignificant, although its interaction term with the relationship-specific index is positively associated to the dependent variable. One of the possible explanations for this situation is that migrants may generate knowledge spillover therefore, they could affect countries' trade patterns by focusing on more complex goods Bahar and Rapoport (2018).

Moreover, the significance level of religious similarity and the its interaction with relationship-specific products slightly reduced to 5% from 1%. Whereas their coefficients improved. However, inclusion of migration variable does not affect strongly religious similarity and its interaction with relationship-specific products. Furthermore, R-square has increased nearly 5% when migration variable is included.



#### 2.4.1.4 Institutional Qualities' Distance

Acemoglu, Johnson, and Robinson (2005) stated in one of the most influential papers in economic literature that long-run economic growth is tied to institutional differences. Similarly, the impact of FDI may be influenced by the quality of the institution (Aleksynska and Havrylchyk, 2013). In the model that described above, one may think probability of exporting new product might depend on a country's institutional quality. In order to address potential omitted variable bias, institutional quality's distance variable based on a paper that is written by Linders et al. (2005). Where intuition of institutional qualities and their estimation had been done by Kaufmann, Kraay, and Mastruzzi (2004). Authors argued that institutional quality of a country can be determined by following components: *voice and accountability, political stability, government effectiveness, regularity quality rule of law, and control of corruption* (Kaufmann, Kraay, and Mastruzzi, 2004).

Time-varying institutional distance between exporter and importer countries has been calculated by the formula given below that is imposed by Linders et al. (2005).

$$Inst\_dist_{odt} = \frac{1}{6} \sum_{i=1}^R \frac{(Inst\_Qual\_var_{oit} - Inst\_Qual\_var_{dit})^2}{Var_{Inst\_Qual\_var_{it}}} \quad (2.6)$$

$R$  = Total number of Institutional quality variables

$Inst\_Qual\_var_{o/d,t}$  = Mean of Institutional quality component  $i$  in  $o/d$  in time  $t$

As table 2.13 column [4] demonstrates, institutional distance variable is negatively related to dependent variable however, it is significant at 10%. Whereas its interaction term is positively related and significant at 1%. One possible explanation for the negative link between institutional distance and extensive margin is that trade costs are lower for countries with similar institutions (Linders et al., 2005). Hence, similar countries in terms of institutions trade more with each other. Nevertheless, the results indicates that the religious similarity and its interaction term with relationship-specific index does not affected by inclusion of institutional distance variable.

#### 2.4.1.5 Religiosity

As it was mentioned before, attitudes belong to religious people may diverse toward women, cooperation, law (Guiso, Sapienza, and Zingales, 2003), innovation (Bénabou, Ticchi, and Vindigni, 2015b), and economic growth (Weber, 2002; Barro and McCleary, 2003). Hence, it is worth include religiosity variable in order to check whether given level of religiosity plays role in international trade. Religiosity variable derives from

TABLE 2.13: LPM robustness institutional quality's distance

	Baseline_1	Baseline_2	Interaction_1	Interaction_2
rel_sim	0.0227*** (0.00609)	0.0225*** (0.00609)	0.0197*** (0.00618)	0.0187*** (0.00618)
linder	0.00481*** (0.00166)	0.00456*** (0.00167)	0.00481*** (0.00166)	0.00451*** (0.00167)
ln_tot	0.00519*** (0.000516)	0.00519*** (0.000517)	0.00518*** (0.000516)	0.00517*** (0.000516)
rta	-0.0206*** (0.00217)	-0.0206*** (0.00219)	-0.0206*** (0.00217)	-0.0206*** (0.00219)
Inst_dist		0.000164 (0.000310)		-0.000629* (0.000340)
rel_sim × rs			0.00708*** (0.00255)	0.00884*** (0.00256)
Inst_dist × rs				0.00204*** (0.000345)
_cons	0.0102* (0.00525)	0.0101* (0.00527)	0.0102* (0.00525)	0.00990* (0.00527)
Origin-Product-Time FE	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes
Observations	1590871	1590871	1590871	1590871
R <sup>2</sup>	0.579	0.579	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

WVS. They ask to individuals following question. *Independently of whether you attend religious services or not, would you say you are:*

1. A religious person
2. Not a religious person
3. An atheist

Average level of religiosity of sample countries have been obtained from survey by taking into consideration the weights. *rel\_iso\_o* and *rel\_iso\_d* have been generated. Former one refers to exporter country's average religiosity whereas latter one represents average religiosity of importer country. Following that, the sample is separated into four subcategories depending on both exporter and importer countries' average religiosity. The thresholds for the religiosity are 50%, and 75% respectively.

TABLE 2.14: LPM robustness religiosity

	Baseline_1	Religiosity_exporter $\geq$ 50	Religiosity_exporter $\geq$ 75	Religiosity_importer $\geq$ 50	Religiosity_importer $\geq$ 75
rel_sim	0.0197*** (0.00618)	0.00402 (0.00768)	-0.00300 (0.0288)	-0.0234*** (0.00778)	0.0496*** (0.0131)
rel_sim $\times$ rs	0.00708*** (0.00255)	-0.00957*** (0.00247)	-0.0159*** (0.00429)	0.00574* (0.00298)	0.00748* (0.00422)
linder	0.00481*** (0.00166)	-0.00281 (0.00310)	0.00679 (0.0129)	-0.00210 (0.00214)	-0.0508*** (0.00568)
ln_tot	0.00518*** (0.000516)	0.00407*** (0.000681)	0.00250*** (0.000820)	0.00171*** (0.000653)	0.00441*** (0.00156)
rta	-0.0206*** (0.00217)	-0.00400 (0.00276)	-0.00209 (0.00339)	-0.0199*** (0.00329)	-0.0591*** (0.00719)
_cons	0.0102* (0.00525)	0.00721 (0.00733)	-0.00105 (0.0231)	0.0492*** (0.00571)	0.0851*** (0.0123)
Origin-Product-Time FE	Yes	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes	Yes
Observations	1590871	823936	379596	799952	405334
$R^2$	0.579	0.360	0.454	0.565	0.575

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.14 column [2], and [3] demonstrate, the variable religious similarity is not statistically significant. However, the interaction term is negatively related and it is significant for both columns at 1%. On the contrast, for the importer countries, as average religiosity increases, the coefficient of religious similarity variable rises. The same hold true for the interaction term. As table 2.14 column [4] illustrates, when the religiosity of importer countries is equal to or more than 50, religious similarity is negatively related to the dependent variable. Although, as the same table column [5] demonstrates, religious similarity is positive whenever the degree of religiosity is equal to or greater than 75. There is no study in the literature that examines the effect of religious similarity and level of religiosity on the extensive margin of international trade. Nonetheless, one possible explanation is that higher religiosity leads to more trust across religiously similar groups since religious people are reported to trust others more. (Guiso, Sapienza, and Zingales, 2003). Furthermore, R-square increases gradually as average religiosity of importer country goes up. This result indicates, religiosity of a country matters more for the importer countries rather than exporter ones.

#### 2.4.1.6 Development Level of Countries

Despite the fact that this work seeks to address countries' preferences by using the Linder hypothesis, this work also includes two additional robustness checks to account for potential bias caused by countries' different levels of development.

To begin, the Linder term, which accounts for differences in GDP per capita between exporter and importer countries, has interacted with the relationship-specificity index and is thus included in the estimation. The objective is to demonstrate that the effect of religious similarity on the dependent variable is robust across countries with differing trade patterns.

TABLE 2.15: LPM :the interaction of the Linder with relationship-specificity index

	base	linder
rel_sim	0.0180*** (0.00615)	0.0181*** (0.00615)
rel_sim×rs	0.00707*** (0.00255)	0.00732*** (0.00255)
ln_tot	0.00511*** (0.000514)	0.00511*** (0.000515)
rta	-0.0208*** (0.00217)	-0.0208*** (0.00217)
linder×rs		0.00111 (0.000918)
_cons	0.0192*** (0.00412)	0.0183*** (0.00420)
Origin-Product-Time FE	Yes	Yes
Destination-Product-Time FE	Yes	Yes
Origin-Destination FE	Yes	Yes
Observations	1590871	1590871
R <sup>2</sup>	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.15 column [2] illustrate, although the interaction term of the Linder term with relationship-specific products is positively related to the dependent variable, it is not statistically significant. Nevertheless, religious similarity variable and its interaction term with relationship-specific index are not affected by the inclusion of linder×rs, since there is no substantial change in their coefficient as well as their significance level. Implying that, when differences in GDP per capita and trade patterns of countries are

accounted for -through a relationship-specific index-, the finding is robust.

Second, to account for the different levels of development, the sample is divided into two sub-samples, the first of which refers to higher differences in per capita GDP between exporter and importer countries -equal to or greater than the 75th percentile-, and the second of which refers to lower differences in per capita GDP between exporter and importer countries -less than the 75th percentile-.

TABLE 2.16: LPM dividing sample depending on the Linder term

	base	linder $\geq$ 75th percentile	linder< 75 percentile
rel_sim	0.0197*** (0.00618)	0.218*** (0.0451)	0.0356*** (0.00765)
rel_sim $\times$ rs	0.00708*** (0.00255)	0.0254** (0.0115)	-0.000480 (0.00262)
ln_tot	0.00518*** (0.000516)	0.00168 (0.00220)	0.00343*** (0.000564)
rta	-0.0206*** (0.00217)	-0.0337*** (0.00557)	-0.00444** (0.00224)
linder	0.00481*** (0.00166)		
_cons	0.0102* (0.00525)	-0.0507*** (0.0187)	0.0131*** (0.00502)
Origin-Product-Time FE	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes
Observations	1590871	374214	1188186
$R^2$	0.579	0.622	0.612

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 2.16 demonstrate, the coefficient of religious similarity is statistically significant in both scenarios, although it is considerably higher for countries with much larger differences in per capita GDP. The interaction term, religious similarity times relationship-specific index, has a statistically significant effect only in column [2] with a positive association. That is, the impact of religious similarity on the dependent variable is unaffected by differing levels of development. However, as Heckscher-Ohlin theory states, one possible explanation for the positive and statistically significant relationship between the interaction term -religious similarity times relationship specific index- and dependent variable is that trade occurs between countries due to differences in factor endowments.

#### 2.4.1.7 Killing the Variation

As previously stated, the model possesses high dimensional fixed effects. That is, the model is robust to a wide range of variables. Nonetheless, there is still room to make fixed effects even more stringent. Hence, pair fixed effect is recalled and interacted with time operator. By doing so, it will be taken into account exporter-importer characteristics and their variation over the time. The fixed effect, be it  $\Omega_{odt}$ , will control the model's main concerns, such as foreign direct investment, migration, cultural distance, and institutional distance. However, the model will not be able to estimate religious similarity since it will be captured by the  $\Omega_{odt}$  fixed effect. Only thing remains to be estimated is interaction of religious similarity and relationship-specificity. As table 2.17 illustrates, The interaction term of religious similarity and relationship specificity is positively related and statistically significant at 5%. This implies that religious similarity plays an important role in international trade, at least in terms of relationship-specific goods.

