

# Is God Good for Trade?

Matthias Helble<sup>1</sup>

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<sup>1</sup>Graduate Institute of International Studies; Avenue de la Paix, 11; 1202 Geneva; Switzerland; e-mail: helble2@hei.unige.ch. The work on this paper was supported by the German Academic Exchange Program (DAAD). I wish to thank Richard Baldwin and Alexander Raubold for their helpful comments. I owe special thanks to Jose Anson for his encouragement and valuable remarks.

## **Abstract**

In the gravity equation literature common religion is often used as a control variable, without distinguishing between religious groups. This paper studies the impact of five world religions, namely Hinduism, Judaism, Buddhism, Christianity and Islam on trade. We first investigate each religion's view on economic activity, in particular trade, and how each religion posits itself towards other beliefs. Analyzing trade between 151 countries our results reveal that religions have different impacts on trade. For inter-religious trade the study indicates that several religions have clear preferences with whom to trade or not.

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# 1 Introduction

The individual person is at the origin of all economic activity. His personal and cultural traits decide how and with whom he interacts economically. Whereas personal characteristics may be assumed to be purely random, cultural traits are not; the latter may have an important impact on economic behavior. The economic behavior we are focusing on in this paper concerns international trade. With an annual growth rate of around 6 percent, world trade is one of the major engines of globalization. Even though the number of trading relationships seems to remain stable (HELPMAN, ET AL. 2005), more and more goods are being exchanged. The exchange of goods does not stand by itself and always takes place in a cultural context. Therefore, the more goods are exchanged between countries the more inter-cultural interaction between trading partners is necessary. Some authors argue that globalization brings down cultural differences. However, over the recent years we have witnessed a surge in conflicts that have been fought over cultural rather than political-ideological issues. Furthermore, a globalizing world does not only create opportunities, but also fears. One of the strongest fears concerns the preservation of cultural identity, which is considered as a valuable asset, but menaced by globalization. But what are the determinants of culture? Why is culture such a sensitive issue?

Culture can be defined as

"Behaviour peculiar to Homo sapiens, together with material objects used as an integral part of this behaviour. Thus, culture includes language, ideas, beliefs, customs, codes, institutions, tools, techniques, works of art, rituals, and ceremonies, among other elements." BRITANNICA (2005).

Beside individual differences between people, culture is the main driving force that separates humans into groups. Out of the many elements that define culture only two are readily observable: language and religion. Language is not only a means of communication; it also carries ideas, customs, and values. Religion is even more influential for the human behavior. Many religious believes encompass rules for every aspect of daily life. For example,

one finds rules on nutrition in nearly all world religions. Religious beliefs have also been highly influential in institution building. It is therefore only logical to conjecture that religious beliefs also impact economic exchange within and between religions. The questions that come to mind in this context are: Which religion is especially trade-promoting? Are there product groups for which religion has a more important role to play than for other product groups? Is there an influence when analyzing economic development?

Whereas many studies have been undertaken to show the impact of language on trade (MELITZ, 2004), relatively few studies exist that analyze religion as a determinant of trade. In numerous empirical studies, which use a gravity model approach, religion is included only as a control variable. These studies come to the conclusion that sharing a common belief has a small or no effect on trade.

These results are, however, in many cases, misleading for various reasons: First, the control variable religion typically takes the values 1 if the population of the two trading countries share the same belief. As a consequence, the effect on religious minorities on trade is overlooked. Second, in general, no distinction is made between the potentially different impacts of certain religious beliefs on trade. However, not all religions share a common view on trade.

There exist few empirical studies that take a careful look at the relation between religion and trade. The empirical investigation of MEHANNA (2004) finds for a sample of thirty-three countries that Muslim majority countries trade less than their Christian, Buddhist or other counterparts when controlled for oil-exporting status and regional trade arrangements. GUO (2004) constructs an index of cultural similarity between the US, China and their trading partners. Using a gravity model, his results indicate that religious similarity fosters trade, but only between developing countries.

As far as we know no study exists that compares the different impacts of religious beliefs on trade. The purpose of this paper is to study the different impacts of five world religions on trade. In order to have a clearer picture of how religion influences trade, we distinguish between differentiated and homogenous goods.

The paper is constructed as follows: Section 2 elaborates the different positions of the five religions towards economic behavior, and if existent, towards trade. It also briefly outlines the view of the main world religions on their counterparts. In section 3 we explain which data sources and method-

ology have been chosen. Section 4 presents the results before concluding.

## 2 The Influence of Religions on Trade

At the beginning it might be helpful to clarify what we understand as religion. BRITANNICA (2005) offers the following definition:

"Human beings' relation to that which they regard as holy, sacred, spiritual, or divine. Religion is commonly regarded as consisting of a person's relation to God or to gods or spirits. Worship is probably the most basic element of religion, but moral conduct, right belief, and participation in religious institutions are generally also constituent elements of the religious life as practiced by believers and worshipers and as commanded by religious sages and scriptures." BRITANNICA (2005).

This definition reveals an interesting feature of religion. The believer has a personal relation to God or Gods, but at the same time he is not religious on his own, but in interaction with other adherents (HUTTER, 2005). Both relations may have a considerable impact on the social and economic behavior of an individual. Over the last thirty years a large number of economists have studied the determinants of religious beliefs and behavior.<sup>1</sup> Most of the work in this field focuses on Judeo-Christian beliefs, mainly because for these beliefs data is more readily available.

Religious beliefs can influence trading behavior in mainly two ways. First, sharing the same religious belief often implies sharing similar values. A common religion may therefore enhance trust between trading partners and reduce transaction costs. As a consequence, the trade volume between traders of the same religion should be higher than trade between different religions. Second, each religion has its own ethical standpoint towards the activity of trading. As we will see in the next section in greater detail, some religions perceive trade as a necessity, others as a value creating activity.

We consider it therefore as crucial to understand the view of each religion on trade. Since we would like to examine the influence of religions on international trade, we consider only religions that are practiced in several

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<sup>1</sup>IANNACONE (1998) provides a valuable literature review.

countries. We limit our study to the following five religions: Hinduism, Judaism, Buddhism, Christianity, and Islam. All five of them are also referred to as world religions either because of their geographical dispersion or the number of adherents (HUTTER, 2005). This section introduces the five religions according to their date of origin. We thereby focus on the question of what each religion posits concerning economic behavior in general and trade in specific. A short table at the end of the section summarizes the main conclusions.

## 2.1 Hinduism

Hinduism is a religion that is mainly based in India where it developed in the 1st millennium b.c. Hinduism is a polytheistic religion that was highly influential in the development of the Indian culture. As other world religions Hinduism is based on a sacred book called *Veda* which was written by several authors, the *Rishis*. In the *Veda* are found important concepts of economics such as production, exchange, wages, interest, rent, profit and the market.

Hinduism proclaims four legitimate aims of life: *dharma*, *artha*, *kama*, and *moksha*. These translate roughly into righteousness, economic well being, pleasure, and salvation. Every Hindu is free to pursue these aims as long as he also fulfills his *dharma*. The *dharma* is comparable to the ten commandments and gives guidance for the religious as well as social life. It is important to notice that the *dharma* changes from caste to caste and also during an individual's life. The *dharma* gives everyone the right to pursue economic gains and therefore every individual is also capable to find his economic well-being.

This market-oriented view of Hinduism finds its limits when it comes to the caste system. Depending on the counting measure one can count up to several thousand castes. Each caste preserves its identity by following a strict and complex set of rules. A Hindu is born into a certain caste and changing caste is nearly impossible. Castes are often defined by the profession of their members. Accordingly, there is one caste responsible for goods' trade. Giving the exclusive right to trade to one group of people within a country, may negatively impact the trading performance of the country as a whole, especially if the group is small. All goods' exchange within the country as well as with outsiders has to go through these especially designated traders.

We conclude that Hinduism takes a rather complicated stance towards international trade. Whereas economic exchange is welcome, trading is traditionally reserved to a specific caste. This system implies high transaction costs that could nevertheless be offset by the high level of trust between the trading caste. For religions other than Hinduism, it might be difficult to find the appropriate Hindu trading partner.

## 2.2 Judaism

Judaism is one of the oldest world religions and has its origin in the Middle East.<sup>2</sup> At the core of Judaism is the *Torah*, which sets out Jewish law and consists out of five books. In Jewish life conducting business and trade has always played a very prominent role. One reason might be that the Jewish community since its beginning was surrounded by neighbors with different beliefs. The *Torah* therefore provides guidance on how to conduct business with non-Jews. Even though the Jews considered themselves as the selected people, it did not impede normal commercial relations with people of other beliefs. It is reported that Jewish tribes of ancient Israel had intensive trade relations with their neighbors (WILSON, 1997).

The ten commandments constitute the most important guidance to practical life. Three of them concern economic matters: the commandments not to work on Sabbath, not to steal and not to covet a neighbor's possession. The rule of not laboring the seventh day might be understood as not working excessively at the expense of spiritual obligations (WILSON, 1997). The prohibition of theft and covetousness have more important economic implications since they help to conduct business in an orderly manner. Traditionally, the fair exchange of goods is considered as a valuable concept. It is recognized that the market facilitates transactions and that money is an appropriate medium of exchange. Further, human beings are regarded as basically selfish and that their economic actions are motivated by self-interest (WILSON, 1997).

In summary, Judaism can be seen as a religion that not only provides an appropriate framework for economic exchange, but also the incentive to build up trade relations, without discriminating necessarily between Jews and non-Jews.

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<sup>2</sup>Experts estimate that the earliest date from which on Judaism was developed as a religion was 538 b.c. upon the returning from the exile in Babylon (HUTTER, 2005).

## 2.3 Buddhism

Buddhism is a religion founded in India around 525 b.c. by Siddhartha Gautama, called the Buddha. It spread from India along the commercial roads, most importantly the Silk Road, to China, Mongolia, Korea and Japan. Today, Buddhism counts over 300 million adherents worldwide and is divided into two main schools: the *Theravada* in Sri Lanka and South East Asia, and the *Mahayana* in China, Mongolia, Korea, and Japan.

Buddhism is a very flexible system of belief. It can easily be adopted to country-specific customs and therefore today we find many different types of Buddhism. Buddhism is also a very tolerant belief concerning other religions. It even agrees with the moral teachings of other religions and calls for inter-religious collaboration to alleviate the suffering of humans (BRODBECK, 2002).

Buddhism does not include explicit guidelines for economic behavior. However, the social ethic of Buddha touches several times on economic issues. For example, Buddha did not allow that the monks and nuns to take money as donation. All donations have to be given in kind and the donors receive religious instruction in exchange. In this context, he also calls for direct economic relations between men, without the intermediation of money. The total economic relations should also be limited. Only if men are able to keep track of their economic relations, the stability of the whole system is guaranteed (BRODBECK, 2002).

An important principle of Buddhism is the principle of interdependence. Life should be perceived as an inextricable web in which nothing can claim separate or static existence. Humans form an integral part of this system, but are not supposed to dominate nature (unlike the claims of Christianity). The resources should therefore be used according to the principles of sustainability and provision of all species.

Differences in ability and wealth are respected as long as the interest of all participants are maintained. Buddha asks, however, to restrict the acquisition of wealth to the necessary, if not the attainment of enlightenment is precluded.

All in all, Buddhism is a highly flexible and diversified belief. The considerable differences between country-specific versions of Buddhism may limit the trust-enhancing effect of sharing Buddhism as a common religion between trading partners. We therefore conjecture that the trust effect for

trade between Buddhist countries is small. Furthermore, since the activity of trading is not perceived positively, Buddhist countries may have a general disincentive to trade.