TABLE 2.17: LPM Robustness Killing the Variation

	Interaction
rel_sim $\times$ rs	0.00567** (0.00253)
_cons	0.0425*** (0.000490)
Origin-Product-Time FE	Yes
Destination-Product-Time FE	Yes
Origin-Destination-Time FE	Yes
Observations	1590871
$R^2$	0.582

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 2.5 Concluding Remarks

This chapter investigated whether religious similarity which is defined as a time variant variable, between contractual parties, would have an impact in the extensive margin of international trade. The sample contains as many countries as possible, a total of 75, to provide complete insight into this relationship. The extensive margin of international trade is analyzed at the macro level and relates to the probability of a given country beginning to export a new product that has not been exported in the previous two years anywhere else. Furthermore, this chapter also shed light on whether the effect of religious similarity on extensive margin differs for the relationship-specific products. Where relationship-specificity index has been constructed à la Nunn (2007).

The findings of this chapter reveal that religious similarity between contracting parties is statistically significant and it positively affects exporting new products that have not been exported in the previous two years. Nonetheless, as the relationship-specificity of products rises, the influence of religious similarity increases on extensive margin.

These findings have various ramifications. To begin with, extensive margin supports faster trade growth (Hummels and Klenow, 2005; Kehoe and Ruhl, 2013; Evenett and Venables, 2002). Following that, exported product diversity boosts economic growth



(Hesse et al., 2009; Al-Marhubi, 2000; Lederman, Maloney, et al., 2007; Agosin et al., 2007). Thus, countries that focus on the extensive margin of international trade grow more rapidly. Furthermore, small new entrant exporters have the potential to account for a larger share of total exports. (Albornoz et al., 2012; Morales, Sheu, and Zahler, 2014). Secondly, relationship-specific products might be categorized as complex products. Thus, exporting complex products would yield less output volatility of a country. (Maggioni, Lo Turco, and Gallegati, 2016; Krishna and Levchenko, 2013; Koren and Tenreyro, 2013). Moreover, religious similarity can be seen as a source of comparative advantage since it facilitates trade of relationship-specific products. Because these products necessitate inputs obtained from relationship-specific investments Nunn (2007).

The point is, why can religious similarity have such a significant and favourable effect on new exported products? One possible explanation is that religious similarity fosters greater trust among contracting parties and therefore, reduces uncertainty. Therefore, higher trust between contracting parts prompts economic activity (Guiso, Sapienza, and Zingales, 2009; Guiso, Sapienza, and Zingales, 2003).

These findings are in line with the existing literature: Helpman, Melitz, and Rubinstein (2008) argued that the effect of religious similarity is more pronounced for extensive margin, Lo Turco and Maggioni (2018) showed positive effect of Islamic proximity on extensive margin, Lee and Park (2016) demonstrated the favourable effect of religious similarity on international trade in services, and Rauch (1999), Rauch and Trindade (2002), and Lewer and Berg (2007a) proved that the effect of cultural components is stronger for differentiated goods. Finally, by attributing religious similarity as a time-variant, this chapter confirms and contributes to recent international trade literature in which cultural aspects are ascribed as time-variant (Disdier et al., 2010; Felbermayr and Toubal, 2010).

It is thought that the outcome is not influenced by factors other than those mentioned above. Firstly, this chapter uses the stringiest fixed effects in the gravity literature that capture a large variation. Secondly, the model has a set of control variables such as preferential trade agreements, total number of product exported and linder term. The results are robust to the inclusion of cultural distance, institutional distance, foreign direct investment, and migration.

Nevertheless, there is an open door for endogeneity. First of all, less likely that there is a reverse causality problem. Because producing either complex or relationship-specific

goods might require a high level of education. If so, only countries that have a high level of education (developed countries) could produce these goods. Therefore, we might have a reverse causality only and only if education hinders religiosity. However, in the existing literature there is no clear association between education and religion Barro and McCleary, 2003. Thus, one of the concerns of this study is partially resolved. Moreover, omitted variable bias may arise even though this work included pair-time fixed effect as a robustness check.

## Chapter 3

# Islamic Banking and Exports: the Case of Turkey

### 3.1 Introduction

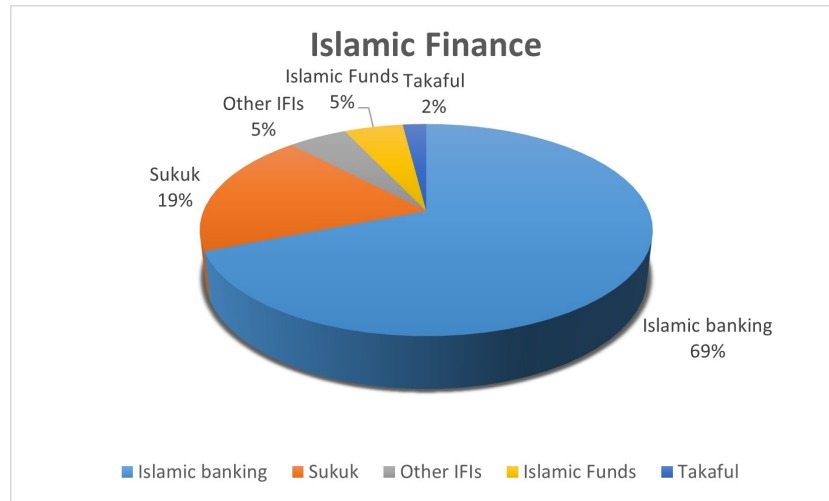
In many countries, Islamic finance has gotten a lot of attention, and its effect isn't restricted to Muslim-majority countries. Since its inception in the 1970s, Islamic finance has grown to offer increasingly innovative and diverse products (Warde, 2000). Hence, the number of Islamic finance institutions worldwide increased to 1526, with assets totaling US\$ 2.88 trillion in 2019 (ICD-Refinitiv, 2020). Furthermore, the growing trend toward Islamic finance is positively embraced by Western institutions. They set up subsidiaries and started offering Islamic financial products. There is also the Dow Jones Islamic Market Index, which determines whether or not the products on offer are *sharia*-compliant<sup>1</sup> (Warde, 2000; Khan, 2010).

As shown in Figure 3.1, Islamic banking is the most widespread practice in the Islamic finance environment, accounting for 69 percent of worldwide Islamic finance assets in 2019. (ICD-Refinitiv, 2020).

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<sup>1</sup>Sharia refers to Islamic law.

FIGURE 3.1: Distribution of Global Islamic Finance Assets 2019



Source: Author's calculations from ICD-Refinitiv (2020).

The existing empirical literature highlights a positive association between Islamic banking and economic development due to the fact that Islamic banking promotes real economic activity. Nonetheless, empirical studies on the relationship between Islamic banking and trade are limited and should be examined. Because trading is traditionally one of the most common forms of revenue permitted by Islam.

This chapter looks into whether Islamic banks boost the probability of Turkish cities exporting as the destination country becomes more Muslim populated. The idea behind the aforementioned hypothesis is that because participation banks are founded on Islamic law, they may have a distinct impact in Muslim abundant countries. In terms of model settings, this study adopts a Linear Probability model, which is similar to a theoretically grounded state-of-the-art gravity model of international trade. The only difference is that this model has, on the left-hand side, the probability of exporting rather than the quantity of exports. This work uses Turkish city-level banking and export data from 2007 to 2020. To the best of the author's knowledge, there is no such work that uses gravity model settings to investigate the influence of Islamic banking on international trade.

The mechanism through which Islamic banks can favourably influence the probability of Turkish cities exporting goods is by providing capital to enterprises that conventional banks have declined because of their hazardous credit ratings. Because of its formation in accordance with Islamic law, Islamic banks are not permitted to invest in government bonds or financial instruments like future contracts and options. For Islamic banks, the only option to turn a profit is to invest in legitimate economic activity, even when there is a risk involved. As a result, this risky investment in enterprises has the potential to raise the likelihood of exporting for Turkish cities.

Anticipating the findings, it should be expected that Islamic banking promotes Turkish provinces' export diversification by supplying capital to them, as Islamic banks' activities should or must focus on real economic activity due to the characteristics that Islamic banking possesses.

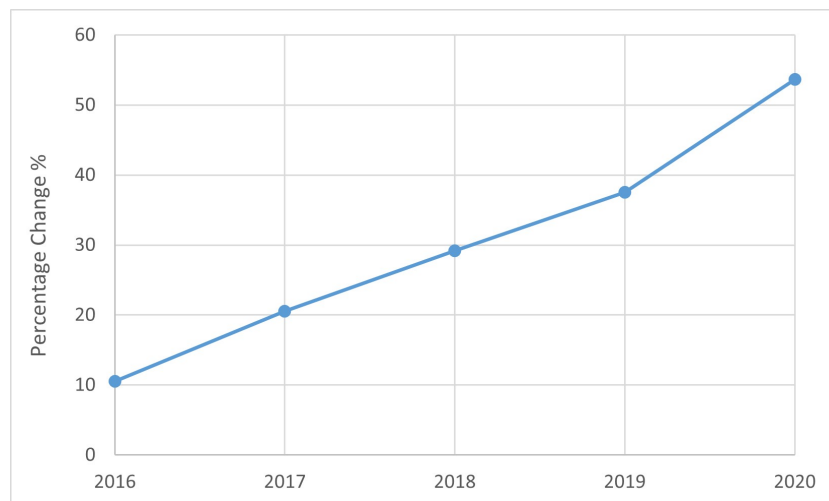
The rest of this chapter is structured as follows. It starts with detailed information regarding the Islamic banking case in a dual banking system. Information about the data sources used, as well as variable construction follow it. The next section explains how Islamic banks work in Turkey. Following that the section 3.3 explains the strategy of this work. 3.4 discusses the empirical model and its properties, while section 3.5 gives the results and investigates them. Finally, the section 3.6 brings the chapter to a conclusion.

## **3.2 Islamic Banking in Dual Banking System: a Case of Turkey**

In the 1980s, Islamic finance was extended to Turkey. Today, both the conventional and Islamic financial services are provided in a dual banking framework (Pirgaip and Hepsen, 2018). Despite the fact that various Islamic finance methods were already in use in Turkish territory throughout the Ottoman Empire's reign (Çizakça, 1996). Turkey is welcomed to Islamic financing due to a severe need for finances rather than religious motivation. Turgut Ozal, Turkey's secular-liberal prime minister, granted Islamic finance institutions special privileges (Warde, 2000). Islamic finance institutions' obligations were comparatively lower than conventional banks due to the privileges. Initially, Islamic finance Institutions were known as 'Special Finance Houses' in Turkey (Warde, 2000). Since 2005, their title has been changed to Participation Bank (Participation Banks Association of Turkey, n.d.). The rationale for this is that by depositing money in an

Islamic bank, an individual becomes a shareholder of the bank. Following that, the bank distributes profits to shareholders, which is how Islamic banks differ from conventional banks (Iqbal and Mirakhor, 2011). The banking system in Turkey is composed of three types of banks among them Deposition banks, Participation banks, and Development & Investment banks. Their number is 34, 6, and 15 respectively (BBDK, September, 2021). In recent years, as seen in Figure 3.2, Turkish participation banks have had great success. Since 2017, their number of branches has grown to over a thousand. Furthermore, their total assets have risen to 437,1 billion Turkish Liras, with a growth rate of 53,7% in 2020 whereas Turkey's banking sector's total assets increased by 36%. The sectoral share of total assets held by Participation banks, on the other hand, is only 7.2% in 2020 (TKBB, 2020).