## 2.4 Christianity

During its 2000 year old history Christianity has become the religion with the most numerous adherents worldwide. Christian beliefs are all based on the *Bible* containing the Old and New Testament. Even though some Christian beliefs put emphasis on the *Old Testament*, the *New Testament* is the primary source that determines Christian thinking.

Concerning economic issues, the *New Testament* differs substantially from the *Old Testament*. One of the authors of the *New Testament* underscores the obligation of the rich toward the poor. The *New Testament* stresses several times the material necessity of life, but also encourages the wisely use of resources. God is seen not only as the creator of the spiritual, but also material world. God has given people control over resources and people are obliged to use them to the best of their abilities. The material means need to be produced, protected and sustained (WILSON, 1997). Accumulating material wealth is not condemned by the *New Testament*, as long as it does not distract from worship to God and if men do not try to replace God through security in material goods.

Concerning trade there is relatively little written in the Old Testament and even less in the *New Testament* (WILSON, 1997). The values of trust and honesty which are important prerequisites for trade are compatible with Christian morality. However, the early Christian fathers were reluctant with trade since it was seen as a source of fraud and greed. However, trade was not condemned as such, but rather considered as part of the natural order. Some authors (i.e. VINER, 1978) even find a supportive position towards trade by early Christian fathers.

St. Thomas Aquinas (1225-74) was one of the most influential Christian scholars. His extensive work also touched upon questions of economic thinking and his position on this topic was widely adopted by the Catholic Church. Aquinas recognized the role of markets and considered money as a legitimate mean of exchange. However, according to Aquinas it is crucial that the exchange is voluntary and at a just price. The just price results from subjective human estimation and may involve a greater gain to the

buyer or seller. However, the price should not only reflect the value of the good, but it should also take into account the situation of both parties. As a result, a transaction between Christians should involve market forces as well as considerations on equity.

A reformist movement that begun in the 15th century led to the rise of a new Christian church, called Protestantism. The reforms put forward by the reformists not only concerned theological issues, but also impacted political and economic life. The most prominent reformist leader Martin Luther (1483-1546) argued that one can witness his faith not merely through prayer, but also through work. He encouraged Christians to be critical and to assess the secular law against the biblical teaching. John Calvin (1509-1564), the founder of the Protestant church called Calvinism, emphasized on individual conscience. He proclaimed that people were free to carry out good work in God's name and that they were not bound by a secular authority or even the church. According to Calvin, business has to be conducted in accordance with the ten commandments and with strict honesty in all transactions.

One of the most important reforms introduced by Protestantism concerned the theology of salvation. In Catholicism the confession of sins to a priest and a sequent penance allow for salvation. Since priests are trained to adjust the moral code to the strength of the penitent, moral standards may be quite diverse (ARRUÑADA, 2004). The reformist movement abolished the confession of sins to priests focusing more on the individual conscience. This position led to a greater homogeneity of moral standards by Protestantism. This slight difference may have an impact on trade. The more diverse Catholic standards result in higher transaction costs for trade between Catholics than for trade between Protestants. In other words, Protestantism is more trade-promoting than Catholicism.

However, due to data constraints we were not able to treat Catholicism and Protestantism separately. For several countries the official statistics does not make a difference between Catholics and Protestants and count both as Christianity.

In summary, the Christian economic thinking recognizes the market system, but places some constraints on it which are defined by Christian ethical standards. Trade is not treated explicitly and probably seen more as a necessity than a contribution to the economic well-being.

## 2.5 Islam

Islam is the youngest of the world religions considered in this paper. At the core of Islam is Prophet Mohammed (570-632) who was the author of the *Koran*, the main text of the Islamic religion. Prophet Mohammed was not only a religious leader, he also was an important political figure. As a secular ruler he had experience in trading and in the mechanisms of economic transactions. As a consequence, the *Koran* gives very explicit guidelines in economic behavior. With over 1400 of 6226 verses referring to economic issues, the *Koran* is much more concerned about economic life than the *Bible* (WILSON, 1997). For many aspects of daily life the *Koran* provides very specific and practical guidance. Enacted in the *Shariah*, the Islamic religious law, these rules are applied in all countries where the *Shariah* law is the ultimate legal authority. In Muslim countries that have adopted secular laws many believers still adhere to the *Shariah*.

Concerning trade the Islamic view differs substantially from the Christian one. Whereas for Christians trade is a necessity that does not add value to the commodity traded, in Islam trading is considered as important as producing. It is argued that without the exchange of goods, production would be worth much less. This trade favoring position is pronounced explicitly in several passages of the *Koran*. *Sura* 4:29 warns to keep exclusive control over personal property and postulates "let there be amongst you traffic and trade by mutual goodwill." However, trade is not seen as beneficial *per se*. It has to obey rules, most importantly honesty. The *Koran* condemns any attempt to deceive or to cheat in economic transactions. Furthermore, Muslims should only get involved into trading when they are able to take responsibility concerning the quality of the traded good. Finally, the possible gains from trade should not result in materialism. As in the *Bible*, materialism is considered as diverting the attention from more important spiritual concerns. The *Koran* also condemns coveting of a neighbor's good. However, it does not denounce the accumulation of wealth. Wealth is seen as a mean of serving God and not an end in itself. Wealth also comes with responsibilities, most prominently with the responsibility to give. And since believers are promised much more in the afterlife, material wealth in this world is seen as secondary.

Other two particularities might have an impact on the trading behavior of muslim people. First, in the Islamic world traders are highly respected as knowledgeable individuals since they originally contributed to the dissemi-

TABLE 1–PREDICTIONS FOR TRADING BEHAVIOR

Exp./Religion	Hinduism	Judaism	Buddhism	Christianity	Islam
Hinduism	+	+	+	=	+
Judaism	+	++	+	=	=
Buddhism	+	+	+	=	+
Christianity	=	-	=	+	-
Islam	=	-	=	-	++

*Notes:* ++ highly trade promoting, + trade enhancing, = neutral, - trade preventing.

nation of knowledge. Second, traditional Islamic teaching and writing put much more emphasis on quality rather than on quantity aspects. Disposing of a considerable variety of goods is more praised than accumulating huge quantities of few goods.

In summary, Islam is a very trade friendly belief. Trading is explicitly recognized as welfare enhancing for both parties. In contrast to the Christian belief, concerns of equity in trade relations are not addressed.

## 2.6 Intra-religious versus Inter-religious Trade

The main diagonal of Table 1 summarizes the predictions for trading behavior within religions. We call those effects intra-religious trade effects. However, religions may not only come into play in the context of commercial relations between adherents of the same religion, but they might also influence trade when trade takes places between different religions (interreligious trade effects).

Many religions have established clear stances towards other religions. These rules might be already written down in the sacred books, but may have also been developed over time. An example of the former case is the explicit criticism of Judaism in the *Koran*. Whereas the conflict-filled relation between Christianity and Islam is the result of subsequent interpretations of the *Bible* and the *Koran* and the sense of mission of both religions.

The theological position of each might translate into a specific socio-economic behavior. For our study it is therefore interesting to analyze the position of each religion towards other beliefs. Since we are far from being experts in religions science, we have made vague guesses how each religion positions itself towards other beliefs and the probable impact on trade. The results are presented in Table 1, on the main diagonal. The first column shows the exporting religions, the first row the importing religion. The signs denote whether the inter-religious trade relation is highly trade promoting ( $++$ ), trade enhancing ( $+$ ), neutral ( $=$ ), or trade preventing ( $-$ ).

As we have seen above, the caste system in Hinduism may negatively influence trade. Therefore, we assume that trade relations between Hindus are higher than on average, but not exceptionally high. Hindu may have a preference to trade with Buddhists since both faiths are close and maybe trust creating. Hinduism has probably more trade with trade favoring religions such as Judaism and Islam. The trade relations towards Christians should be neutral.

Judaism should maintain healthy trade relations towards the two Asian religions, whereas the trade links to Christianity and Islam might be more conflict prone and outweigh the openness of Judaism towards trade. Buddhism as a very tolerant and diversified religion probably only conducts more trade with Hinduism because of cultural proximity as well as with other trade favoring religions, such as Judaism and Islam. The trading attitude towards Christians is conjectured to be neutral.

From a theological point of view Christians should refrain from trade with Jews and Muslims, and take a neutral positions for trade with the two Asian religions. Finally, Islam should show some hesitations to trade with Jews and Christians. In the *Koran* Jews are heavily criticized several times. Islam as Christianity both have a sense of mission which lead to repeated clashes between both religions. On the other hand, Muslims probably behave neutrally or even encourage trade with Hindus or Buddhists.

In the following section we present the methodology and the results of our estimations. At the end we compare the main results with the predictions made above.

## 3 Data and Methodology

### 3.1 Data

First of all, it has to be noted that the reliability and availability of religious data is limited. Governments collect few religious statistics and religious organization often intentionally overestimate the number of adherents. For our study we collected data on the number of affiliates of the five world religions in each country of our sample. The word "affiliation" means that there is some sort of formal connection between the individual and the religion. However, the affiliation does not say anything about the nature of the individual's religious practice. In many country cases, affiliates of minority religions practice their faith much more actively than the majority religion. Further particularities of religious data need to be mentioned. Until 1989 communist countries had made substantial efforts to suppress or ignore religious practice. These efforts still impact religious data of these countries; a considerable percentage is counted as atheist or nonreligious. In countries with a majority of traditional, often animist beliefs, little or no distinction is made between the various religious practices (BRITANNICA, 2004). Finally, several countries small minority religions are only recorded as "others" without reporting the exact affiliation.

In order to get the most detailed data, we had to consult several religious data sources. Our primary sources are the CIA WORLD FACTBOOK as well as the BRITANNICA Book of the Year 2004. We compared the data with data reported by religious organizations. In cases where both primary sources reported little detailed data on minority religions, we used the latter sources to complement our data set. In total we count 18 countries with Hindu communities, 51 with Buddhist communities, 40 with Jewish, 137 with Christian communities, and 87 with Muslim communities. The worldwide number of adherents of the five religions are 850 million Hindu, 14 million Jews, 400 million Buddhists, 2 billion Christians, and 1,2 billion Muslims (HUTTER, 2005).

For the other ingredients of the gravity equation we consulted the World-bank Statistical Database, the CEPII website,<sup>3</sup> as well as the CIA WORLD FACTBOOK. The trade data was downloaded from the COMTRADE Database of the United Nations via the World Bank's World Integrated Trade Solution.

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<sup>3</sup>see Data Appendix

## 3.2 Methodology

In its simplest form the gravity equation states that the volume of trade,  $T$ , between country  $i$  and  $j$  is positively related to the economic size of both countries  $i$  and  $j$  and negatively to the distance separating them,  $dist_{ij}$ :

$$T_{ij} = \frac{Y_i Y_j}{dist_{ij}} \quad (1)$$

Taking the logarithm we obtain the following equation:

$$t_{ij} = \alpha + \beta_1 y_i + \beta_2 y_j + \beta_3 dist_{ij} + \mu_{ij} \quad (2)$$

In this equation  $x_{ij}$  denotes the logarithm of exports from country  $i$  to country  $j$ ;  $y_i$  and  $y_j$  stand for the logarithm of gross domestic production in unit  $i$  and  $j$ ;  $dist_{ij}$  measures the logarithm of distance between unit  $i$  and unit  $j$ . Finally,  $\mu_{ij}$  denotes a Gaussian white noise error term.