FIGURE 3.2: Participation Banks' Assets Change for 2016-2020  
(million Turkish Liras)

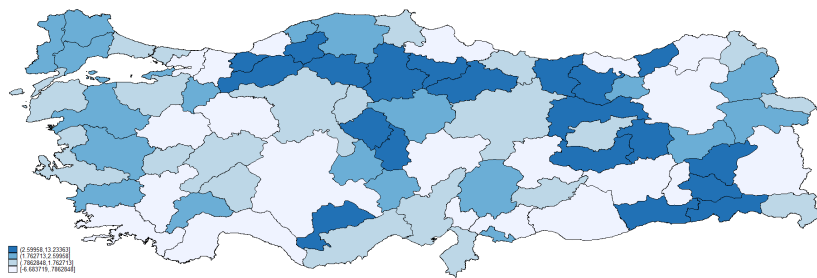


Source: Author's calculations from TKBB, 2020.

According to the Turkish Association of Participation Banks, participation banks can be considered as a complement to the existing banking system rather than alternative. Consequently, they exist to promote real economic activity by lending money that has been gathered (TKBB, 2020). In other words, because *riba* is prohibited in Islam, religious

people would not deposit their money in traditional banks (Demiralp, 2009). Thus, we should expect religious people to be attracted to sharia-compliant banks. In a similar vein, the same argument holds for the borrower. However, religious motivations may not be the borrower's only reason. Participation banks may be able to offer a better contract. Particularly in a country where the economy is unstable, interest rates fluctuate. (Demiralp, 2009).

FIGURE 3.3: Participation Banks' Growth of Cash Credit Shares from 2007 to 2020



Source: Author's calculations from Turkey Banking Regulation and Supervision Agency (BBDK).

It would be interesting to observe how participation banks perform across provinces over time. In other words, is there heterogeneity across provinces in the proportion of credit provided by participation banks? The data indicate that growth rate of share of cash credit devoted by participation banks heterogeneously distributed across Turkish provinces as table 3.3 demonstrates. Nonetheless, there is a concentration of participation banks' credit share in central and eastern Turkey.

Furthermore, according to Demiralp (2009), most Islamist entrepreneurs are cash-strapped, therefore, they are turned down by traditional banks due to their poor credit ratings. Participation banks are the only choice for small businesses. Moreover, Turkish Participation banks increased their allocation of funds to small and medium-sized enterprises (henceforth SMEs) by 79.9% in 2020 (TKBB, 2020). According to the president of the Turkish Association of Participation Banks, cash loans to SMEs account for 32% of the total for Participation banks, while it accounts for 24% of the total for the Turkish banking sector (TKBB, 2020). Hence, he contends that a higher cash loan devoted to

SMEs indicates a strong relationship between Turkey's real sector and participation banks (TKBB, 2020). Why would Participation banks be able to lend a larger portion of a cash loan? Because Participation banks don't invest in state treasury bonds that have an interest rate linked to them (Demiralp, 2009). This means that Participation banks will be able to provide more capital to SMEs. As a result, SMEs have the potential to stimulate economic growth (Hu, 2010; Aris, 2007).

In this dual banking system setting, according to İçellioğlu and Öztürk (2019)'s research, Islamic banking is positively associated to Turkish exports. They used a panel fixed effect to quarterly data from 2008 to 2012 to study the association between total assets of the three largest Turkish participation banks (Türkiye Finans, Kuveyt Türk and Albaraka Türk) and Turkey's overall export.

### 3.3 Empirical Strategy

#### 3.3.1 The Data

This chapter's empirical analysis is based on three different sources. Namely, bilateral export data from Turkish provinces to destination country is downloaded from Turkish Statistical Institute<sup>2</sup> (TÜİK), the banking data which is province level loans given by participation banks and conventional banks acquired from Turkish Banking Regulation and Supervision Agency<sup>3</sup> (BDDK). Finally, the percentage of Muslims in each country around the world is obtained from the Pew Research Center<sup>45</sup>. Because the Pew Research Center acquires data from a variety of sources, the year of data for the proportion of the Muslim population varies in each country. Their sources include the World Values Survey, European Values Survey, World Religion Database, National Census, and their own surveys. This sample's data is based on a report issued by the Pew Research Center on November 17, 2017<sup>6</sup>. Although, the year 2017 reflects the year of report rather than

<sup>2</sup><https://www.tuik.gov.tr/Home/Index>

<sup>3</sup><https://www.bddk.org.tr/>

<sup>4</sup><https://www.pewresearch.org/>

<sup>5</sup>It is worth noting that Pew Research Center states that the Muslim population share in some counties is less than one percent or less than 0.1 percent. These percentages of the Muslim population are substituted with 0.5 and 0.05, respectively.

<sup>6</sup>Full report can be found here: <https://www.pewforum.org/chart/interactive-data-table-world-muslim-population-by-country/>



the year of data collection. The descriptive data of the Muslim population share in the sample countries are shown in table 3.1.

TABLE 3.1: Descriptive statistics of share of Muslim population

share_Mus					
Percentiles	Smallest				
1%	0.5	0.05			
5%	0.5	0.05			
10%	0.5	0.05	Obs	212,706	
25%	0.1	0.05	Sum of Wgt.	212,706	
50%	1.55		Mean	22.51337	
			Std. Dev.	35.85757	
			Largest		
75%	30.2	99.7			
90%	95	99.7	Variance	1285.766	
95%	98.4	99.7	Skewness	1.33117	
99%	99.4	99.7	Kurtosis	3.012851	

The sample covers the year interval between 2007 and 2020. Furthermore, banking data and export data are time-variant whereas share of Muslim in each country is time-invariant. Moreover, there are 81 provinces in Turkey. Thus, the sample of this work covers all Turkish provinces. In the similar manner, the sample contains all available countries including dependent and associated territories with autonomy as reported by TÜİK. Therefore, total number of destination countries is 213. However, when control variables are included, the number of countries drops to 202. Nevertheless, some exports are occurred from Turkish provinces to Turkish free zones. Thus, these exports data are excluded from the sample. Excluded exports accounts for only 2.5 percent of Turkey's overall export value in the sample years.

### 3.3.2 Variable Construction

By using bilateral trade data from Turkish provinces to across countries, the first variable that has been constructed is probability of exporting. It is a binary variable in which takes value 1 if a Turkish province's export value is positive in time  $t$ . 0, otherwise. Table 3.2 demonstrates summary statistics of the dependent variable<sup>7</sup>. There is a increasing

<sup>7</sup>Due to the inclusion of lagged explanatory variables, the data begins in 2007, whereas the sample begins in 2008.

trend over the sample years apart from the last year. The decline in the year 2020 can be attributed to Covid-19 pandemic that depressed world economies.

TABLE 3.2: Mean of the dependent variable, credit given by Islamic banks, and credit given by Conventional banks by the year

Year	Islamic banks	Conventional banks	Credit share of Islamic banks	Mean of the dependent variable
2007	177119.3	2817835	0.03	0.287
2008	225674.2	3480831	0.027	0.303
2009	306154.7	3928930	0.035	0.315
2010	386310.5	6055775	0.042	0.333
2011	478517	7773488	0.041	0.34
2012	598865.3	9005404	0.044	0.357
2013	774605.7	11800000	0.047	0.371
2014	815891.9	14000000	0.044	0.38
2015	926202.8	16800000	0.041	0.386
2016	962108.4	19600000	0.037	0.398
2017	1231017	23400000	0.038	0.406
2018	1428697	26400000	0.039	0.412
2019	1750385	29700000	0.04	0.427
2020	2815025	39300000	0.047	0.361
Total	919755.2	15300000	0.04	0.363

The banking data derives from BDDK provide the information related to total credit given by banks at province level for the sample years. There are three types of bank in the Turkey. Namely, Conventional banks (traditional banks), Participation banks (Islamic banks), and Investment and development banks. For the scope of this study, only Conventional banks and Participation banks are considered. Because Investment and development banks do not collect deposits and do not provide credit directly to firms<sup>8</sup>. The data enables this study to calculate share of total credit given by Islamic Banks (Participation Banks). It's formula is given below.

$$share\_Part\_c\_cre_{pt} = \frac{TCIB_{pt}}{TCIB_{pt} + TCCB_{pt}}$$

where;

<sup>8</sup>Investment and development banks could provide credit under certain circumstances, However, they do differ than Conventional banks and Participation banks.

$sshare\_Part\_c\_cre_{pt}$  is the share of total cash credit given by participation banks in Turkish province  $p$  in time  $t$ .

$TCIB_{pt}$  refers to total cash credit given by participation banks in Turkish province  $p$  in time  $t$ .

$TCCB_{pt}$  represents total cash credit given by conventional banks in Turkish province  $p$  in time  $t$ .

The next variable that has been constructed is spatial exports of Turkish provinces for the sample years. The idea that is imposed is similar to Porojan (2001). The intuition behind of that if a region exports to a destination then it is more likely that region will export to destination country's neighbourhood. For instance, if Ankara exports to Germany then the likelihood of exporting to Poland, Netherlands, Denmark France Luxembourg, Belgium, Switzerland, Austria, and the Czech Republic would be higher with respect to other countries.

### 3.4 The Empirical Model

The empirical model of this chapter based on gravity models of international trade. However, on the left hand side, this work investigates probability to exports rather than quantity of exports. For the given reason, the dependent variable is a binary variable. Furthermore, this chapter broadens the scope of the inquiry by investigating additional hypotheses based on variation between Turkish provinces and target markets. To begin, the empirical model in this chapter investigates whether the proportion of credit provided by participation banks affects export probability for a higher proportion of Muslims in a given country, as well as whether the proportion of credit provided by participation banks affects export probability regardless of the proportion of Muslims in the destination country. Following that, it would be investigated whether Islamic banks could facilitate export for cities with low/high levels of economic development. The model then identifies a plausible pathway through which bank credits can be influenced by political decisions. Finally, this study will provide an insight into whether the influence of Islamic banks on Turkish exports is affected by political characteristics of destination markets such as accountability, corruption control, government effectiveness,

political stability, regulation quality, and rule of law. For the model setting, the Linear Probability Model (LPM) was chosen because of its flexibility in incorporating high-dimensional fixed effects.

Equation 3.1 illustrates, the empirical model to be estimated.

$$\begin{aligned} \text{Pr}(\text{exp})_{\text{pct}} = & \beta_0 + \beta_1 \text{share\_Part\_c\_cre}_{\text{pt},(t-1)} \times \text{share\_Mus}_c \\ & + \psi X_{\text{pct},(t-1)} + \delta_{\text{pt}} + \zeta_{\text{ct}} + \theta_{\text{pc}} + \epsilon_{\text{pct}} \end{aligned} \quad (3.1)$$

The aim is to estimate the interaction term since the share of cash credit given by participation banks can not be estimated solely in this setting due to fact that the model possesses high dimensional fixed effects. Nonetheless, this study seeks to relax fixed effects and proposes possible explanations for the results after incorporating additional control measures.

Moreover,  $X$  matrix represents set of control variables for the model that varies by city, country and year. The first component of  $X$  matrix is the  $\ln(\text{spatial\_exp})_{\text{pct},(t-1)}$ , and it meant to capture sequential spatial exports of a province. The second control variable is  $\text{imp\_gdp}_{\text{pct},(t-1)}$  which refers to lag of total imports of Turkish cities from destination market divided by GDP of turkish cities. It is sort of a proxy that accounts for the trade openness of a city.

The model presented here also possess three-way fixed effects. To begin,  $\zeta_{\text{ct}}$  stands for the destination country-time fixed effect, and it captures the country's features as well as their changes over time. In other words, the importer-time fixed effect accounts for overall expenditure, country policy, institutional change, and exchange rate, among other things (Yotov, Piermartini, Larch, et al., 2016; Heid, Larch, and Yotov, 2015). Likewise,  $\delta_{\text{pt}}$  represents the country-time fixed effect in the model. The province-time fixed effect accounts for characteristic of provinces and its variation over time. For instance, province fixed effect could capture a province's characteristic such as, infrastructure, regulation, legislation, and cultural components. Nevertheless, province-time fixed effect, as this model has, could also control for GDP per capita, population, unemployment, productivity, exchange rate and total output. The last fixed effect is

the pair fixed effect in which it appears as  $\theta_{pc}$  in the model. Pair fixed effects account for everything between province and country that are time invariant. For example, common language, colonial tie, somatic distance, ethnic distance, physical distance, and contiguity between contracting parties would be captured by  $\theta_{pc}$  (Yotov, Piermartini, Larch, et al., 2016). The most important future of the pair-fixed effect that has been addressed in the literature is accounting for trade costs between exporter and importer countries. In addition, the pair-fixed effect would, of course, capture the characteristics of cities.

### 3.4.1 Estimation Issues

The main advantage of the Linear Probability Model (LPM) is that it allows for the use of high-dimensional fixed effects. Maximum likelihood estimators such as probit and logit, on the other hand, are excluded due to the problem of incidental parameters. Generally, fixed effects are inconsistently estimated in non-linear models as N (number of observation) grows and T (time) is limited (Arellano, Hahn, et al., 2007; Wooldridge, 2010). LPM could estimate consistently by treating to fixed effect parameter as a parameter to be estimated. Furthermore, Timoneda (2021) argued that LPM performed relatively better than maximum likelihood estimators in rare event data. Nevertheless, LPM has several handicaps. Firstly, some predicted values may fall into the out-of-unit interval. However, this may not be important as Wooldridge (2010) argued. Secondly, LPM suffers from heteroscedasticity. In order to deal with heteroskedasticity, White, 1980's robust standard errors are used in the estimation. Additionally, standard errors are clustered for country pairs due to possibility of serial correlation.

## 3.5 Results

The impact of the participating bank, due to their characteristics that are highlighted in the literature, is expected to foster the propensity of exporting to Turkish cities. The empirical model first investigates the effect of both, the share of credit given by participation banks and its interaction with the share of Muslims in the destination country.

To begin with, the province-year fixed effect is dropped in order to estimate the sole impact share of credit given by participation banks, as table 3.3 column [1] illustrates. Additional control variables are included in the model to account for possible omitted variable bias. The lagged fraction of cash credit provided by participation banks is negatively linked to the dependent variable, although its interaction with the proportion of Muslims in the destination country is positively related. In other words, the effect of the credit share provided by participating banks would be determined by how Muslim-intense the destination countries are.

The table 3.4 shows the marginal effect of the share of credit given by participation banks. The marginal effect of the share of credit given by participation banks is negatively related to dependent variable for the first 10 percentile and for the 50 percentile. The following two subsections will attempt to suggest some probable explanations for this negative link; nonetheless, the shift from 10 percentile to 50 percentile is just about 1%, as table 3.1 demonstrates. This is due to the fact that the sample is composed of 213 countries and Muslims are the minority in most of the countries. Moreover, the marginal effects turn out to be positive starting from the 75 percentile of the Muslim population in the sample. Although, 75 percentile is not statistically significant.

After that, as table 3.3 column [4] illustrates, the model has been estimated by using most feasible stringiest fixed effects. The interaction term has a positive relationship with the dependent variable as table 3.3 demonstrates. This positive link shows that participation banks have a selective effect on Muslim abundant destinations for Turkish cities. The influence of the share of credit provided by participation banks, in particular, improve the probability of exporting for the big proportion of Muslim countries.

The interpretation of the model is straightforward in which the coefficients are the slopes since it is a Linear Probability Model. Other conditions being equal, a rise in the variable of interest by one standard deviation (1.870166) increases the probability of exporting by .00948174. The right hand side variables explain 76 % variation for the probability of exporting. However, the most of the explaining power of the model can be attributed to high dimensional fixed effects.

In order to interpret the economic meaning of the estimate on the interaction, it has been taking the provinces at the 25th and 75th percentiles of the distribution of the share of participation banks - Tekirdağ and Kırşehir, respectively - and the countries at the 25th and 75th percentiles of the distribution of the share of Muslim - Japan,

and Tanzania, respectively - and calculate the differential probability of exporting to Tanzania compared to Japan in Kırşehir compared to Tekirdağ explained by the two significant factors under analysis. The estimate on the coefficient of  $L.(share\_Part\_c\_cre \times share\_Mus)$  predicts that, compared to Tekirdağ, the probability of Kırşehir exporting to Tanzania rather than to Japan will be higher by .024<sup>9</sup>.

However, the negative association between Turkish cities' export probability and the share of credit provided by participation banks remains ambiguous. The two subsections which follow seek to explain this negative relationship using evidence from existing literature. Cities' level of development and political use of credit, in particular, may be contributing factors to the aforementioned association.

### 3.5.1 The Effect of the Development Process of Cities on Export Probability

Despite the fact that a negative association has been discovered between the proportion of credits provided by participating banks and export probability, this finding will be extended to which disparities across cities could play a role. Turkey is a developing economy with significant geographical disparities between East and West. Indeed many researchers investigated the development process of Turkish provinces. Because, according to neoclassical economic growth theory, if a country/region has a low level of initial GDP per capita, its convergence will be faster (Barro and Martin, 1992). Therefore, provinces with low initial GDP per capita may be expected to accelerate their convergence. Many researchers, however, stated that this is not the situation in Turkey. Gezici and Hewings (2004), for example, investigated the convergence hypothesis and stated that there is no evidence for undeveloped provinces' economic progress between 1980 and 1997. Similarly, Karaca (2004) argued that regional disparities were increasing throughout Turkish provinces using data from 1975 to 2000. Abdioğlu and Uysal (2013) recently, rejected the convergence hypothesis for Turkey using data from 2004 to 2008 at the province level. In a similar vein, Yildirim, Öcal, and Özyildirim (2009) contended that per capita government spending in Western regions is more effective.

For the reasons stated above, this study considers the development level of Turkish cities in its analysis. The argument here is that the motivation for demanding credit

<sup>9</sup>The formula for the computation is given by equation:  
 $\partial Pr(exp) = \beta_1 \times \Delta share\_Mus_c \times \Delta share\_Part\_c\_cre_p \times 100.$

TABLE 3.3: LPM probability of exporting

	Baseline	Interaction Development	Interaction AKP	Province-Time Fixed Effect
L.share_Part_c_cre	-0.148*** (0.0558)	-0.204*** (0.0576)	0.0794 (0.0779)	
L.(share_Part_c_cre × share_Mus)	0.00495*** (0.00150)	0.00495*** (0.00150)	0.00495*** (0.00151)	0.00507*** (0.00149)
L.lc_exp	0.00593*** (0.000335)	0.00591*** (0.000335)	0.00592*** (0.000335)	0.00411*** (0.000329)
L.imp_gdp	0.00319*** (0.00106)	0.00314*** (0.00105)	0.00319*** (0.00106)	0.00271*** (0.000987)
L.lgdpcap_o	-0.0913 (0.0636)	-0.0945 (0.0636)	-0.0882 (0.0637)	
L.lgdp_o	0.0631 (0.0646)	0.0713 (0.0646)	0.0579 (0.0647)	
L.creditgdp	-0.0248*** (0.00612)	-0.0232*** (0.00615)	-0.0281*** (0.00619)	
L.lpop_o	0.100 (0.0612)	0.0995 (0.0612)	0.105* (0.0612)	
L.Netmig_pcp	0.202*** (0.0437)	0.202*** (0.0437)	0.214*** (0.0439)	
L.(share_Part_c_cre × Dummy_develop)		0.470*** (0.152)		
L.(share_Part_c_cre × Dummy_akp)			-0.394*** (0.0952)	
_cons	-1.207*** (0.460)	-1.300*** (0.462)	-1.210*** (0.460)	0.352*** (0.00281)
Province-Time FE	No	No	No	Yes
Country-Time FE	Yes	Yes	Yes	Yes
Province-Country FE	Yes	Yes	Yes	Yes
Observations	212706	212706	212706	212706
R <sup>2</sup>	0.759	0.759	0.759	0.764

Standard errors in parentheses

Robust standard errors are clustered by pair

All explanatory variables considered in time t-1, Whereas the dependent variable is regressed in time t.

Where province-year effect is not present the model has following additional controls at province level that are obtained from TÜİK: GDP per capita, GDP, total credit divided by GDP, population, and net migration divided by population.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



TABLE 3.4: Marginal effects of exporting probability

	Baseline	l.develop_share_Part_c_cre=0	l.develop_share_Part_c_cre=1	l.akp_share_Part_c_cre=0	l.akp_share_Part_c_cre=1
P10	-0.148*** (0.0558)	-0.204*** (0.0576)	0.266* (0.148)	0.0797 (0.0779)	-0.314*** (0.0689)
P50	-0.140** (0.0548)	-0.196*** (0.0566)	0.274* (0.148)	0.0871 (0.0772)	-0.307*** (0.0681)
P75	0.00143 (0.0530)	-0.0543 (0.0558)	0.416*** (0.145)	0.229*** (0.0771)	-0.165** (0.0659)
P90	0.322** (0.127)	0.267** (0.129)	0.737*** (0.180)	0.550*** (0.140)	0.156 (0.132)
P95	0.339*** (0.131)	0.284** (0.133)	0.754*** (0.183)	0.567*** (0.145)	0.173 (0.137)
N	212706	212706	212706	212706	212706

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

from banks could differ depending on how socio-economically developed Turkish cities are. Because credits can be used for purposes other than exports, such as infrastructure, education, and health. Socio-Economic index for Turkish provinces has been constructed by Yildiz et al. (2012) for the year 2010. According to their research, they extracted the index by using Principal Component Analysis (PCA) for 41 socio-economic variables<sup>10</sup>. They also claimed that 16 of Turkey's least developed cities are located in Eastern Turkey. Meaning that there is still persistent disparities between Turkish cities.

Subsequently, the dummy variable has been generated by categorizing Turkish cities into two groups based on the socio-economic index. If a city is in the top 25 percentile, the dummy variable has value of 1, otherwise its value equal to 0. Following that, the dummy variable interacted with the variable of interest which is the share credit given by participation banks. As table 3.3 column [3] illustrates the result, where share credit given by participation banks is negatively related to export probability for the underdeveloped cities whereas it is positively related for the top 25 cities in terms of the socio-economic index. Table 3.4 column [2] and column [3] show the marginal effect of the share of credit supplied by participating banks depending on how Muslim-intensive the destination market is and whether or not the city is socio-economically developed. The results indicate that regardless of the proportion of Muslim population in the destination country, if a city is developed socio-economically, a share of credit

<sup>10</sup>Their variables are classified into the following categories: demographic indicators, employment indicators, education indicators, health indicators, industry indicators, agricultural indicators, construction indicators, financial indicators, infrastructure indicators, and other wealth indicators.

provided by an Islamic bank increases the likelihood of export. However, this is not the case if the city is underdeveloped socio-economically and it is positively related to export probability for the top 10 and top 5 percentiles of the share of the Muslim population in the sample.