This simple form of the gravity equation predicts up to two thirds of international trade. Evidently many possible influences on bilateral trade are not captured by the model. In order to know which other factors influence trade costs, but are not related to distance, one can augment the simple gravity equation by additional variables as long as they are consistent with the assumptions of the model. In our case, we want to analyze the influence of religion on trade and therefore add different variables concerning religion. In order to isolate as best possible the impact of religion on trade, we add several control variables. The augmented gravity equation used has the following form:

$$t_{ij} = \alpha + \beta_1 y_i + \beta_2 y_j + \beta_3 dist_{ij} + \gamma_{1\dots n_1} r_{1\dots n_1} + \delta_{1\dots n_2} s_{1\dots n_2} + \theta_{1\dots n_3} b_{1\dots n_3} + \mu_{ij} \quad (3)$$

As before  $i$  and  $j$  denote the trading partners and  $y_{ij}$  is the log value of bilateral trade between the trading partners (in current US Dollars),  $y_{i,j}$  the log of GDP (in current US Dollars), and  $dist_{ij}$  measures the log of the great circle distance between the capital of country  $i$  and  $j$ .  $r_{1\dots n_1}$  stand for the different bilateral religious variables that we use.  $s_{1\dots n_2}$  and  $b_{1\dots n_3}$  denote the two groups of control variables. The first group contains country-specific control variables, e.g. area, landlocked, and island. The second group captures all bilateral variables, namely adjacency, common language, colonial

links, common ex-colonizer, and free trade arrangement.<sup>4</sup>

ANDERSON AND VAN WINCOOP (2003) point out that the classical specification of the gravity equation (equation(2) and (3)) neglect the different price indices between countries. The authors show that since the difference in price indices can be related to trade barriers, the estimation results are biased in equilibrium. In order to incorporate their critique, we follow their suggestion and estimate our gravity equation using fixed effects for each exporting and importing country. This specification controls for all country-specific differences. In order to avoid multicollinearity problems, the GDP of both trading partners  $y_{i,j}$  as well as all additional country-specific differences, denoted  $s_{1...n_2}$  in (3), are left out. However, all bilateral variables,  $r_{1...n_1}$  and  $b_{1...n_3}$ , are preserved. The gravity equation used in this paper has the following form:

$$t_{ij} = \alpha + \beta_3 dist_{ij} + \gamma_{1...n_1} r_{1...n_1} + \theta_{1...n_3} b_{1...n_3} + ex_i + im_j + \mu_{ij} \quad (4)$$

The fixed effects for exporting and importing countries are denoted  $ex_i$  and  $im_j$ , respectively.

In order to disentangle the effect of religions on trade, we control for five bilateral variables,  $b_1, b_2, \dots, b_5$ , namely

- Common border: The dummy variable "Adjacency" becomes unity if  $i$  and  $j$  share a land border.
- Common language: The binary variable "Lang" is unity if  $i$  and  $j$  have a common language.
- Colonial links: The dummy variable "Col" is unity if  $i$  ever colonized  $j$  or vice versa.
- Common ex-colonizer: The variable "ComCol" becomes zero if  $i$  and  $j$  were colonized by the same colonizer.

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<sup>4</sup>DEARDORFF (1998) discovered that not only the absolute distance between the two countries matters for bilateral trade, but also their geographic positions relative to all other countries. For example, even though the distance between Spain and Sweden is about the same as between Australia and New Zealand, we expect the second pair to trade more due to their remoteness from other markets. We do not include a measure for remoteness since the appropriate measurement and the theoretical underpinning of remoteness remains a topic of active debate (ANDERSON AND VAN WINCOOP, 2003).

- Membership of Regional Trade Agreements: The dummy variable "RTA" is unity if  $i$  and  $j$  belong to the same regional trade agreement. For our sample, only the economically most important adherence was considered.<sup>5</sup>

Since oil is a special commodity and predominately traded by Muslim countries, we decided to use a dummy for the exports of the nine OPEC countries, namely Algeria, Indonesia, Iran, Kuwait, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela.

We further include a variable that allows us to measure the influence of religious openness on trade. We want to test whether the presence of different religions within a country could be highly trade promoting. In order to gauge the degree of religious variety we construct the following variable:

$$V_{ij} = \sum_{i=1}^n (d_{mi}) * \sum_{j=1}^n (d_{mj}) \quad (5)$$

$d_{mi}$  is a dummy variable that is unity if the religion  $m$  is present in country  $i$ . The maximum number of world religions that one country can host is five in our model. We multiply this number with the corresponding number of the trading partner  $j$ . The higher the variable  $V_{ij}$  becomes, the more religions are present in both countries. Finally, it has to be noted that the variable enters equation (4) in logarithmic form.

In order to test the stability of our results we undertake several robustness tests. We estimate the gravity equation using different specification for the religious variables. In another test only differentiated goods are considered.

In the next section, we first estimate the equation (4) for aggregate trade flows between the 151 countries listed in the Data Appendix for the year 2000.

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<sup>5</sup>See also Data Appendix

## 4 Estimation Results

### 4.1 Intra-religious Trade Effects

Religious belief may influence trade in two ways. First, a shared religious belief may enhance trust and therefore reduce transaction costs between trading partners. This effect should be particularly important for goods that are sensitive to trust. Second, as we have seen above the world religions accord different importance to the activity of trade. In Islam, for example, traders enjoy a very positive reputation, whereas in Christianity trade is seen more as a necessity.

At the same time, several religions and their practice have established rules or customs which define the behavior towards other religions. The position of one religion towards another religion might already be outlaid in the written texts of the founders, or it might be the result of the historic interaction between two religions.

We first test the hypothesis whether a common religious belief promotes trade. Table 2 reports the results for three different specification. We first estimate indicators of religious similarity by taking for each religion the product of the fraction of individuals in country  $i$  and  $j$  that share the same religion. This gives the probability that two randomly selected individuals of two countries share the same religion.<sup>6</sup> For example, if in country A has 40 percent Christians and country B 20 percent, we obtain 0.08. Finally, we take the logarithm of this number. The estimation results, reported in column (1) yield highly interesting insights.