Last but not least, participation banks appear to boost export potential in developed cities. However, its impact in developing cities is limited. Following that, the notion of whether there is a difference between developed and underdeveloped cities has been investigated via Wald test. As appendix B.4 illustrates, the study revealed that there is a statistical difference in the effect of participation banks between the two group of cities.

### 3.5.2 The Impact of the Political Usage of Credits on Export Probability

Another explanation for the negative relationship between participation bank share credit and export probability is financing for local projects that is subtracted from exporting activities. Other than the development process of cities, political motivations could be one of the probable causes for funding local projects. Government-owned banks are the principal channel through which government politics are reflected. A large body of research argues that government-owned banks are detrimental to the economy. For example, La Porta, Silanes, and Shleifer (2002) argued negative relationship between government owned banks and subsequent economic growth. Likewise, Sapienza (2004) asserted that electoral results influence the behaviour of state-owned banks, with interest rates being lower in locations where political parties are stronger. Similarly, Dinç (2005) argued that state-owned banks provide 11 % more credit for the election years. Moreover, Carvalho asserted that by borrowing from government banks, Brazilian firms relocate employment from politically inactive regions to active regions. Moreover, Duchin and Sosyura (2012) claimed that enterprises with a government connection in the USA are more likely to get financed. Indeed, *Ziraat Bankası*, *Vakıf Bank*, and *Halk Bankası* are state-owned Conventional banks, whereas *Ziraat Katılım*, *Vakıf Katılım*, and *Emlak Katılım* are state-owned Participation (Islamic) banks.

In the case of Turkey, Luca (2016) uncover the link between electoral behaviour and the regional economic development for the Turkish provinces. He claimed that the Turkish government primarily funds projects to attract voters, and that regional economic progress is governed by the region's closeness to the central government.

Likewise, Onder and Ozyildirim (2011) using province level data for Turkey for the years between 1992-2006, argued that credits given by government-owned banks have been affected by political view. They revealed that state-owned banks have no influence on province growth rates.

Taking into account the viewpoints stated above, funding allocation could be political. As a result, this paper includes an examination of Adalet ve Kalkinma Partisi (AKP)<sup>11</sup>'s share of votes to assess whether the central government funds local projects instead of allocating funds to export activity.

Vote of AKP in the general election at 2007 is download from Wikipedia<sup>12</sup>. Following that, a dummy variable was created by splitting the cities into two groups: highest and lowest vote attributed to AKP. The dummy variable has a value of 1 for cities with the highest proportion of AKP votes in the sample. It is equal to 0 otherwise. Afterwards, it is interacted with the variable of interest. Note that the variable related to the vote of AKP can not be estimated solely due to inclusion of fixed effects. As table 3.3 demonstrates, interaction of variable of interest with dummy variable is statistically significant at 1% and it is negatively related to export probability. Whereas share of credit given by participation banks is positively related but not statistically significant. Considering share of Muslim population in the destination country, perhaps marginal effects could provide intuitive interpretation, as it is illustrated in the table 3.4 by column [4] and column [5].

There is a beneficial affect on the share of credit granted by participation banks for provinces that are in the bottom half of the AKP vote distribution for each percentile of Muslim population in the destination country. However, its significance starting from top 25 percentile of Muslim population in the destination country. In cities where they are in the highest 50 percentile of the AKP's vote distribution, the effect is negative for the first 25, first 50, and top 25 percentiles of the Muslim population share in the destination country. The data show that there may be a political distribution of credits to local projects that are deducted from export activities.

Finally, the Wald test was used to determine if the effect of the share of credit supplied by participating banks differs in cities where the share of AKP's vote is in the highest

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<sup>11</sup>Since 2002, the AKP has been Turkey's ruling party. Justice and Development Party is the English equivalent.

<sup>12</sup>[https://en.wikipedia.org/wiki/2007\\_Turkish\\_general\\_election](https://en.wikipedia.org/wiki/2007_Turkish_general_election)

50 percentile versus cities where the share of AKP's vote is in the lowest 50 percentile. The result indicates two group is statistically different than each other, as appendix B.5 demonstrates.

### 3.5.3 The Institutional Aspects of Destination Markets

Some scholars in the finance literature have studied the risk-aversion behavior of Islamic financing by making comparison to conventional banking (Hussain, Shahmoradi, and Turk, 2016). Notwithstanding this, Islamic banks gained prominence following the 2008 financial crisis due to their distinct qualities from conventional banks. On the one hand, several academics maintained that Islamic banking operations are founded on legitimate economic activity (Islam, 2017). Nonetheless, Islamic banking prohibits such actions as profiting from gambling, fraud, speculative activities, and a lack of information. Islamic banks, on the other hand, supply financing to entrepreneurs who are ineligible for loans from conventional banks (Demiralp, 2009).

Following the assertions presented above, this study expands on the analysis in which the institutional qualities of destination countries are addressed. Kaufman identified a number of governance measures that reflect overall institutional quality. To begin, he contended that the variables Political stability and Voice & Accountability pertain to the government selection procedure, including how it is replaced and monitored. Secondly, Government effectiveness and Regulatory quality define how governments effectively implements policies and the ability of governments. Finally, the Rule of law and the Control of corruption represent the state's and citizens' associated respect for institutions.

The purpose here is that whether the influence of Islamic banking on exports changes for riskier destination markets as proxied by institutional characteristics. The data on institutional attributes is obtained from the World Bank<sup>13</sup>, whereas the dataset is constructed by Kaufmann. Following the collection of data, the interaction terms for each dimension were constructed by multiplying them by the variable of interest. Because the model involves high dimensional fixed effects, this is a necessary step in the estimating process.

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<sup>13</sup><https://databank.worldbank.org/source/worldwide-governance-indicators>

TABLE 3.5: LPM institutional qualities across destinations

	Base	All
L.(share_Part_c_cre × share_Mus)	0.00548*** (0.00158)	0.0111*** (0.00268)
L.lc_exp	0.00410*** (0.000352)	0.00410*** (0.000352)
L.imp_gdp	0.00296*** (0.00110)	0.00295*** (0.00110)
L.(share_Part_c_cre × share_Mus × accountability_d)		0.000504 (0.00220)
L.(share_Part_c_cre × share_Mus × Cont_corr_d)		-0.00120 (0.00432)
L.(share_Part_c_cre × share_Mus × Gov_effect_d)		0.00497 (0.00399)
L.(share_Part_c_cre × share_Mus <i>times</i> Pol_stability_d)		-0.00187 (0.00156)
L.(share_Part_c_cre × share_Mus × Reg_quality_d)		0.000691 (0.00380)
L.(share_Part_c_cre × share_Mus × Rule_of_law_d)		0.00547 (0.00536)
_cons	0.380*** (0.00318)	0.379*** (0.00319)
Country-Time FE	Yes	Yes
Province-Time FE	Yes	Yes
Province-Country FE	Yes	Yes
Joint test		0.0000336
Observations	180549	180549
R <sup>2</sup>	0.760	0.760

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 3.5 demonstrates, all interaction terms of institutional qualities are not statistically different than 0. However, they are significant at 1% when they all jointly tested with the variable of the interest. In this case, a joint test makes more sense to avoid potential bias due to multicollinearity, because the variables were formed by interacting with the variable of interest. Nonetheless, Kaufman asserted that six governance characteristics are already positively and significantly associated among them, as table B.3 in Appendix B demonstrates.

The findings suggest that as the government's efficiency and ability to implement policies in the destination country improves, so does the impact of Islamic banking and share of Muslim population on export probability. While the characteristics of how the government is elected and changed in the destination country improve, the impact of the interaction term on the probability of exporting declines. In other words, when countries destabilize in terms of politics, expressing opinions, and participating in elections, the impact of Islamic banking and proportion of Muslims grows. Finally, as table 3.5 indicates, attributes of respect for the institutions of the destination country have mixed signs.

### **3.5.4 Robustness**

Endogeneity is one of the most serious issues in the empirical studies. There might be omitted variable bias even though this study possesses high-dimensional fixed effects. Nevertheless, it is quite challenging to find a variable that varies for Turkish provinces, destination countries and year. Perhaps the Linder hypothesis, which seeks to explain for similar demand preferences across Turkish cities and destination markets, can be examined. Two alternative Linder hypothesis formulas have been plugged into the model. The variable of interest is still statistically significant. The estimation result can be found in the appendix B.2. Nonetheless, this work performs additional robustness checks to address potential bias in estimation, which can be found below.

#### **3.5.4.1 Reverse Causality**

The reverse causality is another issue with model setting that can lead to inconsistent estimation. Meaning that probability of exporting could also affect credit share given by Islamic banks. In order to handle reverse causality problem, this work implements strict

exogeneity test that is suggested by Wooldridge (2010). When the time period is greater than three, the test can be used. A similar idea has imposed by Yotov, Piermartini, Larch, et al. (2016) to test endogeneity of regional trade agreements on bilateral exports. The intuition behind of the test, if probability of exporting affects the interaction term in time  $t$  then, it should be expected that future value (e.g.  $t+1$ ) of the interaction term have an impact on probability of exporting in current time (e.g.  $t$ ). In fact, a lead variable of  $\text{share\_Part\_c\_cre} \times \text{share\_Mus}$  has been generated. Following that, the lead variable is included to the model. The test's null hypothesis is that the variable in interest is strictly exogenous. Therefore, it should be expected the null hypothesis to fail to be rejected. The model is recalled as follows:

$$\begin{aligned} \text{Pr}(\text{exp})_{\text{pct}} = & \beta_0 + \beta_1 \text{share\_Part\_c\_cre}_{\text{pt},(t-1)} \times \text{share\_Mus}_c & (3.2) \\ & \beta_2 \text{share\_Part\_c\_cre}_{\text{pt},(t+1)} \times \text{share\_Mus}_c \\ & + \psi X_{\text{pct},(t-1)} + \delta_{\text{pt}} + \zeta_{\text{ct}} + \theta_{\text{pc}} + \epsilon_{\text{pct}} \end{aligned}$$

The model has been estimated by including the lead variable. As table 3.6 demonstrates, the lead variable is not statistically different than zero at 10%, 5%, and 1%. Meaning that the null hypothesis is failed to be rejected. In other words, export probability does not affect the share of credit given by participation banks and Musli share in the destination country. One may notice that the number of observations has fallen with respect to baseline model due to dropping the last year.