For Hindu meeting another Hindu does not seem to have an influence on trade. Hindu apparently trust each other as much or as little as they trust on average adherents of other religious beliefs. Jews, however, tend to prefer other Jews as trading partners over other religions. The same is true for Buddhists, Christians and Muslims. For Christians it seems particularly important to have another Christian as a trading partner.

A further interesting insight is revealed by the coefficient of religious variety, which is highly statistically significant. The coefficient of 1.173 suggests that religious openness fosters trade substantially as well.

The results in column (1) show that the probability of meeting a trading

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<sup>6</sup>This measurement is widely used in literature, see e.g. RAUCH (2001)

TABLE 2—RELIGION AND TRADE

Variable		(1)	(2)	(3)
Hinduism	Probability	0.002 (0.007)		
	Network		0.022 (0.099)	
	Majority			-
Judaism	Probability	**0.014 (0.005)		
	Network		*0.085 (0.051)	
	Majority			-
Buddhism	Probability	***0.017 (0.004)		
	Network		***0.234 (0.050)	
	Majority			***-1.118 0.164
Christianity	Probability	***0.024 (0.015)		
	Network		0.244 (0.151)	
	Majority			-0.021 0.076
Islam	Probability	***0.021 (0.003)		
	Network		***0.299 (0.052)	
	Majority			***0.545 0.093
Variety		***1.712 (0.223)	***1.440 (0.184)	***1.677 (0.157)
Adjacency		***0.742 (0.088)	***0.716 (0.087)	***0.727 (0.088)
Language		***0.652 (0.060)	***0.670 (0.060)	***0.591 (0.061)
Col		***1.321 (0.102)	***1.326 (0.102)	***1.431 (0.100)
ComCol		***0.538 (0.064)	***0.526 (0.064)	***0.567 (0.064)
RTA		***0.298 (0.051)	***0.313 (0.051)	***0.323 (0.051)
Oil		***4.730 (0.443)	***2.639 (0.374)	***4.427 (0.419)
N		30502	30502	30502
Adj. R-squared		0.708	0.707	0.708

*Notes:* Parameters are estimated by fixed effects regressions; \*\*\*, \*\*, \* denote significance at the 1, 5, 10 percent level, respectively; robust standard errors in parentheses; N denotes the number of observations

partner with the same religious beliefs influences trading behavior. Another way to measure the impact of religion on trade is to test whether religious networks have a role to play. We therefore re-estimate the gravity equation using a dummy variable when the same religion is present in both countries and has at least a percentage share of 0.1 in both countries. For example, if there exists a Jewish community, in the exporter and importer country and is equal or bigger than 0.1 percent in both countries the variable becomes unity.

Running the regression yields further evidence for the results found in (1). The signs of all religious variables in column (2) are identical to the ones of column (1). However, all coefficients that are statistically significant gain in strength. The presence of Jewish, Buddhist, as well as Muslim communities seem to boost trade considerably. The variety variable is again highly significant, underlining the importance of religious openness for trade in the presence of networks.

In column (3) we re-estimate the gravity equation, but this time we analyze the question whether countries, in which one religion has a majority, trade more with countries, in which the same religion constitutes the majority. For this purpose we define a majority religion as the one that is followed by the relative majority percentage of the population. If both countries share the same majority religion the dummy variable is unity, if not zero. Since Judaism is only in one country a majority religion and Hinduism in only two, no coefficients can be estimated for the two coefficients. Column (3) presents the results for all other variables of interest.

The results corroborate some of the findings of our first specification. Countries with a majority of Muslims apparently have a strong preference for trade with their counterparts. The coefficient for trade between countries with a majority of Christians is now statistically insignificant. Most remarkably, the coefficient for Buddhists majority countries now turns into negative. Apparently, Buddhists majority countries trade less with each other than predicted by the gravity equation. However, we have found before that sharing Buddhism as religion is trade promoting. One possibility could be that Buddhism has a positive influence on trade as long as it is a small network. The network effect falls apart when both countries have Buddhist majorities.

The coefficient for religious variety is similar to the one in (1). This result reaffirms the observation that the presence of other religious beliefs beyond the dominant belief has a trade enhancing effect.

Overall, the results confirm several of our predictions about religion and trade in section 2. Sharing Hinduism as a religion does not seem to enhance trade. The trust enhancing effect of a common religion may be outweighed by higher transaction costs. The Jewish trade networks promote trade, however, to a smaller extent as we might have expected. Judaism is a very homogenous religion and therefore supposed to be particularly well suited to build trust. Compared to other religions the coefficient for Judaism is smaller, which might indicate that Jewish communities are in general open to trade.

Buddhism might be considered as the most diversified religion of all five world religions. The heterogeneity in Buddhism should lower possible trust effects. The relatively high coefficient therefore indicates that Buddhists have a more positive stance towards trade as we have expected.

For Christian trading partner the shared religion is trade promoting. However, it seems that the Christian trade relations do not work via networks. Furthermore, Christian majority countries do not trade more with each other. As predicted in section 2, the link between trade and Christianity is rather weak. For Muslims, the results corresponds fully to our expectations. Muslims have a very positive attitude towards trade regardless of the kind of trade link.

We have explained above that the effects of religion on trade mainly have two sources. First, a common religion helps to build trustworthy relations between trading partners. Second, each religion evaluates the trading activity differently. The different evaluations might result in religion specific trade patterns. Which of the two transmission channels is the predominant one?

In order to find an answer to this question, we separate our trade flows in two groups, differentiated and homogenous goods. For this purpose we follow the classification of RAUCH (1999) and put products that are reference priced or traded at an organized exchange into one group and all differentiated goods into the second group.<sup>7</sup> We then again run three regressions with the same specifications as in columns (1) to (3). The results are presented in Table 3.