#### 3.5.4.2 Global Financial Crisis

Many academics believe that Islamic finance are resistant to financial crises because they are established on Islamic law, which prohibits interest rate and speculative activity. Ahmed (2010) and Kayed and Hassan (2011), in particular, documented the fact that Islamic banks outperformed conventional banks throughout the recent global financial crisis. Similarly, in the empirical analysis of Derbel, Bouraoui, and Dammak (2011), the negative effect of the financial crisis was found to be more prevalent for traditional

TABLE 3.6: LPM strict exogeneity test

	Baseline	Lead estimation
L(share_Part_c_cre × share_Mus)	0.00507*** (0.00149)	0.00545*** (0.00155)
F(share_Part_c_cre × share_Mus)		0.0000741 (0.00162)
L.lc_exp	0.00411*** (0.000329)	0.00419*** (0.000346)
L.imp_gdp	0.00271*** (0.000987)	0.00310*** (0.00111)
_cons	0.352*** (0.00281)	0.352*** (0.00316)
Country-Time FE	Yes	Yes
Province-Time FE	Yes	Yes
Province-Country FE	Yes	Yes
Observations	212706	196344
R <sup>2</sup>	0.764	0.768

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



banks when utilizing the VAR (The vector autoregressive) model. They concluded that the stability of Islamic finance exceeded that of traditional banks.

Subsequently, despite the fact that Islamic banking has been shown to be more resilient to financial crises, in order to address potential estimation bias caused by the global financial crisis between 2007 and 2010, this work presents further evidence supporting the robustness of the variable of interest. For the duration of the global financial crisis, a dummy variable was created, which was then interacted with the variable of interest before being included in the empirical specification. Depending on the start year of the crisis, two dummy variables are constructed. The dummy variable in the table 3.7 column [2] takes value equal to 1 for the years 2007, 2008, 2009, and 2010, Otherwise, it equals 0. Whereas the dummy variable in the table 3.7 column [3] takes value equal to 1 starting from the year 2008 up to 2010, 0 otherwise.

TABLE 3.7: LPM financial crisis

	Baseline	Crisis starting from 2007	Crisis starting from 2008
L(share_Part_c_cre × share_Mus)	0.00507*** (0.00149)	0.00465*** (0.00173)	0.00516*** (0.00157)
L.lc_exp	0.00411*** (0.000329)	0.00411*** (0.000329)	0.00411*** (0.000329)
L.imp_gdp	0.00271*** (0.000987)	0.00271*** (0.000987)	0.00271*** (0.000987)
L(share_Part_c_cre × share_Mus × crisis)		0.000730 (0.00167)	-0.000238 (0.00155)
_cons	0.352*** (0.00281)	0.352*** (0.00282)	0.352*** (0.00280)
Province-Time FE	Yes	Yes	Yes
Country-Time FE	Yes	Yes	Yes
Province-Country FE	Yes	Yes	Yes
Observations	212706	212706	212706
R <sup>2</sup>	0.764	0.764	0.764

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As table 3.7 demonstrates, in both cases, the interaction term which is share\_Part\_c\_cre × share\_Mus is statistically significant at 1%. The coefficient of the variable of interest decreases slightly in column [2]. Whereas the interaction term for crisis is positively related if the crisis is supposed to have begun in 2007, it is negatively related if the crisis is assumed to have begun in 2008. However, in both scenarios, the interaction term of the crisis is not statistically significant. According to this study, while the variable of

interest is statistically significant in both circumstances, there is no effect specific to the global financial crisis.

### **3.6 Concluding Remarks**

The rise of Islamic finance can no longer be ignored. There are limited empirical work regarding to Islamic finance. Turkey serves as a good research study for Islamic banking because it coexists with conventional banks. This analysis reveals the extensive margin of international trade through destination market diversity by utilizing unique Turkish provincial level export data from 2007 to 2020, as well as loans provided by both conventional and Islamic banks at the province level.

According to the findings of this work, despite their tiny share of credit, Islamic banks seem to foster Turkish provinces' export probability, as the share of the Muslim population increases in the destination market. Inferring that Islamic banks have a selective and favourable impact on the extensive margin of international trade, where selectivity refers to Muslim abundance destinations, *ceteris paribus*. The results also showed that for developed cities, the share of credit provided by Islamic banks boosts export probability regardless of destination country. Whereas its impact on underdeveloped cities is conditioned by the destination country's high Muslim percentage. Similarly, assuming that public investment is higher in cities that voted for the central government, less public investment generates higher export probability and is not conditional on the destination market's Muslim population proportion. In fact, public investment has not been studied using direct data, and the government may invest in economically disadvantaged cities.

This research also shed light on whether the impact of Islamic banking is affected by the institutional characteristics of destination markets. The finding implies that when the destination country's political stability worsens and Muslim population is abundant in the destination country, the influence of Islamic banking on export probability increases. Therefore, provinces that receive loans from Islamic banks prefer riskier export destinations.

Taking prior works into account, Islamic banks could contribute development process of Turkish provinces since export diversification is positively related to economic growth

(Agosin et al., 2007; Al-Marhubi, 2000; Hesse et al., 2009; Lederman, Maloney, et al., 2007). Nevertheless, Islamic banks would assist in the stabilization of Turkey's exports since degree of market diversification indicates stability of exports (Hirsch and Lev, 1971). In a similar vein, Islamic banks may help Turkey attract more foreign investment because diversification is associated with greater investment rates in emerging economies (Al-Marhubi, 2000).

Finally, endogeneity issue is partially solved since reverse causality has been tested. Despite the fact that this work applies the most stringent fixed effects feasible and accounts for potential economic concerns such as sequential exports, Linder term, omitted variable bias may arise. Using province-level data from Turkey, this study revealed that Islamic banks, as they say, encourage real economic activity. It would be beneficial for future research to determine, if possible, how exporting firms are capitalized in Turkey. Unfortunately, this chapter up to here.

## Chapter 4

# Conclusion

Religion's function in both society and the economy has regained its prominence in recent decades as a result of the availability of new estimating techniques that allow for quantitative assessment of the relationship. Moreover, the influence of religion on economic outcomes have remained consistent regardless of how the globalization process unfolded. This dissertation focused on the impact of religious similarity and a religious institution on the extensive margin of international trade. Moreover, it has been examined also whether the effect of religious similarity has a role in the trade pattern of a country.

The empirical analysis conducted in this study presents evidence that religious similarity has a effect on the extensive margin of international trade, positively. Furthermore, the impact of religious similarity on extensive margin increases as the relationship-specificity of the product rises. Where the relationship specificity index used in this work had been constructed à la Nunn (2007). Relying WVS survey data, one of the key contributions of this work is that religious similarity between exporters and importers changes over time.

The last chapter of this dissertation also attempted to bring empirical evidence regarding the relationship between Islamic banking and Turkey's export performance. It has been specifically investigated whether Islamic banking has a selective effect on provinces' export probability in terms of highly Muslim population destinations. Where Participation banks are the term to refer to Islamic banks in Turkey. It has been found that participation banks boost export probability for Muslim abundant destinations. Moreover, share credit given by Islamic banks fosters export probability regardless of the share of the Muslim population in the destination country if the city's development level

is among the top 25 percentile. Furthermore, the impact of Islamic banks in undeveloped cities is conditioning highly Muslim countries. Similarly, the effect of Islamic banking has been identified positively for cities that are less favourable to the central government regardless of destination. Meaning that cities that are politically far away from the central government, use their sources for export purposes. In addition, the impact of Islamic banking is particularly pronounced in highly Muslim and politically unstable locations.

The study's analyses have a number of policy implications. To begin, because religious similarity reduces information barriers between contracting parties, countries should strive to disclose more information to firms regarding destination markets, including subsidizing the sunk cost up to a degree. Similarly, countries should provide trust to foreign firms other than religion channel to receive FDI for producing relationship-specific goods since religious similarity can cause comparative advantage. Another policy implication is that countries can either attract – by offering incentives – foreign Islamic banks to expand their operations within their country or establish a new sharia-compliant bank in order to encourage actual economic activity, particularly exporting to highly Muslim populated countries.

This dissertation makes a novel contribution to the literature on international trade, the economics of religion, cultural economics, and finance. This may lead to new research directions for the role of religion, religious institutions and their interactions with the different economic activities. Nonetheless, endogeneity may occur, even though this study used multiple approaches to address it. Future studies may improve the model proposed here by taking into account aspects not stated in this work.

## Appendix A

# Appendix to Chapter 2

### A.1 Grouping Strategy and the List of Religious Affiliations

#### A.1.1 Grouping Strategy

As it can be seen below, there are 97 religious affiliation that have been reported by the survey organizer. The decision for the grouping religious denominations had been made by the author, after one-by-one investigation has been carried out. If an individual belongs to any affiliation that does not appear below, he or she is classified as belonging to the Other affiliation group, which is eliminated from this study because the goal is to analyse religious similarity. The implemented strategies can be found below.

1 - **Christians** : Aglipayan, Alliance, Anglican, Armenian apostolic church, Asseby of God, Baptist, Born Again, Brgy San Birhen, C&S Celestial, Catholic: does not follow rules, Charismatic, Christian, Christian fellowship, Christian reform, Church of Chirst, El shaddai, Evangelical, Faith in god, Greek Catholic, Gregorian, Hussite, Iglesia ni Cristo, Independent African Church, Independent Church, Israelita Nuevo Pacto Universal, Jehovas withness, Jesus is lord, Jesus miracle Crusade, Lutheran, Mennonite, Methodists, Mita, Mormon, New Testament Christ, Orthodox, Pentecostal, Presbyterian, Protestant, Roman Catholic, Salvation Army, Seven day adventist, Spritista, The church of Sweden, The worldwide church of god, Unitarian, United, United Church of Christ in the Philippines, Ratana, Chr jehovah's withness, Uniting church, Dutch reformed, Reformed churches in the netherlands, Evangelical/ Apostolic Faith

2 - **Muslims** :Al-Hadis, Muslim, Qadiani, Shia, Sunni,

3 - **Buddist** :Buddhist, Hoa hao

4 - **Judaist** : Jew

5 - **Hindus** : Hindu,

6 - **Non-belongings** : No religious denomination

### **A.1.2 The List of Religious Affiliations**

Aglipayan, Al-Hadis, Alliance, Ancestral worshipping, Anglican, Armenian Apostolic Church, Assembly of God, Bahai ,Baptist ,Born again ,Brgy. Sang Birhen , Buddhist, C & S Celestial, Cao dai, Catholic: doesn't follow rules, Charismatic, Christian ,Christian Fellowship ,Christian Reform ,Church of Christ / Church of Christ / Church of Christ of Latter-day Saints, Confucianism, Druse, El Shaddai, Essid, Evangelical, Faith in god, Filipinista, Free church/Non denominational church, Greek Catholic, Gregorian, Hindu ,Hoa hao, Hussite, Iglesia ni Cristo (INC), Independent African Church (e.g. ZCC, Shembe, etc.), Independent Church, Israelita Nuevo Pacto Universal (FREPA), Jain, Jehovah witnesses, Jesus is Lord (JIL), Jesus Miracle Crusade, Jew, Ka-a Elica, Lutheran, Mennonite, Methodists, Mita, Mormon, Muslim, Native, New Testament Christ/Biblist, Orthodox, Other, Other:Brasil: (Espirit,candomblé ,umbanda,esoterism,occultism) , Other: Christian com, Other: Oriental, Other: Philippines, Other: Taiwan (taoism, protestant fundam., ancient cults), Paganism, Pentecostal, Presbyterian, Protestant, Qadiani, Roman Catholic, Rosacruz, Salvation Army, Self Lealisation Fellowship, Seven Day Adventist, Shenism (Chinese Religion), Shia, Sikh, Sisewiss, Spiritista, Spiritualists, Sunni, Tac, Taoist, The Church of Sweden, The Worldwide Church of God, Theosophists, Unitarian, United, United Church of Christ in the Philippines (UCCP), Wicca, Zionist, Zoroastrian, Ratana, Ringatu, New Apostolic Church, Yiguan Dao, Daolism, Christian (Quakers, Jehovah's Witnesses, Evangelical, Protestant), Uniting Church, :Dutch Reformed (Nederlands Hervormd), Reformed Churches in the Netherlands (Gereformeerd), Evangelical/Apostolic Faith Mission, African Traditional Religion

## A.2 List of Countries

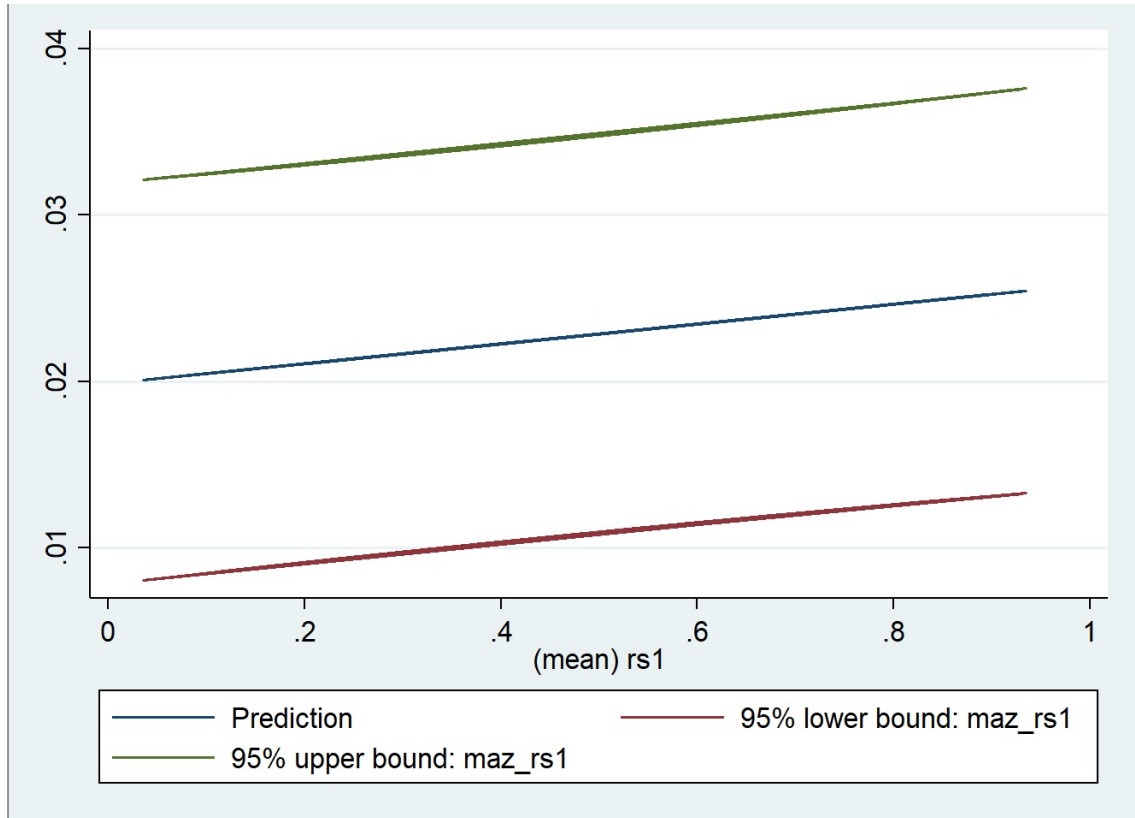
TABLE A.1: List of countries in the sample

List of Countries in the Sample		
1 - Albania	26 - United Kingdom	51 - New Zealand
2 - Argentina	27 - Georgia	52 - Pakistan
3 - Armenia	28 - Ghana	53 - Peru
4 - Australia	29 - Guatemala	54 - Philippines
5 - Azerbaijan	30 - Hungary	55 - Poland
6 - Brunika Faso	31 - Indonesia	56 - Russia
7 - Bangladesh	32 - India	57 - Rwanda
8 - Bulgaria	33 - Iran	58 - Saudi Arabia
9 - Bosnia and Herzegovina	34 - Israel	59 - Slovenia
10 - Belarus	35 - Italy	60 - Sweden
11 - Brazil	36 - Jordan	61 - Thailand
12 - Canada	37 - Japan	62 - Trinidad and Tobago
13 - Switzerland	38 - Kazakhstan	63 - Tunisia
14 - Chile	39 - Kyrgyzstan	64 - Turkey
15 - China	40 - Korea	65 - Tanzania
16 - Colombia	41 - Lebanon	66 - Uganda
17 - Germany	42 - Morocco	67 - Ukraine
18 - Algeria	43 - Moldova	68 - Uruguay
19 - Ecuador	44 - Mexico	69 - United States
20 - Egypt	45 - North Macedonia	70 - Venezuela
21 - Spain	46 - Mali	71 - Vietnam
22 - Estonia	47 - Malaysia	72 - Yemen
23 - Ethiopia	48 - Nigeria	73 - South Africa
24 - Finland	49 - Netherlands	74 - Zambia
25 - France	50 - Norway	75 - Zimbabwe



### A.3 The Marginal Effect of the Interaction Term

FIGURE A.1: Marginal effect of interaction term



## A.4 Alternative Similarity Index

TABLE A.2: LPM alternative religious similarity index

	base	Interaction
rel_sim	0.0272*** (0.00738)	0.0250*** (0.00746)
linder	0.00468*** (0.00166)	0.00468*** (0.00166)
ln_tot	0.00504*** (0.000505)	0.00503*** (0.000505)
rta	-0.0207*** (0.00217)	-0.0207*** (0.00217)
rel_sim $\times$ rs		0.00521* (0.00275)
_cons	0.0115** (0.00505)	0.0115** (0.00505)
Origin-Product-Time FE	Yes	Yes
Destination-Product-Time FE	Yes	Yes
Origin-Destination FE	Yes	Yes
Observations	1590871	1590871
$R^2$	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 2 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## A.5 Alternative Formula of the Linder Hypothesis

TABLE A.3: LPM an alternative linder term

	base_1	base_2	interaction_1	interaction_2
rel_sim	0.0227*** (0.00609)	0.0211*** (0.00606)	0.0197*** (0.00618)	0.0180*** (0.00615)
linder	0.00481*** (0.00166)		0.00481*** (0.00166)	
ln_tot	0.00519*** (0.000516)	0.00511*** (0.000516)	0.00518*** (0.000516)	0.00511*** (0.000516)
rta	-0.0206*** (0.00217)	-0.0208*** (0.00217)	-0.0206*** (0.00217)	-0.0208*** (0.00217)
linder_2		0.00000163 (0.000560)		0.00000680 (0.000560)
rel_sim × rs			0.00708*** (0.00255)	0.00707*** (0.00255)
_cons	0.0102* (0.00525)	0.0191*** (0.00433)	0.0102* (0.00525)	0.0192*** (0.00433)
Origin-Product-Time FE	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes
Observations	1590871	1590871	1590871	1590871
$R^2$	0.579	0.579	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## A.6 Further Robustness Migration

TABLE A.4: LPM further robustness migration

	Pair excluded TUR-DEU & DEU-TUR	Pair excluded TUR-DEU & DEU-TUR	Pair excluded DEU-POL & POL-DEU	Pair excluded DEU-POL & POL-DEU	Pair excluded DEU-ITA & ITA-DEU	Pair excluded DEU-ITA & ITA-DEU	Pair excluded DEU-RUS & RUS,DEU	Pair excluded DEU-RUS & RUS,DEU	Pair excluded DEU-KAZ & KAZ-DEU	Pair excluded DEU-KAZ & KAZ-DEU	Pair excluded USA-MEX & MEX-USA	Pair excluded USA-MEX & MEX-USA
rel_sim	0.0226*** (0.00609)	0.0196*** (0.00618)	0.0229*** (0.00609)	0.0198*** (0.00618)	0.0227*** (0.00609)	0.0196*** (0.00618)	0.0227*** (0.00609)	0.0196*** (0.00618)	0.0227*** (0.00609)	0.0196*** (0.00618)	0.0225*** (0.00609)	0.0195*** (0.00618)
linder	0.00481*** (0.00166)	0.00481*** (0.00166)	0.00488*** (0.00166)	0.00488*** (0.00166)	0.00481*** (0.00166)	0.00481*** (0.00166)	0.00479*** (0.00166)	0.00480*** (0.00166)	0.00481*** (0.00166)	0.00481*** (0.00166)	0.00550*** (0.00163)	0.00550*** (0.00163)
ln_tot	0.00518*** (0.000516)	0.00517*** (0.000516)	0.00517*** (0.000516)	0.00517*** (0.000516)	0.00519*** (0.000516)	0.00518*** (0.000516)	0.00519*** (0.000516)	0.00518*** (0.000516)	0.00519*** (0.000516)	0.00518*** (0.000516)	0.00529*** (0.000515)	0.00529*** (0.000515)
rta	-0.0207*** (0.00217)	-0.0207*** (0.00217)	-0.0208*** (0.00217)	-0.0208*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)	-0.0206*** (0.00217)
rel_sim × rs		0.00704*** (0.00255)		0.00707*** (0.00255)		0.00707*** (0.00255)		0.00711*** (0.00255)		0.00708*** (0.00255)		0.00704*** (0.00255)
_cons	0.0102* (0.00525)	0.0102* (0.00525)	0.0101* (0.00525)	0.0101* (0.00525)	0.0102* (0.00525)	0.0102* (0.00525)	0.0102* (0.00525)	0.0102* (0.00525)	0.0102* (0.00525)	0.0102* (0.00525)	0.00861* (0.00522)	0.00862* (0.00522)
Origin-Product-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Destination-Product-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin-Destination FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1590710	1590710	1590720	1590720	1590796	1590796	1590652	1590652	1590560	1590560	1590626	1590626
R <sup>2</sup>	0.579	0.579	0.579	0.579	0.579	0.579	0.579	0.579	0.579	0.579	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## A.7 Further Robustness Migration Continues

TABLE A.5: LPM further robustness migration continues

	pairs excluded TUR-DEU, DEU-TUR, DEU-POL, POL-DEU DEU-ITA, ITA-DEU DEU-RUS, RUS-DEU DEU-KAZ, KAZ-DEU USA-MEX, MEX-USA	pairs excluded TUR-DEU, DEU-TUR, DEU-POL, POL-DEU DEU-ITA, ITA-DEU DEU-RUS, RUS-DEU DEU-KAZ, KAZ-DEU USA-MEX, MEX-USA
rel_sim	0.0226*** (0.00609)	0.0196*** (0.00618)
linder	0.00556*** (0.00163)	0.00556*** (0.00163)
ln_tot	0.00526*** (0.000515)	0.00526*** (0.000515)
rta	-0.0208*** (0.00217)	-0.0208*** (0.00217)
rel_sim × rs		0.00702*** (0.00255)
_cons	0.00864* (0.00522)	0.00866* (0.00522)
Origin-Product-Time FE	Yes	Yes
Destination-Product-Time FE	Yes	Yes
Origin-Destination FE	Yes	Yes
Observations	1590020	1590020
R <sup>2</sup>	0.579	0.579

Standard errors in parentheses

Robust standard errors are clustered by pair, period and 3 digit product

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Excluded pairs for robustness estimation are as follows: Turkey-Germany, Germany-Turkey, Germany-Poland, Poland-Germany, Germany-Italy, Italy-Germany, Germany-Russia, Russia-Germany, Germany-Kazakhstan, Kazakhstan-Germany, United State-Mexico, and Mexico-United State.



## Appendix B

# Appendix to Chapter 3

### B.1 List of Countries and Share of Muslims

TABLE B.1: List of countries and share of Muslims

Countries	Share of Muslims	Countries	Share of Muslims
Aruba	0.2	Brazil	0.1
Afghanistan	99.7	Barbados	0.8
Angola	1	Brunei Darussalam	67.2
Anguilla	0.3	Bhutan	1
Albania	79.9	Botswana	0.4
Andorra	1	Central African Republic (the)	8.9
United Arab Emirates (the)	76.2	Canada	2
Argentina	1.9	Switzerland	4.3
Armenia	0.05	Chile	0.05
Antigua and Barbuda	0.6	China	1.6
Australia	1.7	Cameroon	17.9
Austria	4.2	Congo (the)	1.4
Azerbaijan	99.2	Cook Islands (the)	0.05
Burundi	2	Colombia	0.5
Belgium	3	Comoros (the)	98.3
Benin	24.4	Cabo Verde	0.5
Burkina Faso	59	Costa Rica	0.5
Bangladesh	89.6	Cuba	0.1
Bulgaria	12.2	Cayman Islands (the)	0.2
Bahrain	81.2	Czechia	0.05
Bahamas (the)	0.1	Germany	5
Bosnia and Herzegovina	40	Djibouti	96.9
Belarus	0.5	Dominica	0.1
Belize	0.1	Denmark	2
Bermuda	0.8	Dominican Republic (the)	0.05
Bolivia (Plurinational State of)	0.05	Algeria	98

TABLE B.2: List of countries and share of Muslims (Continues)

Countries	Share of Muslims	Countries	Share of Muslims
Ecuador	0.05	Honduras	0.1
Egypt	94.6	Croatia	0.5
Eritrea	36.5	Haiti	0.05
Spain	1	Hungary	0.2
Estonia	0.1	Indonesia	88.2
Ethiopia	33.9	India	13.4
Finland	0.5	Ireland	0.5
Fiji	6.3	Iran (Islamic Republic of)	99.4
France	6	Iraq	99
Faroe Islands (the)	0.05	Iceland	0.1
Micronesia (Federated States of)	0.05	Israel	16.7
Gabon	9.5	Italy	0.5
United Kingdom of Great Britain (the)	2.7	Jamaica	0.05
Georgia	9.9	Jordan	98.2
Ghana	15.9	Japan	0.1
Gibraltar	4	Kazakhstan	56.4
Guinea	84.4	Kenya	7
Gambia (the)	95	Kyrgyzstan	86.3
Guinea-Bissau	42.2	Cambodia	1.6
Equatorial Guinea	4	Kiribati	0.05
Greece	3	Saint Kitts and Nevis	0.1
Grenada	0.3	Korea (the Republic of)	0.1
Greenland	0.05	Kuwait	95
Guatemala	0.05	Lao People's Democratic Republic (the)	0.05
Guyana	7.2	Lebanon	59.3
Hong Kong	0.5	Liberia	12.2



TABLE B.3: List of countries and share of Muslims (Continues)

Countries	Share of Muslims	Countries	Share of Muslims
Libya	96.6	Namibia	0.4
Saint Lucia	0.1	New Caledonia	2.8
Sri Lanka	8.5	Niger (the)	98.6
Lesotho	0.05	Nigeria	50.4
Lithuania	0.1	Nicaragua	0.05
Luxembourg	3	Niue	0.05
Latvia	0.5	Netherlands (the)	5.7
Macao	0.05	Norway	1
Morocco	99	Nepal	4.2
Moldova (the Republic of)	0.5	Nauru	0.05
Madagascar	1.1	New Zealand	0.9
Maldives	98.4	Oman	87.7
Mexico	0.5	Pakistan	96.3
Marshall Islands (the)	0.05	Panama	0.7
Republic of North Macedonia	33.3	Pitcairn	0.05
Mali	92.5	Peru	0.05
Malta	0.2	Philippines (the)	5.1
Myanmar	3.8	Palau	0.05
Mongolia	5	Papua New Guinea	0.05
Northern Mariana Islands (the)	0.7	Poland	1
Mozambique	22.8	Korea (the Democratic People's Republic of)	0.05
Mauritania	99.1	Portugal	0.1
Montserrat	0.1	Paraguay	0.05
Mauritius	16.6	French Polynesia	0.05
Malawi	12.8	Qatar	77.5
Malaysia	60.4	Russian Federation (the)	11.7

TABLE B.4: List of countries and share of Muslims (Continues)

Countries	Share of Muslims	Countries	Share of Muslims
Rwanda	1.8	Turkmenistan	93.1
Saudi Arabia	97	Tonga	0.05
Sudan (the)	71.3	Trinidad and Tobago	5.8
Senegal	96	Tunisia	99.5
Singapore	14.9	Tuvalu	0.1
Solomon Islands	0.05	Taiwan (Province of China)	0.5
Sierra Leone	71.3	Tanzania, United Republic of	30.2
El Salvador	0.05	Uganda	12.1
San Marino	0.05	Ukraine	1
Somalia	98.5	Uruguay	0.05
Saint Pierre and Miquelon	0.2	United States of America (the)	0.8
Suriname	15.9	Uzbekistan	96.3
Slovakia	0.05	Saint Vincent and the Grenadines	1.5
Slovenia	2.4	Venezuela (Bolivarian Republic of)	0.3
Sweden	2	Virgin Islands (British)	1.2
Eswatini	0.2	Viet Nam	0.2
Seychelles	1.1	Vanuatu	0.05
Syrian Arab Republic	92.2	Wallis and Futuna	0.05
Turks and Caicos Islands (the)	0.05	Samoa	0.05
Chad	55.8	Yemen	99.1
Togo	12.2	South Africa	1.5
Thailand	5.8	Zambia	0.4
Tajikistan	84.1	Zimbabwe	0.9

## B.2 Robustness Linder Estimation

TABLE B.5: Robustness the linder hypothesis

	Baseline	Linder_1	Linder_2
L(share_Part_c_cre × share_Mus)	0.00507*** (0.00149)	0.00610*** (0.00153)	0.00609*** (0.00153)
L.lc_exp	0.00411*** (0.000329)	0.00422*** (0.000340)	0.00422*** (0.000340)
L.imp_gdp	0.00271*** (0.000987)	0.00270*** (0.000994)	0.00270*** (0.000996)
L.linder_1		-0.0178* (0.0104)	
L.linder_2			0.000329 (0.00180)
_cons	0.352*** (0.00281)	0.395*** (0.0134)	0.370*** (0.0161)
Country-Time FE	Yes	Yes	Yes
Province-Time FE	Yes	Yes	Yes
Province-Country FE	Yes	Yes	Yes
Observations	212706	193185	193185
R <sup>2</sup>	0.764	0.759	0.759

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Where;

$$\text{Linder}_1 = \log(|\text{gdpcap}_p - \text{gdpcap}_c|) \quad (\text{B.1})$$

$$\text{Linder}_2 = |\log(\text{gdpcap}_p) - \log(\text{gdpcap}_c)| \quad (\text{B.2})$$

### B.3 Correlation of Destination country's Institutional Characteristics

TABLE B.6: Correlation of destination country's institutional characteristics

	Voice and accountability	Control of Corruption	Government effectiveness	Political stability	Regularity quality	Rule of law
Voice and accountability	1					
Control of Corruption	0.7643	1				
Government effectiveness	0.7222	0.9196	1			
Political stability	0.666	0.7376	0.6782	1		
Regularity quality	0.7493	0.8628	0.9329	0.6239	1	
Rule of law	0.8036	0.945	0.9326	0.7644	0.9026	1

## B.4 Robustness Development Level of Cities

TABLE B.7: Walt test development level of cities

	est_1
L.(lc_exp × Dummy_develop)	0.00185* (0.000989)
L.(imp_gdp × Dummy_develop)	0.00246 (0.00170)
L.(lgdpcap_o × Dummy_develop)	-0.0379** (0.0176)
L.(lgdp_o × Dummy_develop)	-0.0287*** (0.00977)
L.(creditgdp × Dummy_develop)	0.00533 (0.0112)
L.(lpop_o × Dummy_develop)	0.180** (0.0748)
L.(Netmig_pcp × Dummy_develop)	1.016*** (0.210)
L.(share_Part_c_cre × Dummy_develop)	0.508*** (0.153)
L.share_Part_c_cre	-0.212*** (0.0576)
L.share_pt_Mus	0.00498*** (0.00150)
L.lc_exp	0.00563*** (0.000359)
L.imp_gdp	0.00248** (0.00122)
L.lgdpcap_o	-0.115* (0.0648)
L.lgdp_o	0.0950 (0.0657)
L.creditgdp	-0.0244*** (0.00621)
L.lpop_o	0.0554 (0.0629)
L.Netmig_pcp	0.135*** (0.0448)
_cons	-1.322*** (0.472)
Province-Time FE	No
Country-Time	Yes
Province-Country FE	Yes
High-Development FE	Yes
Observations	212706
R <sup>2</sup>	0.759

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## B.5 Robustness Share of AKP's Vote

TABLE B.8: Walt test share of AKP's vote

	AKP
L.(lc_exp × Dummy_akp)	-0.00111* (0.000666)
L.(imp_gdp × Dummy_akp)	0.00105 (0.00201)
L.(lgdpcap_o × Dummy_akp)	-0.0250* (0.0134)
L.(lgdp_o × Dummy_akp)	0.00409 (0.00615)
L.(creditgdp × Dummy_akp)	0.0294*** (0.00802)
L.(lpop_o × Dummy_akp)	-0.105** (0.0508)
L.(Netmig_pcp × Dummy_akp)	-0.598*** (0.103)
L.(share_Part_c_cre × Dummy_akp)	-0.530*** (0.0987)
L.share_Part_c_cre	0.178** (0.0794)
L.share_Part_c_cre × share_Mus	0.00496*** (0.00151)
L.lc_exp	0.00641*** (0.000474)
L.imp_gdp	0.00271** (0.00130)
L.lgdpcap_o	-0.110* (0.0641)
L.lgdp_o	0.0925 (0.0650)
L.creditgdp	-0.0376*** (0.00693)
L.lpop_o	0.137** (0.0654)
L.Netmig_pcp	0.691*** (0.0942)
_cons	-1.228*** (0.462)
Province-Time FE	No
Country-Time FE	Yes
Province-Country FE	Yes
High-AKP FE	Yes
Observations	212706
R <sup>2</sup>	0.759

Standard errors in parentheses

Robust standard errors are clustered by pair

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

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