If trust is indeed an important element for trade between religions, then it should be especially important for trade in differentiated goods and we would expect that all coefficients increase in magnitude. If however the posture of each religion towards trade in general dominates the trade effect, then the coefficients should remain stable.

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<sup>7</sup>See also Data Appendix

TABLE 3—RELIGION AND TRADE, DIFFERENTIATED GOODS

Variable		(1)	(2)	(3)
Hinduism	Probability	0.004 (0.007)		
	Network		0.026 (0.102)	
	Majority			-
Judaism	Probability	***0.019 (0.006)		
	Network		**0.127 (0.057)	
	Majority			-
Buddhism	Probability	**0.007 (0.004)		
	Network		***0.180 (0.052)	
	Majority			***-1.451 0.173
Christianity	Probability	0.006 (0.008)		
	Network		0.177 (0.147)	
	Majority			***-0.277 0.075
Islam	Probability	***0.024 (0.003)		
	Network		***0.345 (0.055)	
	Majority			***0.578 0.093
Variety		***3.585 (0.476)	***3.733 (0.477)	***3.559 (0.472)
Adjacency		***0.579 (0.107)	***0.602 (0.108)	***0.568 (0.107)
Language		***0.579 (0.065)	***0.768 (0.065)	***0.711 (0.066)
Col		***1.342 (0.100)	***1.328 (0.110)	***1.432 (0.109)
ComCol		***0.591 (0.064)	***0.608 (0.066)	***0.630 (0.066)
RTA		***0.334 (0.050)	***0.293 (0.056)	***0.302 (0.056)
N		15916	15916	15916
Adj. R-squared		0.820	0.820	0.820

*Notes:* Parameters are estimated by fixed effects regressions; \*\*\*, \*\*, \* denote significance at the 1, 5, 10 percent level, respectively; robust standard errors in parentheses; N denotes the number of observations

Comparing the coefficients of column (1) in Table 3 with the ones in column (1) in Table 2 we obtain a mixed picture. The coefficient for Hinduism remains statistically insignificant. The coefficients for Judaism and Islam gain in strength implying that when it comes to differentiated goods, both rely more on their respective religious fellows. The coefficient for Buddhism loses in strength. The coefficient for Christianity becomes even statistically insignificant. For Christians, trade in differentiated goods is apparently not trust sensitive.

When we only focus on networks a similar picture emerges. The coefficients for Judaism and Islam get stronger, Buddhism loses and the coefficient for Christianity turns into insignificant. The result seems to indicate that Jewish and Muslim networks are particularly important for trade in differentiated goods.

If we finally analyze the influence of majority religions on trade, we have similar results to the ones in Table 2. Countries with a Buddhist majority seem to trade particularly little with their Buddhist counterparts when it comes to differentiated goods. Christians show a similar pattern and apparently prefer other than Christian trading partners. Only Muslims still prefer Muslim trading partners for differentiated goods.

Most interestingly, the coefficient measuring variety jumps for the last two specification and remains then stable at around 3.5. The result seems to indicate that for trade in differentiated goods it is especially important that the trading partners host as many religions as possible. One possible explanation might be that the different religious groups tend to trade specific differentiated goods. If one belief is missing less of those religion specific goods are traded. Another explanation might be that in countries with a panoply of religions the demand for variety is stronger than in countries with few religions.

We conclude that when we only consider differentiated goods the results become more pronounced in the case of Judaism and Islam. This result indicates that trust towards fellows of the same religion is indeed an important element of the trade effect for this two religions. However, it is still difficult to gauge which of the two effects mentioned earlier is stronger.

## 4.2 Inter-religious Trade Effects

Table 2 and 3 allowed us to see the impact of religious beliefs on trade. The main results are that Hindu do not prefer trading partners with the

TABLE 4—INTRA AND INTERRELIGIOUS TRADING BEHAVIOR

Exp./Partner	Hinduism	Judaism	Buddhism	Christ.	Islam
Hinduism	0.002 (0.007)	***-0.021 (0.006)	**0.014 (0.010)	*0.018 (0.054)	0.026 (0.045)
Judaism	***-0.035 (0.007)	**0.014 (0.005)	*0.009 (0.005)	0.006 (0.007)	0.005 (0.005)
Buddhism	***0.015 (0.006)	**0.012 (0.006)	***0.017 (0.042)	***-0.044 (0.007)	***-0.014 (0.004)
Christianity	0.011 (0.001)	0.009 (0.007)	***-0.038 (0.007)	***0.024 (0.008)	***-0.021 (0.006)
Islam	0.018 (0.005)	-0.001 (0.005)	***-0.021 (0.005)	***-0.024 (0.034)	***0.021 (0.003)

*Notes:* Parameters are estimated by fixed effects regressions; \*\*\*, \*\*, \* denote significance at the 1, 5, 10 percent level, respectively; robust standard errors in parentheses; N denotes the number of observations

same religion. Buddhists have a tendency to trade more with non-Buddhists than with adherent of their faith. Jews, Christians, Muslim all prefer doing business with trading partner of the same faith. We could therefore state that there exists important intra-religious trade effects.

If religions prefer to trade with adherents of the same faith, it means that they discriminate against other religions. In order to disentangle these effects of positive or negative discrimination, we use the same specification to the one in column (1) in Table 2 and run the regressions with inter-religious probability coefficients. This means we calculate the probability that for example a Hindu of the exporting country meets a Jew, Buddhist, Christian, or Muslim in the importing country. This approach allows us to identify inter-religious trading behavior. The matrix in Table 4 summarizes the results of this exercise.

On the main diagonal one finds again the intra-religious trade effects. For Hinduism it is neutral, for Buddhists negative, and for all others positive. However, we notice that Hindu are not neutral against all trading partners, but have some clear religious preferences. Countries with Hindu communities apparently prefer to export to countries with Buddhist and Christian communities and avoid trade with Jewish communities. Countries with Jewish communities reciprocate this trading behavior discriminating against Hindu countries.

Buddhists have a preference to export to Hindus and Jews whereas they show some reluctance in trading with other Christian and Muslim communities. Christian communities seem to avoid trade with Buddhist and Muslim countries. As we have seen above, over the centuries Christian leaders were molding the idea of the Muslim enemy. The impact can apparently still be felt today. However, the countries with Islamic communities seemed to be influenced by the same rhetoric. The probability to meet a Christian lowers trade. Surprisingly, no discrimination is observed versus Jewish communities.

Overall, we have obtained a very rich picture about inter-religious trading behavior. The majority of prediction we have made in Table 1 have been confirmed. Others, however, have been rejected.

In order to crosscheck the results of Table 3 we have run the same regressions as before, but taking the perspective of the importing country. As expected, the results are nearly identical, and therefore are not reported separately.

## 5 Concluding Remarks

Our paper constitutes a first attempt to disentangle the different effects of religions on trade. The results indicate that sharing a common religion is trade promoting for all world religions, except Hinduism. Identifying the reason behind the positive effect of a common religion on trade is difficult. Sharing a religion certainly increases trust, however, for goods that were particularly sensitive to trust we have obtained a mixed picture.

Our works needs to be extended in various ways. First, it would be interesting to know whether the impact of religion on trade has changed over time.<sup>8</sup> Another necessary extension of our work would consist in re-estimating the gravity model using a Tobit approach. Trade relations might exist or not also for religious reasons.

One of the most remarkable results of our study is that religious openness has a strong positive effect on trade. This effect is even more pronounced for differentiated goods. Countries that host a panoply for religions seem to be the best traders. Overall, we can conclude that god is indeed is good for trade, but gods are even better.

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<sup>8</sup>We have done a first panel estimation including the years 1965, 1970, 1975, 1980, 1985, 1990, 1995, and 2000. Using year fixed effects, the results found above have been confirmed.

## 6 References

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## 7 Data Appendix

- Country-Specific Information: CENTRE D'ETUDES PROSPECTIVES ET D'INFORMATIONS INTERNATIONALES  
<http://www.cepii.fr/anglaisgraph/bdd/distances.htm>
- Overview of Regional Trade Agreement: CRAWFORD, J.A. AND FIORENTINO, R.V. (2005) "The Changing Landscape of Regional Trade Agreements," *WTO Discussion Papers*, 8, World Trade Organization, Geneva.
- RAUCH (1999) Product Classification: Downloaded on June 20th 2005 on the website of HAVEMAN, J. <http://www.maclester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html>

TABLE 1A—Countries included in the sample

Country Name	Country Name	Country Name
Albania	Germany	Paraguay
Algeria	Ghana	Peru
Antigua and Barbuda	Greece	Philippines
Argentina	Grenada	Poland
Armenia	Guatemala	Portugal
Aruba	Guinea	Qatar
Australia	Guyana	Rep. of Korea
Austria	Honduras	Romania
Azerbaijan	Hungary	Russian Federation
Bahrain	Iceland	Saint Kitts and Nevis
Barbados	India	Saint Lucia
Belarus	Indonesia	Saint Vincent and Grenadines
Belgium	Iran	Sao Tome and Principe
Belize	Ireland	Saudi Arabia
Benin	Israel	Senegal
Bolivia	Italy	Serbia and Montenegro
Botswana	Jamaica	Singapore
Brazil	Japan	Slovakia
Bulgaria	Jordan	Slovenia
Burkina Faso	Kazakstan	South Africa
Burundi	Kenya	Spain
Cameroon	Kuwait	Sudan
Canada	Latvia	Suriname
Cape Verde	Lebanon	Swaziland
Central African Republic	Lesotho	Sweden
Chile	Lithuania	Switzerland
China	Luxembourg	Syrian Arab Republic
China Hong Kong	Madagascar	Tajikistan
China Macau	Malawi	Tanzania, United Rep. of
Colombia	Malaysia	TFYR Macedonia
Comoros	Maldives	Thailand
Costa Rica	Mali	Togo
Côte d'Ivoire	Malta	Tonga
Croatia	Mauritius	Trinidad and Tobago
Cyprus	Mexico	Tunisia
Czech Republic	Moldova, Rep. of	Turkey
Denmark	Mongolia	Turkmenistan
Dominica	Morocco	Uganda
Dominican Republic	Mozambique	Ukraine
Ecuador	Namibia	United Arab Emirates
Egypt	Nepal	United Kingdom
El Salvador	Netherlands	United States of America
Eritrea	New Zealand	Uruguay
Estonia	Nicaragua	Vanuatu
Ethiopia	Niger	Venezuela
Fiji	Nigeria	Viet Nam
Finland	Norway	Yemen
France	Oman	Zambia
Gabon	Pakistan	Zimbabwe
Gambia	Panama	
Georgia	Papua New Guinea	

TABLE 2B—MAJOR REGIONAL TRADE AGREEMENTS

Acronym	Name
AC	Andean Community
AMU	Arab Maghreb Union
ASEAN	Association of South East Asian Nations
CACAM	Central American Common Market
CARICOM	Caribbean Community and Common Market
CEFTA	Central European Free Trade Agreement
CEMAC	Economic and Monetary Community of Central Africa
CIS	Commonwealth of Independent States
COMESA	Common Market for Eastern and Southern Africa
ECO	Economic Cooperation Organization
ECOWAS	Economic Community of West African States
EFTA	European Free Trade Association
EC	European Communities
GCC	Gulf Cooperation
MERCOSUR	Southern Common Market
NAFTA	North American Free Trade Agreement
SADC	Southern African Development Community
SAPTA	South Asian Preferential Trade Arrangement
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement