

**The Holy Triad?
Religion, Globalization, and
Sustainable Development**

Kim Tùng Đào

“To myself and my family”

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Abstract

This thesis deals with development, globalization, and religion. These topics have so far largely been studied in isolation (and if studied often only in a qualitative sense and based on the assumption of unidirectional causation). This thesis demonstrates the interrelations of development, globalization, and religion and highlights the heterogeneity of signs, sizes, and causal directions of the relations. Since development, globalization, and religion have always been deeply rooted in human nature, their relations offer a complicated research puzzle. This is further complicated by the fact that globalization and (sustainable) development are multidimensional in nature and the fuzzy concept of (non)religion that to a large extent is subjective and based on self-reporting. The aim of the thesis therefore by necessity is modest; the research project tries to contribute four small pieces to the puzzle posed by development, globalization, and religion.

The first puzzle piece relates to a significant gap in the History of Economic Thought on international trade that by and large neglects thinkers and authors of Ancient Asia. This puzzle piece is uncovered in Chapter 2 which, through traditional narrative reading, reviews and discusses the attitudes toward merchants and their commercial activities in five major philosophies of life in Ancient Asia (Vedic religion, Buddhism, Confucianism, Chinese Legalism, and Islam). Following Jacob Viner's approach to analyze the impact of early Greek, Roman, and Christian thinking on trade the thesis analyses the attitudes toward

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merchants and their commercial activities (that serve as a proxy for the attitude toward trade and international trade). Within the context of religion and international trade, the chapter also reflects on the recent findings regarding the impact these five philosophies of life have on international economic relations and exchange. An important finding is the heterogeneity of these impacts (ranging from a very positive attitude in Islam to a consistently negative evaluation in Chinese legalism). The findings of this chapter serve as a source of inspiration for the remainder of the thesis that due to data availability focus on the contemporary empirical relevance of religion for globalization and sustainable development.

The second puzzle piece is a first look at the empirical relation between religion and globalization, focusing on the direction of religion with the use of a Granger causality analysis and the Impulse-Response Functions of a set of Vector Auto Regression models. In a sense Chapter 3 expands the domain considered in Chapter 2, both in terms of dimension and scope, as it also analyzes believers versus non-believers (and particularly introduces Christianity and Atheism into its models) and because the analysis goes beyond international trade per se covering multidimensional aspects of globalization (economic, social, and political globalization as well as the legal distinction between *de facto* and *de jure* measures of globalization). Chapter 3 methodologically moves to quantitative analysis. Based on a sample of 159 countries in the period between 1990 and 2015, a Granger causality test of the relation between religion and globalization is performed that shows significant – so far not recognized – heterogeneities with respect to the direction, size, and significance of the relationship between multidimensional globalization and the seven categories of (non)religions.

The third puzzle piece is a complicated one: the multidimensional concept of sustainable development. Chapter 4 deals empirically with the relation between globalization and sustainable development. A

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panel data set of 160 countries in the period between 1990 and 2018, is used to estimate 180 non-linear models. Importantly, the measures for globalization are on the whole significant both in a linear and in a quadratic form suggesting an inverted-U relationship between sustainable development and globalization. The underlying genuine effect and the variation in the estimates of these 180 regressions are analyzed by means of a self-meta-analysis, believed to be the first time this tool has been conducted in such a manner in empirical economic research.

The last puzzle piece that this thesis contributes is an analysis of the direct and indirect effects that religion has on sustainable development. Chapter 5 is positioned in the center of the topics addressed in earlier chapters as it is surrounded by the three previous research puzzle pieces. A quantitative analysis estimates a system of four simultaneous equations that allows development, globalization, and religion to simultaneously affect each other under inter-correlated conditions. Based on a sample of 146 countries in the period between 1990 and 2015, Chapter 5 investigates the effects of different religions on sustainable development, both directly and indirectly via two possible channels: globalization and income.

Through the results of these four chapters, this thesis contributes to the literature in five possible ways:

1. The review in Chapter 2 helps to fill the gap due to the lack of research on the ancient period of Asia in the literature on the history of economic thoughts on international trade. Besides, such review and discussion point out the heterogeneity among religions in positioning international trade, which is barely noticed in the literature.
2. The empirical quantitative examination of relations between different religions and globalization reveals heterogeneity among religions. The results in Chapter 3 also suggest various directions of Granger causality (either from religion to globalization or the

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other way round or two-way) in this correlation. Acknowledging and being aware of such heterogeneity and variations in directions of Granger causality could help future research on this topic by improving their methodology.

3. By proposing a non-linear relation between globalization and sustainable development, Chapter 4 calls for different ways of modeling this relation. Besides, the multidimensional approach and the self-meta-analysis enabled by this approach ring a reminder to empirical research to consider the multidimensionality of both globalization and sustainable development rather than taking them as single-dimensional concepts.
4. Chapter 4 provides a self-meta-analysis, innovative use of an established method in economic research. This innovation is relevant to other empirical studies that need to report on important variations in a large range of estimations.
5. The results in Chapter 5 endorse the significant and heterogeneous, direct and indirect effects on sustainable development exerted by different religions and philosophies of life (including Atheism).

The pieces of the research puzzle on the (inter) relationship of development, globalization, and religion do not provide the full picture. As with any jigsaw puzzle, it is likely that some pieces are missing and that the pieces that were put together in later research may fit differently. The bottom line of the dissertation is, however, not influenced by such consideration. The conclusion from this thesis is clear: religion and its potential effects should be elements of the future discourse of development.

Samenvatting

Dit proefschrift gaat over ontwikkeling, globalisering en religie. Deze onderwerpen zijn tot nu toe hoofdzakelijk apart bestudeerd (en dan vaak alleen met behulp van kwalitatief onderzoek waarbij tevens dikwijls wordt uitgegaan van een eenzijdig oorzakelijk verband). In dit proefschrift worden de onderlinge verbanden tussen ontwikkeling, globalisering en religie getoond en wordt de aandacht gevestigd op de heterogeniteit van grootte, richting en significantie van de oorzakelijke verbanden. Aangezien ontwikkeling, globalisering en religie van oudsher diep verankerd zijn in de menselijke natuur, vormt bestudering van de onderlinge verbanden een ingewikkelde onderzoekspuzzel. De puzzel wordt nog ingewikkelder door het multidimensionale karakter van globalisering en (duurzame) ontwikkeling en het onscherpe concept van (non-)religie dat in hoge mate subjectief en gebaseerd op zelfrapportage is. Het proefschrift heeft daarom noodgedwongen een bescheiden doelstelling: het bijdrage van vier stukjes aan de puzzel van ontwikkeling, globalisering en religie.

Het eerste puzzelstukje heeft te maken met een grote blinde vlek in de geschiedenis van het economisch denken over internationale handel. Daarin wordt grotendeels voorbijgegaan aan theoretici en auteurs uit het oude Azië. Dit puzzelstukje duikt op in hoofdstuk 2. Voor dit hoofdstuk is geput uit traditionele narratieve als basis van een beschrijving en bespreking van de wijze waarop er in vijf grote levensbeschouwingen uit het oude Azië (de Vedic religie, het boeddhisme, confucianisme,

Chinees legalisme en de islam) gedacht wordt over kooplieden en hun commerciële activiteiten. Met de methode van Jacob Viner, die eerder is gebruikt voor onderzoek naar de invloed van het vroege Griekse, Romeinse en (vroeg) christelijke denken op de handel, zijn de attitudes ten opzichte van kooplieden en hun commerciële activiteiten (als indicatie van de houding ten opzichte van handel en internationale handel) onderzocht. Binnen de context van religie en internationale handel wordt in het hoofdstuk ook ingegaan op recente bevindingen over de invloed van deze vijf levensbeschouwingen op internationale economische betrekkingen en uitwisselingen. Een belangrijke bevinding is dat deze invloed verschillend is (variërend van een zeer positieve houding in de islam tot een aanhoudend negatieve evaluatie in het Chinees legalisme). De bevindingen van dit hoofdstuk vormen een inspiratiebron voor de rest van het proefschrift. Daarin ligt de focus vanwege de beschikbaarheid van gegevens op de hedendaagse empirische relevantie van religie voor globalisering en duurzame ontwikkeling.

Het tweede puzzelstukje is een eerste verkenning van het empirische verband tussen religie en globalisering. Daarin wordt gekeken naar de richting van de causaliteit tussen religie en globalisering met behulp van een Granger-causaliteitsanalyse en de impulsresponsfuncties van een groot aantal vector-autoregressieve modellen (VARs). Het onderzoek in hoofdstuk 3 bestrijkt een breder domein dan het onderzoek uit hoofdstuk 2, zowel in omvang als reikwijdte, door de toevoeging van het christendom en atheïsme als verklarende variabelen en het onderzoek is niet alleen gericht op internationale handel op zich, maar ook op multidimensionale aspecten van globalisering (economische, sociale en politieke globalisering en het juridisch onderscheid tussen *feitelijke* en *juridische* graadmeters van globalisering). De onderzoeksgegevens in hoofdstuk 3 zijn geanalyseerd met een kwantitatieve methode. Het verband tussen religie en globalisering is onderzocht door middel van een Granger-causaliteitstoets in een steekproef van 159 landen in de periode van 1990 tot 2015. Hieruit blijkt dat er significante - tot nu toe niet

erkende - verschillen zijn in de richting, grootte en significantie van het verband tussen multidimensionale globalisering en de zeven categorieën van (niet-)religies.

Het derde puzzelstukje is ingewikkeld: het betreft het multidimensionale begrip duurzame ontwikkeling. Hoofdstuk 4 beschrijft het empirische onderzoek naar het verband tussen globalisering en duurzame ontwikkeling. Op basis van paneldata die tussen 1990 en 2018 in 160 landen zijn verzameld zijn 180 non-lineaire modellen geanalyseerd. Een belangrijke uitkomst is dat de graadmeters voor globalisering over het geheel genomen zowel lineair als kwadratisch significant zijn. Dit wijst op een omgekeerde U-vormige relatie tussen duurzame ontwikkeling en globalisering. Het onderliggende zuivere effect en de variatie in de schattingen van deze 180 regressies zijn nader geanalyseerd door middel van een zelf-meta-analyse. Dit is voor zover bekend de eerste keer dat dit instrument op deze wijze is gebruikt in empirisch economisch onderzoek.

Het laatste puzzelstukje van het proefschrift wordt gevormd door een analyse van de directe en indirecte effecten van religie op duurzame ontwikkeling. Hoofdstuk 5 neemt als het ware een centrale plaats in tussen de onderwerpen van de vorige hoofdstukken, omdat het omgeven is door de vorige drie puzzelstukjes. Daarom is een stelsel van vier simultane vergelijkingen opgesteld waarbij ontwikkeling, globalisering en religie elkaar gelijktijdig beïnvloeden onder onderling gecorreleerde voorwaarden. In een steekproef van 146 landen in de periode tussen 1990 en 2015 zijn de effecten van verschillende religies op duurzame ontwikkeling onderzocht. In dit onderzoek dat wordt besproken in hoofdstuk 5 gaat het daarbij om zowel directe als indirecte effecten van religie die optreden via twee mogelijke kanalen: globalisering en inkomen.

Met de onderzoeksresultaten uit deze vier hoofdstukken van het proefschrift wordt op vijf manieren een bijdrage geleverd aan de bestaande literatuur.

1. Het literatuuroverzicht in hoofdstuk 2 voorziet in de lacune van het gebrek aan onderzoek naar het oude Azië in de literatuur over de geschiedenis van economische denkbeelden over internationale handel. Daarnaast wijst dit overzicht en de bespreking daarvan erop dat er in de diverse religies verschillend wordt aangekeken tegen internationale handel. Deze heterogeniteit tussen religies wordt nu nog nauwelijks aangestipt in de literatuur.
2. Uit het empirisch kwantitatief onderzoek naar het verband tussen verschillende religies en globalisering blijkt dat er verschillen zijn tussen religies. De resultaten uit hoofdstuk 3 wijzen ook op Granger-causaliteit in twee verschillende richtingen (ofwel van religie naar globalisering, of andersom, of tweezijdig). Erkenning en bewustzijn van deze heterogeniteit en variaties in de richting van Granger-causaliteit kunnen zorgen voor een verbetering in de methodologie van toekomstig onderzoek over dit onderwerp.
3. In hoofdstuk 4 wordt een niet-lineair verband tussen globalisering en duurzame ontwikkeling geconstateerd en gepleit voor verschillende manieren om dit verband te modelleren. Daarnaast dienen de multidimensionale benadering en de zelf-meta-analyse daarvan als reminder om in empirisch onderzoek rekening te houden met de verschillende dimensies van zowel globalisering als duurzame ontwikkeling. Deze begrippen moeten nadrukkelijk niet als eendimensionaal worden opgevat.
4. In hoofdstuk 4 wordt een zelf-meta-analyse beschreven. Dit is een vernieuwende toepassing van een bekende onderzoeks methode uit de economie. Deze innovatie is relevant voor ander empirisch onderzoek waarin belangrijke variaties in een groot aantal schattingen gerapporteerd moeten worden.
5. Uit de resultaten in hoofdstuk 5 blijkt dat verschillende religies en levensbeschouwingen (inclusief atheïsme) significante, verschillende,

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directe en indirecte effecten hebben op duurzame ontwikkeling.

De puzzelstukjes van het onderzoek naar het (onderling) verband tussen ontwikkeling, globalisering en religie geven nog geen compleet beeld. Zoals bij elke legpuzzel ontbreken er waarschijnlijk stukjes en passen de stukjes die in later onderzoek worden aangelegd niet precies op de bevindingen van deze dissertatie. Dit raakt echter niet aan de essentie van het proefschrift. De conclusie van dit proefschrift is duidelijk: religie en de potentiële effecten ervan moeten worden opgenomen in het toekomstige ontwikkelingsdiscours.

Chapter 1

Introduction

This dissertation pays attention to two important drivers of development, namely globalization and religion. Although the relations between development and globalization, on the one hand, and between development and religion, on the other, has been examined to some degree, the interaction between globalization and religion as drivers of (sustainable) development has not received equal attention. Moreover, non-Western, and particularly Eastern views of the relation between globalization and religion have barely been discussed in the field of history of economic thought. This dissertation attempts to fill these gaps, showing the importance of regarding the relations between globalization, religion and (sustainable) development first by detailing how religion and globalization and their relation have been viewed, both in the past (in Asian countries) and in the present, and second by looking at how these two phenomena affect (sustainable) development.

Chapter 1 first shows how the three main concepts discussed in this thesis, ‘development’, ‘globalization’, and ‘religion’, have been defined in scholarly work (Section 1.1). It then proceeds to discuss how the relations between these three concepts has been theorized (Section 1.2) before it finally provides a brief outline of the dissertation structure, including its

objectives and research questions, in Section 1.3.

1.1 Concepts

1.1.1 Development

Development remains an elusive concept despite having featured strongly in policy discourses worldwide since the end of the Second World War some 80 years ago. The meaning of development is far from conclusive and manifest; indeed, it “depends on where and by whom it is used” (Rist, 2007, p. 485). Development frequently has been likened to something utterly material and measurable such as economic growth, industrialization, or poverty alleviation. For example, during his influential inaugural address in 1949, United States President Harry S. Truman described underdeveloped regions and countries as places enduring hunger and poverty, that were not yet industrialized, and that have persistently low economic growth rates (CBS News, 2017). While from this perspective, development can be viewed as positive in alleviating poverty, stimulating economic growth, and so forth—as a change for the better (Chambers, 1997)—it can also be viewed as negative, for example as:

... a set of practices, sometimes appearing to conflict with one another, which require—for the reproduction of society—the general transformation and destruction of the natural environment and of social relations [...] to increase the production of commodities (goods and services) geared, by way of exchange, to effective demand. (Rist, 2014, p. 13)

Development, consequently, can be applied in different ways and with different intents, which may have positive or negative effects on the people at the receiving end. A study by Gasper (2004) shows how challenging development as a concept can be to mobilize by discussing

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the ways in which development evaluations have been designed and carried out. Gasper raises the questions of (a) who or what should be included when evaluating a development project and (b) against whose standards that development project should be evaluated. The “affected parties” of development interventions, according to Gasper, could range widely—from aid providers to directly affected local communities, from entire nations to individuals that could be affected wherever they are, from humans to animals and other life forms and even inanimate objects (Gasper, 2004, p. 58). Thus, not only are definitions of the term diverse; just as diverse are the ways in which it has been mobilized, who has been affected by actions taken in the name of development, and how they have been affected. Development as a concept moreover is present in discourses ranging from foreign aid to inequality, from economic growth to sustainability, and from China-as-threat-to-the-world-order to China-as-global-powerhouse and America-as-hegemonic-power.

As debates on the meaning and value of development continue, with facts and figures adding up, scholars are increasingly questioning the way in which it has manifested and have started to realize that development by itself is not enough—sustainable development is needed. For a long time, many developing countries have been implementing policies in the name of development that have focused on economic growth and industrialization while ignoring other critical issues such as social inequality, environmental degradation, and political conflicts. Such aggressive and unbalanced ways of pursuing development have become dangerous and compromise the entire planet’s future. Therefore, the “achievement of sustained and equitable development remains the greatest challenge facing the human race” (World Bank, 1993, p. 1). Recognizing the problematic definition and use of the concept of development, in 2012, representatives of the 192 United Nations member states gathered in Rio de Janeiro to launch the Sustainable Development Goals (SDGs), a set of development objectives building on the Millennium Development Goals (MDGs) that are aimed at tackling the myriad contemporary and urgent environmental, political,

and economic challenges facing countries worldwide. The SDG project, having been accepted and widely adopted by the member states, is only one of many attempts to push for the simultaneous achievement of development and sustainability.

This marks a broadening of the concept of development and its manifestations to include consideration for environmental and social justice, which before then had largely been neglected. Hence, the concept of development, as it is now applied in policies and discourses at the national and global level, should be considered as a progress on economic, social, political, and environmental prospects toward sustainability. For this reason, this dissertation in describing the interactions of globalization, religion, and development applies the definition of sustainable development introduced in the 1987 Brundtland Report. Sustainable development in the report is defined as “paths of human progress that meet the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs” (Brundtland et al., 1987, p. 29).

1.1.2 Globalization

In spite of the frequent and wide use of the concept of globalization, it remains elusive and problematic to define. Different sources based on diverse points of view provide various descriptive and analytic terms¹. Many scholars view globalization as a process (for example Albrow and King, 1990; Cox, 1994; and Urzúa, 2000), while Held et al. (2000) have emphasized the need for a clear operational definition of globalization to be able to recognize the phenomenon when encountering it. Scholars who have attempted to provide an operational definition of globalization include Waters (1995), Oman (1996), Bairoch and Kozul-Wright (1998), and Holm (2019). Other scholars have sought to provide

¹See Al-Rodhan and Stoudmann (2006) for a comprehensive overview of the definitions of globalization.

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a definition that captures all the fundamental aspects of globalization. An example is the study by Al-Rodhan and Stoudmann (2006), who after reviewing more than 100 sources from different fields of study proposed that “[g]lobalization is a process that encompasses the causes, course, and consequences of transnational and transcultural integration of human and non-human activities.” Although ambitious, Al-Rodhan and Stoudmann’s encompassing definition seems to be obscure in terms of practical observation, measurement, and quantification, which might be a reason why it has not become widely accepted or used.

Essentially, globalization can only be considered to occur when and where multiple societies interact across borders. One would then be inclined to ask what drives societies to interact with one another. One of the “oldest and longest-lived economic doctrines we know of” (Viner, 1991, p. 42), the *Doctrine of Universal Economy*, proposes that different regions enter into trade relations because resources are not distributed equally across the planet, and because the unequal distribution of natural resources has led to the development of socio-economic differences and distinctions between societies of different regions, with resource-poor areas faring less well. Thus, globalization could be driven by such differences and distinctness among these societies.

In order to better understand how and why globalization has arisen, it is also necessary to have an overview of the diverse nature of societies and how differences between them have come to be. Using a ‘multi-dimensional approach’ in analyzing social stratification, Weber (1978) highlights three main dimensions of social stratification, namely (a) social (status), (b) political (power), and (c) economic (class). Weber argues that these dimensions are present in all societies, but that their order of importance differs between contexts, as do the degrees of development and extent of stratification.

To illustrate the way in which this occurs in practice, a simple analogy can be used. If we consider each society as a large tank containing a

CHAPTER 1. INTRODUCTION

unique liquid, then, when one society starts to interact with another, these two reservoirs become linked by a tube. The differences between the two reservoirs encourage liquid to flow into the other tanks. None of the reservoirs thus maintain their initial status: they both receive some of the liquid from the other tank, and the speed and direction of flow depend on many factors, such as the tube volume, the liquids' characteristics, and the temperature of the liquids. A similar process can be said to occur through globalization: the abovementioned differences between societies proposed by Weber mean that globalization would occur in all three aspects: economic globalization, political globalization, and social globalization. Moreover, Keohane and Nye (2000) have shown that: (a) economic globalization portrays the flows of goods, capital, and services as well as the perceptions on international trade; (b) political globalization focuses on the interdependence of public policies; and (c) social globalization indicates the integration and exchange of information and culture between human beings through national boundaries.

In the field of economics, numerous empirical studies have paid attention to these three aspects of globalization. Upon introducing the now widely used KOF Globalization Index, Dreher (2006) argued for the necessity of covering the three main dimensions of globalization, namely economic integration, political integration, and social integration in the study of its effects. Dreher applied the KOF Globalization Index and its dimensional indices to empirically investigate whether globalization enhances growth for a sample of 123 countries in the period 1970–2000. Due to its large coverage and long timespan, the index has become popular among empirical studies involving globalization. Many of these studies use not only the overall index but also pay attention to the three dimensional indices it is comprised of, which indicates the importance of considering all three of these dimensions in empirical analyses. The KOF overall indicator and also all the three dimensional sub-indicators are used in empirical studies, regardless of either they focus on developed or developing countries or both groups. For example, the index has been

applied by several authors to study the effect of globalization processes on different contexts, including Chang and Lee (2010) for OECD countries, Chang et al. (2011) for G7 countries, Chang and Lee (2011) for former European Communist countries and European OECD countries, Chu et al. (2016) for nine OECD countries and China, and Lee et al. (2019) for ‘Belt and Road Initiative’ countries.

The three dimensional sub-indicators of the index are also often used in empirical analyses of globalization in developing countries. For example, Midiyanti and Yao (2019) use three globalization sub-indices (economic globalization index, political globalization index, and social globalization index) to measure globalization when analyzing the dynamic relation between globalization and economic growth in Indonesia. Meanwhile Rao and Vadlamannati (2011) similarly used the same set of globalization indices for their study on African countries, while Lee et al. (2015) used the indices for analyzing the case of China. All in all, considering each of these three dimensions alongside with the general KOF globalization index is a comprehensive best practice in globalization research that is supported both from theoretical and empirical points of view.

1.1.3 Religion

Both for religious and non-religious persons, the concept of religion is difficult to define—to such an extent that Guthrie (1996, p. 412) quipped that “[s]cholars agree broadly that no convincing general theory of religion exists”. On the one hand, religion, defined by Stark and Bainbridge (1979, p. 121)² as a “system of general compensators based on supernatural assumptions”, has been criticized for providing “illusory happiness” (Marx and Engels, 2012, p. 42); from this perspective, religion should form no part of the human experience. This is possibly one reason why

²Earlier writers in this lineage of literature include David Hume and Ludwig Feuerbach.

religion hitherto largely has been ignored in development research and practice. The lack of attention to religion has led numerous scholars to calling for more attention to be paid to the role of and importance assigned to religion in development interventions that, eventually, would lead to “the ‘turn to religion’ by development studies, policy, and practice” (Tomalin et al., 2019, p. 107). On the other hand, religion has been defined by its function, for example, as “a unified system of beliefs and practices relative to sacred things, [...] which unite into one single moral community [...] all those who adhere to them” (Durkheim, 1954, p. 47). Such conceptualizations have been criticized, however, for making “one part of religion, namely one of its uses, the whole” (Guthrie, 1996, p. 413). Even within the group of function-based definitions, debates have focused on whether to consider the effect and meaning of religion from a societal point of view, as Durkheim does, or from an individual point of view, as Geertz (1993) does.

Despite countless efforts to define religion, most definitions attempt to uncover either “what religion is” or “what religion does” (Rakodi, 2012, p. 640). This classification of religion as concept is acknowledged by other scholars as well. Haynes (2008, p. 162), reviewing 17 different definitions of religion listed in Marty (2000, pp. 11–14) concludes that “religion affects the world in two basic ways: by what it says and what it does,” while Selinger (2004) agrees with Haynes’ argument about the ways in which to define religion. However, even with an agreement on how religion should be defined, it is still challenging to devise a definition that can applied in studying all (or even only the major) religions, as religion tends to be multi-dimensional and as the emphasis each religion places on the respective dimensions varies. Rakodi (2012, p. 640) for example noted that “Christianity is traditionally said to put more emphasis on beliefs [...] whereas Islam emphasizes detailed rules to guide behavior overelaborate statements of belief, and Hinduism and Buddhism concentrate on ritual practices and personal transformation rather than uniformity of belief”.

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Aside from religion, the spiritual worlds of humans and their society are also shaped by different philosophies of life. Such philosophies, for example Confucianism, might not involve the belief in a ‘higher power’ or ‘divine providence’ as is the case for many religions, yet they focus on many spiritual and moral questions, including the meaning of life, how we ought to behave, or what a civil society ought to look like and how it ought to be organized. Those following philosophies of life may honor great philosophers as ‘saints’ even though they are not seen to possess supernatural powers; Confucius and Mencius in Confucianism are two examples. The followers/believers of these philosophies of life and their doctrines or mantras moreover might not adhere to any rituals, such as worshiping or making offers. However, they might adjust or even restrict their behaviors and lifestyles in order to abide by the principles of the philosophy of their belief. Thus, a philosophy of life can affect human society through what it prescribes, which in turn results in the specific reactions and behaviors of its adherents. Hence, in this thesis, on many occasions, a philosophy of life is seen as overlapping with a religion in possessing a similar function.

Aimed at quantitatively examining the effects of religion on development, this thesis for practical reasons chooses to define religion in terms of its function, with a focus on measuring what it does to and in society, particularly in relation to globalization and sustainable development (two concepts that are discussed in the previous subsections). Therefore, religion in this research project is considered “a unified system of beliefs and practices relative to sacred things,” as Durkheim (1954, p. 47) claimed. This system of beliefs allows its adherents to apply it to collectively shape different dimensions of human and non-human development—a topic that will be examined in this dissertation.

1.2 Religion, globalization, and sustainable development

1.2.1 Religion and globalization

Globalization is often viewed as a phenomenon that originated in the post-Second World War period and took shape only fairly recently. Scholars such as Rothschild (1999, p. 107) have noted that “globalization or internationalization has been depicted, for much of the last 20 years, as a condition of the present and the future—a phenomenon without a past,” while Armitage (2004, p. 166) indicated that “the very novelty of the term ‘globalization’ (and its cognates in other languages, such as the French term *mondialisation*) encourages the belief that globalization itself must also be quite recent, if not entirely unprecedented.” Therefore, “the lack of the term ‘globalization’ before the 1980s would indicate that globalization is no more than a generation old, whether as a process of market integration and technological innovation or as the proliferating consciousness of globality itself” (Armitage, 2004, p. 166).

A more expansive view of the idea of globalization traces its emergence back to the sixteenth century. For example, Flynn and Giráldez (1995) have linked the start of globalization to 1571, the year in which the city of Manila—and therewith global trade—was founded. The authors followed the logic of Boxer (1977), who claimed that

... only after the Portuguese had worked their way down the West African coast, rounded the Cape of Good Hope, crossed the Indian Ocean and established themselves in the Spice Islands of Indonesia and on the shore of the South China Sea; only after the Spaniards had attained the same goal by way of Patagonia, the Pacific Ocean and the Philippines – then and only then was a regular and lasting maritime connection established between the four great continents. (p. 17)

Flynn and Giráldez argued that because Manila is strategically situated, its establishment marked the birth of global trade as ships could anchor and goods could be exchanged at its port.

However, globalization might be a much older phenomenon. In their discussion of the ancient Silk Road, Foltz has argued that “this network, which existed first and foremost to facilitate trade, at the same time provided a means of cultural exchange that connected peoples over much of the world, conveying not just goods but fashions, traditions, and ideas” (Foltz, 2010, p. 5).³ Most recently, as we have entered what Vanham (2019) called the ‘Globalization 4.0’ wave, countries’ attitude toward globalization have started diverging significantly. Following the financial crisis and the world trade collapses first in 2008 and 2009 and again in 2020, when the Covid-19 pandemic led to the enduring closure of borders worldwide, a backlash against globalization could be witnessed. Many Western countries have started promoting protectionism and discussions on deglobalization⁴ have emerged. On the other side of the world, Asian countries have been defending globalization and have even indicated their willingness to take the initiative of carrying the flag of globalization themselves. For example, at the 2017 World Economic Forum meeting held in Davos, China’s President Xi Jinping defended globalization, arguing that although “economic globalization has created new problems”, that the world should not “write [it] off completely”, and that “many of the problems troubling the world are not caused by [it]” while stressing that “the global economy is the big ocean that you cannot escape from” (Xi, 2017).

A key question that arises is why Western and Eastern countries hold such different views of globalization in general and of international trade

³Janet Abu-Lughod (1991), in her study of the medieval Eurasian, suggested that the initial phase of globalization occurred during the Mongol Empire, establishing an interconnected Eurasian economy and motivating Europeans to compete. This viewpoint is echoed by Giovanni Arrighi (1994) in his book tracing the relation between capital accumulation and state formation.

⁴See, for example, van Bergeijk (2010).

in particular. Acharya and Buzan (2007) have asked why there appears to be no international relations theory of non-Western origin. Although international relations theory can be considered a very new area of study in comparison to international trade theory, this question highlights the fact that Western views on and theories of globalization-related fields tend to dominate non-Western ones. In the study of the history of economic thought, Western schools of thought also appear to be mainstream and dominant. For example, works on the history of economics, such as those of Schumpeter (1954) and more recently Irwin (1998), have tended to focus on writing originating from the Occident, especially during the ancient period.

Furthermore, studies on Eastern economies tend to be influenced by the biased views put forward in Weberian thought, as some Asian authors have argued. For example, Madjd-Sadjadi (2014) criticized Weber (1951) for suggesting “that Confucianism and Taoism, while not antithetical to wealth accumulation, lacked the work ethic and the drive to innovate of Protestantism,” which is considered an anti-Eastern bias, since “China had the most advanced economy on the planet prior to the Industrial Revolution” (Madjd-Sadjadi, 2014, p. 294). On the other hand, Chandrasekaran (2014, p. 324) argued that hardly anyone heeded the warning of the renowned economist Dasgupta about discarding “the distorting mirror of Weberian sociology” when interpreting Indian economic thought. When revisiting the question, a decade after it was posed, Acharya and Buzan (2017) argued that several historical gaps have emerged in the current stream of research and that non-Western theories require more attention to counter Western bias and build a more global view of globalization and development. Relatedly, at the turn of the millennium, the world woke up to a report from the World Bank commending eight high-performing Asian economies⁵ for having created an ‘East Asian Miracle’ through their achievement of rapid economic

⁵Hong Kong, Indonesia, Japan, Malaysia, the Republic of Korea, Singapore, Taiwan, and Thailand.

growth, fast improvement of human welfare, and arguably less inequality in income distribution (World Bank, 1993). Ever since, scholars including Rodrik (1994), Stiglitz (1996), Nelson and Pack (1999), and Chang (2006) have sought to explain, examine, and re-examine this ‘miracle’.

However, these studies have hardly looked at the differences between Western and Eastern schools of thought that date back centuries. In recent years, the Western view of international trade, mainly discussed by scholars from Europe and the United States, has been well established; however, studies that pay attention to Eastern views on international trade, especially those view with ancient roots, remain limited. Given the increasing importance of Asian countries in the global economy, these views are becoming increasingly relevant for better understanding globalization from a non-Western perspective. This dissertation therefore first aims to enrich the scientific inquiry on Eastern understandings of international trade and globalization while also seeking to contribute to the decolonization of knowledge by providing an overview of the major ways in which international trade has been conceptualized by Asian scholars in the ancient time.

At present, East Asian countries tend to be more optimistic than their Western counterparts about international trade in particular and globalization in general. Figure 1.1 shows the share of participants in the PEW Research Center’s Global Attitudes and Trends surveys⁶ undertaken between 2007 and 2011 in four Western countries (the United States, France, Germany, and the United Kingdom) and three Eastern countries (India, China, and South Korea) who believed that increased international trade and stronger business ties with other countries is very good or somewhat good for their own country. Figure 1.1 shows that from 2007 to 2010, three of the four Western countries (the exception is Germany) appeared to be less optimistic than their Eastern peers about

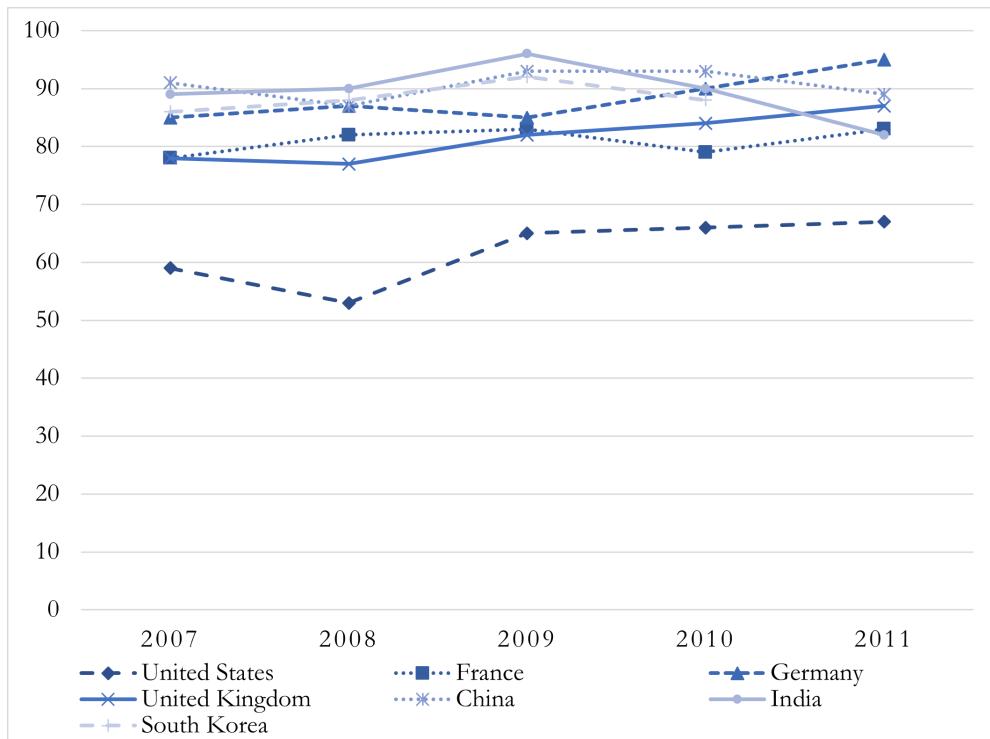
⁶Pew Research Center’s Global Attitudes and Trends Survey (<https://www.pewresearch.org/global/datasets/>).

the value of an increase of international trade and the strengthening of business ties across borders. In these three countries (the United Kingdom, the United States, and France), the share of survey participants believing that trade with other countries is ‘very good’ or ‘somewhat good’ for their own country remained below 85% regardless of the presence or absence of a global/international trade crisis. On the other hand, despite fluctuations in the global economy, the share of survey participants that were positive about increased international trade and strengthened business ties remained at above 80% for the three Asian countries. However, the two East Asian countries (China and the Republic of Korea) tended to have a more stable view of international trade than their South Asian neighbor, India, whose participants had views that differed over time.

From this study, it appears that looking at globalization only through the current Western point of view might not be enough for helping us understand why this gap in attitudes towards international trade persists so strongly, not only between the West and the East but also among Asian countries. As attitudes are subjective and are related more to the ways in which people perceive the world around them, it might be that spiritual or religious beliefs may also shape views of international trade. Moreover, the surveyed countries shown in Figure 1.1 have different major religions, which may be one of the reasons for the observed heterogeneity of attitudes towards international trade.

Furthermore, we also know that international trade has a long history dated back thousands of years, as silk strands found alongside an Egyptian mummy from around 1,000 BCE has shown (Wilford, 1993). Thus, “the phenomenon referred to today as ‘globalization’ is actually nothing new, but merely an accelerated form of patterns going back more than 3,000 years” (Foltz, 2010, p. 5). A look back deep into ancient Asian history subsequently might provide some clues about how the abovementioned gap—in support for/attitude toward international trade between the West

Figure 1.1: Support for international trade among Western and Eastern countries, 2007–2011



Source: Data collected from the Global Attitudes and Trends surveys conducted by the PEW Research Center in the years 2007, 2008, 2009, 2010, and 2011 (accessed at <https://www.pewresearch.org/global/datasets/> on January 13, 2022).

Note. The English wording of the survey question is: “What do you think about the growing trade and business ties between (survey country) and other countries—do you think it is a very good thing, somewhat good, somewhat bad or a very bad thing for our country?”

and the East as well as among Eastern countries—was created in the first place in the hope of taking one step closer towards closing the gap, because, as Carl Sagan famously said, “you have to know the past to understand the present” (Sagan, 1980, 55:44).

Schumpeter (1954, p. 52) argued that “the history of economic thought starts from the records of the national theocracies of antiquity

whose economies presented phenomena that were not entirely dissimilar to our own, and problems which they managed in a spirit that was, in fundamentals, not so very dissimilar either,” while Dasgupta (1993, p. 3) suggested that “in ancient cultures the workings of the human mind tend to be closely linked to religion” and that “a history of economic thought must therefore take the religious factor into account.” For example, in ancient India, “the demand for Chinese silk banners was caused by both Buddhist ceremonies as well as Hindu ceremonies such as weddings” (Liu, 1988, p. 69), and it might be hard to decide whether the spread of religious ideas led to the spread of demand for silk or vice versa. Meanwhile, back in ancient Asia, Islam spread its influence all over the Persian world and even to India, China, and Southeast Asia; Vedic religions rooted deeply in Indian history and Buddhism, although originating from India, spread to and was subsequently developed in East Asian and Southeast Asian countries, especially China.

Meanwhile, within China, Confucianism and Legalism, although more of school of thoughts than religions, had a strong impact on Chinese society. It is in light of this that Islam, Vedic religions (Brahmanism and Hinduism), Buddhism, Confucianism, and (Chinese) Legalism became the most five influential religions or schools of thought in ancient Asia. Therefore, it is necessary to address the lack of ancient Asian economic views of international trade in the field of economics before investigating the potential relationship between globalization and religion using empirical data. These attempts to study the relationship between globalization and religion also contribute to the decolonization of knowledge in the academic literature on globalization and international trade.

1.2.2 Globalization and sustainable development

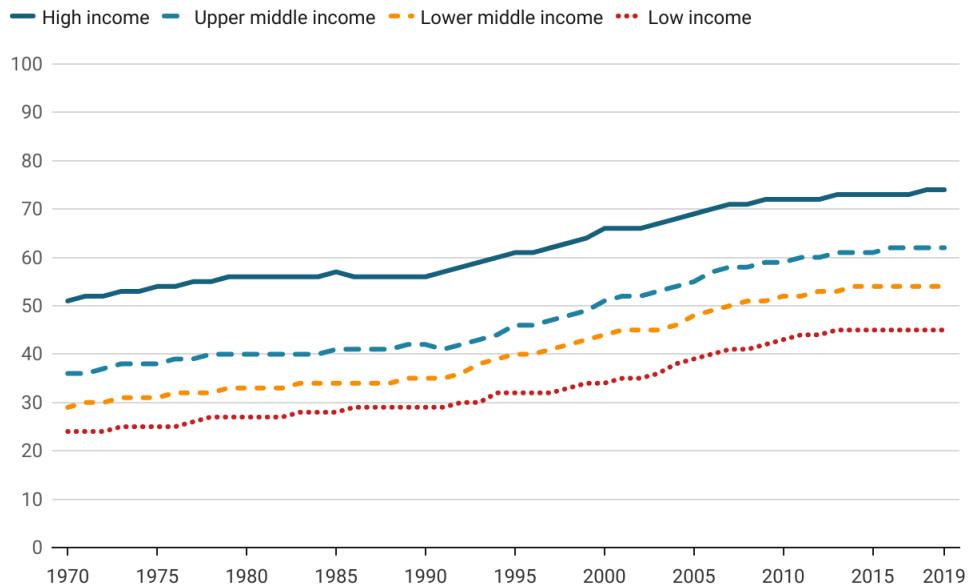
As Figure 1.2 shows, since the 1990s, all countries, regardless of their income levels, have been craving and urging for globalization. Given

its increasing prevalence and importance, the potential implications of globalization for development have been in the center of various debates in academic literature. Many often-cited studies, such as those by Sachs et al. (1995), Dollar and Kraay (2002), Sala-i-Martin (2002), Bhagwati (2004), Dollar and Kraay (2004), Wade (2004), and Wolf (2004), have demonstrated that globalization, especially economic globalization, is the primary means for reaching development among countries who actively participate in the global system. Conversely, others, including Baker et al. (1998), Soros (1998), Stiglitz (2002), and Kaplinsky (2013), have not only criticized this perspective but have also vehemently sought to expose the adverse effects of globalization. Some scholars even argue that globalization should be stopped in its tracks. For example, Milanovic (2003, p. 668) discussed two opposite views on globalization, which they named the Left View and the Right View. The Left View urges the recognition of globalization as a force of evil because it is “led by a triumphant, and often, unbridled capitalism” that have harmful effects, including environmental destruction, the obliteration of indigenous cultures, the exploitation of the weak (see Milanovic, 2003), income dispersion (see Lundberg and Squire, 2003; Milanovic and Squire, 2007; and Bergh and Nilsson, 2010), and unequal space as well as freedom in policy formulation between developed and developing countries (see Bairoch, 1995; Maddison, 1995; Chang, 2002; and Nayyar, 2007). Meanwhile, the Right View is rooted in xenophobic beliefs that have been present in many developed countries for a long time. This view might have arisen from the fear of risking the loss of cultural homogeneity and centuries of socio-economic progress as a result of the free movement of people and information (Milanovic, 2003). Such fears are not new and might even be as old as the idea of globalization itself—Graeco-Roman writers, such as Aristotle and Aquinas, suspected that “contact with foreigners would disrupt civic life” (Irwin, 1998, p. 19). The fear of being disrupted by outsiders has endured. For example, French magistrate Jean Samuel de Pont shares with ancient Roman authors a common view on

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traders which D'Arms (1981, p.7) describes as “moral disdain”.

Figure 1.2: Globalization trends among different income groups, 1970–2019



Source: Data collected from the KOF Swiss Economic Institute (accessed at <https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html> on April 15, 2021).

Note. The vertical axis depicts the score of the overall KOF Globalization Index (2021 version). Income classifications are based on the World Bank's guidelines, using World Bank data for the 2021 fiscal year.

Theoretically, globalization could contribute both positively and negatively to development in several ways. Supporting globalization as driver of economic development, the Stolper-Samuelson theorem for example suggests that the abundant factor would gain from international trade. Stolper and Samuelson (1941) argued that international trade would shift a country's production towards commodities that use its abundant production factor, which then leads to increased prices of that abundant production factor. In the case of developing countries, the abundant factor is (poor) labor; hence, globalization should reduce

poverty by increasing real wages. However, the theory of trade liberalization suggests that only the country as whole would benefit from globalization, not the individuals in that country. There will always be winners and losers within a country, the theory contends, but it also assumes that the economic gains can be used to compensate for the losses. This assumption may often prove false in reality, for example where there exists weak governance and ill redistribution policies (Stiglitz, 2006).

For peace, globalization could allow humankind to develop into a stable world by preventing conflicts as the exchange of information and ideas increases cross-border understanding, while economic globalization could reduce conflicts by raising the costs of waging wars (Polacheck and Xiang, 2010). Conversely, globalization has frankly unified different groups of people around the world who resist the phenomenon, as is evident in the numerous protests that have erupted. Stiglitz (2006) noted that:

Factory workers in the United States saw their jobs being threatened by competition from China. Farmers in developing countries saw their jobs being threatened by the highly subsidized corn and other crops from the United States. Workers in Europe saw hard-fought-for job protections being assailed in the name of globalization. AIDS activists saw new trade agreements raising the prices of drugs to levels that were unaffordable in much of the world. Environmentalists felt that globalization undermined their decades-long struggle to establish regulations to preserve our natural heritage. Those who wanted to protect and develop their own cultural heritage saw too the intrusions of globalization. (p. 7)

Perceptions of globalization's impact on development are thus far from unified, and perhaps now more than ever as a result of the backlash against globalization and the corresponding rise of protectionism, anti-globalism, and nationalism in many countries and several sectors. On

one hand, there have been discussions about deglobalization as an avoidable alternating phase in the globalization cycle (Van Bergeijk, 2010). On the other hand, several scholars have attempted to determine the reasons behind this backlash. Many scholars, including Stiglitz (2010), Kobrin (2017), Colantone and Stanig (2018), and Eckhardt and Curran (2019), support the argument that economic problems starting with the global financial crisis of 2008 and its aftermath ignited skepticism of globalization and trade, in particular in developed countries. Others believe that the reasons lie not only in economic issues but also in other aspects such as culture (Rodrik, 2018) and environmental standards (Dür et al., 2019). Notably, resistance is stronger in developed countries, whereas in the developing world, globalization is still considered as the mantra for development. Despite the promotion of protectionism, globalization might be the only way forward because at present, all countries have dived too deep into the global ocean and have become so interdependent that no country would be able to ensure long-term development on its own (González, 2016).

In sum, an empirical analysis of globalization's effects on sustainable development using a multi-dimensional approach is needed to enrich the literature in this field and to provide more evidence on whether globalization is good or bad for sustainable development and how important measuring approaches are when analyzing the relations between multi-dimensional concepts.

1.2.3 Religion and sustainable development

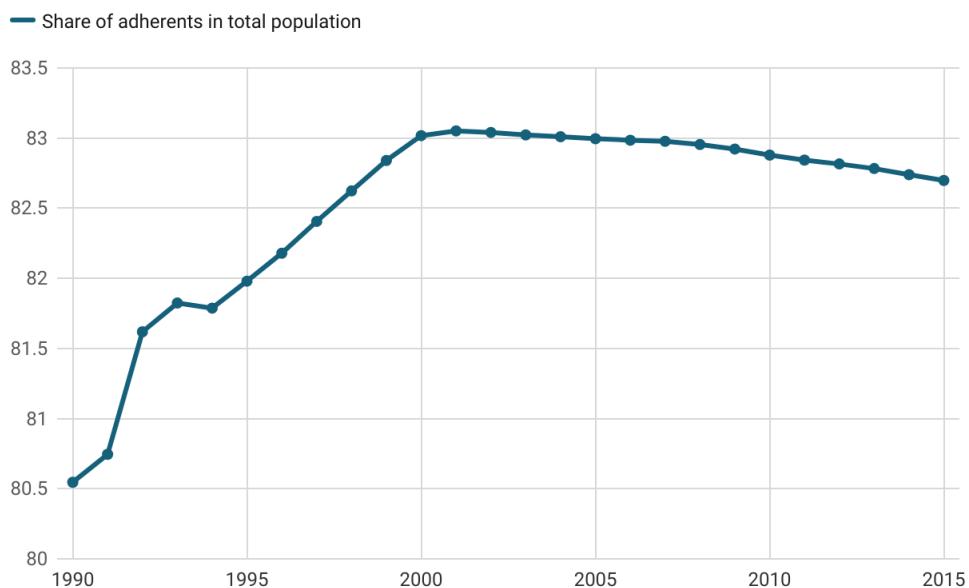
In the history of development, religion was once an important force. For example, Harari (2014, p. 52) suggested that religious festivals helped build and maintain cooperation between tribes during the dawn of Homo sapiens, and that such cooperation provided ways for our ancestors to develop and survive severities. Another much more recent example is the role that missionaries and their religious missions played in the

Age of Exploration in the fifteenth to seventeenth century and that of colonialism in especially the nineteenth and twentieth centuries. It seems that religion has continually affected development throughout the history of humankind and that globalization appears to be one of the major ways in which religion influences development.

The impact of religion on development remains unceasingly, despite the lack of attention paid to the subject by development scholars and practitioners. Even without arguments on how and to which extent religion affects development, its continued existence should not be negated. As shown in Figure 1.3, by adding up the shares of adherents to the five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam), we can see that since 1990, the share of the total global population practicing one of these five religions has never dropped below 80%. In fact, in the period 1990–2000, the share of adherents increased sharply, while after the turn of the millennium, a slight decrease can be observed. Nevertheless, the share of the total global population practicing religion remains above 82%. Therefore, Figure 1.3 is telling us that religion remains a major force and will continue to play a major role in the coming years.

However, due to its role in political conflicts, religion often tends to be observed as impeding the process of development. Ter Haar (2005) for example argued that religion has been ignored and even dismissed in dialogues on development. Yet, the impact of religion on human life, whether positive or negative, is undeniable, and we could expect that it would not disappear in the near future. Even when only economic growth is considered, religion can help to explain how cultural differences affect the ways in which economies around the world are growing, stagnating, or declining, not to mention the case in which some economies appear to share several characteristics while their performance still varies as a result of cultural effects. For example, while there might have been a “stereotyping of Chinese and Chinese values” (Cheung et al., 2016,

Figure 1.3: Total share of adherents to the world’s major religions (sum of Buddhists, Christians, Confucians, Hindus, and Muslims) as part of the total global population, 1990–2015



Source: Brown, D., & James, P. (2022). *Religious Characteristics of States Dataset Project — Demographics v.2.0 (RCS-Dem 2.0)*, COUNTRIES ONLY [Data set]. OSF. <https://doi.org/10.17605/OSF.IO/7SR4M>

Note. The vertical axis shows the total share of adherents to the world’s five biggest religions at present (the sum of Buddhists, Christians, Confucians, Hindus, and Muslims) as part of the total global population.

p. 221) when discussing Chinese communities in different countries, Herrmann-Pillath (2010, p. 328) has argued that “there is no monolithic so-called Chinese culture, as there are significant differences between Hong Kong, Singapore, Taiwan, and Mainland Chinese,” even within Mainland China, where cultural differences between northern and southern China are rather distinct. Such differences might partially stem from a long history of religion-based policy making (Laliberté, 2011).

On the other hand, for a long time, development has been closely, if not solely, associated with economic and material development.

Consequently, religion, which is mainly perceived as a connection purely with the spiritual aspect of human life and at times even as an anti-material development force, has been considered a taboo in development literature and practice (Ver Beek, 2000, p. 40). Since the turn of the century, sustainable development has been gaining more attention. Together with this phenomenon, religion has slowly started reclaiming its place in modern development study and practice (Narayanan, 2016), especially in the past two decades. Considering sustainability, development is no longer only about human beings' economic or material welfare but has also been extended to non-material aspects, including cultural and environmental issues, where religion might become more visible. Hence, when talking about sustainability in development, religious ideologies might be more relevant than currently recognized, as observed by Ter Haar and Ellis (2006):

The traditional Hindu idea of humankind, for example, emphasizes harmony with the living environment. This easily translates into a view that economic growth should be integral to the well-being of the environment as a whole. Similarly, Muslims believe that the ultimate aim of life is to return humanity to its creator in its original state of purity. In African traditional religions, the pursuit of balance and harmony in relations with the spirit world is paramount. (p. 355)

Ever since Ver Beek (2000) pointed out the absence of religion and its potential impact on development research and practice, an increasing number of scholars have acknowledged this omission and have discussed the consequences of neglecting the role of religion in development studies (including Marshall, 2001; Selinger, 2004; Ter Haar and Ellis, 2006; Lunn, 2009; Ogbonnaya, 2012; Rakodi, 2012; Stenmark, 2015; Narayanan, 2013, 2016; Tomalin et al., 2019; and Öhlmann et al., 2020). Therefore, in recent years, a ‘turn to religion’ could be observed in the field of

development (Kaag and Saint-Lary, 2011; Tomalin et al., 2019). However, to date, studies forming part of this ‘turn to religion’ have been more theoretical and less empirical. Such studies also ignore the possibility of the indirect effects of religion for sustainable development, which might be enacted in different ways, such as through globalization. Therefore, an empirical analysis that is designed to capture both the direct and indirect (through globalization) effects of religion on sustainable development could meaningfully contribute to understandings of how development is shaped and enacted.

1.3 Research questions and thesis structure

The relations between religion, globalization, and development are complicated and require an extensive effort to unpack through research. The study of the relations between these concepts is important, especially in this time where views on globalization are shifting, particularly for developing countries who have less power in the making of global policies or in playing the protectionism game⁷. In fact, for developing countries, globalization appears to be a one-way highway where you need to play by the rules that have already been set, attempt to make use of these rules, or alter them slightly while trying to gain the most benefits for your people. This probably might or might not be the highway to heaven but surely no country wants to end up driving themselves to hell (the case of unsustainable development). Meanwhile, religions have long been rooted deeply in the social, economic, and political realms of countries, with extensive effects on their globalization processes and sustainable

⁷Protectionism refers to a set of government policies that restrain globalization processes, especially international trade. Protectionist policies tend to be imposed when a nation, believing that globalization is a zero-sum game, wants to win the game of globalization by restricting imports through tariffs, production standards, quotas, and government subsidies for domestic firms that are considered as directly competing with imports. See Bhagwati (1988) for a more in-depth discussion of protectionism.

development.

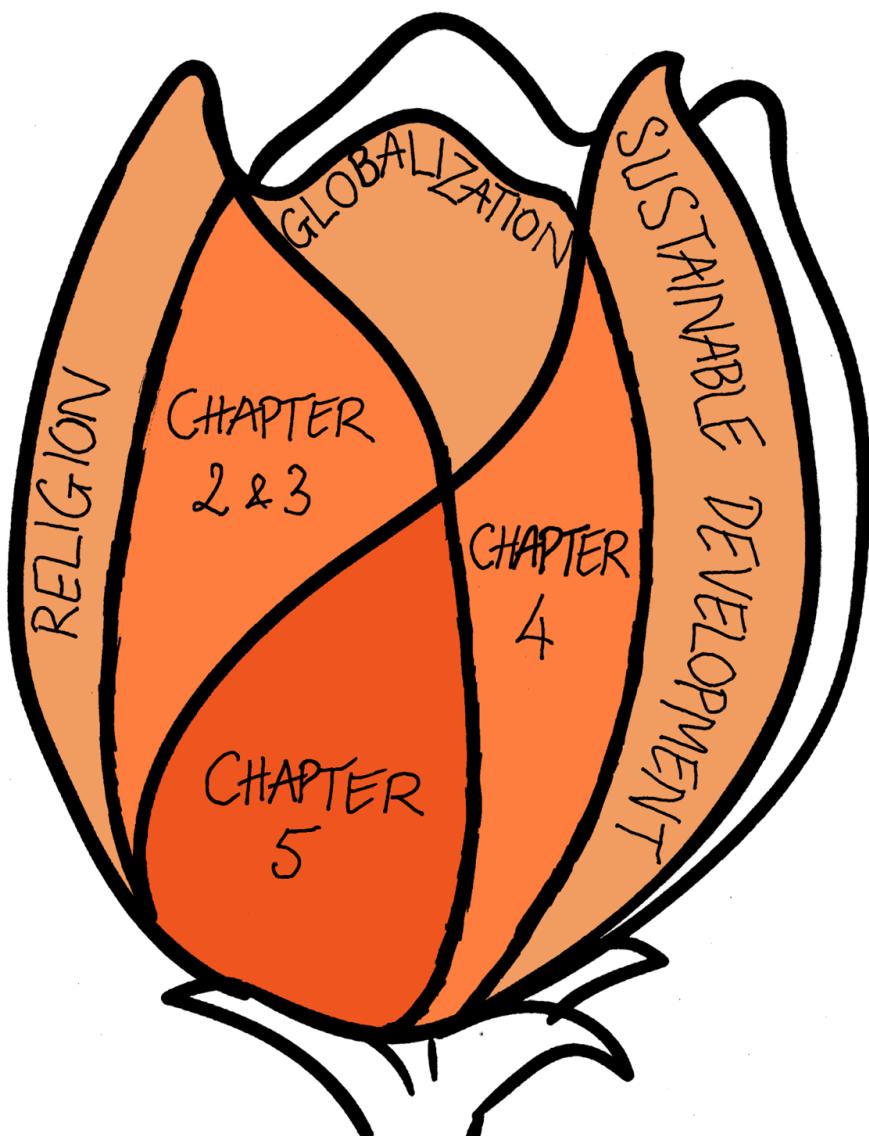
This thesis imagines the development literature as a big flower with several aspects and drivers symbolizing as the flower's petals. It looks at three small petals of the development flower, with each chapter dealing with one of the following four research questions:

1. How did ancient Asia perceive international trade, compared to their Western counterparts and contemporary views? (Chapter 2)
2. How do religion and globalization interact with each other in the modern world? (Chapter 3)
3. What are the effects of globalization on sustainable development, from a multi-dimensional approach? (Chapter 4)
4. What are the direct and indirect effects of religion on sustainable development, with globalization as a potential effect-transmitting channel? (Chapter 5)

Figure 1.4 illustrates the development flower and the three petals of interest in this dissertation: religion, globalization, and sustainable development. The relations and interactions between the three petals (religion, globalization, and sustainability/sustainable development) already form a big puzzle, with small pieces of the puzzle explored in each of the chapters of this dissertation. The petals of globalization and religion form two first puzzle pieces: while Chapter 2 looks into the history of economic thought on international trade and adds to discussions on the ancient theories and views of international trade in Asia, a less highlighted area, as well as how ancient Asian thinkers looked at trade and merchants, Chapter 3 connects to the previous chapter by analyzing the relation between globalization and religion using recent data. The thesis then turns to the relation between globalization and sustainable development, with Chapter 4 investigating globalization's impacts on sustainable development using a multi-dimensional approach. Finally, the

role of religion in development is examined in Chapter 5, which although mainly paying attention to religion's effects on sustainable development also incorporates the possibility of globalization channeling religion's indirect effects to sustainable development.

Figure 1.4: Thesis structure



Chapter 2

Winds from the East: Ancient Asian Views on International Trade and Traders^{1,2}

... in ancient China, the home of the oldest literary culture of which we know ... no piece of reasoning on strictly economic topics has come down to us that can be called scientific. (Schumpeter, 1954, p. 53)

¹This chapter is a reworked version of the International Institute of Social Studies Working Paper No. 705, co-authored with Prof. Dr. Peter A.G. van Bergeijk.

²Earlier versions of this chapter have been presented at the 48th Annual Conference of the History of Economics Society (online, December 9–12, 2021), at the European Trade Study Group's annual meeting in Groningen (September 2022), and at the Vrije Universiteit Amsterdam (April 26, 2023). Helpful comments by participants, by Douglas Irwin, Ruben Gowricharn, and Matthijs van Dijk, are gratefully acknowledged.

2.1 Introduction

International trade is governed by many factors. For the past several decades, it has been examined by regarding its so-called ‘hard’ determinants. Economists for long have focused on absolute and comparative advantages (that are ultimately based on the relative abundance of the factors of production and their respective qualities), on trade-distorting or -enhancing factors (such as tariffs and other barriers, WTO membership, or regional and bilateral trade agreements), and on first-nature economic geography elements such as distance to foreign markets, access to sea, climate, and natural resources. Increasingly, however, recently attention has been drawn by so-called ‘soft’ determinants of international trade such as language, culture, institutions (including the political organization of society) and – the topic of this chapter – religion, spirituality, and philosophies of life.

The idea that similarities in moral values facilitate trade between individuals and the notion that religion is detrimental to free trade are not new; and were already recognized by Adam Smith, who specifically argued that the Roman church promoted anticommercial attitudes and barriers to international trade (Anderson, 1988). Discussing earlier mercantilist policy before Smith, Viner (1937, p. 26) observed that ‘pre-economic’ doctrines did not so much depend on economic reasoning but rather derived “much of their vitality from moral and religious principle...” Indeed, in his first Wabash lecture titled “Early attitudes toward trade and the merchant”, Viner (1959) uncovered some of the ancient Greek, Roman, and early Christian roots of modern conceptions of trade. The dominant view in the ancient Graeco-Roman world is perhaps best illustrated by the fact that Hermes/Mercurius was the god of thieves, travelers, and merchants, which reflects the low esteem in which trade and traders were held in Graeco-Roman times. Early Christianity likewise viewed trade as a dishonest and exploitative activity. Interestingly, Viner also spotted an undercurrent of thought that recognized the

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potential benefits of international exchange based on the so-called God-given heterogeneity of the climate, natural resources, and production conditions. However, it would take the Reformation in sixteenth-century Europe to break from the Catholic doctrines dictating the shape of trade and to arrive at a more positive view in Europe of the role of the merchant and the benefits of free trade.

In the 1990s, however, the importance of religion, spirituality, and the philosophy of trade was downplayed by scholars, especially regarding their relation with economic attitudes (Iannaccone, 1998, p. 1447). However, but since a good decade interest in the subject has been steadily increasing. Helble (2006, 2007) in his seminal writings argued that religion and philosophy of life are important for explaining bilateral trade flows both because trade between people with similar religious backgrounds and moral values is easier owing to higher levels of trust and because one's attitude towards international trade may be related to the particular religion or philosophy of life to which one adheres.³ Empirical research confirms the importance of religion for international merchandise trade (e.g. De Groot et al., 2004), services (Lee, 2013; Lee & Park, 2016), tourism (Fourie et al., 2015), trade networks (Lewer & Van den Berg, 2007a, 2007b), and foreign direct investment (Hergueux, 2011).⁴ Notably, at present, religion is often included as one of the standard controlling variables in gravity modeling as it is provided by one of leading data sources for applied gravity modeling CEPII.⁵

Despite the increasing recognition of religion as an important determinant of trade and economic performance, its role in the history of economic thought has been studied predominantly through the lenses

³Interreligious conflict moreover may result in a reduction in bilateral trade activity.

⁴However, Leroch et al. (2014) find no evidence of a strong relation between religion and home bias. While Kang & Fratianni (2006) find that bilateral trade tends to be stronger for the pair of non-religious countries.

⁵*Centre d'Études Prospectives et d'Informations Internationales*; the data set can be accessed at http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=8

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of capitalism, Christianity, and Western civilization. Scholarships on the history of economic thought, such as those of Schumpeter (1954), and more recently on international trade, such as Irwin (1998) tend to focus on writing originating from the Occident, especially regarding the ancient period. This general lack of attention to earlier Eastern views on trade is a sizable and relevant omission to the history of economic thought on internationalization and international trade not only because of the increasing role of China in the world economy but also due to the importance of ancient Asian philosophy that underlies China's institutions and policies (e.g. Morris, 2018).⁶

Moreover, as some Asian authors have argued, Western views may have been influenced by a biased view rooted in Weberian sociology. For example, Madjd-Sadjadi (2014, p. 294) points out that arguments in Weber (1951) suggest that “Confucianism and Taoism, while not antithetical to wealth accumulation, lacked the work ethic and the drive to innovate of Protestantism,” arguing that this can be considered an anti-Eastern bias since “China had the most advanced economy on the planet prior to the Industrial Revolution”. Chandrasekaran (2014, p. 324) likewise argued that the Dasgupta’s warning about discarding “the distorting mirror of Weberian sociology” is ignored in mainstream analyses of Indian economic thought. This is a broader phenomenon that extends to all aspects of the study of international relations; Acharya & Buzan (2017) for instance have argued that many historical gaps in the current stream of research can be observed and that non-Western theories need more attention to avoid a Western bias and to build a more balanced, global view of trade.

The current Western domination of our thinking carries with it a high analytical cost. As the prominence of Asian countries in the global economy steadily grows, Eastern thinking on globalization is becoming

⁶For a more in-depth discussion of early modern history, see for example Hua (2021) and Becker et al. (2020).

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increasingly important for understanding the basis of current policies on and attitudes towards international trade. The lack of studies on this topic makes it a formidable task to unpack through research, however. Indeed, students of international economic relations typically face the complex task of the East Asian and Chinese ‘Miracles’ that do not fit into the box of mainstream economics, as well as the continuing wide popular support for globalization in Eastern societies⁷ that contrasts with recent anti-globalist developments in Western market democracies (Van Bergeijk, 2018, 2019). This chapter aims to contribute to an improved understanding of these developments in a way that can facilitate future analyses of the implications of diverging views on trade relations. It provides an overview of the major views in ancient Asia of international trade and traders because as Irwin (1998, p. 12) argued, “ancient attitudes toward those engaged in commercial activity also lend insight to early conceptions of trade.”

When discussing ancient religions and schools of thought, one might argue that thoughts dating back millennia could hardly have an influence on modern economies and related policies. However, traditional cultures and values are deeply rooted in human societies and continue to affect our present-day world in several ways. For example, China’s President Xi Jinping in a speech in 2014 emphasized the intention of reviving Confucian values, addressing the Chinese Communist Party as “the successor to and promoter of” Confucianism in an attempt to carve out a non-Western path of development for the second-most populous country in the world (Kai, 2014).

Another example, at micro-economic level, concerns the impact of India’s caste system with Vedic origins on its economy despite the denial by some scholars of the existence and therefore influence of this system. The results of an empirical analysis conducted by Rajam et

⁷Such views are explored amongst others in the Bertelsmann Stiftung’s 2020 Globalization Survey and the YouGov and Oxford University’s Globalism Project 2021.

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al. (2021)—one of many practical studies on inequality caused by the caste system in India over the past few decades—suggest the existence of caste-based inequality in access to information and communication technologies in India, which feeds into inequalities in education and income among the castes. On the other hand, Western approaches have also recently turned to old religious thoughts; Tatum & Ma (2022) for instance perceive biblical requisites as a source of theological and foundational support for economic globalization and even for its reform in the new era. Therefore, the exploration of ancient religions and schools of thought not only supplements the existing literature of economic thought on international trade but is also highly applicable in the field of modern economic theology.

The long history of Eastern trade that dates back thousands of years can hardly be refuted—silk strands found on an Egyptian mummy from around 1,000 BCE is but one example indicating that international trade was alive and well at least three millennia ago (Wilford, 1993). Indeed, “the phenomenon referred to today as ‘globalization’ is actually nothing new, but merely an accelerated form of patterns going back more than 3,000 years” (Foltz, 2010, p. 5). Schumpeter (1954, p. 52) likewise argued that:

... the history of economic thought starts from the records of the national theocracies of antiquity whose economies presented phenomena that were not entirely dissimilar to our own, and problems which they managed in a spirit that was, in fundamentals, not so very dissimilar either.

Dasgupta (1993, p. 3) furthermore suggested that “in ancient cultures the workings of the human mind tend to be closely linked to religion” and that “a history of economic thought must therefore take the religious factor into account.”

However, the causal links between religion and international trade are

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not always straightforward. For example, in ancient India, “the demand for Chinese silk banners was caused by both Buddhist ceremonies as well as Hindu ceremonies such as weddings” (Liu, 1988, p. 69); it therefore might be hard to decide whether the spread of religious ideas led to the spread of demand for silk or vice versa (Liu, 1998). The Vedic religion is deeply rooted in Indian history while Buddhism, although originating from India, spread to and further developed in East Asian and Southeast Asian countries, especially China. Meanwhile, within China itself, Confucianism and Legalism, although perhaps more schools of thought or philosophies of life than religions, carved and shaped Chinese society,⁸ and Islam spread its influence all over the Persian world and even to India, China, and Southeast Asia.

This chapter discusses ancient Asian thought on international trade. Views on trade as found in ancient writings are often not explicit but rather focus on the activities of traders. Hence, this chapter follows the approach of other writers such as Viner and Irwin in providing a narrative review of the societal appreciation found in ancient writing of traders and trading activities.⁹ The chapter discusses the views on traders, merchants, and their commercial activities across the five major religions and schools of thought identified above in order to shed light on the differences between Western and Eastern perceptions on international trade.

The organization of this chapter follows a historical timeline (see Figure 2.1), starting in Section 2.2 with a discussion of how trade was viewed within the Vedic religions (ancient Hinduism and Brahmanism).

⁸Another important philosophy, Taoism (or Daoism), focuses on the need to balance yin and yang—the individual and the universe—and hardly concerns itself with politics and even less so with economics. However, recent studies have linked Taoist and Confucian principles to the legal underpinning of the Belt and Road Initiative (Shan et al., 2018).

⁹An alternative method is machine—learning (possibly in combination with econometric methods) as Grajzl and Murrell (2023) did in their study of effects of religion ideas on science and institutions.

The subsequent sections do the same for Buddhism (Section 2.3), Confucianism (Section 2.4), Legalism (Section 2.5), and Islam (Section 2.6). Section 2.7 finally synthesizes the findings; and shows that attitudes of different religions or schools of thought towards international traders and international economic activity diverge significantly.

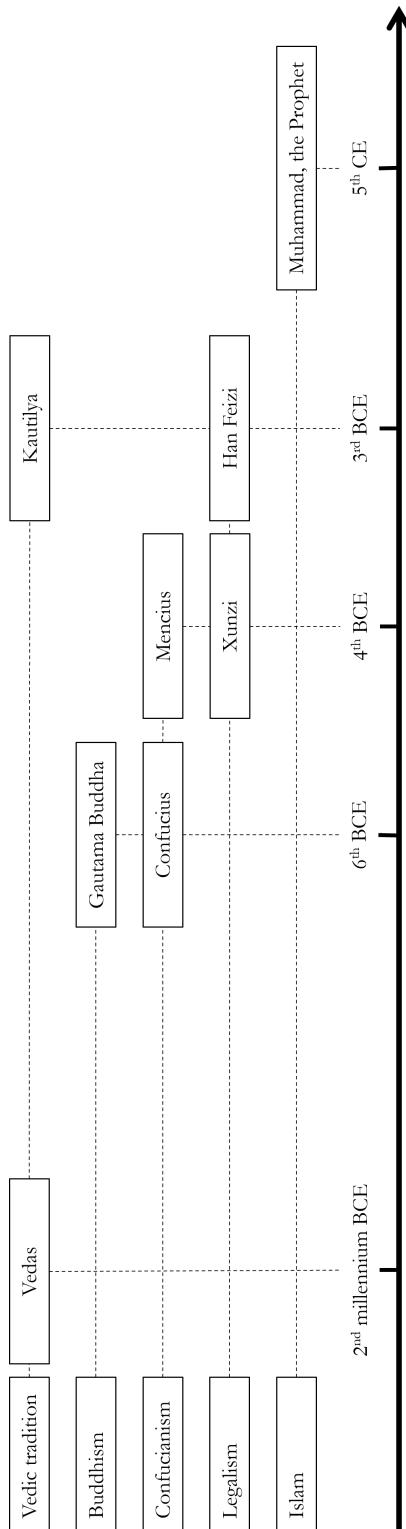
2.2 The merchant in Vedic religion: a servant in low esteem

The Vedic religion is a concept that is used to refer to “a complicated yet systematic set of religious values, ideas, and practices” (Mahony, 1998, p. 1) that are found in the Veda, “a large body of literature composed in Sanskrit, a sacred language of Hinduism, revered as revelation” (Flood, 1996, p. 11). In the historical development of the Vedic religion, Brahmanism is considered as the predecessor of Hinduism. Brahmanism is usually used to refer to Vedic “religious ideas and practices prior to about 200 BCE” while Hinduism is used for the period after 200 BCE (Sullivan, 2001, p. 9).

In the Vedic world, merchants were held in low esteem and long-distance trade was discouraged. In early Vedic texts, such as Ápastamba Dharmasútras (आपस्तम्ब धर्मसूत्र) sailing a ship on the sea was explicitly forbidden (Ray, 1994, p. 153). Merchants were to serve the upper social classes, and trade was a facility to achieve wealth in order to fulfill the political and religious aims of the upper class. Traders and merchants did not enjoy a high status in Vedic ideologies. Together with farmers and cattle breeders, merchants belonged to the Vaishyas caste that ranked third out of the four *varnas* (social classes), which formed part of a social stratification system that divided ancient Indian society into four castes. The *varnas* were described as originating from different body parts of Purusha, “the primeval cosmic being” who was “the source and origin not only of the physical universe but also of religion and the social order”

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Figure 2.1: Timeline historically locating the key ideas, philosophers, and religious leaders discussed in this chapter



(Klostermaier, 2007, p. 485). More specifically, according to the *Purusha Sukta*, hymn 10.90 of the *Rig Veda* (most likely written between 1,500 and 1,000 BCE),¹⁰ the four *varnas* are formed from four parts of Purusha's body: "His mouth became the Brahmana; his arms were made into the Rajanya; his thighs the Vaishya, and from his feet the Shudras were born" (O'Flaherty, 1986, p. 32). The body symbolizes the descending order from Brahmana to Shudra (Singh, 2008, p. 202).

MERCHANTS, who belonged to the Vaishya group, were thus certainly not among the powerful and valued social groups. In fact, Vaishyas were considered inferior, and those born into this caste were to serve the upper classes, the Brahmana and Rajanya/Kshaytriya:

Though entitled to the services of the priesthood and to the initiation ceremony in Vedic times, the Vaishya is regarded as a strictly inferior member of society. Despite the increasing significance of trade in the later Vedic period, the Vaishya's status does not improve. (Darian, 1977, p. 233)

As society developed, merchants started to acquire more economic power. The Brahmins, the upper class, strongly opposed the rise of the Vaishyas into the religious sphere. Basham (1959, p. 142) for example noted the belittlement of farmers and merchants by the Brahmins stemming from the belief that as Vaishyas, they were "paying tribute to another, to be lived on by another, to be oppressed at will." Furthermore, early Brahmanic texts showed how Vaishyas were perceived as "... wretched and down-trodden cultivator[s] or petty merchant[s], who [are] of no interest to [their] betters except as a source of profit" (Basham, 1959, p. 142). This view was also evident in Hindu laws. In *Manu's Code of Law* (मनुस्मृति), an authoritative legal text dating back to the second or third century BCE that contained prescriptions on how to conduct political and societal affairs, the king is reminded to make sure that

¹⁰See Flood (1996, pp. 37–39) and Anthony (2010, p. 454).

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those belonging to the two lowest *varnas* (Vaishya and Shudra) performed their duties and remained repressed (Olivelle & Olivelle, 2005, p. 189). The text stipulated that the king should “make Vaishyas pursue trade, moneylending, agriculture, and cattle herding, and make Shudras engage in the service of twice-born people” (Chapter 8, verse 410) and should “strenuously make Vaishyas and Shudras perform the activities specific to them; for when they deviate from their specific activities, they throw this world into confusion” (Chapter 8, verse 418).

Furthermore, of all the occupations in the Vaishya group, those engaging in trade were distrusted most. For example, in the *Arthashastra* (अर्थशास्त्र),¹¹ Hindu statesman and philosopher Kautilya (375–283 BCE) observed that merchants were “all thieves, in effect, if not in name; they shall be prevented from oppressing the people” (Rangarajan, 1992, p. 236). The text moreover claimed that they tended to “fix prices by forming cartels,” “make excessive profits,” and “deal in stolen property” (Rangarajan, 1992, p. 86). The *Arthashastra* even contained information on “various subterfuges for separating the merchant from his money” (Darian, 1977, p. 232). For example, Kautilya (Rangarajan, 1992, p. 237) determined that the “profit margins allowed to merchants shall be: 5% for locally produced goods and 10% for imported goods.” The merchant moreover should hand over excess profits to the king due to competition among buyers:

After the duty is paid, the merchant shall place himself near the customs house and declare the type, quantity and price of his goods. He shall call out for bids three times and sell to anyone who is willing to buy at the price demanded. If there is competition among buyers and a higher price is realized, the difference between the call price and the sales price along

¹¹The *Arthashastra* is an ancient Sanskrit treatise written and redacted probably by Kautilya between the first century BCE and 300 CE (Olivelle, 2013, pp. 25–31) that is dedicated to the conduct of state affairs, including economic policy, military strategy, and foreign policy (Boesche, 2002, pp. 7–8).

with the duty thereon shall go to the Treasury. (Rangarajan, 1992, p. 239)

However, the *Arthashastra* also recognized the importance of commercial activities such as “agriculture, cattle-rearing and trade constitute economic activity,” stating that “they are the main sources of wealth” (Rangarajan, 1992, p. 108). This body of work consequently contained advice and instructions on how the king was to promote both domestic and foreign trade. For domestic commercial trade, Kautilya (Rangarajan, 1992, p. 235) suggested that the king “shall promote trade and commerce by setting up trade routes by land and by water and market towns/ports” and that “trade routes shall be kept free of harassment by courtiers, state officials, thieves and frontier guards and from being damaged by herds of castle.”

Meanwhile, in terms of foreign trade, imported goods were viewed rather positively in the *Arthashastra*, which bore the instruction that they “shall be sold in as many places as possible” (Rangarajan, 1992, p. 236) so that they could be available to both people who lived in urban areas as well as those residing in the countryside. Kautilya even suggested quite generous incentives for increasing imported goods and foreign trade activity, for example stating that “[local] merchants who bring in foreign goods by caravans or by water routes shall enjoy exemption from taxes, so that they can make a profit” and that “foreign merchants shall not be sued in money disputes unless they are legal persons in the country; their local partners can, however, be sued” (Rangarajan, 1992, p. 237). According to Sihag, Kautilya in doing so was the “only economist who [recommended] the promotion of imports and the construction of roads to facilitate importation” (2005, p. 746).

As for exports, Kautilya took a more cautious approach. Exports were under the supervision of the Chief Controller of State Trading, who was to focus on trade with foreign countries that could generate profits (“he shall avoid unprofitable areas”); likewise, when no profits

were expected to be made, the Chief Controller of State Trading might still have carried on trading if there could have been “economic, political or strategic advantages in exporting to or importing from a particular country” (Rangarajan, 1992, pp. 237–238). Besides the general rules of imports and exports, the *Arthashastra* also specified several types of goods that were exempt from foreign trade—an early form of national security-based trade policy. Prohibited exports were specifically listed including “weapons and armor of all kinds including coats of mail; metals; chariots; jewels and precious stones; grains and cattle,” while prohibited import goods were only briefly mentioned and described in quite general terms as “those harmful to the country and those that are useless” (Rangarajan, 1992, p. 239).

To sum up, merchants were considered inferior in early Vedic thought, and the overall economic benefits of foreign trade, or trade in general, were barely mentioned, except for the benefits of trade as a means to serve the upper classes. Later, however, the *Arthashastra* recognized the importance of trade and foreign affairs but showed that free trade was still not favored. Kautilya while admitting that trade could have several advantages for the country strongly promoted policies and measures to control imports and exports in a way that he thought would benefit his country most. Kautilya also mistrusted merchants and encouraged rules that would keep merchants’ profits low. Across the *Arthashastra*, the need to register goods and merchants upon their entry to a city was brought up repeatedly, which suggests that he believed that goods and merchants should not have been able to move freely. In conclusion, Vedic writings showed a distrust of merchants (and trade), which had a low social standing and who were considered servants supposed to work under direct control of their superiors in order to serve the upper classes and the country as a whole.

2.3 Trade and Buddhism: a mutually reinforcing relation

Like the Vedic religion, Buddhism originated in ancient Asia, but had a much more positive attitude towards trade and traders. Indeed, Buddhism and cross-border trade, especially trade along the Silk Road, were mutually reinforcing—it is generally acknowledged that Buddhism was able to spread across Asia owing to the existence of major trade routes of the time (Lewis, 1993; Hartmann, 2004; Bumbacher, 2007).¹² Buddhism did not spread across the continent only along the trade routes as a pathway for its geographical expansion, however, when monks set foot in new countries, they also created a demand for foreign goods. For example, Foltz (2010, p. 10) argued that “the expansion of Buddhism brought an increased demand for silk, which was used in Buddhist ceremonies, thereby further stimulating the long-distance trading activity that had facilitated the spread of Buddhism in the first place.” It might be that Buddhism and a positive attitude towards trade spread together to new territories; hence, the new devotees to Buddhism could as well have had a positive view of trade and foreign goods, such as silk, which they did not hesitate to use in ceremonies and daily life.

Buddhism’s attitude towards trading activities and traders was more favorable than Brahmanism’s had been from the start (Ray, 1994, p. 126). It is telling that the first lay persons received by the Buddha after he attained enlightenment and became his first followers were merchants, as texts on the origins of Buddhism reveal:

After the Buddha had attained enlightenment, he remained under the bodhi-tree and entered a deep state of meditative

¹²The Silk Road later also facilitated the spread of Islam (Xinru, 2011)—see also Section 2.6 below. The spread of religions and philosophies along the trade routes is a general observation made in the literature (see for example Becker et al., 2020; Iyer, 2016).

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concentration (*samādhi*) that lasted for seven days. When he emerged from his meditation, he went and sat under another tree to contemplate the bliss that had resulted from his enlightenment. While he was sitting under this second tree, two merchants, Trapusa and Bhallika, saw the Buddha, offered him cakes sweetened with honey, and thus became the first lay Buddhists. (Hirakawa, 1990, p. 30)

A fresco found in the Bezeklik Thousand Buddha Caves in the Taklamakan Desert in China (Figure 2.2) depicts this scene. It shows the Buddha in the center, surrounded by Bodhisattvas on the upper part of the fresco and mortal donors on the lower part. In the fresco, there are three mortal donors—one in the bottom left corner and two in the bottom right corner. They wear silk robes with different embroidery patterns and different hats. They also have different hair colors: black, gray, and red. These features suggest that the donors come from different regions. Moreover, the man in the bottom left corner is accompanied by a horse and a camel and both are carrying merchandise, which suggests that he is a merchant traveling with a caravan.¹³

Buddhists, as mentioned by Chakravarti (1996, p. 112), “attached tremendous significance to the economic function and considered it to be as important as religious and political functions.” Trade was thus rated among the higher occupations along with agriculture and cattle keeping. Unlike Hinduism, Buddhism rejected the notion of a social hierarchy and superiority assigned by birth (‘superiority on the grounds of birth’); hence, in Buddhism, anyone could “become a monk, or remain a lay follower and enjoy certain religious status in return for relatively modest financial responsibilities” (Darian, 1977, p. 235).

¹³The positive attitude towards merchants/caravan owners is also illustrated by a well-known metaphor for the Buddha. Nāgasena, one of the Eighteen Arhats (original followers of the Gautama Buddha) in Mahayana Buddhism, when answering a question asked by Menander I, King of Bactria, referred to the Buddha as “a caravan owner to men in that he brings them beyond the sandy desert of rebirths” (Davids, 1890, p. 274).

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Figure 2.2: Fresco of Buddha and the donors in the Bezeklik Thousand Buddha Caves



Source: Wikimedia Commons (Public Domain Mark 1.0).

Note. Figure 2.2 shows a fresco (Praṇidhi scene No. 6) located in Temple No. 9, dated to the 9th century, at the Bezeklik Thousand Buddha Caves near Turpan, Xinjiang, China. This and many other paintings were removed by Prussian/German explorer Albert von Le Coq from the Bezeklik caves and were taken to Berlin, where they were later destroyed in the Allied bombing of the city during the Second World War.

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Moreover, Buddhist literature acknowledged the importance of trade, especially foreign trade, in spreading Buddhism to faraway lands. Buddhist monks and nuns were encouraged to go out in different directions and preach; in fact, rejecting an (even foreign) invitation to preach was not allowed. How could monks afford traveling, which was very costly and difficult at the time? Their travels were afforded and facilitated by merchants, who provided them with transport in return for sermons to be delivered during the trip. Ray (1994, p. 132) for example refers to a passage in the *Milindapañha* that supports this observation:

The venerable Nāgasena once wanted to travel to Pataliputra and was apprehensive about how and where he would obtain alms and food on the way. Just then he met a caravan on its way to Pataliputra and the merchant leader requested him to join the caravan and to preach the Dhamma to him on the way.

The encouragement to travel with the caravan became so popular that even the Buddha himself was sometimes “portrayed in Buddhist art and literature as a merchant caravaneer” (Elverskog, 2011, p. 18).

Importantly, Buddhism also provided spiritual support to those undertaking long commercial journeys through its ideal of a Bodhisattva, “a protector who could be called upon in distress either by merchants traveling in caravans or by seafarers” (Ray, 1994, p. 153). Many different stories and tales recount how a Bodhisattva saved merchants and seafarers from monsters, demons, and perils at sea or on islands. The savior could be called upon by “meditating on the Buddha” and appeared as the Buddha himself, as a monk, or in the form of an animal such as a horse (Ray, 1994, p. 153).

Buddhism’s view of private wealth accumulated from the proceeds from (international) trade was also quite positive. For example, the collection of the *Long Discourses of the Buddha*, a translation of the Dīghanikāya

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Nikāya (ii, 86), lists wealth as one of the five advantages of practicing good morality. This was explicitly linked to wealth accumulation:

In the first place, through careful attention to his affairs he gains much wealth. In the second place, he gets a good reputation for morality and good conduct. In the third place, whatever assembly he approaches, whether of Khattiyas, Brahmins, householders or ascetics, he does so with confidence and assurance. In the fourth place, he dies unconfused. In the fifth place, after death, at the breaking-up of the body, he arises in a good place, a heavenly world. These are the five advantages to one of good morality, and of success in morality. (Walshe, 1995, p. 237)

The ancient Buddhist texts thus show acceptance of and even appreciation for merchants and their accumulation of wealth (provided that their conduct was moral)—a point often missed in recent Western interpretations. An example is the critique of mainstream economics titled *Small is Beautiful* that statistician and economist Ernst Friedrich Schumacher published in the 1970s¹⁴—Schumacher perceived the Buddhist view of wealth as a way to achieve sustainability because the ultimate goal of Buddhism is liberation; therefore, “it is not wealth that stands in the way of liberation but the attachment to wealth; not the enjoyment of pleasurable things but the craving for them” (Schumacher, 2011, p. 41). Hence, Buddhism urges people to obtain wealth honestly like “the bee gathers honey” and use it uprightly by devoting it to “his people’s good” (Walshe, 1995, p. 466).

This way of life handsomely matches the principle of ‘small is beautiful’ that Schumacher’s teacher Leopold Kohr. In contrast to Buddhist encouragement of international trade, Schumacher’s ‘Buddhist economics’ tends to be in favor more of self-sufficiency than international

¹⁴See Opdebeeck (2011) for a discussion of Schumacher’s theory.

exchange; he cited Buddhist teachings of pursuing a non-violent lifestyle and reasoned that “people who live in highly self-sufficient local communities are less likely to get involved in large-scale violence than people whose existence depends on worldwide systems of trade” (Schumacher, 2011, p. 43). In this sense, Buddhism may offer an alternative to the ‘liberal peace’ paradigm (the idea that international trade strengthens democracy and reduces international conflicts) that underpins much of the architecture of international institutions. Buddhist economics *a la* Schumacher in particular provides a philosophical alternative by stressing that simplicity and low consumption levels allow for highly self-sufficient local communities that have no incentives to get involved in large-scale conflicts (Van Bergeijk, 2021, pp. 132–133). However, as we have seen, Buddhist teachings are mainly about not doing evil and trying to do good. People could practice this teaching through economic and cultural exchanges so that they might understand their foreign peers better and improve their bonds by sharing trading benefits, not by secluding themselves and avoiding cross-community interactions.

2.4 Trade in Confucianism: the lowliest of occupations

Confucius, who was Buddha’s contemporary, is located at the opposite of the spectrum of views on trade, perhaps as an unintended side effect of his emphasis of the importance of education. As Confucianism developed, his followers popularized a philosophy that segmented a civilized society into four groups of occupations, ranked in order of their perceived societal contribution.¹⁵ This philosophy deliberately aimed at promoting the status of scholars in ancient Chinese society, as Schuman (2015, p. 165) noted: “At the top, of course, were the scholars, who, because of their superior learning, had a responsibility to guide everyone else. Thereafter

¹⁵Confucians focused on the societies touched by Confucianism and considered others barbarians although recognizing that others had their own cultural practices.

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followed, in descending order, farmers, artisans, and merchants". In the idealized fourfold hierarchy of Confucian society, not counting the slaves, merchants thus stood at the bottom (Chang, 1987, p. 495).

Merchants, who strove to make money, and their related business activities were widely looked down on and regarded as undignified, even in educative children's books. An example of the latter is the *Thousand Character Classic* (千字文),¹⁶ the very first book that young children would learn to read and copy in writing in the days of imperial China (Rainey, 2010, p. 196). Relatedly, a famous story recounting how Mencius' mother made them move house three times in order to give her son the best environment for his development clearly shows societal attitudes at that time towards different occupations, including trading.¹⁷ This story starts when Mencius' literate and caring mother, who wanted her son to be well educated, realized that he enjoyed getting into fistfights with illiterate children in the neighborhood of their first home and causing trouble (including fake crying at a funeral in exchange for money). Hence, she decided that their family should move closer to the city center. However, they then lived near a marketplace, and she again found the milieu to be unsuitable because her clever son started learning all the merchants' tricks at the bazaar, including how to haggle, cheat, and deceive. Hence, they moved again, this time to a neighborhood near the Palace of Education, where intellectuals would gather to discuss current affairs with rites and politeness. The young Mencius consequently quickly learned to behave virtuously and started paying serious attention to studying. His mother was pleased, and they settled in the third place. This story is one of the most popular and influential tales among the Confucianism classics that are still widely told today. The story first details the mother's sublime love for her son, then the serious effects of the environment on

¹⁶The *Thousand Character Classic* is "China's oldest primer" which was "written between 507 and 521 A.D. by Chou Hsing-szu" (Zhou, 1963, p. 3).

¹⁷Mencius (372–289 BCE) is considered the 'second sage' of Confucianism. His influence in Confucianism is only second to that of Confucius himself (Van Norden, 2019).

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a child's development and, finally, the importance of education. From this story, we can also see that merchants/retailers were seen as dishonest swindlers. Obviously, trade in this Confucian world was not a respectable occupation.

Despite ranking merchants at the bottom of the list of occupations, Confucius himself stressed that everyone deserved an education and never refused to teach anyone. His disciples came from various backgrounds and included merchants and sons of criminals. In fact, Zigong, one of Confucius' three outstanding disciples, "had once been a merchant and would, from time to time, still think and talk like a merchant" (A. Chin commented on *The Analects*¹⁸, 9.13). Furthermore, Confucius did not always condemn the accumulation of private wealth provided that individuals kept to the moral path: "When the moral way prevails in a state, being poor and lowly is a cause for shame. When the moral way does not prevail in the world, having wealth and position is a cause for shame" (*The Analects*, 8.13). Thus, it is not a matter of being rich or poor—it is a matter of living honorably.¹⁹

Although not considered an esteemed occupation in the Confucian tradition, trade was not completely spurned, either—an honest merchant simply might have been considered someone who made money in a less honorable way. Confucian teachings focused instead on the importance of education and the equality of opportunity to acquire education. For Confucius, studying is the proper path to make wealth: "It is hard to find a person who, after three years of studying, has not yet turned his thoughts to earning a salary" (*The Analects*, 8.12). In *The Analects*, he kept reminding that everyone should be treated equally in education: "In educating others, let go all preconceptions of class and categories" (15.39) and that education would help everyone to become more civilized,

¹⁸ *The Analects* (Lun Yu – 論語) is a collection of Confucius' sayings collected and put together, after his death in 479 BCE by his student (Rainey, 2010, p. 10).

¹⁹ This argument is similar to some extent to one found in Greek mythology that positions Hermes as the god of both traders and thieves (López-Pedraza, 2003).

even ‘barbarian tribes’. Keeping the importance of equality in mind, Confucian classics did not truly disparage merchants but rather might have felt pity toward them, as they had chosen to pursue a less moral, less righteous, and less virtuous way of life: “People are similar by nature; they become distinct through practice” (*The Analects*, 17.2). Therefore, in Confucianism, commerce might not have been considered the best occupation but also not a terribly vulgar one that should be avoided.

2.5 Trade in Chinese Legalism: a threat to the state’s stability

Next to Confucianism, Chinese Legalism (Fajia – 法家) also greatly influenced ancient Chinese society, especially in building the government and making laws. Legalism gained acceptance around the end of the Zhou (周) Dynasty²⁰ and became significant, even dominant, after the successful reform of the Qin (秦) state. This later allowed it to conquer the other six of the Seven Warring States, eventually bringing an end to the then-powerless Zhou Dynasty. Even after the fall of the Qin Dynasty, Legalism managed to retain its influence alongside Confucianism: “Legalism seems to have steadily infiltrated Confucianism over a long period,” wrote Creel (1956, p. 218). Feng (1997, p. 215) on the other hand noted that each of these doctrines were associated with different spheres:

Both Confucianism and Legalism have had their proper sphere of application. The proper sphere for Confucianism is that of social organization, spiritual and moral culture, and learned scholarship. And the proper sphere for Legalism is that of the principles and techniques of practical government.

Hence, when taking into account how ancient China perceived trade and merchants, the legacy of Legalism may have been as important as that of

²⁰The Zhou Dynasty lasted from 1,046 BCE until 256 BCE, just before the ascension of the Qin Dynasty.

Confucianism.

However, differing from the Confucian view, merchants were perceived in Legalism thought as a potential threat to the government that needed to be strictly controlled. The difference lies in their contrasting views of human nature. The famous Confucian Mencius (孟子), who lived during the fourth century BCE, believed that human beings are innately good (人之初，性本善); thus, he believed, “human nature has within it the potential to grow into goodness, just as a fruit tree has the potential to grow fruit” (Rainey, 2010, p. 90).²¹ Conversely, Xunzi (荀子), also a famous Confucian scholar who lived in the third century BCE and who was more realistic and practical, believed that human beings are innately evil (人之初，性本恶), claiming that “the innate nature of man embraces a love of profit” (Knoblock, 1988, p. 213). Hence, according to Xunzi, the government needed to impose laws for individuals to behave properly (Madjd-Sadjadi, 2014).

Inheriting Xunzi’s perception of human nature, Han Feizi (also known as Han Fei Tzu - 韓非子) between around 280 and 233 BCE developed a system of political thought that had “a remarkable resemblance in its scope and approach to modern economics, especially the public choice variety” (Choi, 1989). Han Feizi, whom Feng (1997, p. 157) called the “greatest theorizer of the Legalist school,” named (undisciplined) merchants one of ‘The Five Vermin’ that could become a threat to the state power. He stated that “[t]he tradesmen and craftsmen disguise worthless, broken articles as proper goods, collect useless luxuries, accumulate riches, wait for good opportunities, and exploit the farmers” (Qian, 1959, p. 297).

Hence, the Legalists wanted to prohibit private wealth accumulation that at the time was an activity primarily of merchants (Lai, 2008, p. 195). Han Feizi for example claimed that it is in human nature to “seek

²¹Mencius’ point of view toward human nature to some extent is similar to the Calvinist view on predestination.

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only for security and profit and to avoid danger and poverty” (Qian, 1959, p. 295). This view bore a close resemblance to the Western notion of the ‘economic man’ (*homo economicus*), but with a negative undertone that pointed to the willingness of merchants to bribe the authorities to get what they want. For this reason, in ancient Chinese Legalism, trade activities were to be suppressed:

The enlightened king so administers his state as to diminish the number of tradesmen, craftsmen, and idlers, and to lower their names in order to incline their minds to primary callings and to lessen their interest in secondary occupations. (Qian, 1959, p. 296)

For Han Feizi, then, merchants were full of mischief and iniquity as they would seize the opportunity to exploit farmers whom alongside warriors he considered the foundation of the country.

From his writing, we can therefore see that Han Feizi disliked and mistrusted trade and traders maybe just as much as Kautilya did. Nevertheless, these two political writers had very different views of the role of merchants and commerce. While Han Feizi perceived merchants not as a resource but as a threat, and listed merchants as one of the five vermin of the state; he wished to get rid of these vermin. However, getting rid of them was impossible so he came up with a system of rules and laws to minimize them and minimize their impact. Meanwhile, Kautilya saw merchants as thieves that needed to be controlled strictly; however, he also acknowledged the benefits of trade and wanted to use it to the state’s advantage. Because of their different views on the possible favorable outcomes of engaging in trade activities, despite both disliking merchants, Han Feizi and Kautilya had different ways of dealing with merchants and commercial activity: the Chinese theorizer wanted trade to be oppressed, while his Indian peer wanted to profit from of them.

2.6 Trade in Islam: the best livelihood

In Islamic thinking, traders, especially silk traders, were highly respected, and trade was seen as the best occupation (Liu, 1988, p. 158). The Prophet praised that “among means of livelihood, trade occupies the most prominent place, the honest merchant being one of the righteous servants of Allah” (quoted in Ali, 2013, p. 292). Jahangir, Emperor of the Mughal Dynasty, likewise proclaimed that “of all the professions, only trade is respectable in the eyes of Islam” (Alam & Subrahmanyam, 2007, p. 127). This high standing of traders in Islamic society is reasonable considering that the Prophet himself when his first revelation took place in a cave in Mecca “was then a middle-aged merchant, a happily married forty-year-old with a full brood of children and a good reputation in the city of his birth, built up over thirty years’ experience of caravan trade” (Rogerson, 2004, p. 88). It is worth noting that honesty and trustworthiness were emphasized as essential characteristics that traders needed to be honorable; the Prophet declared that “the truthful, honest merchant is with the prophets, and the truthful ones, and the martyrs” (quoted in Ali, 2013, p. 294). Moreover, Elverskog (2011, p. 30) observed that “the value of trade and the commercial spirit was so important in early Islam that much of the *Shari'a* (Islamic law) is devoted to supporting it.” Thus, Islam may have been the most commerce-friendly religion in the ancient world. Moreover, “commerce and business have remained central subjects in the Islamic ethical tradition. During a limited period of Islam’s history, its spread was due to the sword, but otherwise [in the ancient world] its spread has been essentially through individual proselytization, more particularly as a result of trade and commerce” (Bassiouni, 1993, p. 118). Indeed, according to the *Qur'an* (القرآن - Translated by M. A. S. A. Haleem), “God has allowed trade and forbidden usury” (2:276) and “it is lawful to trade while on pilgrimage” (2:198).

Furthermore, Islamic perceptions of the sea—and thus trade by sea—have always been very positive. Unlike the Greek and Roman writers

who were unsure of “whether location near the sea was a blessing or a curse” (Irwin, 1998, p. 11), Islamic texts claimed that the sea was an arrangement of the God for his believers to seek blessings: “It is God who subjected the sea for you—ships sail on it by His command so that you can seek His bounty and give Him thanks” (The *Qur'an*, 45:12). In addition, the *Qur'an* even suggested how merchants should perform their commercial activities; it for instance stated that Muslim traders in concluding transactions should “[h]ave witnesses present whenever you trade with one another, and let no harm be done to either scribe or witness, for if you did cause them harm, it would be a crime on your part” (2:282) and that trade should be fair and honest by stipulating that “[y]ou who believe, [should] not wrongfully consume each other's wealth but trade by mutual consent” (4:29).

Notable is that both Islam and Buddhism saw trade routes and merchant caravans as the superior way of spreading their teachings and influence. It might be due to this positive attitude towards international trade that these two religions were able to reach and influence so many countries all over ancient Asia.

2.7 *Tableau de la troupe*: some comparisons and conclusions

This chapter started by pointing out the lack of studies on the history of (ancient) Asian thought on international trade. Since international trade is an activity dating back thousands of years, this chapter argued that it is appropriate to look into ancient views on traders and trading because of the light that this may shed on trade in its current form. Turning to the teachings and writings of the Vedic religion (Brahmanism and Hinduism), Buddhism, Confucianism, (Chinese) Legalism, and Islam, this chapter detailed the different views on trade, both as a profession and for society. It is clear from this chapter of the different religions that ancient Asian

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thinking on trade and traders is heterogeneous (Figure 2.3).

Figure 2.3: Schematic representation of views of traders and international trade for the five major schools of thought in ancient Asia

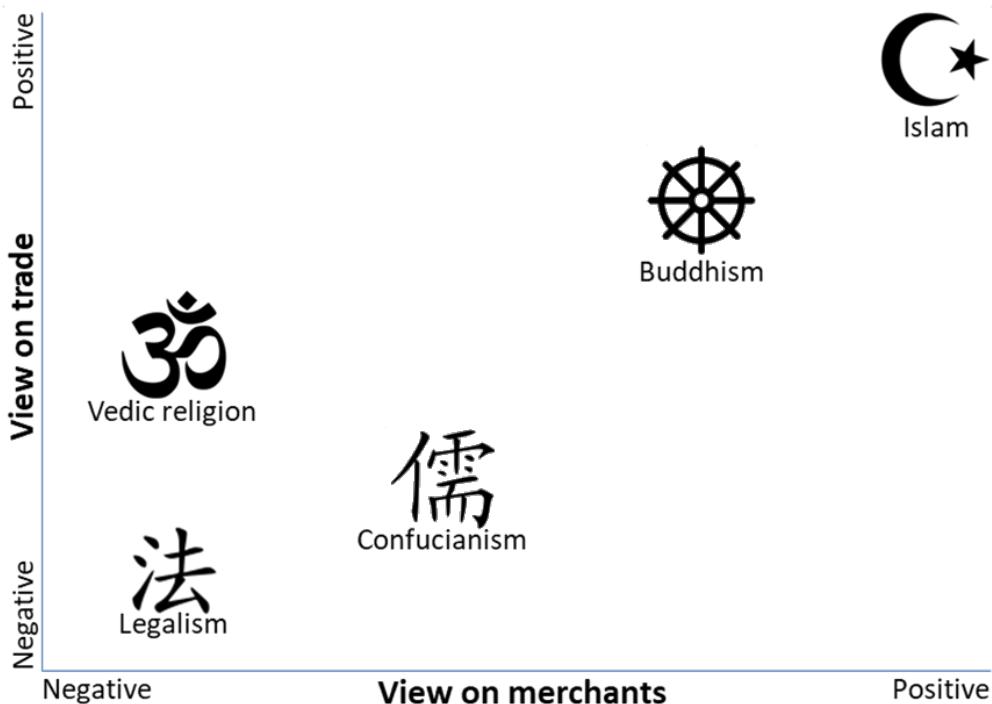


Figure 2.3 indicates that of the five schools of thought present in ancient Asia, Islam and Buddhism had very positive attitudes towards trade and traders, while Confucianism pitied merchants for choosing to live a less dignified life but was not against traders and commercial activity per se. Islamic teachings are similar to those of Buddhism in terms of the importance attached to trade. Moreover, both see trade routes and merchant caravans as the best way to spread their teachings and influence. These two religions also share a positive view of the sea and sea traveling—Islam perceives the sea as God's way for followers to seek blessings, while in Buddhism, sea travelers are protected by the Buddha or the Bodhisattvas. It is not unlikely that due to their positive perception of international trade, Buddhism and Islam were able to spread to and

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influence so many countries all over ancient Asia. On the other hand, the Legalist school of thought and Vedic religion scorned merchants, but while Legalism wanted to oppress trade as much as possible, Hinduism tried to seize the benefits of trade.

With this *tableau de la troupe* in mind, it is interesting to contemplate the ancient Greek and Roman views on trade and merchants. In ancient Greece, “it was widely believed that citizens should not participate in commerce, but that it should be left entirely to resident aliens who were deprived of political rights and kept separate from the civic life of the Greek city-state” (Irwin, 1998, p. 12). Likewise, in ancient Rome, commercial activity was considered “beneath the dignity of elite citizens, and laws even prohibited senators from participating in commerce” (Irwin, 1998, p. 12). This would locate the dominant Graeco-Roman and early Christian conceptions of merchants and international trade in the southwest corner of Figure 2.3, between Legalism and the Vedic religion. Overall, the ideas embedded in ancient religions and philosophies of life have shaped societies and attitudes, and their impacts can be traced to trade as it is manifested today.

In general, Buddhism has been empirically found to have positive effects on international trade (Lewer & Van den Berg, 2007b). The findings for the Hindu religion are more complex: a negative association between international trade, on the one hand, and the Hindu religion, on the other hand, while international trade is positively associated with trade between similar (i.e. Hindu) trading partners (Lewer & Van den Berg 2007a, 2007b). This contradicts the *a priori* expectation that the significant Hindu diaspora provides a network of family ties and facilitates the spread of consumer preferences in a way that would seem to be conducive to trade (Gowricharn, 2019). This may be because people that self-identify as Hindu appear to display the most consistent tendency towards a home bias in comparison to other religions (Leroch et al., 2014, p. 12), or because the caste specificity of trading activities may make it

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difficult for distinct religions to find suitable Hindu trade partners (Helble, 2006, p. 213).

For long, modern mainstream economic thinking on Confucianism was determined by Weber's view of religion as explanation for 'Chinese backwardness',²² in addition to Chinese Legalism's belief in law as the basis of governmental control rather than accountability mechanisms. The impact of Chinese Legalism has especially been recognized in the area of trade law and its institutions (Toohey & Picker, 2012) and in particular regarding WTO-related issues such as a high frequency of dispute settlements (Picker, 2015), as well as transparency issues (Ala'i & Beshkardana, 2021). However, especially since the 1990s, the 'East Asian Miracle'²³ and the economic ascent of China have led to renewed attention for Confucian values and related literature have grown significantly since the early 2000s (cf. Pezzutto, 2019). This body of literature recognizes the importance of the combination of hierarchy, social rank, and ethical values, including the importance of individual education and a strong sense of (extended) family, as the basis of production and accumulation (also by means of inheritance). The links of these values to high savings rates that translate into large holdings of foreign assets and trade surpluses have also inspired empirical research that is generally supportive of the hypothesis that Confucianism is an important co-determinant of modern Asian globalization.²⁴

Contemporary Islam finds itself in a more complicated situation than the other ancient Asian religions and philosophies. Noland (2005) in noting the heterogeneous impact of specific religions on economic performance observed that Islam was the one exception, with robust and positive coefficient patterns. This finding stems from growth regressions while confirmed in the earlier literature (e.g., Helble, 2006); however,

²²See Huang (1994) for a critical evaluation.

²³A combination of high growth, human welfare improvement, and equitable income distribution (World Bank, 1993).

²⁴See Liang (2010) for an empirical assessment.

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it does not spill over to empirical trade models, which bring more nuance (see for example Mehanna, 2003; Nijkamp & Ratajczak, 2021). The heterogeneity of the findings possibly reflects the heterogeneity of views within Islam itself. For some Muslim countries, the emergence of consumer boycotts of Western countries as well as trade and migration measures taken by Western countries in reaction to (perceived) Muslim threats of terrorism have been detrimental to their global economic position. Meanwhile, other Muslim countries such as Indonesia, with the world's largest Muslim population, keep pushing forward international trade and other aspects of globalization. In summary, in ancient times, major Asian religions and philosophies had diverse views of international trade, which can be understood in relation to their attitude toward international commercial activities and merchants, as discussed above.

In addition, at present, these five major religions and philosophies of life still wield different levels of influence on international trade. Hinduism tends to encourage co-religion rather than cross-religion trade, Buddhism helps strengthen international merchandise trade, as has been found empirically, while the present-day impact of Islam, Confucianism, and Legalism on trade is more difficult to determine. With this caveat in mind, however, it is clear that the study of the history of ancient Asian thinking on trade and traders is important for understanding international economic relationships in a world of growing multidimensional integration.

Chapter 3

Globalization and religion: A Granger causality analysis

3.1 Introduction

Globalization essentially refers to ongoing economic and social interactions across borders. Such borders could be national, like those separating nation-states today, but they could also be tribal, like those that existed long before modern borders were assigned. And since the very start of human history, religion has been present, forming part of the human experience and closely interwoven with our interactions. Historian Yuval Noah Harari for example describes this relation in *Sapiens: A Brief History of Humankind*:

They exchanged members, hunted together, traded rare luxuries, cemented political alliances and celebrated religious festivals. Such cooperation was one of the important trademarks of Homo Sapiens and gave it a crucial edge over other human species. (Harari, 2014, p. 52)

The discussion in Chapter 2 suggested that religion and

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internationalization may be related in multiple ways, building on one of the primary research questions of this dissertation that asks whether religion and internationalization remain as entwined as in the ancient world and, if so, what is the direction of causality. Some scholars argue in favor of the ‘secularization thesis’ which contends that as society at large accumulates more scientific knowledge and becomes more educated, people will become less religious, and that the eventual elimination of religion(s) is inevitable (Iannaccone, 1998, p. 1468). Despite the curse of extinction cast by those scholars and writers has been looming over it for centuries and might last many more to come, religion remains crucial also in our modern world (Iyer, 2016, p. 401). Yet the presence of religion as a topic of study in the academic literature on globalization seems to be limited both theoretically and empirically (Iannaccone, 1998; Lehmann, 2002; Beyer, 2007; Wessels, 2008; Iyer, 2016).

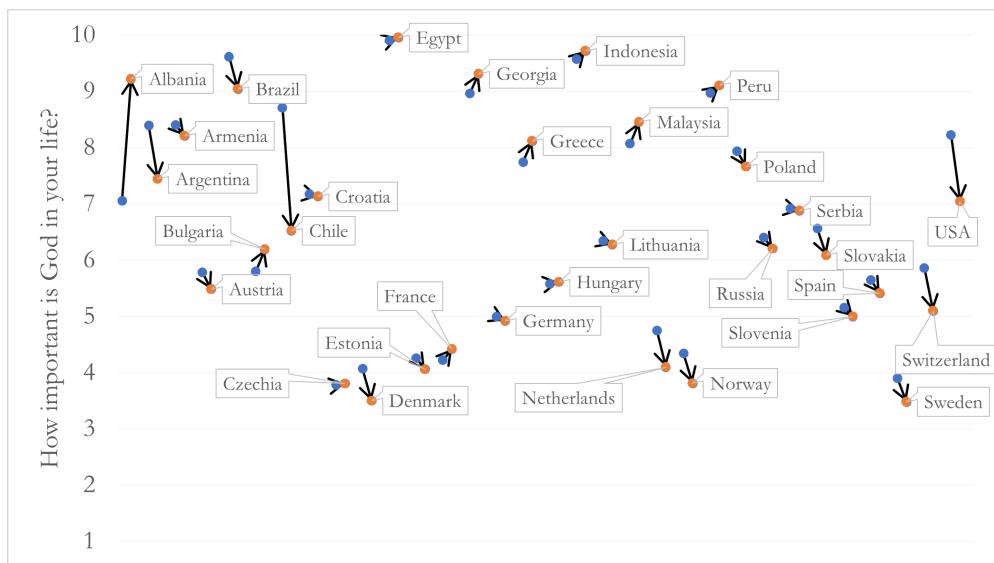
Religion is far from disappearing, and some might even argue that religious attitudes do not change quickly and that it consequently may be difficult to analyze the impact of religion in our contemporary world. For example, in Figure 3.1, answers to the question “How important is God in your life?” across 32 countries¹ show little change over the course of ten years, with only 3 out of 32 countries measuring a significant change (larger than one point). On the surface, thus, religious convictions seem stable over time. On the other hand, as a result of the different waves of globalization that swept across the globe in the past few decades, humans are crossing artificial borders in multiple ways. Flows of people and their ideas could create sustained changes both in the size of religious communities and in religious attitudes. It is also worth noticing that almost all of the 32 countries mentioned above have become

¹Only 32 countries for which data on the importance of God could readily be accessed are included in this figure: Albania, Argentina, Armenia, Austria, Brazil, Bulgaria, Chile, Croatia, Czechia, Denmark, Egypt, Estonia, France, Georgia, Germany, Greece, Hungary, Indonesia, Lithuania, Malaysia, the Netherlands, Norway, Peru, Poland, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United States of America.

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more globalized in the past decade (Figure 3.2), which contrasts with the multidirectional variations in religious conviction shown in Figure 3.1. Such variations in religious conviction may be linked to the countries' levels of income. Figure 3.3 maps the strength of religious conviction against the level of globalization and real per capita GDP, showing that the higher the real per capita GDP, the more globalized a country is and the less important God is said to be.

Figure 3.1: The importance of religion for 32 countries in 2008 (blue) and 2018 (orange)

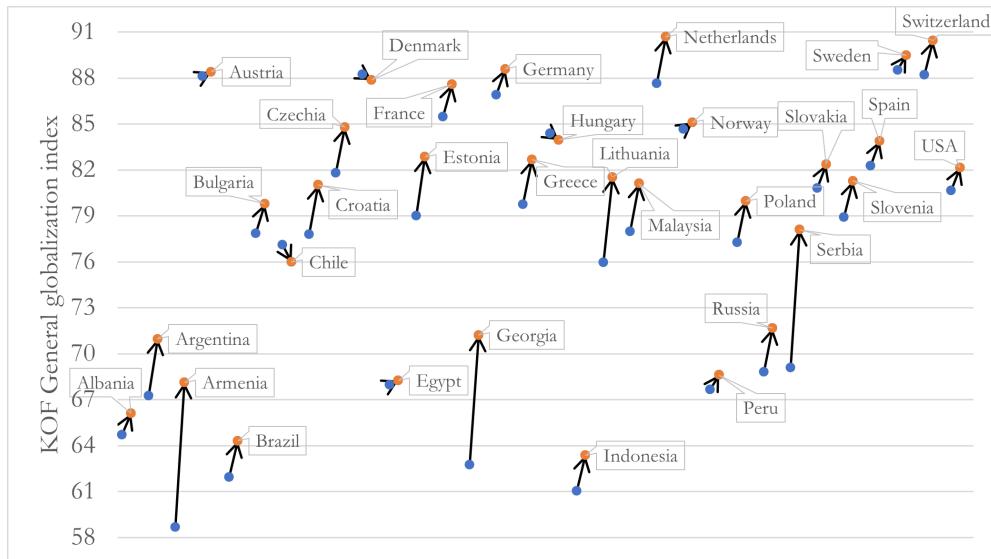


Note. For the year 2008 (blue), answers to the question “How important is God in your life?” were from both 2007 and 2008; likewise, for the year 2018 (orange), answers were from both 2017 and 2018. Answers ranged from 0 (not at all important) to 10 (very important). Data were extracted from the Integrated Values Surveys (WVS/EVS trend 1981–2020) constructed from the European Value Study (EVS, 2020, 2021) and the World Value Survey (Haerpfer et al., 2020, 2021) published by the Quality of Government Institute. The dataset can be accessed at https://datafinder.qog.gu.se/variable/wvs_godimp (last accessed on October 6, 2022).

The two graphs in Figure 3.3 (for the years 2008 and 2018, respectively) show the links between the stated importance of God (vertical axis), the level of globalization (horizontal axis), and the real

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Figure 3.2: The level of globalization for 32 countries in 2008 (blue) and 2018 (orange)



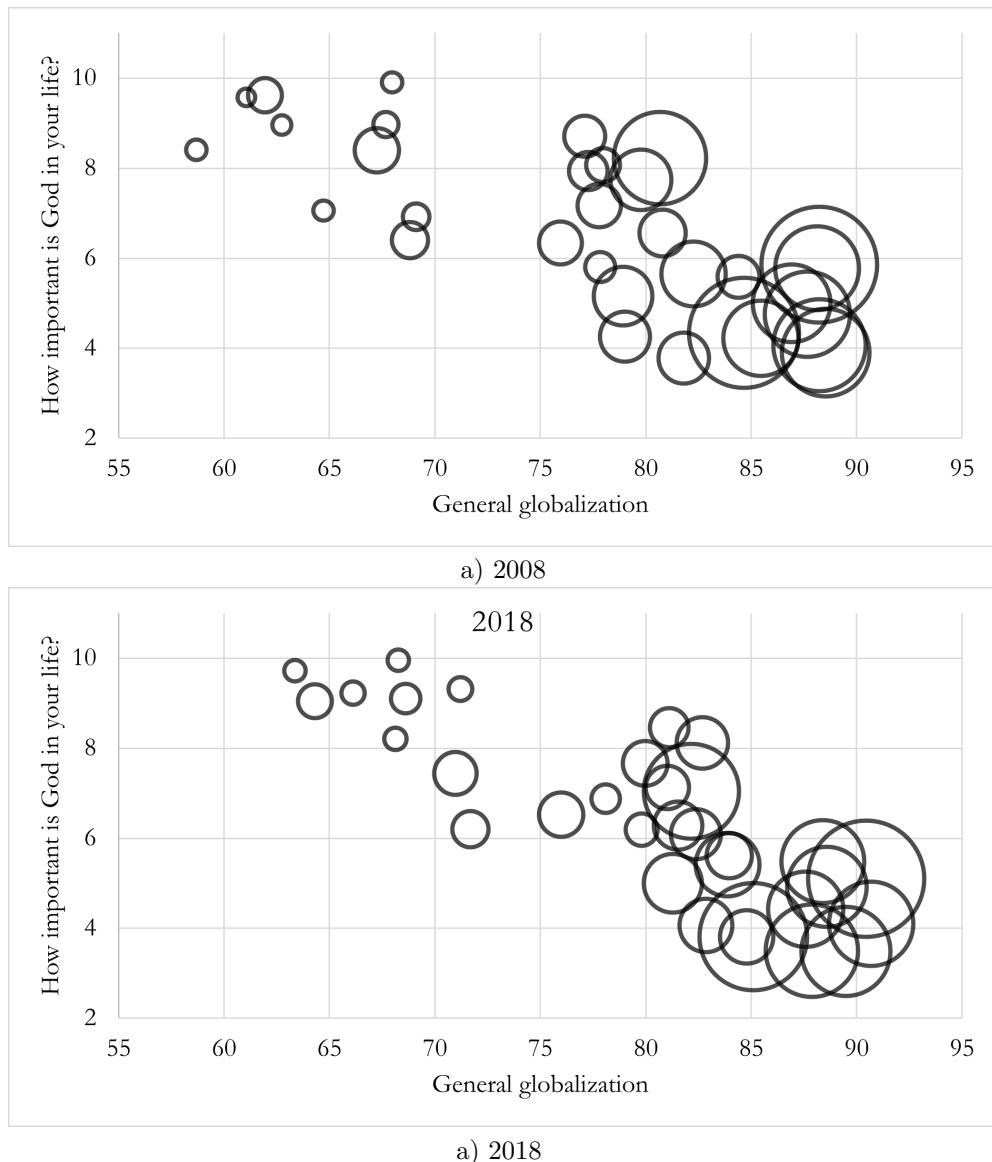
Note. General globalization is measured using the KOF Globalization Index (Gygli et al., 2019, last accessed on March 4, 2022) for the year 2008 (blue) and 2018 (orange).

GDP per capita (indicated by the size of the circle) for the selected countries (same as in Figure 3.1 and 3.2). The figures indicate that for countries with a higher real GDP per capita (larger circles) and a higher level of globalization, God seems to be assigned less importance, and vice versa. In general, globalization seems to increase between 2008 and 2018, while the importance of God in life seems to decrease. Thus, while religious attitudes may not change overnight, changes can be discerned over a longer period of time, in this case over a period of ten years.

Moreover, even when we ignore the physical movements of adherents to diverse religions and schools of thought and only consider data at the global level, changes both in the size of religious communities and in religious attitudes can be observed using aggregate data. Although religious attitudes at the global level can be hard to capture quantitatively, the size of the global religious population may be an

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Figure 3.3: Real per capita GDP mapped against the importance of God and the general globalization level in 2008 (a) and 2018 (b)



Note. Data on religion and globalization are from the same sources as those of Figures 3.1 and 3.2. The circles are sized by 2018 real gross domestic production per capita in 2015 constant United States (U.S.) dollar (World Bank, 2021, last accessed on March 4, 2022).

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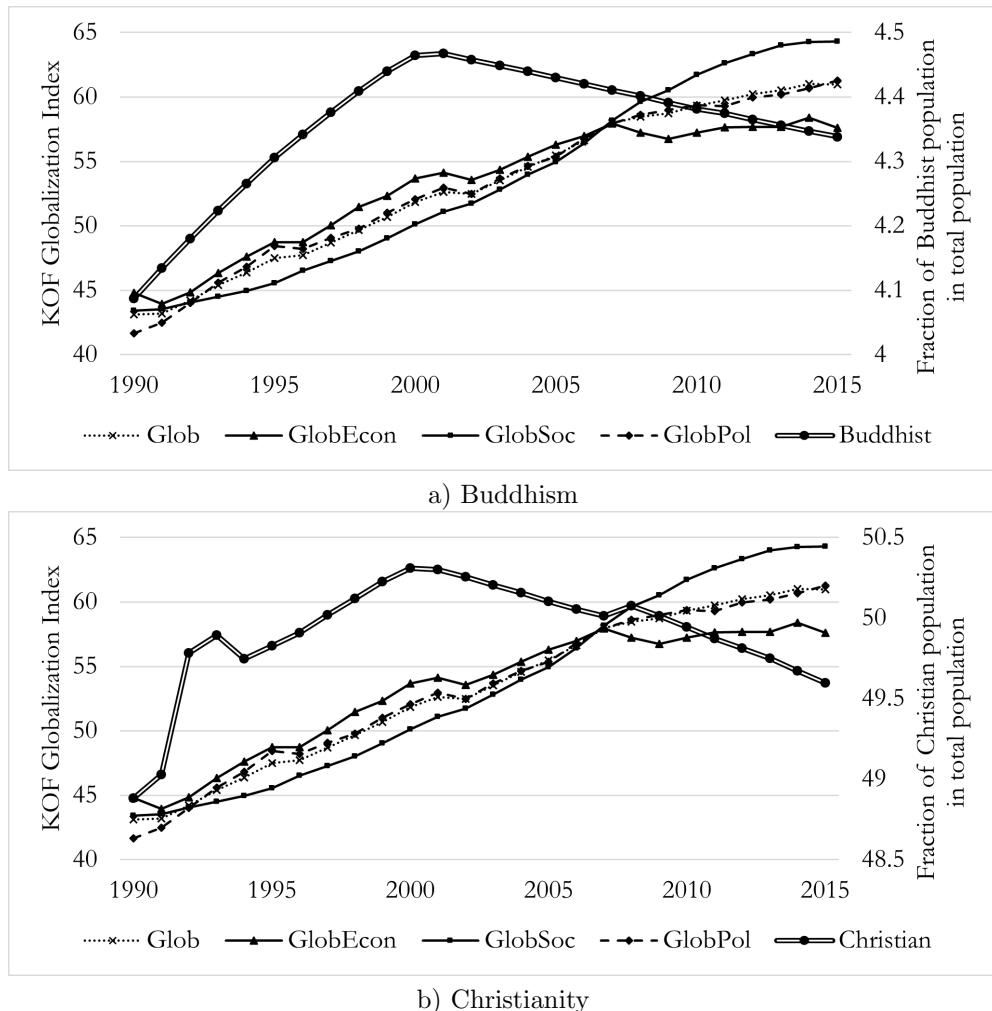
appropriate way in which to observe larger global changes. As Figure 3.4 shows, the sizes of the six religious/atheist communities at the global level are not stable and seem to be moving in different directions. However, given the dissimilarities across the five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam) and Atheism both in terms of ideologies and population size, it is more appropriate to investigate the relation between globalization and religion using individual models for each religion/Atheism. Thus, changes in religious population size are mapped separately for each of the religions plus Atheism.

Thus, in terms of religious attitudes, the exchange of ideas and increase in intercultural interaction all over the world possibly affect the weight of religion in daily life. In terms of the size of religious communities, this indicates that as people migrate abroad, their original beliefs move with them. Such physical movements of adherents could therefore increase (or decrease) the size of the religious population in destination (or departure) countries, which may affect the share of adherents as part of the total population faster than the speed of change in religious attitudes. The changes in the religious population as well as the level of globalization are captured both at the global and the national level². Hence, to control for national effects, it might be reasonable for this chapter to examine the relation between religion and globalization with country level data.

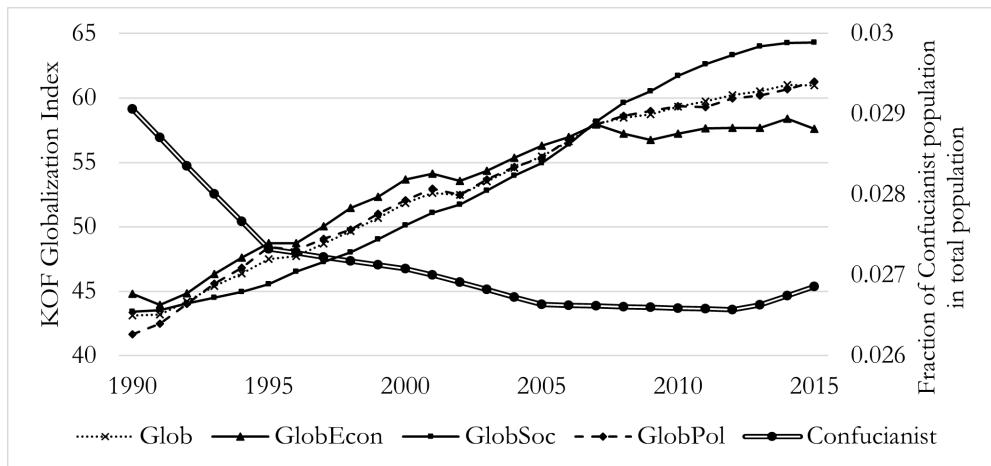
²Figure 3.5 demonstrates the changes in the share of the religious and atheist population in the total population at country level for selected countries.

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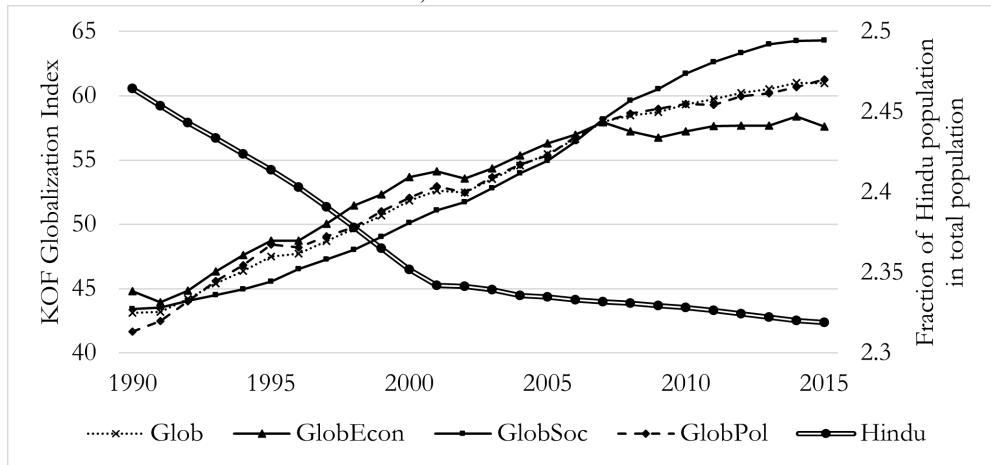
Figure 3.4: Globalization levels measured by four globalization indices and the size of the global religious/atheist population for the five major religions and atheism, 1990–2015



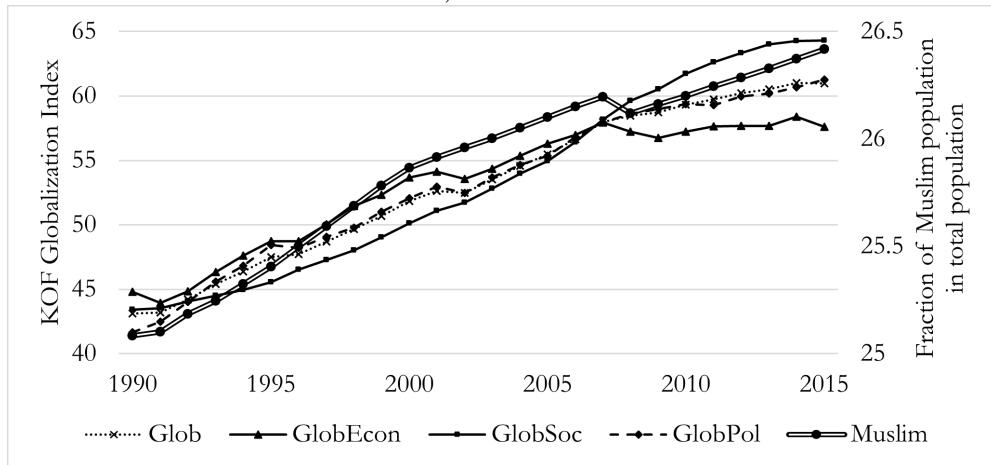
CHAPTER 3. GLOBALIZATION AND RELIGION: A GRANGER CAUSALITY ANALYSIS



c) Confucianism

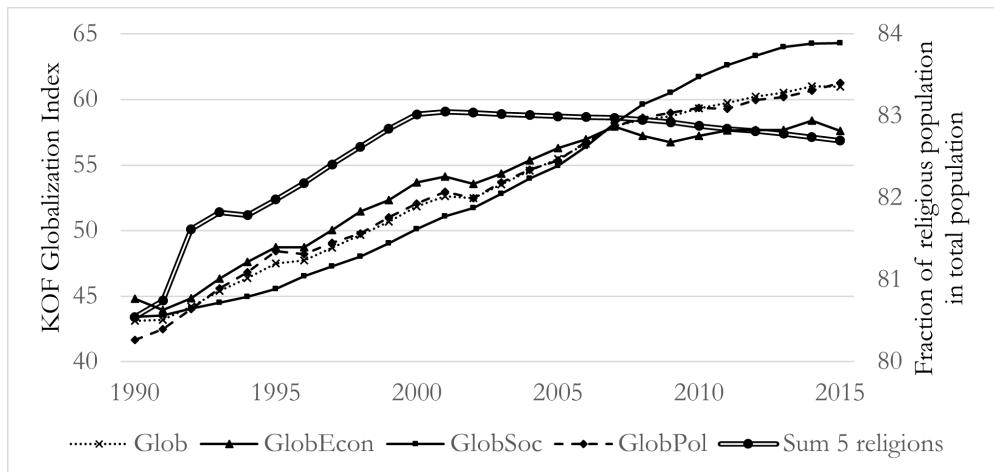


d) Hinduism

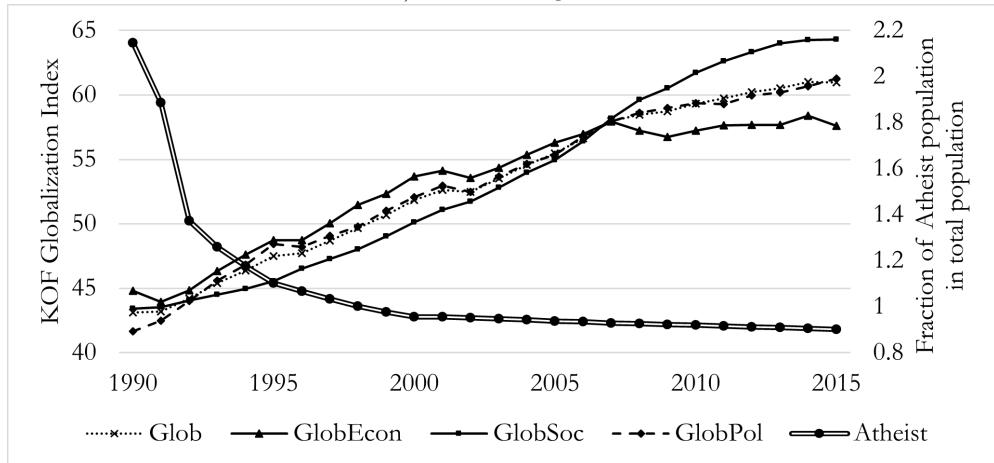


e) Islam

CHAPTER 3. GLOBALIZATION AND RELIGION: A GRANGER CAUSALITY ANALYSIS



f) All five religions



g) Atheism

This chapter, acknowledging the lack of attention paid to the relation between globalization and religion, aims to initiate an exploration of empirical evidence on the existence and characteristics of this relation through the Granger causality test, which is facilitated by a panel vector autoregressive model integrating the KOF Globalization Index and the share of religious devotees as part of the total population at the country level. Using the KOF Globalization Index (Gygli et al., 2019) constructed and provided by the KOF Swiss Economic Institute allows for a comprehensive empirical investigation both of general globalization and dimensional globalization, the latter referring to economic globalization,

social globalization, and political globalization, respectively. Meanwhile, religious data are obtained from the Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0) that covers the share of the religious population as part of the total population for the five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam) and Atheism for “220 independent states, 26 selected substate entities, and 41 geographically separated dependencies, for every year from 2015 back to 1900” (Brown and James, 2019). The dataset used in this chapter covers 159 countries (see Appendix 3A for the full list of countries) for the period 1990–2015 and serves as a basis for an empirical analysis of the relation between globalization and religion over the past three decades. The rest of the chapter is devoted to the review of relevant literature (Section 3.2), introducing the panel vector autoregressive model (Section 3.3), the description of the data and statistical tests (Section 3.4), the display and discussion of the empirical results (Section 3.5), and a conclusion.

3.2 Literature review

In the context of this chapter, globalization is considered for three aspects: economic, social, and political. This section investigates how these aspects may be related to religion. First, literature surveys of ‘Economics of Religion’, from the seminal work of Iannaccone (1998) to the more recent study of Iyer (2016), emphasize the need to pay more attention to the impact of religion on economics. On economic globalization, only a few empirical studies exist that examine the effect of religion on international trade, notably those of De Groot et al. (2004), Kang and Fratianni (2006), Helble (2006, 2007), Lewer and van den Berg (2007a, b), Lee (2013), Fourie et al. (2015), and Lee and Park (2016); studies on Foreign Direct Investment such as that of Hergueux (2011). Most of these studies exploit the gravity model for bilateral trade (of goods and sometimes also services) and capital flows. Of the existing empirical

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analyses of the effect of religion on economic globalization, that of Leroch et al. (2014) is perhaps the only one dealing directly with the topic of religious attitudes toward trade, in particular as basis for an anti-trade home bias. While the number of empirical studies on the relation between globalization and religion is limited, the relation between religion-specific characteristics (for example, the religious/atheist population as share of the total population of a country) and specific dimensions of globalization (such as economic globalization) at country level has enjoyed even less attention.

Theoretical, and especially empirical, research on the relation between religion and social and political globalization in particular is even more scarce (with the few studies on political globalization including those of Beyer, 2007 and Wessels, 2008, and on social globalization such as that of Lehmann, 2002). It is worth noting that these discussions on the relation between globalization and religion theoretically, evolved within the scope of migration and political and social movements. On the one hand, migration, as a part of globalization, can influence religion in complex ways, with migrants bringing their own culture and religious beliefs with them when moving, while also trying to adapt to the host country's culture and beliefs; this happens in parallel with the existing religious community of the host country receiving an impulse from a minor yet new and possibly confusing set of culture and beliefs, which it then responds to (Beyer, 2007, pp. 446–447). On the other hand, many religions such as Christianity, Islam, and Buddhism tend to “accentuate transnational homogeneity” and attempt to spread their influence as widely as possible through many political and social movements that “benefit from, and take advantage of, globalization in order to strengthen or maintain boundaries and in order to run conversion campaigns” (Lehmann, 2002, p. 416).

Wessels (2008) points out a crucial problem, namely that empirical studies often “simply treated” either globalization or religion “as a selective variable to fill in a few more facts about the dynamics

of the other” by assuming a unidirectional influence of religion on globalization, or vice versa (Wessels, 2008, p. 323). On the one hand, the abovementioned empirical studies consider the effect of religion on globalization (either trade, capital flows, migration, or attitudes toward international trade). On the other hand, empirical research such as that by Van Ingen and Moor (2015) consider globalization an explanatory variable for an indicator of religion. Such studies pay attention only to the effect that globalization has on religion. However, religion can be both an impulse and a response. The same is true for globalization, because “the formation and global spread of religion in general, and the religions in particular, is a critical expression of the historical process of globalization” (Beyer, 2007, p. 456). Hence, there is a need to empirically regard the two-way correlation between the characteristics of religions within countries and the extent to which states are pushing toward or pulling away from globalization, illustrated for example by the existence and direction of a Granger causality between the level of (general and dimensional) globalization of a country and the share of the religious/atheist population as part of its total population.

3.3 Research strategy

This chapter investigates the dynamic relation between religion and globalization for the period 1990 to 2015 in 159 countries (see Appendix 3A for the full list of countries) by applying a panel vector autoregressive (VAR) model in a generalized method of moments (GMM) framework in order to deal with the potential endogeneity problem. Developed from the time-series vector autoregressive model by Sims (1980), Holtz-Eakin et al. (1988) proposed the panel vector autoregressive model which can capture not only the time variation but also the cross-sectional dynamic heterogeneity. As discussed in Section 3.2 above, religion and globalization are deeply entwined, which suggests an endogenous relation. The panel VAR model addresses this potential endogeneity problem by

treating all included variables unrestrictedly in an endogenous system. Moreover, given the scope of data in this chapter, a panel VAR model is useful in that it also takes into account cross-sectional effects, which helps with understanding dynamic heterogeneity. Besides, the VAR analysis appears to be appropriate in cases when a structured model is difficult to specify, such as in this case of religion and globalization.

The panel VAR model applied in this chapter is specified as follows:

$$Y_{it} = A_0 + \sum_{j=1}^p A_j Y_{it-j} + BX_{it} + \mu_i + \varepsilon_{it} \quad (3.1)$$

$$i \in \{1, 2, \dots, N\}, t \in \{1, 2, \dots, T_i\}$$

where Y_{it} is the two-dependent-variables vector including six variables of religion (Buddhist, Christian, Confucian, Hindu, Muslim, and Atheist) and four measures of globalization (general, economic, social, and political globalization). X_{it} is the exogenous-variables vector, which, in this chapter following Occam's razor, only includes income per capita to control for the level of national economic development. A_j and B are matrices of coefficients to be estimated. μ_i denotes the panel-fixed effects which is removed by using first differences as proposed by Anderson and Hsiao (1982). ε_{it} captures the idiosyncratic errors, with the assumptions that $E(\varepsilon_{it}) = 0$, $E(\varepsilon'_{it}\varepsilon_{it}) = \Sigma$, and $E(\varepsilon'_{it}\varepsilon_{ij}) = 0$ for all $t > j$. Then, lagged orders of the dependent variables are used as instruments and the model as a system of equations is estimated to improve the efficiency, as Holtz-Eakin et al. suggest (1988, p. 1380).

Following the panel-VAR regression, and if the fitted model is stable according to the post-estimation test results, a Granger causality Wald test can be carried out. A Granger causality test (Granger, 1969) examines whether the past values of a variable (X) contribute to the predicting of the (past) values of another variable (Y). The null hypothesis of this test is that in the equation of Y, all the coefficients of X's lags are

simultaneously equal to zero; in this case, then, X ‘does not Granger cause’ Y. When this null hypothesis is rejected by the Wald test, we can say that X ‘Granger causes’ Y. In this chapter, X and Y are globalization and religion, interchangeably.

3.4 Data and stationarity

Much attention has been paid to measuring globalization, which results in many different globalization indicators. This chapter utilizes the well-known KOF Globalization Index (Gygli et al., 2019) due to its good coverage and general acceptance. For religion, the Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0) provides a good match for the KOF Globalization Index in terms of coverage, timespan, and frequency. The percentage of the total global population that follows one of the five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam) or Atheism is extracted from this data set.

Table 3.1: Descriptive statistics

Variable	Short definition	Obs.	Mean	Std. Dev.	Min	Max
<i>Glob</i>	KOF General Globalization	4,109	55.05	16.24	18.87	90.65
<i>d_Glob</i>	First difference of <i>Glob</i>	3,950	0.82	1.36	-6.28	8.42
<i>GlobEcon</i>	KOF Economic Globalization	4,083 ^a	53.19	16.05	14.51	94.96
<i>d_GlobEcon</i>	First difference of <i>GlobEcon</i>	3,925	0.58	2.51	-12.52	17.93
<i>GlobSoc</i>	KOF Social Globalization	4,109	51.65	20.49	6.40	91.59
<i>d_GlobSoc</i>	First difference of <i>GlobSoc</i>	3,950	0.90	1.27	-5.65	7.75
<i>GlobPol</i>	KOF Political Globalization	4,109	60.44	21.77	7.43	98.14
<i>d_GlobPol</i>	First difference of <i>GlobPol</i>	3,950	0.98	2.74	-13.34	17.81
<i>lnGDPpc</i>	Natural log of GDP per capita	4,004	8.34	1.46	5.21	11.35
<i>d_lnGDPpc</i>	First difference of <i>lnGDPpc</i>	3,845	0.02	0.06	-1.05	0.80
<i>Buddhist</i>	Share of Buddhist in total population	4,134	4.36	15.90	0.00	88.37
<i>d_Buddhist</i>	First difference of <i>Buddhist</i>	3,975	0.01	0.19	-0.93	4.05
<i>Christian</i>	Share of Christian in total population	4,134	49.91	35.75	0.02	99.30
<i>d_Christian</i>	First difference of <i>Christian</i>	3,975	0.03	1.50	-30.70	73.74
<i>Confucianist</i>	Share of Confucianist in total population	4,131 ^b	0.03	0.18	0.00	1.91
<i>d_Confucianist</i>	First difference of <i>Confucianist</i>	3,972	0.00	0.00	-0.07	0.02
<i>Hindu</i>	Share of Hindu in total population	4,134	2.36	10.37	0.00	86.76
<i>d_Hindu</i>	First difference of <i>Hindu</i>	3,975	-0.01	0.09	-0.71	0.49
<i>Muslim</i>	Share of Muslim in total population	4,134	25.86	36.02	0.00	99.77
<i>d_Muslim</i>	First difference of <i>Muslim</i>	3,975	0.05	0.45	-18.79	2.52
<i>Atheist</i>	Share of Atheist in total population	4,134	1.07	2.39	0.00	35.14
<i>d_Atheist</i>	First difference of <i>Atheist</i>	3,975	-0.05	0.80	-33.79	1.32

Sources: *d_Variable_name* is the first-difference series of the corresponding variables. Data on globalization and its dimensions were extracted from the KOF Globalization Index (Gygli et al., 2019, last accessed on March 4, 2022). Data on religious and atheist population shares as part of the total population were extracted from the Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0) (last accessed on February 14, 2022).

Note. GDP per capita is the real gross domestic product per capita in 2015 constant United States (U.S.) dollar; data extracted from the World Development Indicators Database (World Bank, 2021, last accessed on March 4, 2022). ^a Data on economic globalization are not available for Cuba. ^b Data on the share of Confucianists as part of the total population of Indonesia have negative values from 2013 to 2015. To avoid measurement errors, these observations of *Confucianist* and *d_Confucianist* variables are dropped.

Table 3.2: Panel unit root test

Variable	Fisher DF				Fisher PP			
	P	Z	L	Pm	P	Z	L	Pm
Glob	489.39*	-2.44*	-3.40*	6.80*	747.68*	-5.87*	-8.87*	17.04*
d_Glob	1623.82*	-28.15*	-34.82*	51.78*	3023.99*	-44.97*	-66.00*	107.30*
GlobEcon	574.93*	-6.58*	-7.42*	10.30*	460.58*	-4.12*	-4.42*	5.75*
d_GlobEcon	1539.24*	-28.07*	-33.29*	48.66*	3059.76*	-46.00*	-67.09*	109.14*
GlobSoc	92.15	15.36	15.76	-8.96	95.63	17.35	18.09	-8.82
d_GlobSoc	1362.09*	-25.73*	-29.32*	41.40*	2869.51*	-44.38*	-62.72*	101.17*
GlobPol	844.11*	-8.90*	-12.10*	20.86*	2081.41*	-21.67*	-40.32*	69.92*
d_GlobPol	1965.34*	-32.84*	-42.47*	65.32*	4346.58*	-55.46*	-95.04*	159.74*
lnGDPpc	273.81	6.78	6.51	-1.75	265.73	9.12	9.03	-2.07
d_lnGDPpc	1453.30*	-25.15*	-30.97*	45.02*	2254.46*	-34.93*	-48.85*	76.79*
Buddhist	377.89*	0.48	0.08	2.37*	1499.58*	-15.73*	-30.85*	46.85*
d_Buddhist	1267.17*	-15.26*	-27.43*	37.64*	2298.84*	-24.20*	-53.44*	78.55*
Christian	635.06*	0.20	-2.27	12.57*	1663.69*	-15.87*	-30.84*	53.36*
d_Christian	876.81*	-7.16*	-13.88*	22.16*	1090.81*	-9.76*	-18.66*	30.64*
Confucianist	24.89	3.07	3.25	-11.62	178.17	-1.22	-6.75*	-5.54
d_Confucianist	400.45*	-14.77*	-27.26*	3.27*	576.71*	-18.61*	-39.45*	10.26*
Hindu	307.01	4.43	3.89	-0.44	1070.47*	-9.66*	-20.73*	29.84*
d_Hindu	1548.52*	-20.47*	-36.64*	48.79*	2619.41*	-29.12*	-64.43*	91.26*
Muslim	563.03*	0.94	-0.09	9.72*	2223.04*	-22.65*	-42.93*	75.54*
d_Muslim	1102.89*	-8.51*	-18.21*	31.12*	1902.16*	-16.00*	-36.26*	62.82*
Atheist	880.31*	-1.38	-7.17*	22.30*	2165.26*	-22.43*	-44.66*	73.25*
d_Atheist	1779.23*	-17.86*	-34.41*	57.94*	2703.90*	-23.91*	-55.19*	94.61*

Note. Fisher DF: Fisher-type unit root test based on augmented Dickey–Fuller tests; Fisher PP: Fisher-type unit root test based on Phillips–Perron tests. In the Fisher-type unit root test, the p-values from the panel-specific unit-root tests are combined using either inverse chi-squared (P), inverse normal (Z), inverse-logit transformation of p-values (L), or a modification of the inverse chi-squared transformation that is suitable for when N tends to infinity (Pm). The Stata command *xtunitroot* was used, with lag(1). The unit root test's hypotheses are: H_0 : All panels contain unit roots; H_a : At least one panel is stationary. * Reject the null hypothesis at the 1% level.

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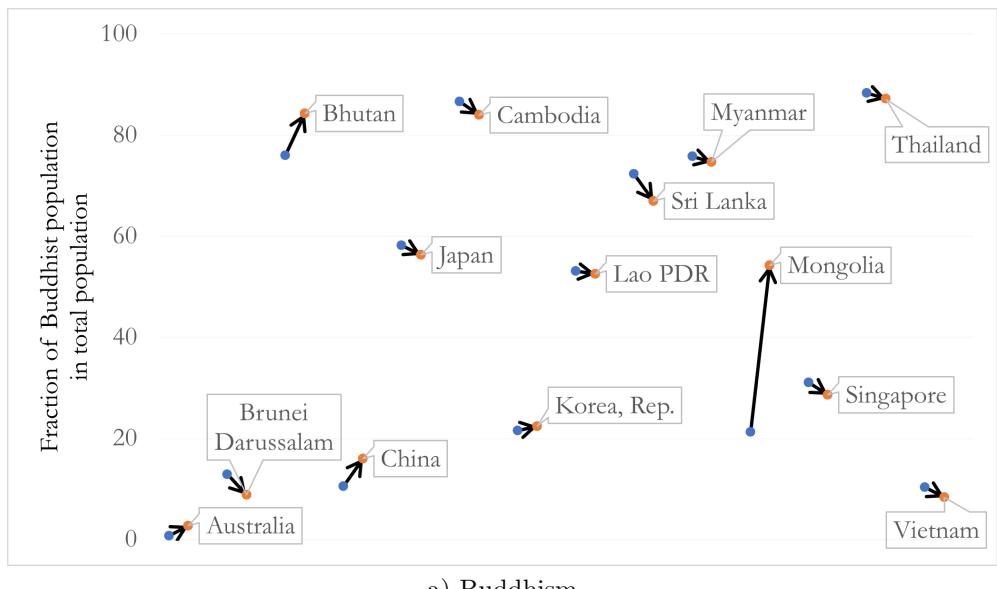
In this chapter, the general KOF Globalization Index and its three sub-indexes, economic, social, and political globalization, are analyzed. These globalization indicators are examined in terms of their endogenous relation with each of the five major religious populations regarded in this study as well as the atheist population. The exogenous variable, income per capita, is the real gross domestic product per capita in 2015 in constant U.S. dollar, taken from the World Development Indicators Database (World Bank, 2021, last accessed on March 4, 2022). Table 3.1 gives the descriptive statistics of all the mentioned variables. As suggested by the unit root tests results in Table 3.2, some of the original series are not stationary and hence are not suitable for the panel VAR model. It was therefore necessary to use the first-differenced series that are also included in Table 3.1. The names, data sources, and definitions of all variables in this chapter (as shown in Table 3.1 and 3.2) are presented in Appendix 3B. As shown in Table 3.2, while the series of social globalization, log of income per capita, and the share of Buddhist, Christian, Confucianist, Hindu, and Muslim followers as part of the total population show signs of non-stationary, the rest of the original series are stationary. All the first-differenced series are consistently stationary. For consistency, all the analyses in this chapter are carried out on the first-differenced series only.

The extensive discussion on the history of economic thought on international trade in ancient Asia in Chapter 2 suggested heterogeneous views on international trade among major religions in the ancient time. Due to data unavailability, it is not possible to test this heterogeneity empirically for the ancient period, but such an empirical investigation is possible for recent times. Figure 3.4 gives an overview of trends in general globalization and its dimensions and of the five religions considered in this chapter, as well as Atheism, at the world aggregate level. Worldwide, we can see a change, although slowly, in the share of religious adherents as part of the total population, and the trends are different among religious groups. Across these six figures, heterogeneity stands out. We can see variations in the evolutionary trajectories of the different religions plus

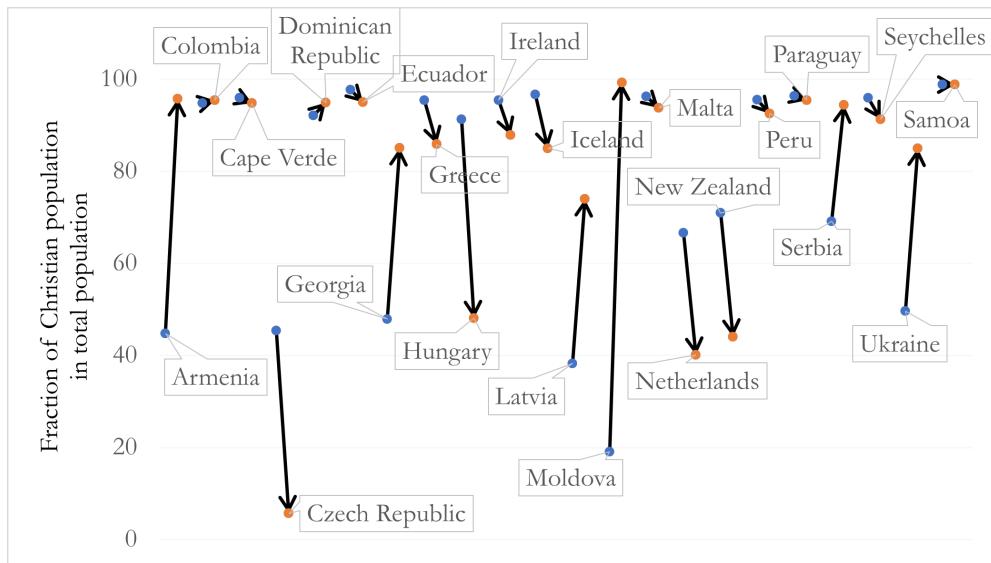
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atheism. However, despite such variations, in each graph there seems to be a correlation between changes in each religion and globalization. Yet, due to the variation across different religions, the nature of these correlations may as well be different from each other. Hence, the potential correlation between globalization and religion may be different across religions as well as across different measures of globalization. Therefore, a panel VAR analysis for each religion variable against each globalization proxy is helpful for investigating the existence and nature of the relation between globalization and religion. This analysis is done using country level data, with substantial variations in the data (as shown in Figure 3.5).

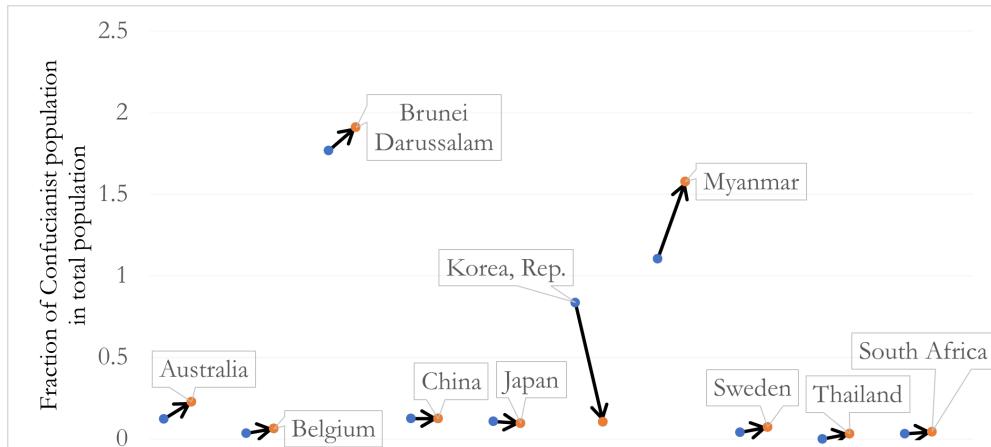
Figure 3.5: Religious/atheist population as a share of the total population for selected countries, from 1990 (blue) to 2015 (orange)



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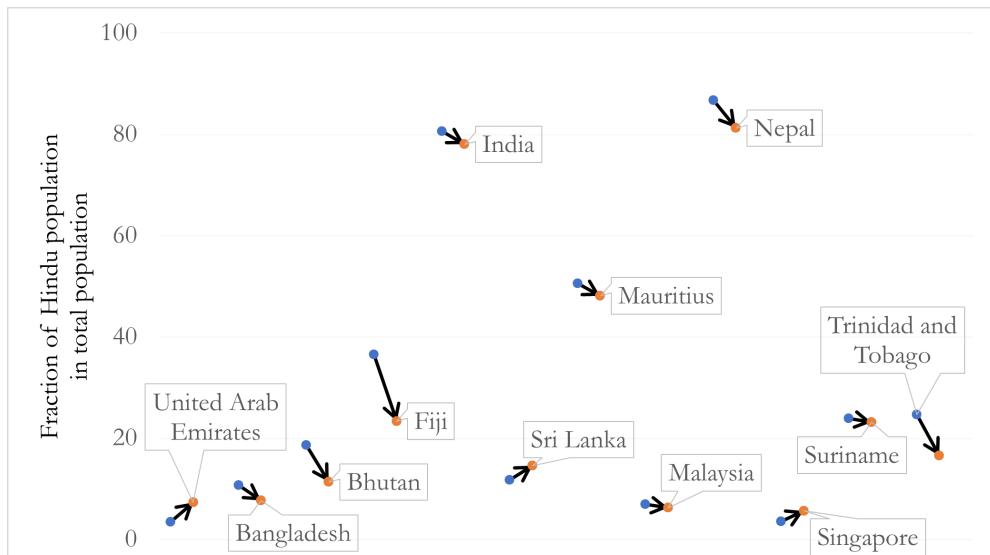
b) Christianity



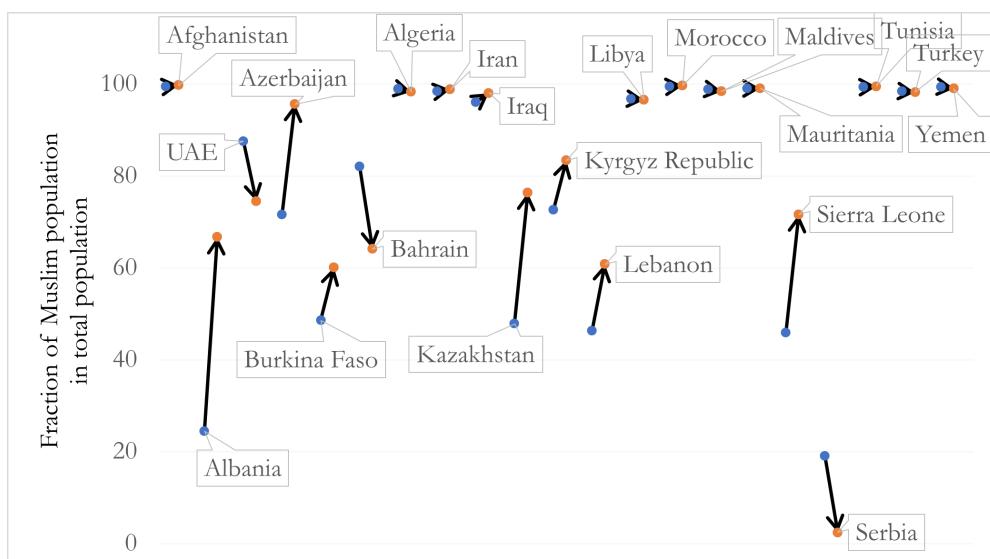
c) Confucianism*

* Because the share of Confucians as part of the total population is much smaller than for other religious groups, the vertical axis in the Confucianism graph show changes ranging from 0 to 2.5 percent for easier observation of the changes.

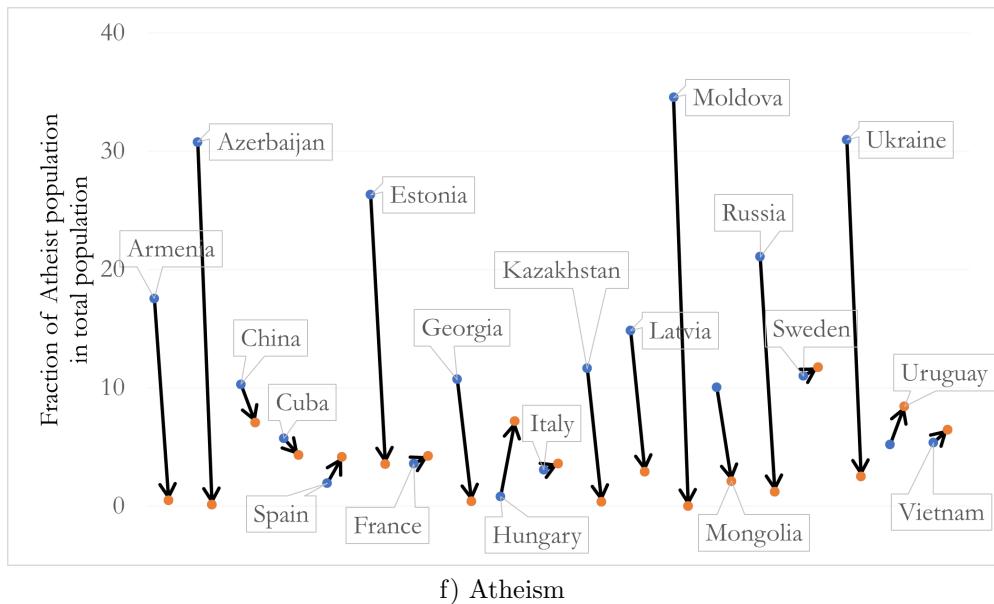
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d) Hinduism



e) Islam



Sources: Data on religion were taken from the Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0) (last accessed on February 14, 2022).

Note. As the entire sample consists of 159 countries, it is not efficient to display all of them in the figure. Hence, for each religion plus Atheism, the ten countries with the largest corresponding religious/atheist populations in the year 1990 and the ten countries with the largest corresponding religious/atheist population in the year 2015 together with the top ten countries with the largest change for the period 1990 to 2015 are shown. This selection of countries effectively displays changes in the size of religious/atheist populations at country level.

3.5 Empirical results

Before proceeding to the panel VAR analysis, it is first necessary to identify the optimal lag order for the model. The Stata *pvarsoc* command is used for the models of general globalization and each religion variable with income variable serves as the exogenous regressor³. Appendix 3C presents the results, which suggest a 1 lag panel VAR model in all the cases. Hence, 1 lag models are used to investigate the relation between (general and dimensional) globalization and religions. Following each panel VAR regression, the model was tested for stability. With the model

³Software: Stata 17 (64-bit).

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satisfying the stability condition (all the eigenvalues lie inside the unit circle), a Granger causality test was then performed following that panel VAR regression. The stability test's results are reported in Appendix 3F.

Importantly, it is worth noting that the Granger causality Wald test's null hypothesis is that the 'excluded variable' (religion or globalization) does not Granger-cause the 'equation variable' (globalization or religion). Likewise, the rejection of this null hypothesis does not imply a true causation between the two tested variables, but more of a time dependence of these two variables' fluctuations. Although it is considered different from the 'real causality', 'Granger causality' is an important first step to get an indication of the dependence between two variables. In this chapter, it is referred to as the 'excluded variable' (religion or globalization) *Granger-causes* the 'equation variable' to distinguish 'Granger causality' from 'real causality'. In addition, the impulse-response function is used to check for robustness and to illustrate the results from the Granger causality Wald test.

The discussion in Chapter 2 showed that Buddhism and Islam were the most trade-friendly religions in ancient Asia; they are therefore expected to have a positive and two-way correlation with general and dimensional globalizations, especially economic globalization. Meanwhile, Hinduism is expected to have a mixed correlation with the different dimensional globalizations owing to its penchant to exploit international trade not only for economic gain but also for political purposes. Next, Confucianism, as reviewed in Chapter 2, appears to look down on trade but does not attempt to restrict international trade; the establishment of Confucius Institutes network around the world in recent years may help spread the Confucian ideology. Hence, Confucianism may show little correlation with globalization, and when there may be a correlation, it could be more likely that the direction may run from globalization to Confucianism rather than the other way around. Chapter 2 furthermore showed that Christianity was less friendly toward trade than Buddhism and Islam;

however, since the Age of Exploration, this religion has been an important force in globalization. Therefore, the correlation between Christianity and the globalizations may be mixed both in terms of sign and direction. Finally, Atheism is rarely discussed in the globalization literature and unlike religious devotees, atheists tend to not operate any community based on their nonbelief (but rather other motivations – either related to religious attitudes or not). For this reason, there may not be any correlation between Atheism and globalizations.

3.5.1 Relation between general globalization and selected religions

Table 3.3 shows the results from the Granger causality test for the general globalization models. Notably, of the six models of religion and general globalization, only the Buddhism and Christianity models show a bidirectional influence. First, the results of the Granger causality test in Table 3.3 suggest a bidirectional relation between general globalization and Buddhism. This is also illustrated by the impulse-response function (IRF) in Figure 3.6 below (see Appendix 3D for the full set of all the impulse-response functions of the model in Section 3.5). The impulse-response function implies that both general globalization and the Buddhist population as share of the total population have positive effects on each other, which matches the hypothesis on the relation between Buddhism and globalization proposed earlier. This finding reminds us of the discussion of international trade and Buddhism in ancient Asia in Chapter 2, which proposed that the two had a mutually reinforcing relation. Supported by the results of recent data analysis in this subsection and Sub-Section 3.5.2, we can deduce that Buddhism appears to be a consistently trade-friendly religion.

Second, the results of the Granger causality test shown in Table 3.3 indicate a bidirectional relation between general globalization and Christianity. The impulse-response functions for the panel VAR model of

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Table 3.3: Granger causality test: General globalization and selected religions

Equation	<i>d_Glob</i>	<i>d_Religion</i>
Excluded	<i>d_Religion</i>	<i>d_Glob</i>
	Prob > chi2	
Buddhism	0.00	0.00
Christianity	0.00	0.03
Confucianism	0.48	0.00
Hinduism	0.85	0.83
Islam	0.65	0.00
Atheism	0.03	0.64

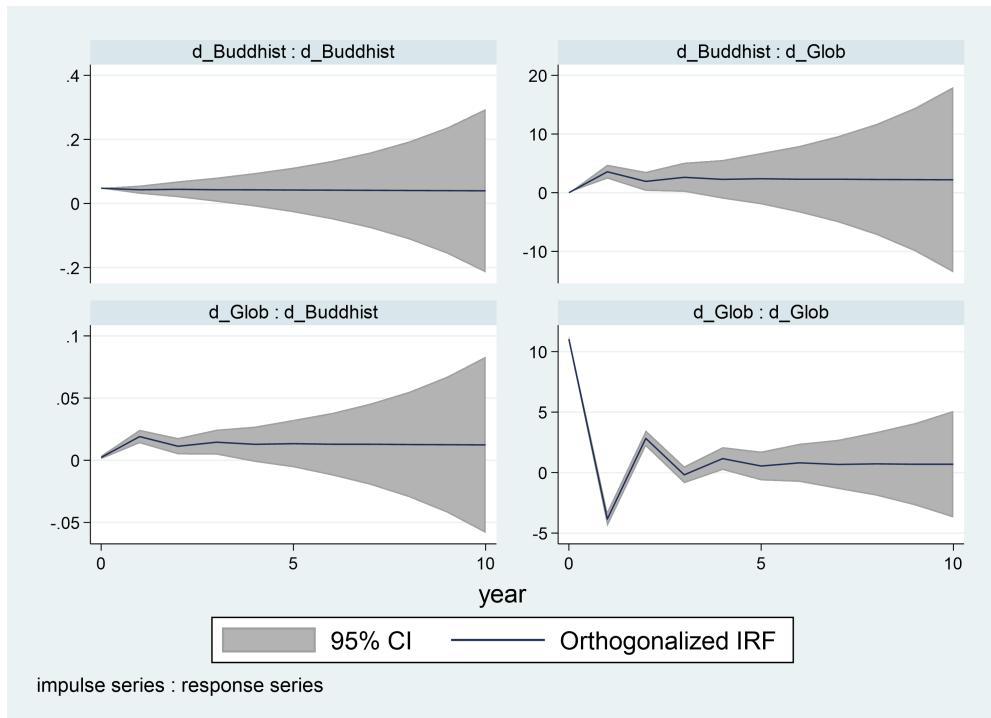
Note. *d_Religion* is the general denotation of *d_Buddhist*, *d_Christian*, *d_Confucianist*, *d_Hindu*, *d_Muslim*, and *d_Atheist* in correspondence with the religions in each row of the table.

general globalization and the Christian population as share of the total population in Figure 3.7 also confirm a bidirectional influence; however, the signs are different, as a shock in the change of general globalization produces a negative effect on the change of the share of Christian in the population, while a shock in the share of Christians produces a positive effect on the change of general globalization. This finding of the link between Christianity and general globalization supports the hypothesis proposed at the beginning of Section 3.5 that Christianity may show a mixed correlation with globalization both in terms of sign and direction.

Table 3.3 also suggests unidirectional Granger causality running from general globalization to Confucianism and Islam, respectively. In both cases, the impulse-response is siding with the Granger causality test results to indicate an effect running from general globalization to religion: a shock in general globalization produces positive effects on the size of the Confucianist and Muslim population, respectively (see Figure 3D3 and 3D5 in Appendix 3D). Thus, in the case of Confucianism, as is expected, it appears that the establishment and development of the Confucius Institutes indeed may have led to an increase in the Confucian population in more globalized countries. On the other hand, the correlation between

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Figure 3.6: Impulse–Responses for 1 lag panel VAR of general globalization and Buddhism model



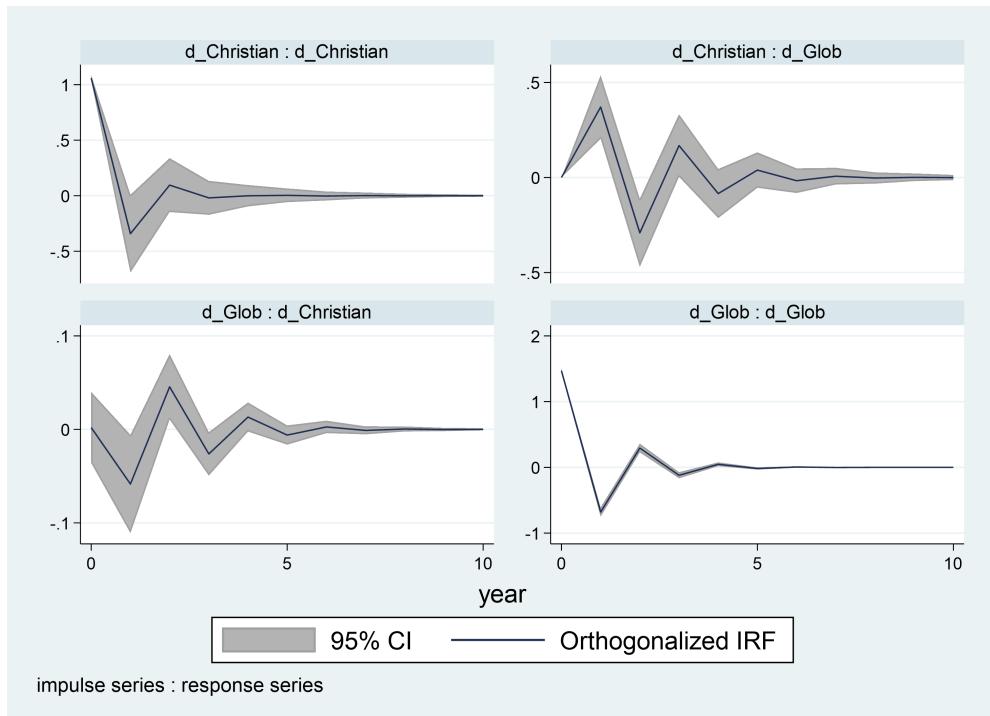
Note. The confidence interval is 95%. The vertical axis is the size of the response to the shock. The horizontal axis is the timeline measure in years after the shock. The pair of variables above each graph indicates which variables are indexed in the graph as well as their roles, following the template that the impulse series is written before the “colon (:)” while the response series comes after this punctuation mark.

Islam and general globalization found here does not meet the hypothesis of bidirectional causality based on the discussions in Chapter 2 where trade was found to have been considered the best livelihood according to this religion. Instead, the recent data here suggest a positive unidirectional Granger effect running from general globalization to Islam.

Meanwhile, the results in Table 3.3. indicate a unidirectional Granger causality running from the share of Atheists in the population to general globalization, as the null hypothesis of the Granger causality test is rejected at 3% level. The impulse–response function of the panel VAR

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Figure 3.7: Impulse–Responses for 1 lag panel VAR of general globalization and Christianity model



Note. The confidence interval is 95%. The vertical axis is the size of the response to the shock. The horizontal axis is the timeline measure in years after the shock. The pair of variables above each graph indicates which variables are indexed in the graph as well as their roles, following the template that the impulse series is written before the “colon (:)” while the response series comes after this punctuation mark.

model of general globalization and Atheism also implies that a shock in the share of the atheist population produces a negative effect on general globalization (see Figure 3D6 in Appendix 3D). This is the only case for the group of general globalization and religion models that show a negative effect coming from a religion variable. This finding seems to reflect Figure 3.4.g, in which the share of the atheist population as part of the total population decreases while the general trends of globalization are to increase. However, due to the lack of attention paid to the effect of Atheism in globalization literature, it is hard to predict the mechanism behind such a correlation, not to mention the caveat that

Granger causality does not equate true causality and that it could be either a coincident correlation or a yet-undiscussed causation. Hence, more effort should be put into studying the relation between Atheism and globalization.

Finally, in the case of Hinduism, the results in Table 3.3 fail to provide evidence of a Granger causality relation, hence, there may be no Granger causality between general globalization and the share of Hindus as part of the total population. This might be a result of the previously discussed hypothesis of mixed correlations between Hinduism and different dimensional globalizations. As Chapter 2 showed, in ancient times, Hinduism acknowledged the gains from international trade and tried to benefit from it but at the same time did not want to be dependent on or affected by alien nations/communities. In order to understand this finding of no Granger causality between Hinduism and general globalization, it is necessary to look at the results from models of dimensional globalizations.

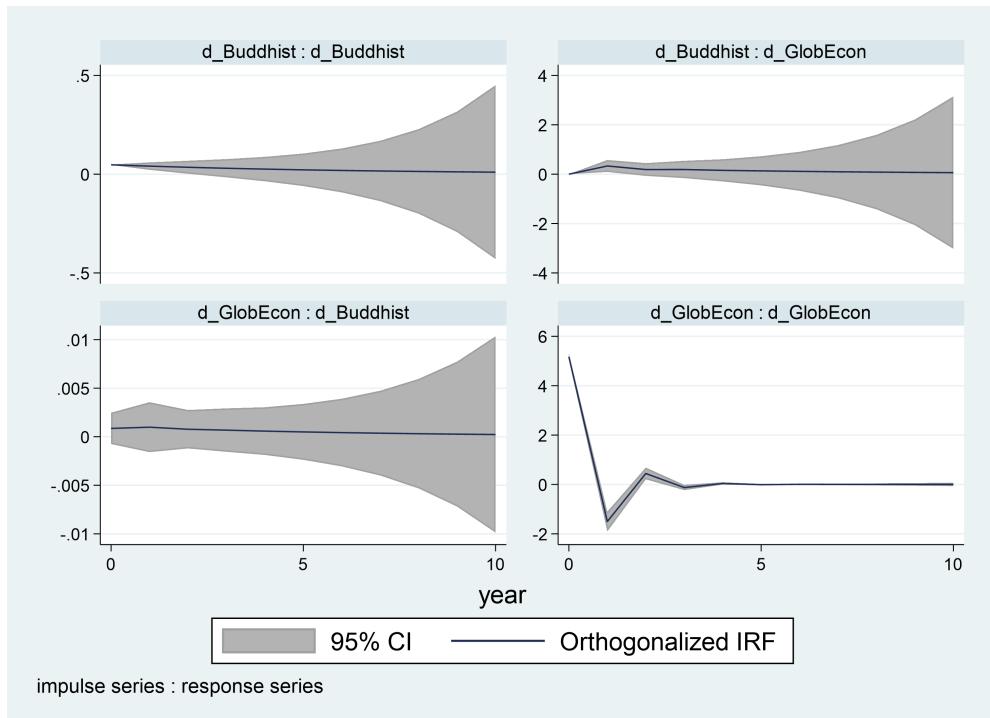
3.5.2 Relation between economic globalization and selected religions

In the case of economic globalization, as discussed, Buddhism and Islam were the most trade-friendly religions in ancient Asia and the two religions also spread across the continent largely by means of trade routes. These two religions are therefore expected to have positive and bidirectional correlations with economic globalization. However, the Granger test results (Table 3.4) reveal that no bidirectional Granger causality were found. Instead, the direction of Granger causality runs from religion to economic globalization for the models of Buddhism, Christianity, and Hinduism while it runs the other way round for the remaining three religions. The impulse-response function of the panel VAR model of economic globalization and Buddhism, shown in Figure 3.8 below, implies that a shock in the Buddhist population as share of the total population

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produces a relatively small positive effect on economic globalization, which is consistent with the hypothesis of Buddhism as trade-friendly religion that was discussed in Chapter 2. However, both the Granger causality test and the impulse–response function show no sign of economic globalization having an impact on the share of Buddhists in the total population.

Figure 3.8: Impulse–Responses for 1 lag panel VAR of economic globalization and Buddhism model



Note. The confidence interval is 95%. The vertical axis is the size of the response to the shock. The horizontal axis is the timeline measure in years after the shock. The pair of variables above each graph indicates which variables are indexed in the graph as well as their roles, following the template that the impulse series is written before the “colon (:)” while the response series comes after this punctuation mark.

Table 3.4 shows that the Granger causality running from Christianity to economic globalization is found to be significant, at 3% level, while the opposite direction of Granger causality can only be considered statistically significant at 18% level. Besides, the impulse–response function suggests

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a negative bidirectional influence between the Christian population as share of the total population and economic globalization: a shock in the share of Christian population may result in a negative change in economic globalization, and vice versa (see Figure 3D8 in Appendix 3D). Thus, both the unidirectional or bidirectional Granger causality relation between Christianity and economic globalization appear to be negative. In the case of Hinduism, Granger causality test results presented in Table 3.4 suggest a unidirectional Granger causality running from Hinduism to economic globalization, while the impulse–response function of these two variables implies that a shock in the share of the Hindu population would boost economic globalization (see Figure 3D10 in Appendix 3D).

Table 3.4: Granger causality test: Economic globalization and selected religions

Equation	<i>d_GlobEcon</i>	<i>d_Religion</i>
Excluded	<i>d_Religion</i>	<i>d_GlobEcon</i>
	Prob > chi2	
Buddhism	0.01	0.80
Christianity	0.03	0.18
Confucianism	0.20	0.02
Hinduism	0.05	0.72
Islam	0.60	0.00
Atheist	0.11	0.76

Note. *d_Religion* is the general denotation of *d_Buddhist*, *d_Christian*, *d_Confucianist*, *d_Hindu*, *d_Muslim*, and *d_Atheist* in correspondence with the religions in each row of the table.

Next, on the relation between economic globalization and Confucianism and Islam, respectively, Table 3.4 suggests Granger causality running one-way from economic globalization to these religious variables. In addition, the impulse–response functions imply that a shock in economic globalization produces small positive effects on the Confucianist and Muslim populations as shares in the total population (see Figure 3D9 and 3D11 in Appendix 3D). Finally, Atheism does not

appear to have a Granger causality relation with economic globalization, which could mean that when it comes to economic globalization, atheists' attitude does not depend on their (non-)beliefs.

3.5.3 Relation between social globalization and selected religions

As social globalization in the KOF Globalization Index captures information flows, personal contact, and cultural proximity, it is expected to have a closer relation with the studied religions than the other two dimensions of globalization. However, the Granger causality test statistics after the panel VAR analysis (Table 3.5) suggest unidirectional effects running only from Buddhism and Hinduism to social globalization. These results, contrary to the a-priori expectation, make social globalization the least correlated with religion of the three globalization dimensions of the KOF Globalization Index.

Table 3.5: Granger causality test: Social globalization and selected religions

Equation	<i>d_GlobSoc</i>	<i>d_Religion</i>
Excluded	<i>d_Religion</i>	<i>d_GlobSoc</i>
	Prob > chi2	
Buddhism	0.00	0.67
Christianity	0.90	0.29
Confucianism	0.27	0.24
Hinduism	0.00	0.50
Islam	0.56	0.48
Atheist	0.22	0.74

Note. *d_Religion* is the general denotation of *d_Buddhist*, *d_Christian*, *d_Confucianist*, *d_Hindu*, *d_Muslim*, and *d_Atheist* in correspondence with the religions in each row of the table.

First, the Granger causality test results (Table 3.5) indicate that changes in the share of the Buddhist population Granger cause the changes in social globalization. Second, the impulse-response function

of the panel VAR model of Buddhism and social globalization illustrates that a shock in the size of Buddhist population as a share of the total population produces a positive effect on social globalization (Figure 3.9). This finding reminds us of the monks who would never refuse to preach and would travel thousands of miles with caravans along the ancient Silk Road, which encouraged the movement of information and cultures that may have given rise to the demand for silk in faraway lands, first in Buddhist ceremonies then spilled over to daily life. Here, evidence of a unidirectional Granger causality running from Buddhism to social globalization once again confirms the hypothesis that Buddhism may not favor a seclusive and self-sustained economy that much.

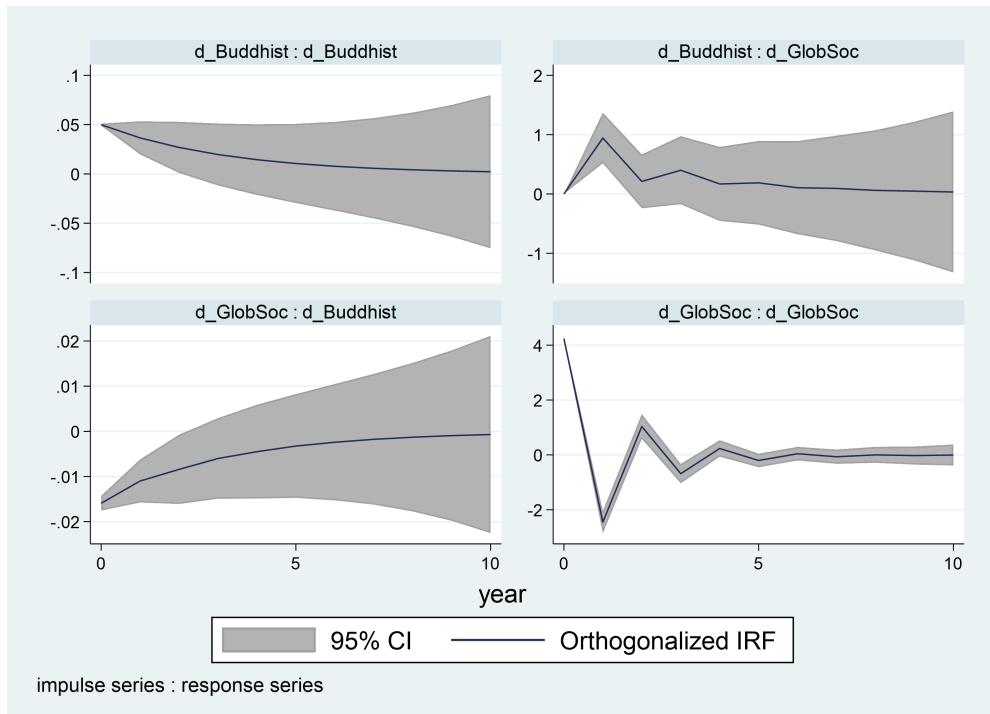
Next, the Granger causality test results in Table 3.5 also propose a unidirectional Granger causality running from Hinduism to social globalization; however, the sign of the possible effect is opposite to that of Buddhism, with the impulse-response function (Figure 3.10) indicating that a shock in the size of the Hindu population as a share of the total population generates a sizable negative effect on social globalization. The negative effect of Hinduism on information flows, personal contact, and cultural proximity together with its previously discovered positive effect on economic globalization could help explain why Hinduism appears to prefer co-religion trade to the cross-religion, which empirical studies such as those of Lewer and van den Berg (2007a, b) also indicate.

3.5.4 Relation between political globalization and selected religions

The Granger causality test results (Table 3.6) suggest a bidirectional Granger causality between Buddhism and political globalization. The impulse-response function of this panel VAR model also illustrates this relation: a shock in the size of the Buddhist population as a share of the total population produces a positive effect on political globalization, while a shock in political globalization has a negative effect on the share of the

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Figure 3.9: Impulse–Responses for 1 lag panel VAR of social globalization and Buddhism model



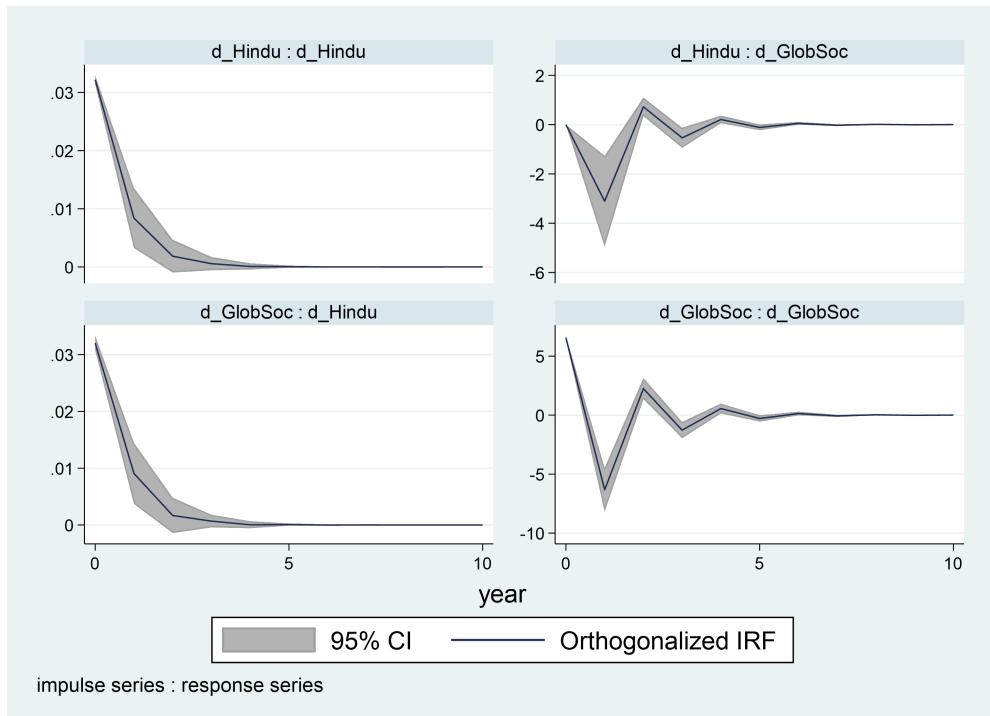
Note. The confidence interval is 95%. The vertical axis is the size of the response to the shock. The horizontal axis is the timeline measure in years after the shock. The pair of variables above each graph indicates which variables are indexed in the graph as well as their roles, following the template that the impulse series is written before the “colon (:)” while the response series comes after this punctuation mark.

Buddhist population, although the size of the effect appears to be very small compared to that of Buddhism on political globalization (see Figure 3D19 in Appendix 3D). Thus, Buddhism is once again found to enhance a dimensional globalization, which makes it the only religion in this chapter to consistently have positive impacts on general and dimensional globalization.

The second religion with a bidirectional Granger causality relation with political globalization is Hinduism. It is also worth noting that of the different dimensional globalizations, only political globalization

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Figure 3.10: Impulse–Responses for 1 lag panel VAR of social globalization and Hinduism model



Note. The confidence interval is 95%. The vertical axis is the size of the response to the shock. The horizontal axis is the timeline measure in years after the shock. The pair of variables above each graph indicates which variables are indexed in the graph as well as their roles, following the template that the impulse series is written before the “colon (:)” while the response series comes after this punctuation mark.

has strong bidirectional Granger causal effects with Hinduism, as the Granger causality test results in Table 3.6 indicate. In terms of the sign of effect, the impulse–response function hints that a shock in the size of the Hindu population as a share of the total population produces a considerably negative impact on political globalization, while a shock in political globalization produces a small positive effect on the share of the Hindu population (see Figure 3D22 in Appendix 3D). It seems that Hinduism may not be in favor of the presence/influence of foreign political entities or the participation in international missions and organizations.

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Table 3.6: Granger causality test: political globalization and selected religions

Equation	<i>d_GlobPol</i>	<i>d_Religion</i>
Excluded	<i>d_Religion</i>	<i>d_GlobPol</i>
	Prob > chi2	
Buddhism	0.00	0.00
Christianity	0.13	0.57
Confucianism	0.22	0.13
Hinduism	0.00	0.00
Islam	0.64	0.00
Atheist	0.01	0.01

Note. *d_Religion* is the general denotation of *d_Buddhist*, *d_Christian*, *d_Confucianist*, *d_Hindu*, *d_Muslim*, and *d_Atheist* in correspondence with the religions in each row of the table.

Next, Table 3.6 also suggests a bidirectional Granger causality between Atheism and political globalization. The impulse–response function of the Atheism model hints that Atheism could have a negative effect on political globalization, while in the opposite direction, a relatively small positive effect (see Figure 3D24 in Appendix 3D) can be observed. Thus, it appears that Hinduism and Atheism share a skepticism towards international political cooperation—the opposite of Buddhism’s view on international trade. Meanwhile, the Granger causality test results (Table 3.6) point to a one-way Granger causality running from political globalization to Islam, while the impulse–response function of the panel VAR model of these two variables implies that a shock in political globalization produces a small, yet positive impact on the size of the Muslim population as a share of the total population (see Figure 3D23 in Appendix 3D).

Lastly, Christianity and Confucianism do not have a Granger causality relation with political globalization, as shown in Table 3.6. The impulse–response functions of these two models suggest a possible effect of political globalization on Christianity and Confucianism, respectively (see Figure 3D20 and C21 in Appendix 3D). These findings reflect high levels

of heterogeneous and nuanced views that contemporary Christianity and Confucianism have of political globalization. In sum, there seem to be more Granger causal effects between political globalization and religion, as suggested by the Granger causality tests, in comparison with the other two dimensions of globalization. This to some extent supports the claim Wessels (2008, p. 323) makes about “a pressing need for a new theoretical stance on the theme of religion and globalization” as “the intersection of religion and politics is at the core of the real world of human activity, and especially of what we call globalization today”.

3.5.5 A short summary of the relations between selected globalizations and religions

Table 3.7 provides an overview of the test results of the Granger causality tests presented separately in Tables 3.3 to 3.6, showing how the relation between religion and globalization varies across the selected religions as well as across the selected types of globalization.

First, there is sustained evidence of positive effects running from Buddhism to general globalization as well as all three dimensions of globalization studied in this chapter. Such positive effects are supported by the Granger causality test statistics with a strong level of significance. The results in this section suggest that Buddhism appears to be a globalization-friendly religion.

Second, social globalization has no Granger causal effect on any of the six religions in this chapter, which at the first glance seems surprising but, after looking at the structure of the KOF Globalization Index, turns out to be reasonable. The relation between religion and migration is at the center of many discussions on the topic of globalization and religion, which makes the assumption of a strong correlation between religion and social globalization, of which migration is a part, become favorable. However, numerically, migration accounts for only 2.68% of the overall KOF Social

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Globalization Index (for more details on the structure, variables, and weight, see Gygli et al., 2019, p. 545). This share is much lower than those of some potentially less relevant variables such as high levels of technology exports, the number of international airports, or even a very Western and American valued variable, the number of McDonald's restaurants. Hence, there may be still some correlation between religion and migration and even other variables in the domain of social globalization, but these links are outweighed by those showing less correlation.

Next, globalization occurs to enhance the development of Confucianism (general and economic globalization) and Islam (general, economic, and political globalization); the Granger causality test statistics support this finding. Several potential factors could account for these positive effects of globalization. In the case of Confucianism, the rise of East Asian and Southeast Asian economies in the global economy may have facilitated the spread of Confucian values rooted in these societies. For example, taking advantage of its increasing economic importance in the world economy, China has been trying to establish and advance its influence in non-economic ways through many initiatives that include its vast global network of Confucius Institutes. For Islam, it could be that countries that are more economically and politically globalized appear to be more welcoming to Muslim migrants in terms of both material and spiritual aspects.

Table 3.7: Synthesized Granger causality test results for selected globalizations and religions

Direction of causality	General globalization		Economic globalization		Social globalization		Political globalization	
	R → G	G → R	R → G	G → R	R → G	G → R	R → G	G → R
Buddhism	34.64***	42.63***	7.03***	0.06	19.48***	0.18	29.86***	10.96***
Christianity	17.46***	4.55**	4.81**	1.79	0.02	1.13	2.30	0.33
Confucianism	0.51	13.15***	1.62	5.77**	1.23	1.36	1.52	2.34
Hinduism	0.04	0.05	3.94**	0.13	11.78***	0.46	10.37***	30.90***
Islam	0.21	59.11***	0.27	15.35***	0.35	0.50	0.22	75.53***
Atheist	4.99**	0.22	2.56	0.09	1.49	0.11	7.77***	6.28***

Note. R and G represent corresponding religion and globalization variables, respectively.

*, **, *** reject the null hypothesis of X does not Granger cause Y at the 10%, 5%, and 1% level.

In addition, the economic dimension is the only proxy of globalization that has some sort of Granger causality correlation with all six of the religions studied in this chapter, even when no Granger causality was found in the model of general globalization, for example in the case of Hinduism. However, the direction of Granger causality is not the same for all religions. Granger causality runs from economic globalization to religion in the cases of Confucianism and Islam, and inversely for the other religions (Buddhism, Christianity, and Hinduism), while there is no Granger causality for Atheism. This emphasizes the heterogeneous views among these religions of globalization, particularly economic globalization.

Third, the Granger causality correlations between each religion and different proxies of globalization (general, economic, social, and political) are diverse. Except for the positive effects of Buddhism on globalization, the existence and direction of Granger causality are never the same for all proxies. In many cases, the signs of significant Granger causalities that have the same direction are even in conflict, such as the effects of political globalization and general globalization on Buddhism, or the effects of Christianity on general and economic globalization, or the effects of Hinduism on economic, social, and political globalization. The differences in the Granger causality test results across the four measures of globalization illustrate the necessity of further examining the relation between religion and globalization using a differentiated multi-dimensional approach, both with respect to globalization and religion.

3.5.6 Granger causality for different income groups

Apart from the world sample, this chapter also performed a Granger causality test after the analysis 1 lag panel VAR model using two sub-samples with differing income levels: high- and low-income countries⁴. The

⁴The *High-income* sub-sample includes countries classified by the World Bank as high- and upper-middle-income in real historical time (changing over the years), while the *Low-income* sub-sample includes countries classified by the World Bank as lower-

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Granger causality test for income sub-samples is motivated by Figure 3.3, in which higher-income countries appear to be located at the bottom (lower importance of God in life) and to the right (higher score on the general globalization index). Hence, the relations between religion and globalization may be unalike for different per capita income levels.

Table 3.8 displays a summary of the Granger causality direction as suggested by the test results (for more details on the Granger causality test results, see Appendix 3E). In this table, although the number of Granger causalities found in each sub-sample are quite similar (21 in the *High-income* sub-sample and 22 in the *Low-income* sub-sample), heterogeneity again is the key theme of the relation between globalization and religion when we look at the pattern and direction of these Granger causalities. Thus, even though the panel VAR model included income per capita as an exogenous variable, the difference in frequency of Granger causality among the different income sub-samples remains, which may suggest that whether religion and globalization interact with each other could depend to a large extent on the level of economic development.

First, the significance of Granger causality is different across income sub-samples, even for the same religion. For example, in the case of Buddhism, results from the full sample show Granger causalities (either unidirectional or bidirectional) for all four models of general and dimensional globalizations. However, results from the *High-income* sub-sample show only one unidirectional Granger causality running from economic globalization to Buddhism. Meanwhile, results from the *Low-income* sub-sample show some sort of Granger causalities (either unidirectional or bidirectional) for all four models of globalizations. These findings suggest that despite the differences between income groups, Buddhism appears to be consistently correlated with economic globalization. This points to the legacy of Buddhism and international

middle- and low-income in real history time (changing over the years). Hence, some countries can appear in both sub-samples at different points in time as their level of income changed.

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trade reinforcing each other in ancient times, as discussed in Chapter 2.

Table 3.8: Globalization and religion: Granger causality in sub-samples

High-income sub-sample	General globalization	Economic globalization	Social globalization	Political globalization
Buddhism		R ← G		
Christianity		R ↔ G	R → G	R ↔ G
Confucianism			R ← G	
Hinduism	R → G	R → G	R → G	R ↔ G
Islam	R → G	R ↔ G	R ↔ G	R → G
Atheism	R ← G	R ↔ G		
Low-income sub-sample	General globalization	Economic globalization	Social globalization	Political globalization
Buddhism	R → G	R → G	R → G	R ↔ G
Christianity	R ← G			R ↔ G
Confucianism	R ← G		R ← G	R ↔ G
Hinduism	R ← G	R ← G	R ↔ G	R ← G
Islam	R ← G			
Atheism	R ↔ G			R ↔ G

Note. R and G represent corresponding religion and globalization variables, respectively.

Second, heterogeneity can also be found within the same dimension of globalization. For instance, the models of economic globalization show four cases where Granger causality runs from religions (Christianity, Hinduism, Islam, and Atheism) to economic globalization in the *High-income* sub-sample, while this is the case only for Buddhism in the other sub-sample. Meanwhile, the models of political globalization found three cases of Granger causality running from religions (Christianity, Hinduism, and Islam) to political globalization for the *High-income* sub-sample, while four religions (Buddhism, Christianity, Confucianism, and Atheism) were found to Granger cause political globalization in the *Low-income*

sub-sample. These differences suggest that the importance of religion or spiritual (dis-)belief in the process of globalization varies across different dimensions of globalization and along with national income levels.

Next, the characteristics of Granger causality are also different across income sub-samples, again even for the same religion. For example, in the case of Hinduism, in the *High-income* sub-sample, Granger causality mainly runs from Hinduism to the globalizations, while in in *Low-income* sub-sample, Granger causality mostly runs the other way around. These results from the sub-sample investigation offer a remarkable observation. As discussed at the beginning of Section 3.5, Hinduism is supposed to have a mixed relation with globalization. In ancient Vedic writings, we see instructions on how to milk international trade for national benefits. These instructions can be considered quite similar to the modern idea of strategic trade policy⁵, while national benefits in many cases can be as materialize as increasing the national income level. Then, the strategic trade approach could change when the level of income changes, which may lead to a difference in the direction of Granger causality between Hinduism and globalizations found across the two sub-samples.

3.6 Conclusions

In this chapter, the relation between globalization together with its three dimensions (economic, social, and political globalization) and the major religions in the world, namely Buddhism, Christianity, Confucianism, Hinduism, and Islam, as well as Atheism, were studied. Panel VAR models with a GMM approach were applied to a sample of 159 countries for the period 1990 to 2015. The empirical results of the Granger causality test performed after each panel VAR analysis emphasized the heterogeneity across different religions in the relation with globalization and its distinctive aspects, as shown in Table 3.9 below.

⁵See Chapter 2 for details.

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Table 3.9: Globalization and religion: Granger causality for full sample

	General globalization	Economic globalization	Social globalization	Political globalization
Buddhism	$R \xleftrightarrow{+} G$	$R \xrightarrow{+} G$	$R \xrightarrow{+} G$	$R \xleftrightarrow{-} G$
Christianity	$R \xleftrightarrow{-} G$	$R \xrightarrow{-} G$		
Confucianism	$R \xleftarrow{+} G$	$R \xleftarrow{+} G$		
Hinduism		$R \xrightarrow{+} G$	$R \xrightarrow{-} G$	$R \xleftrightarrow{-} G$
Islam	$R \xleftarrow{+} G$	$R \xleftarrow{+} G$		$R \xleftarrow{+} G$
Atheism	$R \xrightarrow{-} G$			$R \xleftrightarrow{-} G$

Note. R and G represent corresponding religion and globalization variables, respectively. The sign of the Granger causality is based on the corresponding result from the impulse-response function.

First, bidirectional Granger causality is found for (1) Buddhism and general globalization as well as political globalization, (2) Christianity and general and economic globalizations, and (3) Hinduism and political globalization. Except for the relation between social globalization and Christianity, Confucianism, and Islam, respectively, and except for the relation between Hinduism and general globalization, unidirectional Granger causality was found for all relations. However, such unidirectional Granger causal effects do not run in the same direction—some of them run from the specified religion to globalization, while the others run in the opposite direction. In terms of the sign of effects, while Buddhism is shown to consistently positively affect globalization (for general, economic, social, and political globalization), Atheism appears to do the opposite (for general and political globalization). In the opposite direction, general, economic, and political globalization seem to positively affect the expansion of Islam. For the remaining cases, mixed Granger causal effects, both in terms of direction

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and sign, were discerned.

Importantly, both Confucianism and Islam show no Granger causal effect on globalization for all four measures of globalization. However, the mechanisms behind this non-significance may be very different for these two religions, starting with the fact that Confucianism can be considered more of a philosophy of life than a religion, although in this chapter it is referred to as a religion for general communicative purposes and to adhere to the Religious Characteristics of States Dataset Project – Demographics v. 2.0 (RCS-Dem 2.0). In addition, unlike the other four religions, the values associated with Confucianism may have a stronger influence on modern society than its teachings, preaching, and spiritual rituals. And among the five major religions, Islam, alongside Christianity and Buddhism, may have the strongest potential to influence policy. Hence, it is reasonable to believe that the non-Granger-causality finding in the case of Confucianism and globalization differs greatly from that of Islam.

On the other hand, as discussed earlier, the Granger causality test captures the correlation of fluctuations between variables over time and not a ‘real’ causality between these variables. Although time dependence may be associated with the ‘real’ causality, a Granger causality should not be viewed as a causal impact or effect. The main limitation of this chapter is therefore that its conclusions on the relation between religion and globalization are limited under Granger conditions. However, as a first exploration of the relation between religion and globalization, this chapter by using Granger causality test can nevertheless make an academic contribution in that it highlights the need to further examine the importance and potential role of religion in the process of globalization. Another limitation of this chapter is that owing to the inability to access more recent data, no data from after 2015 were used. The chapter therefore fails to cover the entire period of deglobalization that to some extent may create bias. Future research using more recent data for example could examine the relation between religion and globalization

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by considering the different waves and stages of globalization, including the recent phenomenon of deglobalization that is not considered in this thesis.

To summarize, the existence of Granger causal effects between religion and globalization as well as their heterogeneity point to the need for further analyses of the relation between globalization and religion in an intertwined framework. Given the differences in the presence and direction of a Granger causality between the different types of globalization and religions presented in this chapter, a universal theoretical framework describing the relation between religion and globalization (and its dimensions) that accurately describes this relation for all countries and religions can hardly be developed. For this reason, more research on this topic, both theoretically and empirically, is needed.

3.7 Appendix

3.7.1 Appendix 3A: List of countries for the full sample (159 countries)

-Afghanistan	Darussalam	-Egypt, Arab Rep.	-Iraq
-Albania	-Bulgaria	-El Salvador	-Ireland
-Algeria	-Burkina Faso	-Eritrea	-Israel
-Angola	-Burundi	-Estonia	-Italy
-Antigua & Barbuda	-Cambodia	-Ethiopia	-Jamaica
-Argentina	-Cameroon	-Fiji	-Japan
-Armenia	-Canada	-Finland	-Jordan
-Australia	-Central African Rep.	-France	-Kenya
-Austria	-Chad	-Gabon	-Korea, Rep.
-Azerbaijan	-Chile	-Gambia, The	-Kuwait
-Bahamas, The	-China	-Georgia	-Kyrgyz Republic
-Bahrain	-Colombia	-Germany	-Lao PDR
-Bangladesh	-Congo, Rep.	-Greece	-Latvia
-Barbados	-Costa Rica	-Guatemala	-Lebanon
-Belgium	-Cote d'Ivoire	-Guinea	-Lesotho
-Belize	-Croatia	-Haiti	-Liberia
-Benin	-Cuba ⁶	-Honduras	-Libya
-Bhutan	-Cyprus	-Hungary	-Lithuania
-Bolivia	-Czech Republic	-Iceland	-Macedonia, FYR
-Bosnia & Herzegovina	-Denmark	-India	-Madagascar
-Botswana	-Dominican Republic	-Indonesia	-Malawi
-Brazil	-Ecuador	-Iran, Islamic Rep.	-Malaysia

⁶Due to a lack of economic globalization data for Cuba, this country is not included in regressions where economic globalization serves as an explanatory variable.

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-Maldives	-Oman	-Serbia	Tobago
-Mali	-Pakistan	-Seychelles	-Tunisia
-Malta	-Panama	-Sierra Leone	-Turkey
-Mauritania	-Papua New	-Singapore	-Turkmenistan
-Mauritius	Guinea	-Slovak	-Uganda
-Mexico	-Paraguay	Republic	-Ukraine
-Moldova	-Peru	-Slovenia	-United Arab
-Mongolia	-Philippines	-South Africa	Emirates
-Morocco	-Poland	-Spain	-United
-Mozambique	-Portugal	-Sri Lanka	Kingdom
-Myanmar	-Qatar	-Suriname	-United States
-Namibia	-Russian	-Swaziland	-Uruguay
-Nepal	Federation	-Sweden	-Uzbekistan
-Netherlands	-Rwanda	-Switzerland	-Vanuatu
-New Zealand	-Samoa	-Tajikistan	-Vietnam
-Nicaragua	-São Tomé &	-Tanzania	-Yemen, Rep.
-Niger	Príncipe	-Thailand	-Zambia
-Nigeria	-Saudi Arabia	-Togo	-Zimbabwe
-Norway	-Senegal	-Trinidad &	

3.7.2 Appendix 3B: Variable definitions and data sources

Variable	Name	Source	Definition
<i>Glob</i>	General globalization	KOF Index of Globalization	Measures globalization in three main dimensions: economic, social, and political
<i>GlobEcon</i>	Economic globalization	KOF Index of Globalization	Sub-indicator of general globalization; measures actual economic flows and economic restrictions
<i>GlobSoc</i>	Social globalization	KOF Index of Globalization	Sub-indicator of general globalization; measures information flows, personal contact, and cultural proximity
<i>GlobPol</i>	Political globalization	KOF Index of Globalization	Sub-indicator of general globalization; measures the diffusion of government policies and engagement in international political cooperation
<i>d_Glob</i>	First difference of <i>Glob</i>	Author's calculation	$d_Glob_{it} = Glob_{it} - Glob_{it-1}$
<i>d_GlobEcon</i>	First difference of <i>GlobEcon</i>	Author's calculation	$d_GlobEcon_{it} = GlobEcon_{it} - GlobEcon_{it-1}$
<i>d_GlobSoc</i>	First difference of <i>GlobSoc</i>	Author's calculation	$d_GlobSoc_{it} = GlobSoc_{it} - GlobSoc_{it-1}$
<i>d_GlobPol</i>	First difference of <i>GlobPol</i>	Author's calculation	$d_GlobPol_{it} = GlobPol_{it} - GlobPol_{it-1}$

Variable	Name	Source	Definition
$GDPpc$	GDP per capita	World Development Indicators	Gross domestic product divided by mid-year population. In constant 2010 U.S. dollar
$\ln GDPpc$	Natural log of $GDPpc$	Author's calculation	$\ln GDPpc_{it} = \ln(GDPpc_{it})$
$d_{\ln GDPpc}$	First difference of $\ln GDPpc$	Author's calculation	$d_{\ln GDPpc_{it}} = \ln GDPpc_{it} - \ln GDPpc_{it-1}$

Variable	Name	Source	Definition
<i>Buddhist</i>	Buddhist	Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0)	Share of Buddhist population as part of the total country population
<i>Christian</i>	Christian		Share of Christian population as part of the total country population
<i>Confucianist</i>	Confucianist		Share of Confucianist population as part of the total country population
<i>Hindu</i>	Hindu		Share of Hindu population as part of the total country population
<i>Muslim</i>	Muslim		Share of Muslim population as part of the total country population
<i>Atheist</i>	Atheist		Share of Atheist population as part of the total country population
<i>d_Buddhist</i>	First difference of <i>Buddhist</i>	Author's calculation	$d_Buddhist_{it} = Buddhist_{it} - Buddhist_{it-1}$
<i>d_Christian</i>	First difference of <i>Christian</i>		$d_Christian_{it} = Christian_{it} - Christian_{it-1}$
<i>d_Confucianist</i>	First difference of <i>Confucianist</i>		$d_Confucianist_{it} = Confucianist_{it} - Confucianist_{it-1}$
<i>d_Hindu</i>	First difference of <i>Hindu</i>		$d_Hindu_{it} = Hindu_{it} - Hindu_{it-1}$
<i>d_Muslim</i>	First difference of <i>Muslim</i>		$d_Muslim_{it} = Muslim_{it} - Muslim_{it-1}$
<i>d_Atheist</i>	First difference of <i>Atheist</i>		$d_Atheist_{it} = Atheist_{it} - Atheist_{it-1}$

3.7.3 Appendix 3C: Lag order selection criteria

Religion	Lag	CD	J	J p-value	MBIC	MAIC	MQIC	Optimal lag order
Buddhism	1	0.89	17.21	0.37	-108.00	-14.79	-48.63	*
	2	0.66	8.47	0.75	-85.43	-15.53	-40.90	
	3	0.15	2.19	0.97	-60.42	-13.81	-30.73	
	4	-4.76	0.56	0.97	-30.74	-7.44	-15.90	
Christianity	1	0.84	20.58	0.20	-104.62	-11.42	-45.25	*
	2	0.87	18.59	0.10	-75.31	-5.41	-30.79	
	3	0.80	11.13	0.19	-51.47	-4.87	-21.79	
	4	-16.09	4.04	0.40	-27.26	-3.96	-12.41	
Confucianism	1	0.97	28.65	0.03	-96.54	-3.35	-37.18	*
	2	0.98	15.21	0.23	-78.68	-8.79	-34.16	
	3	0.95	3.44	0.90	-59.15	-12.56	-29.47	
	4	0.90	1.47	0.83	-29.83	-6.53	-14.99	
Hinduism	1	0.85	17.57	0.35	-107.63	-14.43	-48.27	*
	2	0.77	8.30	0.76	-85.60	-15.70	-41.08	
	3	0.67	1.81	0.99	-60.79	-14.19	-31.11	
	4	-1.03	0.41	0.98	-30.89	-7.59	-16.05	

Note. The Stata command *pvarsoc* provides the coefficient of determination (CD), the Hansen's J statistic (J), the p-values for the Hansen's J statistics (J p-value), the Bayesian information criterion (MBIC), the Akaike information criterion (MAIC), and the Quinn information criterion (MQIC).

Religion	Lag	CD	J	J p-value	MBIC	MAIC	MQIC	Optimal lag order
Islam	1	-0.29	28.50	0.03	-96.71	-3.50	-37.34	*
	2	-1.22	13.54	0.33	-80.37	-10.46	-35.84	
	3	-12.64	1.57	0.99	-61.03	-14.43	-31.35	
	4	-29.51	0.98	0.91	-30.32	-7.02	-15.48	
Atheism	1	1.00	19.87	0.23	-105.33	-12.13	-45.96	*
	2	0.99	6.98	0.86	-86.92	-17.02	-42.40	
	3	0.99	4.63	0.80	-57.97	-11.37	-28.29	
	4	-0.46	1.79	0.77	-29.51	-6.21	-14.67	

Note. The Stata command *pvarsoc* provides the coefficient of determination (CD), the Hansen's J statistic (J), the p-values for the Hansen's J statistics (J p-value), the Bayesian information criterion (MBIC), the Akaike information criterion (MAIC), and the Quinn information criterion (MQIC).

3.7.4 Appendix 3D: Impulse–Response functions

Due to its excessive length, Appendix 3D is not included in the main text and is available online at <https://figshare.com/s/9c0ab5e3684344047ef3>

3.7.5 Appendix 3E: Granger causality tests in sub-samples

Due to its excessive length, Appendix 3E is not included in the main text and is available online at <https://figshare.com/s/9c0ab5e3684344047ef3>

3.7.6 Appendix 3F: Stability reports

Due to its excessive length, Appendix 3F is not included in the main text and is available online at <https://figshare.com/s/9c0ab5e3684344047ef3>

Chapter 4

Is globalization good for sustainable development? A multidimensional approach with a self-meta-analysis (SMA)¹

4.1 Introduction

Over the past few decades, the discussions on development and how the world should develop have gone beyond any boundaries. For much of the twentieth century, countries had implemented policies promoting economic growth and industrialization in the name of development, while other critical issues such as social inequality, environmental

¹This chapter was presented in the form of a working paper at the EPG Online Seminar—Spring Session in June 2022, at the 2022 Gothenburg International Research Workshop on Sustainable Economic Growth and Decent Work for All in August 2022, and at the Vietnam Economist Annual Meeting in November 2022. The useful comments by participants are greatly appreciated.

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degradation, and political conflicts were ignored. Such an aggressive and unbalanced way of pursuing ‘development’ has become dangerous and is compromising the entire planet’s future, as the World Bank observed thirty years ago when it stated that the “achievement of sustained and equitable development remains the greatest challenge facing the human race” (1993, p. 1). Since then, the need for sustainable development has been recognized, with a multitude of studies focusing on this more holistic interpretation of development that seeks to minimize environmental harm accompanying human-economic development.

In the field of development, the relation between globalization and development has been a topic of interest for quite some time, resulting in a vast number of studies seeking to capture different aspects of this relation (Jones, 2010). However, conclusions on the effects of globalization on development are far from definite and in some cases, where different globalization and development indicators are used, findings even contradict each other within the same study (Dreher et al., 2008). Moreover, research on the links between globalization and sustainable development is limited (Potrafke, 2015; Figge et al., 2017). Moreover, development should not be only about growing economically but should rather be about how to grow sustainably. Hence, there is a need for analyses of the effects of globalization on sustainable development in which both globalization and sustainable development are defined and measured as multidimensional concepts rather than as processes with singular dimensions.

This chapter aims to examine the relation between globalization and sustainable development by analyzing indicators capturing the multidimensional characteristics of these two concepts. First, the KOF Globalization Index (Gygli et al., 2019) constructed by the KOF Swiss Economic Institute provides information on three dimensions of globalization (economic, social, and political globalization). This indicator allows for an analysis of the impacts of not only general

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globalization (the average sum of the three dimensions) but also its partial dimensions through the sub-indexes. In addition, the index measures globalization in two ways: *de facto*, which captures the actual flows of globalization, and *de jure*, which captures the institutions and rules affecting these flows. Most studies analyze the ‘overall’ globalization level (the average of *de facto* and *de jure* globalization). However, different measurement foci capture different aspects of globalization even within the same dimension; hence, this chapter analyzes the effect of globalization on sustainable development using *de facto*, *de jure*, and *overall* globalization measurements of both general globalization and dimensional globalization. Second, to measure the effect on sustainable development, analyses in this chapter utilize a relatively new indicator introduced by Hickel (2020) called the Sustainable Development Index. This index uses the base formula of the Human Development Index while also capturing the ecological dimension of sustainable development.² These two indicators together provide inclusive and legitimate data for conducting the empirical analysis. Third, both indicators include sub-indexes measuring dimensions of globalization and sustainable development, which allows for further dimensions-on-dimensions analyses.

This study is perhaps the first to date, or one of few, that examines the relation between globalization and sustainable development through a multidimensional lens and that considers this relation for almost all countries by drawing on a sample of 160 countries. Moreover, academic studies examining the effects of globalization on sustainable development usually use linear models. This chapter proposes a non-linear relation between globalization and sustainable development—a proposition informed by diverging empirical results, by theoretical arguments on the effect of globalization on sustainable development (discussed in Section 4.2 below), as well as by the observation of non-linearity from real data scatter plots (shown in Figure 4.1 in Section 4.3).

²See Hickel (2020) for details on the methodology.

This chapter produces a substantial number of estimates, especially due to the use of a multidimensional approach. In order to keep the results trackable and trustable, a so-called self-meta-analysis (SMA) was developed. Normally, a meta-analysis is used to detect and overcome errors in a group of studies investigating the same research question. The meta-analysis appears to be a useful tool for identifying the real effect size as well as potential sources of errors. In this chapter, the data used for this meta-analysis come from the chapter itself, which is why it is called a self-meta-analysis. The SMA is expected to answer the questions of whether globalization has an impact on sustainable development and, if so, whether the relation between these two phenomena is non-linear. This is perhaps also the first time that a self-meta-analysis has been reported in a quantitative economic study.

The rest of this chapter is structured as follows: Section 4.2 reviews the relevant academic literature on the relation between globalization and sustainable development; Section 4.3 discusses the empirical analysis strategy; Section 4.4 describes the data; Section 4.5 presents the empirical findings of the panel analyses; Section 4.6 uses results from Section 4.5 to conduct the self-meta-analysis; and Section 4.7 concludes the chapter.

4.2 Literature review

Sustainable development in the 1987 Brundtland Report is referred to as the ways in which the present generation's needs can be satisfied without compromising the ability to satisfy those of future generations (Brundtland et al., 1987). This means that sustainable development has two important components: meeting present and future needs. Meeting present needs refers to ensuring human-economic development, while meeting future needs implies sustaining the living environment in a way that ensures that human-economic development is also possible in the future. In the literature, many empirical studies have investigated the impact of globalization on either human-economic development or the

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environment. However, few studies have combined these two aspects of sustainable development in relation to globalization, and the results of these studies on each of the two aspects are still inconclusive and/or disputed.

Studies on the relation between globalization and human development have focused mainly on addressing inequality and eradicating poverty. Stolper and Samuelson (1941) argued that increased international trade can shift a country's production towards commodities that use its abundant production factor, which then leads to increased prices of that abundant production factor. In the case of developing countries, the abundant factor is (low wage) labor; hence, globalization should be able to reduce poverty by increasing real wages. In practice, this is seldom the case. The world has seen more than a billion people lifted out of poverty (since 1990), potentially owing to economic globalization (Koopman and Freund, 2019). However, empirical studies suggest that the poor do not always benefit from globalization. Indeed, globalization creates both winners and losers among the poor themselves (Harrison, 2006). Consequently, global income per capita is far from convergence. In fact, Nayyar (2017) pointed to a global trend in rising income inequality between and within countries, which has drawn attention to this phenomenon.

In empirical studies, the relation between globalization and inequality has been examined since the mid-1990s. Wood (1995) argued that the growth of trade between developed and developing countries has worsened unskilled labor's income in developed countries, while Cragg and Eppelbaum (1996) observed, for the case of Mexico, less growth in low-skilled employment in the trade sector due to competition from foreign producers. Feenstra and Hanson (1996) relatedly found that in the 1980s, international outsourcing by U.S. firms was responsible for a 31–51% increase in the relative demand for skilled labor. Besides, the trend of outsourcing, the flow of migrant labor into the U.S. also appears

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to threaten the livelihoods of low- and non-skilled workers, as Borjas et al. (1997) suggested. In the case of developing countries, however, Edwards (1997) found no evidence of a link between openness to trade and income inequality, while Barham and Boucher (1998) in a study of Bluefields in Nicaragua looked at different flow forms of globalization – migrant workers and their remittances – and argued that the phenomenon increased income inequality among households.

The direction of the relation between globalization and inequality is far from defined and for this reason has been revisited many times in more recent years. For instance, a review by Goldberg and Pavcnik (2007) of empirical studies interested in the 1970s till 1990s first revealed that in most developing countries, globalization and inequality both increased during this period and, second, identified several channels through which globalization negatively affected the poorer parts of population. Using a relatively new globalization measurement index at that time, Dreher and Gaston (2008) suggested that globalization magnifies inequality, especially in OECD countries, while Bergh and Nilsson (2010), paying attention to the three main dimensions of globalization (economic, social, and political globalization), found that the significance and importance assigned to each of these three dimensions depend on the country's level of development. They argued that while economic globalization increases inequality in advanced economies, social globalization plays a more important role in less developed countries, and political globalization does not appear to have an impact on income inequality.

Besides studies looking at globalization as a whole, others have focused on more specific dimensions of globalization. For example, Figini and Görg (2011) investigated the link between Foreign Direct Investment (FDI) and wage inequality, allowing for the possibility of a non-linear relationship and controlling for the development level of the countries in their sample. The authors indeed found significant non-linear, positive diminishing effects in the case of developing countries, but also identified

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negative effects in the case of developed countries, with no evidence found of a significant non-linear relation. To explain the confusing impacts of globalization on inequality, Jaumotte et al. (2013) suggested that two offsetting tendencies can be discerned: (1) trade reduces inequality, while (2) financial globalization increases inequality. While such studies focused on the poorer population segments, others focused on the wealthiest population segments, such as that of Dorn and Schinke (2018), who found a negative correlation between globalization and the share of income of the wealthiest 1% of the population and a positive correlation in the case of the upper-middle class (next 9%). In sum, the use of different measurements of globalization and inequality, as well as different samples, yield different results. It is worth noting that some scholars have found that globalization increases inequality, while others have argued that the presence or absence of a relation between globalization and inequality depends on country characteristics and on the aspects of globalization that are considered.

As a widely used measure of globalization, the KOF Globalization Index has been applied in many empirical studies to examine the effect of globalization on economic development. Table 4.1 displays information on some of these studies, including their different findings regarding the sign of the relation between globalization and economic development. The table reveals that even the long-discussed relation between globalization and economic development is ambiguous.

Table 4.1: Overview of studies on the relation between globalization and economic development using the KOF Globalization Index

Study	KOF Index	Dependent variable	Coverage	Method	Finding
Midiyanti and Yao (2019)	Economic, Social, Political	Economic growth	Indonesia 1980–2014	VECM, Granger Causality	Positive, significant
Lee et al. (2022)	General, Economic, Social, Political	Economic growth	50 Belt and Road Initiative countries 2010–2015	Panel OLS, REM, and FEM	Positive, significant
Chu et al. (2016)	General	Economic growth	China and 9 OECD countries 1981–2008	Bootstrap Panel Granger Causality	Mixed
Lee et al. (2015)	General, Economic, Social, Political	Economic growth	30 provinces, municipalities, and autonomous regions in China 1970–2006	Two-step system GMM	Mixed
Rao and Vadlamannati (2011)	General, Economic, Social, Political	Economic growth	21 low-income African countries 1970–2005	Pooled OLS, REM, FEM, and SGMM	Positive, significant
Rao et al. (2011)	General	Steady State Growth Rate	Singapore, Malaysia, Thailand, India, and the Philippines 1974–2004	2SNL-IV	Positive, significant
Chang and Lee (2011)	General, Economic, Social, Political	Economic growth	10 former communist countries and 18 OECD countries in Europe 1990–2006	Modified OLS and Dynamic OLS	Positive, significant
Chang et al. (2011)	General, Economic, Social, Political	Real output	G7 countries 1970–2006	Panel cointegration test and Dynamic OLS	Mixed
Chang and Lee (2010)	General, Economic, Social, Political	Economic growth	23 OECD countries 1970–2006	Panel cointegration tests and Fully Modified OLS	Positive, significant

Note. OECD: Organization for Economic Co-operation and Development; VECM: vector error correction model; OLS: ordinary least squares; REM: random-effects model; FEM: fixed-effects model; GMM: dynamic panel generalized method of moments; SGMM: system generalized of moments; 2SNL-IV: Two-stage nonlinear least squares instrumental variables method.

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The second important aspect of sustainable development is the sustainability of our living environment. Most, if not all, activities related to the process of globalization impact the environment. For example, many of our daily activities, like the transit of humans or goods, are already affecting the environment. But globalization enlarges the scope and scale of these daily activities, which places even more pressure on the environment. However, globalization could also play a role in helping protect the environment. For example, globalization could foster the more efficient allocation of resources through global value chains and could help ease cooperation between environmental movements across borders. Moreover, environmental impacts are not limited to national borders but can affect entire regions. In the past few decades, as environmental problems have accumulated, more attention has been paid to the relation between globalization and the environment. Studies on this relation have paid attention both to specific indicators of globalization (such as openness to trade, Foreign Direct Investment, tourism, internet usage, migration, political agreements, and treaties) and to encompassing globalization indicators (the KOF Globalization Index and its sub-indexes, for example).

The results are mixed and inconclusive, often even within the same study. For instance, Martens and Raza (2010) analyzed the effects of globalization on a set of sustainability indicators (including the Human Development Index, Environmental Performance Index, Global Environment Facility Benefits Index, Responsible Competitiveness Index, and Sustainable Society Index), finding positive correlations with the Human Development Index, Environmental Performance Index, and Responsible Competitiveness Index, but a negative correlation with the Global Environment Facility Benefits Index, while no significant relation was found for the Sustainable Society Index. These contradicting results could be due to the inclusion of too many different sources for measuring sustainable development—different measurements capture certain aspects or groups of aspects without considering other aspects or

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dimensions of sustainable development. The use of mono-dimensional indicators could also have contributed to this study's contradictory results. However, despite several other studies having used one measurement of environmental quality at a time, a definite conclusion about the relation between globalization and environment has still not been reached. In particular, studies such as those by Al-mulali (2012), Farhani et al. (2014), Kasman and Duman (2015), Bento and Moutinho (2016), Ali et al. (2017), and Amri (2018) on the effect of globalization on carbon dioxide emissions suggest an increasing effect of the former on the latter, while studies by Al-mulali and Sheau-Ting (2014), Leitão (2014), Ohlan (2015), and Shahbaz et al. (2016) find no or mixed effects and studies by Shahbaz et al. (2013) and Destek and Ozsoy (2015) find a reducing effect.

As shown in Table 4.2 below, many empirical studies pay attention particularly to flows of Foreign Direct Investment and international trade when examining globalization. Indeed, of the several international flows made possible by globalization, capital flows have been emphasized when discussing the relation between globalization and sustainable development. International capital flows such as foreign investment can stimulate economic growth as well as reduce environmental degradation. The effect of foreign investment on the receiving country's environment can be positive or negative, as both theoretical and empirical studies have demonstrated. Demena and Afesorgbor (2020) for instance conducted a meta-analysis of the effect of Foreign Direct Investment on environmental emissions, suggesting after controlling for publication bias and individual study characteristics that Foreign Direct Investment not only facilitates economic growth but can also help reduce emissions. This resulted in an optimistic view of globalization, with the authors concluding that “[g]lobalization is not solely about increased competition, production and consumption, but can also reduce environmental emissions through the transfer of green technologies across borders” (Demena and Afesorgbor, 2020, p. 13).

Table 4.2: Overview of studies on the effect of globalization on carbon dioxide emissions

Study	Method	Globalization factor	Coverage	Period	Effect of globalization on carbon dioxide emissions
Al-mulali (2012)	Panel model	– FDI net inflow – Total trade	12 Middle Eastern countries: Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and Yemen	1990–2009	Increasing effect
Shahbaz et al. (2013)	– ARDL – VECM Granger causality	Trade openness	Indonesia	1975–2011 (quarterly)	Reducing effect

Note. FDI: Foreign Direct Investment; GDP: Gross Domestic Product; ARDL: autoregressive distributed lag bounds testing approach; VECM: vector error correction model.

Study	Method	Globalization factor	Coverage	Period	Effect of globalization on carbon dioxide emissions
Al-mulali & Sheau-Ting (2014)	Panel fully modified OLS	– Trade – Exports – Imports	189 countries from 6 regions: Asia-Pacific, Eastern Europe, the Americas, the Middle East and North Africa, Sub-Saharan Africa, and Western Europe	1990–2011	– All regions except Eastern Europe: long-run increasing effect; – Countries with large trade shares and high development level: long-run increasing effect; – Countries with small trade shares and low development level: reducing or non-significant long-run effect.
Farhani et al. (2014)	ARDL	Trade openness	Tunisia	1971–2008	Increasing effect in both the short and long run
Leitão (2014)	VECM and Granger causality	General globalization	Portugal	1970–2010	Globalization does not Granger cause carbon dioxide emissions
Destek & Ozsoy (2015)	ARDL	Economic globalization	Turkey	1970–2010	Reducing effect

Note. FDI: Foreign Direct Investment; GDP: Gross Domestic Product; ARDL: autoregressive distributed lag bounds testing approach; VECM: vector error correction model.

Study	Method	Globalization factor	Coverage	Period	Effect of globalization on carbon dioxide emissions
Kasman & Duman (2015)	<ul style="list-style-type: none"> – Panel unit root test – Panel cointegration methods – Panel causality tests 	Trade openness	Bulgaria, Croatia, Czech, Estonia, Hungary, Latvia, Iceland, Lithuania, FYR of Macedonia, Malta, Poland, Romania, Slovak Republic, Slovenia, and Turkey	1992–2010	Increasing effect in the short run
Ohlan (2015)	<ul style="list-style-type: none"> – ARDL – VECM Granger causality 	Trade openness	India	1970–2013	<ul style="list-style-type: none"> – Increasing effect in the long run – Reducing effect in the short run
Bento & Moutinho (2016)	ARDL	International trade	Italy	1960–2011	Increasing effect in the long run

Note. FDI: Foreign Direct Investment; GDP: Gross Domestic Product; ARDL: autoregressive distributed lag bounds testing approach; VECM: vector error correction model.

Study	Method	Globalization factor	Coverage	Period	Effect of globalization on carbon dioxide emissions
Shahbaz et al. (2016)	ARDL	General globalization	Angola, Cameroon, Congo Republic, Kenya, Libya, Tunisia, and Zambia _____ Ghana, Morocco, South Africa, Sudan, and Tanzania _____ Algeria, Nigeria, Togo, Zambia, and Zimbabwe	1971–2012	Reducing effect _____ Increasing effect _____ No effect
Ali et al. (2017)	– ARDL – Granger causality test	– Trade openness – FDI	Malaysia	1971–2012	Increasing effect
Amri (2018)	ARDL	Total trade in percentage of GDP	Tunisia	1975–2014	Increasing effect

Note. FDI: Foreign Direct Investment; GDP: Gross Domestic Product; ARDL: autoregressive distributed lag bounds testing approach; VECM: vector error correction model.

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Beside capital flows, international trade is also caught in the debate on environmental sustainability. On the one hand, international trade tends to increase consumption demand which consequently could lead to the overexploitation of natural resources and environmental degradation. On the other hand, international trade makes production more efficient through specialization, resulting in the better allocation of production resources, which means less waste, less energy used, and less pollution. Moreover, supporting environmental sustainability does not necessarily mean opposing trade liberalization, since environmental problems do not always arise directly from international trade per se, while “a solution on the basis of trade impediments will waste the potential contribution that international specialization can make to global environmental efficiency” (Van Bergeijk, 1991, p. 106).

In this chapter, sustainable development is understood as a multidimensional concept instead of as a conglomeration of concepts. In order to have a systematical view of the relation between globalization and sustainable development, on April 13, 2021, a literature search was conducted. The following search term comprising keywords with a Boolean connector was used: (globalization OR globalisation) AND “sustainable development”. The search yielded 1,457 results in the Web of Science database, of which 1,325 were in the English language. Of these, 129 articles in the two categories of Development Studies and Economics³ were identified as relevant for this thesis. The screening process identified only two empirical studies on the effect of globalization on sustainable development (as a multidimensional concept). First, using the Human Development Index and the Global Competitiveness Index to measure sustainable development, Urbšienė (2013) investigated the effect of globalization on sustainable development in Lithuania using data for the years 2000 and 2008. Both the globalization indices used in the study (the Maastricht Globalization Index and KOF Globalization Index) were

³For more details of the Web of Science categories, see <https://mjl.clarivate.com/help-center>

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shown to have a positive impact on sustainable development; moreover, the study revealed that the impact on competitiveness is larger than the impact on human development. Second, Fuinhas et al. (2017) analyzed the effect of trade openness on sustainable development, the latter as measured by the Index of Sustainable Economic Welfare (composed of inequality adjusted private consumption, benefits from unpaid household and volunteer work, public expenditures on education and health, capital growth, and the depletion of natural capital) for 14 OECD countries for the period 1995–2013. Their panel ARDL regression results suggested that trade openness affects long-term sustainable development negatively.

It seems that most empirical research tends to assume a linear relation between globalization and sustainable development. These incompatible results could be due to a linear modelling approach failing to capture this relationship. A popular hypothesis on non-linearity, the Kuznets curve, was put forth by Simon Kuznets in the 1950s, who proposed that the relation between economic growth and income inequality assumes the shape of an inverted U-curve (Kuznets, 1955). A few decades later, when the effects of economic development on the environment started to capture the attention of economists, Grossman and Krueger (1991) predicted that the relation between environmental pollution and economic development is also an inverted U-shaped curve; such curves are generally referred to as ‘environmental Kuznets curves.’ An early review of studies on the Kuznets curve and the environmental Kuznets curve by Borghesi and Vercelli (2003) concluded that the existing empirical literature seems to find globalization a process with unsustainable outcomes—their review found that developing countries at the time of research were in the diminishing phase of both the Kuznets curve and the environmental Kuznets curve. The reviewers also showed doubts about Kuznets bell-shaped curves, as the existence of a turning point is disputable and even if it does exist can only be achieved through strict institutional regulation. Nevertheless, they contended that placing sustainable development at the heart of the policy-making process would allow for globalization to push

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the world economy past the peak and downward part of the Kuznets bell-shaped curves, which would ensure a more sustainable economy.

All in all, studies examining the relation between globalization and sustainable development using multidimensional concepts remain scarce. Most of the existing studies pay attention to the two main aspects of sustainable development, human-economic development and the environment, separately. Moreover, the empirical results of studies regarding the relations between different dimensions of globalization and those of sustainable development are inconclusive about the effects of globalization on sustainable development. Hence, there is a need for empirical research investigating the impacts of globalization on sustainable development by means of a multidimensional approach.

4.3 Research strategy

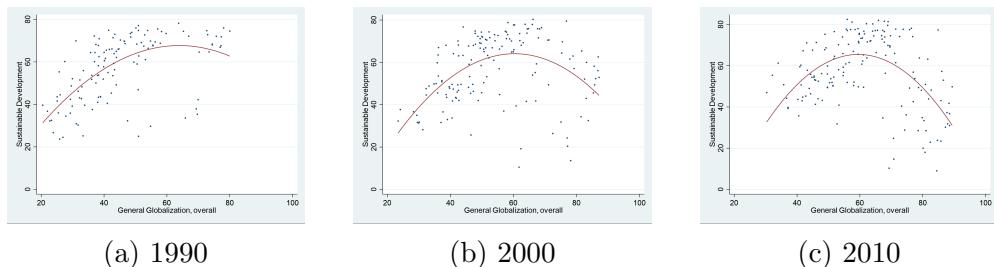
The main objective of this chapter is to investigate the relation between globalization and sustainable development as multidimensional concepts, as well as between their dimensions, by drawing on data from the relatively new Sustainable Development Index, which encompasses human-economic development and ecological dimensions of sustainable development.⁴ Different analyses of the impact of globalization on development found in the academic literature show contradictory results, and a possible non-linear relation between globalization and development is not explored. Real data for 1990, 2000, and 2010, such as those shown in Figure 4.1, suggest that this relation might be quadratic. Hence, in this analysis, both globalization and its square are included as explanatory variables for sustainable development. In addition, Copeland and Taylor (2003) argued that the income level of a country affects its environmental policies as high-income countries tend to demand stricter environmental policies, while Demena and Afesorgbor (2020) found that almost 95% of

⁴More details are provided in the data section.

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the studies regarded in their meta-analysis sample included the level of per capita income as one of the main determinants of environmental emissions in the relation with globalization. The previously discussed Kuznets curve (Kuznets, 1955) mapping the effect of income on inequality has been widely examined in the literature. It therefore seems reasonable to assume a possible non-linear effect of income on sustainable development. Hence, due to its consistently significant and sizable effects on human development and the environment as found in the literature (see e.g. York et al., 2003; Rosa et al., 2004; Jorgenson and Clark, 2011; Shahbaz et al., 2017; Xu et al., 2018), per capita income and its square are also included in this analysis. Figure 4.2 in addition suggests that a higher income level may not necessarily positively contribute to sustainable development. Borghesi and Vercelli (2003) for example questioned the existence of a real peak in the Kuznets curve; no clear evidence for this peak has been found.

Figure 4.1: Sustainable development and globalization in 1990, 2000, and 2010



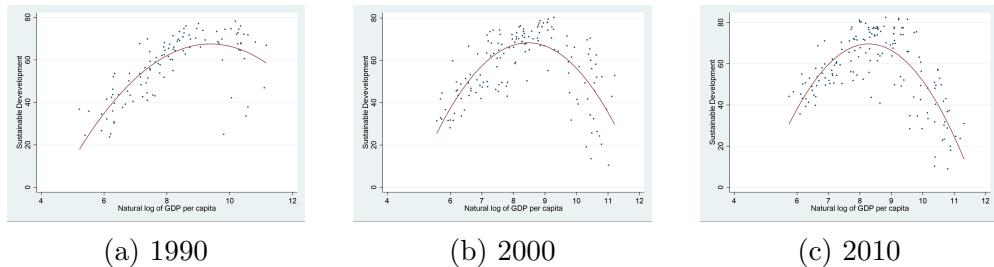
Data sources: Sustainable Development Index of Hickel (2020) measuring sustainability on a scale of 0–100, last accessed on February 18, 2020. Data on general globalization are from the KOF Globalization Index of Gygli et al. (2019), last accessed on March 4, 2022.

Note. The higher the Sustainable Development Index value, the higher the level of sustainable development of a country.

Furthermore, as both globalization and development are considered continuous processes, the effect of globalization on sustainable development may not instantly appear or may last longer than a

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Figure 4.2: Sustainable development and income in 1990, 2000, and 2010



Data sources: Sustainable Development Index of Hickel (2020), measuring sustainability on a scale of 0–100, last accessed on February 18, 2020. The log of GDP per capita is calculated from GDP per capita data provided by the World Development Indicators Database (World Bank, 2021), last accessed on March 4, 2022.

Note. The higher the Sustainable Development Index value, the higher the level of sustainable development of a country.

measurement period (in this case, annually) due to many spill-over channels. It then seems reasonable to include the lagged values of globalization and its square. In this chapter, the one-period lags of these variables are introduced to enrich the analysis. Empirically, the delayed effect could last longer than one year, but it is expected to be much less than in the first post year. Moreover, data used in this chapter cover only the period 1990 to 2018; adding more lags of a longer duration would significantly reduce the sample size. Besides globalization and per capita income, sustainable development could also be affected by the state of a country's democracy, the education level of its population, and population growth. These factors could play a role in channeling the effect of globalization on sustainable development, especially in the case of distributing the gains from international trade and are therefore included in the equation. This chapter assesses democracy levels as measured by the "Polity Score" from the Polity5 Project (<https://www.systemicpeace.org/polityproject.html>) (last accessed on April 12, 2022). The Polity5 Project measures key qualities of governing authorities of 167 countries and provides scores that determine the level of democracy, with countries ranging from fully institutionalized

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autocracies to fully institutionalized democracies. These Polity Scores have often been used as proxies for institutional quality and in this chapter are named *Democracy*. Meanwhile, the level of education (*Education*) is captured through the net primary school enrollment rate, measured by the ratio of children of official school age who are enrolled in schools to the population of the corresponding official school age. Data on these are provided by the World Bank's World Development Indicators 2021 (last accessed on March 1, 2023). Data on population growth (annual percentage) (*PopGrowth*) were also extracted from the World Bank's World Development Indicators 2021 (last accessed on March 1, 2023).

Ultimately, the full model of the multidimensional panel analysis in this chapter is shown in Equation (4.1) below:

$$\begin{aligned} SusDev_{it} = & \alpha_0 + \alpha_1 Glob_{it} + \alpha_2 (Glob_{it})^2 + \alpha_3 lnGDPpc_{it} + \alpha_4 (lnGDPpc_{it})^2 \\ & + \alpha_5 Glob_{it-1} + \alpha_6 (Glob_{it-1})^2 + \alpha_7 Democracy_{it} + \alpha_8 Education_{it} \\ & + \alpha_9 PopGrowth_{it} + \mu_i + \delta_t + \varepsilon_{it} \end{aligned} \tag{4.1}$$

where $SusDev_{it}$ is the sustainable development status of country i in year t (this could be the level of sustainable development itself as captured by the Sustainable Development Index of Hickel or its sub-indexes, also from the same database); $Glob_{it}$ is the globalization level of country i in year t (this could be the general level of globalization or for each sub-dimension); $lnGDPpc_{it}$, $Democracy_{it}$, $Education_{it}$, and $PopGrowth_{it}$ are the gross domestic product per capita measure under the natural log form, the Polity Score obtained from the Polity5 Project capturing the level of institutional democracy, the net primary school enrollment rate, and the annual population growth rate of country i in year t , respectively (for detail definitions and data sources, see Appendix 4B); μ_i is the within-country error term; δ_t is the unknown coefficient for the time

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regressors; and ε_{it} is the overall error term. Although the list of control variables seems limited, it should be kept in mind that the analyses in this chapter using Equation (4.1) are relatively exploratory and not the definite analysis if such analysis is ever possible.

The Sustainable Development Index displayed in Figure 4.1 captures two aspects of sustainable development: human-economic development and ecological sustainability. This figure suggests that there might be a local maximum where higher globalization level would become harmful for sustainable development. It seems that in the early stage of globalization, the Heckscher-Ohlin trade theorem (Heckscher and Ohlin, 1991) could be applicable; this theorem contends that international trade helps compensate for the uneven distribution of resources around the world and helps maximize global gross production as well as consumption. As countries become more globalized, production efficiency increases, cheaper goods are consumed, higher incomes are earned, and living standards increase, contrasting with the conditions of closed economies. On the downside, as production and consumption increase, more waste is generated, which is mostly dumped domestically. In this first stage, the positive effects of globalization on human-economic development could outweigh the negative impacts on the environment of continuously increasing production. In the second stage, however, as economies are opened up even more, freer flows of productive resources, manufactured goods, and financial capital are triggered, all of which could eventually become “a threat to national sovereignty, to accountable democracy, and to economic stability” (Rees, 2002, p. 257), and require more redistribution. At this stage, environmental degradation can no longer be ignored.

Therefore, globalization may have a non-linear relation with sustainable development—a hypothesis that is tested here by estimating Equation (4.1) with a stepwise procedure. The panel analysis starts with a bi-variate regression that includes only sustainable development

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explained by globalization. The squared globalization variable is then added to make the second step of the procedure. The third step allows for the combination of per capita income and its square to be included in the regressions. Next, the pair of lagged globalization and lagged squared globalization values is introduced in the fourth step. The last step is to analyze the full model when three control variables (*Democracy*, *Education*, and *PopGrowth*) are included. This entire procedure allows for robustness checks and together with the multidimensional approach, it produces a sufficient number of regressions results for a feasible self-meta-analysis.

Importantly, in acknowledging that both globalization and sustainable development are multidimensional concepts, this chapter goes on to investigate the correlation between their dimensions with the aim of contributing to a deeper understanding of the ways in which globalization could affect sustainable development. Hence, the stepwise procedure for analyzing Equation (4.1) mentioned above is followed in order to analyze the effects of general globalization on each of the sustainable development dimensions (the Development Index and the Ecological Impact Index), as well as the effects of the globalization dimensions (economic, social, and political globalization) on sustainable development and each of its dimensions. Moreover, the KOF Globalization Index drawn on in this chapter offers two approaches to measuring globalization and its dimensions: *de facto* and *de jure* globalization, besides the *overall* measure, which is the average of these two. Gygli et al. (2019) define *de facto* globalization as the measure of the actual flows across national borders, while *de jure* globalization is referred to as the measure of policies and institutions that facilitate or hinder these actual flows. To attain a more comprehensive overview of the relation between globalization and sustainable development and to offset the potential effects of different measures, this chapter besides using the *overall* globalization measure thus also applies *de facto* and *de jure* globalization measures. This stage of the analysis hence provides a full matrix of the effects of multidimensional

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globalization on multidimensional sustainable development.

As mentioned above, the Sustainable Development Index includes two important aspects of sustainable development: human-economic development and ecological impact. Figure 4.2 indicates that countries seem to become less sustainable after a certain level of per capita income is surpassed—this seems to contest the conventional belief set by the Kuznets curve and the environmental Kuznets curve. The Kuznets curve (Kuznets, 1955) hypothesizes that as per capita income increase, income inequality first rises then decreases after income passes a turning point. While the environmental Kuznets curve emerged from Grossman and Krueger (1991) predicting that the relation between environmental degradation and per capita income can be represented as an inverted U-shaped curve. This environmental Kuznets curve hypothesis is based on two assumptions: (1) in the process of development, the economy shifts from green agriculture to polluting industry before it ends up with a clean service sector, and (2) as income rises, people demand a better living environment (Dinda, 2004). However, both the original Kuznets curve and the environmental Kuznets curve have been challenged, both theoretically and empirically, for example by Lyubimov (2017) and Stern (2004). This might as well be a good opportunity to, once again empirically, test these two hypotheses. Thus, in addition to analyzing the relation between globalization and sustainable development, the analysis in this chapter also allows for the testing of the possible existence of a non-linear relation between income and sustainable development based on the Kuznets curve and the environmental Kuznets curve.

Finally, as the data for globalization and sustainable development in this chapter is a panel, it is necessary to control for country and time trend effects when analyzing this relation. Hence, a Hausman test has been performed and the results suggest that countries fixed-effects model should be used, while time dummies are also added to account for the time effects. In addition, while the sample of up to 160 countries is likely not

too small but to make the estimate results more robust, bootstrapping method is used to resample the data to increase the robustness of the regression standard errors. The resampling process is performed by adding the option *vce(bootstrap)* to the *xtreg* command in the statistical software Stata (version: Stata 17; 64-bit).

4.4 Data

As discussed in Chapter 1, globalization in this thesis is conceptualized as a multidimensional process with the three main dimensions: social globalization, political globalization, and economic globalization. The KOF Globalization Index first introduced by Dreher (2006) captures these three dimensions of globalization and therefore informs this chapter's empirical analyses. Many studies have used this index and its dimensional sub-indexes especially in the last decade to measure globalization, for example those by Midiyanti and Yao (2019), Lee et al. (2022), Chu et al. (2016), Lee et al. (2015), Rao and Vadlamannati (2011), Rao et al. (2011), Chang and Lee (2011), Chang et al. (2011), and Chang and Lee (2010). Table 4.1 provides a brief overview of these studies.⁵

Given the importance of studying the consequences of globalization, numerous attempts have been made to measure globalization using indicators such as the CSGR Globalization Index (Lockwood and Redoano, 2005), the A.T. Kearney/Foreign Policy Magazine Globalization Index, the GlobalIndex (Raab et al., 2008), the Maastricht Globalization Index (Martens and Raza, 2009; Figge and Martens, 2014), and the KOF Globalization Index (Gygli et al., 2019). Table 4.3 provides an overview of popular globalization measurement indexes. Of these indexes, the KOF Globalization Index has been used most often in empirical studies of the consequences of globalization (Potrafke, 2015). The index (2021 version) is available for 203 countries (which is quite clo-

⁵For a more comprehensive review of studies using the KOF Globalization Index, see Potrafke (2015).

Table 4.3: Globalization measurement indices

Index	Provided by	Coverage	Period	Number of indicators	Dimension	Reference
G–Index	World Markets Research Centre	185 countries	30-year period*	6	Economic	Randolph (2001) in Dreher et al. (2008)
CSGR Globalization Index	Centre for Study of Globalization and Regionalization at Warwick University	62 countries	1982–2004	16	– Economic – Social – Political	Lockwood and Redoano (2005)
ATK/FP Globalization Index	A.T. Kearney and Foreign Policy Magazine	72 countries	1998–2005	16	– Economic integration – Personal contact – Technology – Political engagement	A.T. Kearney/ Foreign Policy (2007)
GlobalIndex	TransEurope research program of the European Science Foundation	97 countries	1970–2002	31	– Economic – (Socio-)technological – Cultural – Political	Raab et al. (2008)
Maastricht Globalization Index	Maastricht Sustainability Institute at Universiteit Maastricht	117 countries	2000, 2008, 2012	11	– Political – Economic – Social and cultural – Technological – Ecological	Figge and Martens (2014)
KOF Globalization Index	KOF Swiss Economic Institute at ETH Zurich	197 countries	1970–2019	43	– Economic – Social – Political	Gygli et al. (2019)

Note. *“For some countries, there is an analysis of the evolution of the scores over a 30-year period” (Dreher et al., 2008, p. 27). The exact period cannot here be identified, as the original data set and its references are no longer accessible through open sources.

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-se to the global coverage), covering the period 1970–2019 and including 43 underlying variables encompassing various aspects of the three main dimensions of globalization (economic, social and political). Moreover, the index is updated annually and provides data not only on the general index but also on the component sub-indexes of economic, social, and political globalization. Another globalization index that also has wide coverage (117 countries) is the Maastricht Globalization Index. Although this index encompasses more dimensions of globalization (political, economic, social, and cultural, technological, and ecological), in comparison with the KOF Globalization Index it has fewer underlying variables, which could make it less accurate.

Sustainable development for this thesis is conceptualized, in Chapter 1, as the process on improving human-economic welfare in a way that does not jeopardize the environment on the long term. As sustainable development is a multifaceted concept that is broader than a set of indicators such as ecological footprint, poverty rate, environmental performance, social development, or competitiveness, a problematic but crucial issue is determining the best way in which to measure sustainable development. To measure sustainable development, an encompassing index covering the main elements of sustainable development, human-economic development and ecological impact is needed. The Sustainable Development Index (Hickel, 2020) is suitable for its wide coverage (available for 166 countries in the period 1990-2019) and encompasses human-economic development and ecological dimensions of sustainable development. The coverage of the Sustainable Development Index can be considered a good match with the coverage of the KOF Globalization Index.

In sum, data on general globalization (*Glob*), economic globalization (*GlobEcon*), social globalization (*GlobSoc*), and political globalization (*GlobPol*) were extracted from the 2021 version of the KOF Globalization Index data set (Gygli et al., 2019, last accessed on March 4, 2022).

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Data on sustainable development were retrieved from the Sustainable Development Index (Hickel, 2020) on April 14, 2021, while data on the dimensions of sustainable development (Development Index and Ecological Impact Index) were supplied on March 2, 2022, by Professor Jason Hickel and his colleague, Huzaifa Zoomkawala. Data used to measure sustainable development (*SusDev*) and its dimensions, the Development Index (*SDIDev*) and the Ecological Impact Index (*SDIEco*), were then obtained by multiplying the original indexes by 100. This was done to bring the sustainable development and globalization variables to the same measurement scale—the KOF Globalization Index uses a scale of 0–100, while the Sustainable Development Index uses a scale of 0–1. Data on the GDP per capita data were taken from the World Development Indicators Database (World Bank, 2021, last accessed on March 4, 2022). In this analysis, the real GDP per capita in 2015 constant U.S. dollar was used. Data on institutional quality (*Democracy*) came from the 2018 version of the Polity5 Project (Marshall and Gurr, 2020, last accessed on March 11, 2022). Finally, due to the simultaneous availability of data from the abovementioned sources, the sample covers only the period 1990–2018 for 160 countries (the full list of countries can be found in Appendix 4A). Table 4.4 shows the descriptive statistics of all variables, Appendix 4B presents the details of variable definitions and data sources, while Appendix 4C shows the pairwise correlations between these variables.

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Table 4.4: Descriptive statistics

Variable	Short definition	Obs.	Mean	St. dev.	Min.	Max.
<i>SusDev</i>	Sustainable Development Index	4,337	56.64	16.78	7.90	85.00
<i>SDIDev</i>	Development Index of SDI	4,370	70.36	16.93	20.69	96.51
<i>SDIEco</i>	Ecological Impact Index of SDI	4,627	141.37	103.04	100	1098.44
<i>Glob</i>	KOF General Globalization Index	4,615	55.96	16.22	18.87	90.73
<i>GlobEcon</i>	KOF Economic Globalization sub-index	4,586	53.64	16.16	14.51	94.96
<i>GlobSoc</i>	KOF Social Globalization sub-index	4,615	52.88	20.43	6.40	91.59
<i>GlobPol</i>	KOF Political Globalization sub-index	4,615	61.50	21.55	7.43	98.14
<i>Glob_df</i>	<i>De facto</i> measure of <i>Glob</i>	4,615	53.82	15.91	18.70	91.28
<i>GlobEcon_df</i>	<i>De facto</i> measure of <i>GlobEcon</i>	4,586	54.64	17.11	8.09	98.34
<i>GlobSoc_df</i>	<i>De facto</i> measure of <i>GlobSoc</i>	4,615	49.63	21.83	3.62	97.56
<i>GlobPol_df</i>	<i>De facto</i> measure of <i>GlobPol</i>	4,615	57.12	24.77	3.67	98.85
<i>Glob_dj</i>	<i>De jure</i> measure of <i>Glob</i>	4,615	58.11	17.52	9.21	93.59
<i>GlobEcon_dj</i>	<i>De jure</i> measure of <i>GlobEcon</i>	4,532	52.55	20.02	12.21	94.52
<i>GlobSoc_dj</i>	<i>De jure</i> measure of <i>GlobSoc</i>	4,615	56.10	20.19	6.58	92.38
<i>GlobPol_dj</i>	<i>De jure</i> measure of <i>GlobPol</i>	4,615	65.87	20.59	1.37	99.69
<i>lnGDPpc</i>	Natural log of GDP per capita	4,478	8.38	1.46	5.21	11.38
<i>Democracy</i>	Polity5 score	4,221	3.44	6.42	-10	10
<i>Education</i>	Primary school enrollment rate	2,744	87.90	14.01	19.19	100
<i>PopGrowth</i>	Population growth rate	4,639	1.53	1.77	-27.72	19.36

Note. SDI is the Sustainable Development Index of Hickel (2020). GDP per capita is the real Gross Domestic Product per capita in 2015 constant U.S. dollar. Obs. is short for Number of observations. Min. and Max. are short for Minimum and Maximum, respectively. St. dev. is short for Standard deviation.

4.5 Empirical results

It is worth noting that because data on globalization, its dimensions, per capita income, and other control variables are not simultaneously available for all countries or years, the panel data used for this chapter is not strongly balanced, and the number of observations in each regression depends on the set of regressors included in that regression. Based on the results of the Hausman test, a fixed effects specification is used to account for country-invariant unobservable heterogeneity potentially correlated with the explanatory variables, while time dummies for each year are also included to control for the time trend effects. Besides, all standard errors are robustly estimated under the non-parametric bootstrap sampling.

The estimated results of Equation (4.1) showing the relations between globalizations (general and dimensional globalization with three measurement foci – *overall*, *de facto*, and *de jure*) and sustainable development as well as its dimensions (human-economic development and ecological impact) are summarized in Table 4.5, Table 4.6, and Table 4.7, respectively. The full estimate results from the stepwise procedure that was used to analyze Equation (4.1), as discussed in Section 4.3, are shown in Appendix 4D at the end of this chapter.

4.5.1 Sustainable development and globalization

Table 4.5 displays a summary of the estimated results of the last two steps of the stepwise procedure analyzing Equation (4.1) for the effects of (general and dimensional) globalization on sustainable development. Figure 4.1 suggests possible non-linear (and even quadratic with local maximum/minimum) effects of globalization on sustainable development. From Table 4.5, we can see that, except for *de jure* social globalization and *de facto* political globalization, the relation between globalization and sustainable development is non-linear. For general, economic, and social globalization, the estimate results suggest an inverted-U-shaped

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relation between sustainable development and these three proxies of globalization; however, U-shaped relations are found for the *de jure* measurements. Moreover, *overall* and *de jure* political globalization both appear to have a U-shaped relation with sustainable development, while *de facto* political globalization has no statistically significant effect on sustainable development. In other words, any changes in globalization could affect sustainable development in a non-linear way for the same period, but the direction and significance of the effects seem to depend first on the dimension of globalization and second on the measurement foci (whether we consider actual flows of globalization or the policies on globalization). At this point, a non-linear effect of globalization on sustainable development can be discerned, but such an effect could contain much noise and could be hard to predict.

If we stop here, the sign of the effect of globalization on sustainable development seems to be inconsistent. However, as discussed earlier, both globalization and sustainable development are considered continuous processes, which is why lagged values of globalization and squared globalization were introduced into the model. Table 4.5 indicates that the estimated results of the lagged effects are more consistent in terms of the signs of the coefficients, with fewer instances of statistical insignificance. Such observations support the hypothesis that a delay period before globalization can affect sustainable development. Thus, in most of the cases shown in Table 4.5 (except for *de facto* social globalization), substantial evidence is found for an inverted-U-shaped relation between sustainable development and globalization. In this relation, when a country increases its level of globalization, its level of sustainable development is affected; the effect of the shock depends on the characteristics of globalization (economic, social, or political; *de facto* or *de jure*), but the true extent of its effects, which can be expressed as an inverted-U-shape, might only become clear after one year. Moreover, an inverted-U-shaped relation means that countries can benefit from globalization but that there could be a local maximum at which higher l-

Table 4.5: Sustainable development and globalization

Dependent variable: <i>SusDev</i>	General globalization						Economic globalization						Social globalization						Political globalization						
	<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
Globalization	++	+	++	++	NS	-	++	NS	++	+	NS	--	++	++	++	++	NS	NS	-	--	NS	NS	--	--	
Square of globalization	--	-	--	--	NS	++	--	NS	--	-	NS	++	--	--	--	--	NS	NS	++	++	NS	NS	++	++	
Log (per capita GDP)	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
Square of Log (per capita GDP)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Lag1 of Globalization	++	++	++	++	++	++	++	++	++	++	++	+	++	++	++	++	++	++	++	++	+	NS	++	++	
Lag1 of Square of globalization	--	--	--	--	--	--	--	--	--	--	NS	-	NS	NS	NS	--	--	--	--	--	NS	--	--	--	
<i>Democracy</i>		NS		NS		+		NS		NS		NS		NS		NS		NS		NS		NS		NS	
<i>Education</i>		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	
<i>PopGrowth</i>		-		--		--		--		NS		-		NS		-		-		-		NS		-	
Number of countries	159	140	159	140	159	140	158	139	158	139	156	138	159	140	159	140	159	140	159	140	159	140	159	140	140
Number of observations	4091	2389	4091	2389	4091	2389	4063	2361	4063	2361	4047	2354	4091	2389	4091	2389	4091	2389	4091	2389	4091	2389	4091	2389	
Adjusted R-squared (within)	0.53	0.59	0.55	0.56	0.49	0.56	0.49	0.56	0.50	0.58	0.44	0.53	0.53	0.59	0.51	0.56	0.51	0.58	0.44	0.52	0.43	0.51	0.44	0.52	

Note. The estimation method is country fixed effects. Year dummies are included. Regression samples were bootstrapped.

Remarks:

“+” and “++” mean the coefficient is positive and statistically significant at least at the 10% and 5% level, respectively.

“-” and “--” mean the coefficient is negative and statistically significant at least at the 10% and 5% level, respectively.

“NS” means the coefficient is not statistically significant even at the 10% level.

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-evel of globalization would start to hinder sustainable development.

In addition, income variables show an inverted-U-shaped relation with sustainable development in most of the cases. This provides another reason for testing the Kuznets curves in this chapter. Regarding the other control variables, *Democracy* is shown to have a positive effect in only one case in the *de jure* general globalization model, while Table 4.5 reveals that *Education* has no effect and that *PopGrowth* (population growth) appears to have a negative effect in many of the cases across the four models. It therefore appears that leaning more towards a democratic regimes and higher primary school enrollment rates might not necessarily foster sustainable development, while accelerated population growth could place more pressure on the development process, which could make it less sustainable.

In summary, the results indicate that globalization could have a non-linear effect on sustainable development regardless of the dimension of globalization considered; they also indicate that the focus of measurement of globalization (*de facto* or *de jure*) could influence the statistical significance of the effects. Besides, as discussed, both globalization and sustainable development are multidimensional phenomena. Hence, this chapter also investigates the effects that general globalization and its dimensions could have on each of the respective dimensions of sustainable development. Moreover, Hickel (2020) showed that the Sustainable Development Index is constructed by dividing the Development Index by the Ecological Impact Index. This suggests an inverted-U-shaped relation between globalization and the Development Index and a U-shaped relation between globalization and the Ecological Impact Index. The same predictions are made for the relations between per capita income and each of the dimensions of sustainable development. Here, it may be helpful to recall that in the formula of the Sustainable Development Index, the Development Index captures the human-economic development aspect, while the Ecological Impact Index describes the pressure a country

places on its natural environment and resources.

4.5.2 Human-economic development and globalization

Table 4.6 shows a summary of the estimated results of the last two steps of the stepwise procedure analyzing Equation (4.1) for the effects of (general and dimensional) globalization on human-economic development. This component of sustainable development is captured by the Development Index, a sub-index of the Sustainable Development Index. As the Sustainable Development Index is constructed by dividing the Development Index by the Ecological Impact Index (Hickel, 2020), we can hypothesize that the direction of the non-linear effects of globalization on human-economic development will be similar to that of the non-linear effects of globalization on sustainable development (an inverted-U-shape with a local maximum), as found and discussed in the previous sub-section.

Table 4.6 shows fewer instances of significant effects of globalization on human-economic development for both current and lagged values of globalization than Table 4.5. An inverted-U-shaped relation between globalization and human-economic development is found in the cases of general globalization (all three foci of measurement), *overall* economic globalization and *overall* and *de facto* social globalization, but only in the absence of the three control variables (*Democracy*, *Education*, and *PopGrowth*). No effect was found for political globalization, *de jure* social globalization, and *de facto* and *de jure* economic globalization. As the previous sub-section on the relation between sustainable development and globalization suggests, it is necessary to look at the coefficients of globalization's lagged values. In the case of *de facto* general globalization, *overall* and *de facto* economic globalization, and social globalization (all three foci of measurement), inverted-U-shaped relations are found in the full models (for *de jure* social globalization only without control variables)

Table 4.6: Human-economic development and globalization

Dependent variable: <i>SDIDev</i>	General globalization						Economic globalization						Social globalization						Political globalization							
	<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)		
Globalization	++	NS	++	NS	++	NS	++	NS	NS	NS	NS	NS	++	NS	++	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Square of globalization	--	NS	--	NS	--	NS	-	NS	NS	NS	NS	NS	-	NS	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Log (per capita GDP)	++	++	++	++	++	++	++	++	++	++	++	++	++	NS	++	++	++	NS	++	++	++	++	++	++	++	
Square of Log (per capita GDP)	--	NS	--	-	--	--	--	--	--	--	--	--	NS	NS	--	NS	NS	NS	--	--	--	--	--	--	--	
Lag1 of Globalization	NS	NS	NS	++	NS	NS	NS	++	NS	++	NS	NS	++	++	++	++	++	++	--	--	NS	NS	--	--	--	
Lag1 of Square of globalization	NS	NS	NS	--	NS	NS	NS	-	NS	-	+	NS	NS	-	--	--	--	NS	++	++	NS	NS	++	++	++	
<i>Democracy</i>	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	
<i>Education</i>	++		++		++		++		++		++		++		++		++		++		++		++		++	
<i>PopGrowth</i>	NS		NS		NS		NS		NS		NS		NS		NS		NS		+		NS		NS		+	
Number of countries	159	140	159	140	159	140	158	139	158	139	156	138	159	140	159	140	159	140	159	140	159	140	159	140	140	
Number of observations	4101	2389	4101	2389	4101	2389	4073	2361	4073	2361	4057	2354	4101	2389	4101	2389	4101	2389	4101	2389	4101	2389	4101	2389	4101	
Adjusted R-squared (within)	0.89	0.90	0.89	0.90	0.89	0.89	0.88	0.89	0.88	0.89	0.88	0.89	0.90	0.91	0.89	0.90	0.90	0.91	0.88	0.90	0.88	0.89	0.89	0.90	0.90	

Note. The estimation method is country fixed effects. Year dummies are included. Regression samples were bootstrapped.

Remarks:

“+” and “++” mean the coefficient is positive and statistically significant at least at the 10% and 5% level, respectively.

“-” and “--” mean the coefficient is negative and statistically significant at least at the 10% and 5% level, respectively.

“NS” means the coefficient is not statistically significant even at the 10% level.

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These results partially match those obtained from the estimates of the relation between sustainable development and globalization shown in Table 4.5. However, *overall* and *de jure* political globalization are shown to have a consistent U-shaped relation with human-economic development, which matches the results of the current values but is the opposite of the results of lagged values of *overall* and *de jure* political globalizations in relation with sustainable development. In summary, while the results shown in Table 4.6 indicate that the lagged values of globalization have a greater effect on sustainable development than the current values of globalization, a non-linear (U-shaped or inverted-U-shaped) relation between globalization and sustainable development remains central.

While more instances of statistical insignificance are evident for the pair of income variables, in general, the results are consistent with those in Table 4.5 in that both indicate an inverted-U-shaped relation between per capita income and human-economic development. Regarding the other three control variables, *Democracy* is found to have no effect across the models, *PopGrowth* only shows a positive impact on human-economic development of *de jure* social and political globalizations, while *Education* appears to have a positive effect on human-economic development for all models. These results emphasize the importance of education for human development and economic development, even if only the primary school enrollment rate is considered.

4.5.3 Ecological impact and globalization

Besides human-economic development, sustainable development also has a second dimension, namely ecological impact. This dimension is captured in the Ecological Impact Index, a sub-index of the Sustainable Development Index used to obtain the estimates shown in Table 4.5. As the Sustainable Development Index is obtained by dividing the Development Index by the Ecological Impact Index (Hickel, 2020),

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this sub-section theorizes that the direction of the non-linear effects of globalization on ecological impact as a dimension of sustainable development will be the opposite (U-shaped with a local minimum) of that of the effects of globalization on sustainable development in the previous sub-section. Table 4.7 presents a summary of the estimated results of the last two steps in the stepwise procedure analyzing Equation (4.1) for the effects of (general and dimensional) globalization on ecological impact as a dimension of sustainable development.

Table 4.7 shows more instances of a statistically insignificant relation between the studied concepts when compared to Table 4.5, but fewer than those in Table 4.6. Contradicting a priori expectations, more than half (four out of seven) of the significant non-linear relations between globalization and ecological impact shown in Table 4.7 are inverted-U-shaped. It is also worth noting that these seven non-linear relations appear in models where the current values of globalization are found to have no statistically significant effect on human-economic development. In addition, six of the seven non-linear relations shown in Table 4.7 have opposite signs to those in the same models in Table 4.5. This finding is in line with the general hypothesis stating that the effect of globalization on ecological impact will be opposite to that of globalization on sustainable development, as the formula of the Sustainable Development Index suggests.

Concerning the lagged values of globalization, Table 4.7 contains more instances of insignificant effects in comparison to Table 4.5, but fewer than those in Table 4.6. And unlike in Table 4.6, where the lagged values of political globalization have opposite signs to the lags of other proxies of globalization, in Table 4.7, the lags of all proxies of globalization show U-shaped relations with ecological impact in at least one model. It should be noted that the lagged values of social globalization show a negative effect on ecological impact for all six models, with the only exception being the *de facto* social globalization model without control variables, -

Table 4.7: Ecological impact and globalization

Dependent variable: <i>SDIEco</i>	General globalization						Economic globalization						Social globalization						Political globalization						
	<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		<i>Overall</i>		<i>De facto</i>		<i>De jure</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
Globalization	NS	NS	NS	--	NS	++	NS	NS	--	NS	NS	++	NS	-	NS	-	NS	NS	NS	NS	+	NS	NS	++	
Square of globalization	NS	NS	NS	++	NS	--	NS	NS	++	+	NS	--	NS	NS	NS	+	-	NS	NS	NS	--	NS	NS	--	
Log (per capita GDP)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Square of Log (per capita GDP)	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
Lag1 of Globalization	--	--	-	NS	--	--	--	NS	NS	NS	--	NS	-	-	--	--	-	--	NS	-	NS	NS	NS	--	
Lag1 of Square of globalization	++	++	+	NS	+	++	++	NS	NS	NS	++	NS	NS	++	NS	NS	NS	NS	+	NS	NS	NS	NS	++	
<i>Democracy</i>		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	
<i>Education</i>		++		++		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	
<i>PopGrowth</i>		++		++		++		++		++		++		++		++		++		++		++		++	
Number of countries	159	140	159	140	159	140	158	139	158	139	156	138	159	140	159	140	159	140	159	140	159	140	159	140	
Number of observations	4323	2444	4323	2444	4323	2444	4295	2416	4295	2416	4250	2399	4323	2444	4323	2444	4323	2444	4323	2444	4323	2444	4323	2444	
Adjusted R-squared (within)	0.36	0.48	0.36	0.50	0.36	0.50	0.35	0.46	0.36	0.47	0.35	0.48	0.36	0.49	0.37	0.48	0.36	0.49	0.34	0.46	0.34	0.45	0.35	0.47	

Note. The estimation method is country fixed effects. Year dummies are included. Regression samples were bootstrapped.

Remarks:

“+” and “++” mean the coefficient is positive and statistically significant at least at the 10% and 5% level, respectively.

“-” and “-” mean the coefficient is negative and statistically significant at least at the 10% and 5% level, respectively.

“NS” means the coefficient is not statistically significant even at the 10% level.

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-where a U-shaped relation is found. It could be the case that sharp increases in tourism, the excessive use of energy for international information exchange, and other factors contribute to this negative impact of social globalization on the environment. Thus, the results of the coefficients in the cases of the lagged values of globalization tend to support the general hypothesis in this sub-section that globalization in the form of lags could have a U-shaped relation with ecological impact. Hence, when being included in the data set for self-meta-analysis conducted in the next section, it is reasonable for coefficients in Table 4.7 to have opposite signs.⁶

In addition, *Democracy* once again appears to have no effect on sustainable development, in this case through ecological impact. The empirical results presented in Table 4.5, Table 4.6, and Table 4.7 indicate that institutional political regimes may not affect the process of sustainable development. Moreover, *Education* has no effect on ecological impact, either, which may be the reason why we could not find evidence of its significance in the sustainable development models but only in the human-economic development model. Thus, education could boost only the human-economic aspect of sustainable development, but only at the primary-school level; however, this hardly helps with sustainability, which might require a higher level of education. Lastly, it is not surprising to see a higher population growth rate placing more pressure on the environment, as suggested in Table 4.7. Such results seem to be in line with the argument about our world being overpopulated.

Finally, across all 24 models in Table 4.7, the pair of income variables always show a U-shaped relation with ecological impact. This direction is opposite to that shown in Table 4.5, which is reasonable when bearing in mind the formula of the Sustainable Development Index. Hence, the non-linear relation between per capita income and sustainable development is considered significant and robust, while that between globalization and

⁶See Section 4.6 for a more detailed discussion on this practice.

sustainable development still contains notable noise. For this reason, a meta-analysis is reasonable and necessary.

4.6 Genuine effects and explaining the differences in the effects of globalization – a self-meta-analysis (SMA)

My estimations of the effects of globalization and its square shown in the previous section use comparable fixed-effects models. The results obtained from these regressions generally suggest a quadratic relation between globalization (both current and lagged values) and sustainable development. However, the findings are not always consistent, as there are cases where the relation is either the opposite or insignificant. How can these different findings be synthesized? This is a relevant question because the size of the effects also varies across different specifications that reflect the different dimensions of both globalization and sustainable development. In this section, I attempt to detect the genuine effect and account for these differences in a transparent manner. In economics, meta regression analyses are increasingly being used to synthesize heterogeneous findings. Hence, this tool is used here to analyze the specifications in this chapter, but in a slightly different way through a so-called self-meta-analysis (SMA).

It might be useful to first take a look at what a meta-analysis is, how it has been used in economic research, and how a self-meta-analysis differs from a standard meta-analysis. First, a meta-analysis according to Field (2001, p. 161) “is a statistical technique by which information from independent studies is assimilated.” Meta-analyses are considered more objective than traditional literature reviews, as the latter tend to suffer from human selection bias (Field, 2001, p. 161). Stanley and

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Jarrell (2005) pointed out that meta-analyses were initially and frequently used in psychological and educational research and then attempted to introduce meta-analyses into the field of economic research, asking “why there is so much variation among the reported empirical results of economic research [...] when they are purportedly investigating the same phenomenon” (Stanley and Jarrell, 2005, p. 209). They suggested that a quantitative method learning from the health and social science research could help with integrating and explaining variations in the literature. Meta-analyses are expected to reveal which specific parameters or factors might contribute to this variation and could separate the genuine effect from, most of the time, the publication bias. Since then, meta-analysis has increasingly been used in economic research—a simple search conducted on March 11, 2023, in the Web of Science Core Collection⁷ database using the formula “*economic*” AND “*meta-analysis*” only in the field “Topic” yielded 4,603 results; of these publications, 4,023 were published between 2010 and 2022.

The meta-analysis conducted in this chapter uses a data set composed of all the reported effects of globalization and its square in Section 4.5; it is therefore called a self-meta-analysis (SMA). It is worth noting that three different dependent variables are used in Section 4.5: sustainable development, the Development Index, which has a positive correlation with sustainable development, and, lastly, the Ecological Impact Index, which has an inverse relation with sustainable development. Consequently, the effects of globalization and its squared term on the Ecological Impact Index are not directly the effect they have on sustainable development, in terms of size and direction. If the estimated effects from regressions with the Ecological Impact Index as dependent variable are included plainly in the self-meta-analysis data set, the analysis would therefore be imprecise. These estimated effects

⁷The query link to this search conducted on this Web of Science database on March 11, 2023 is <https://www.webofscience.com/wos/woscc/summary/55471490-aebb-49fa-86b6-c16c6215049b-77e173c6/relevance/1>

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(coefficients of globalizations and of squared globalizations) are thus given opposite signs in the SMA data set.

Instead of integrating the variations disclosed by various independent studies in the literature of the same research question, in this chapter the meta-analysis method is used to explain the variation arising from the same study. Unlike standard meta-analyses that require data collection, including a specific process of selecting and incorporating empirical studies into the meta-analysis data set, all data for the SMA comes from the current chapter itself, which should eliminate the possibility of selection bias. Also, as the variation occurs within the same study, a publication bias induced by the review and publication process of academic studies should not even exist. Thus, in the SMA, a possible bias from external sources, such as publication bias, is less likely; instead, a tendency to report the effects due to the nature and characteristics of the chapter can be discerned. The factors that could inform this tendency are discussed later in this section; the SMA is conducted in the same way as a standard meta-analysis.

First, this SMA starts with a useful inspection of a graphic representation of findings, as do standard meta-analyses. Figure 4.3 and Figure 4.4 display the funnel plots for the effects of globalization and squared globalization, respectively. In Figure 4.3, the funnel plots are skewed to the right, suggesting a tendency of finding positive estimates of the effects of globalization. On the other hand, in Figure 4.4, the funnel plots are skewed to the left, suggesting a tendency of reporting negative effects of squared globalization. Table 4.8 provides a detailed overview of such tendencies, including the summary statistics of the simple (unweighted) and weighted (inverse-variance weighting) averages of the coefficients of globalization and squared globalization reported in Section 4.5. In Panel A of Table 4.8, both the simple and weighted averages of the effects of globalization, the effects of general globalization, the effects of economic globalization, and the effects of social globalization

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are significant at the 1% level, while in the case of political globalization, no average is found to be statistically significant. In Panel B, for the effects of squared globalization, both simple and weighted averages are significant at the 1% level, with the same pattern as in Panel A; they are insignificant in the case of political globalization. In general, with political globalization being the exception, Panel A suggests a positive effect of globalization, while Panel B suggests a negative effect of squared globalization.

In a meta-regression-analysis, without bias, the estimated effect should be independent of its standard error. Thus, in Equation (4.2) below, β_1 should be insignificant. In contrast, with the existence of bias, the genuine effect can be identified by estimating Equation (4.3). The equations are expressed as follows:

$$effect_i = \beta_0 + \beta_1 se_i + \alpha X + \mu_i \quad (4.2)$$

$$t_i = \frac{effect_i}{se_i} = \beta_1 + \beta_0 \frac{1}{se_i} + \alpha \frac{X}{se_i} + \varepsilon_i \quad (4.3)$$

where $effect_i$ is an individual estimated effect of regression i , se_i is its standard error, X is a vector of moderator variables in case of bias existence, and μ_i is the error term. When both sides of Equation (4.2) are divided by the individual standard error, we have β_0 as the genuine effect, while β_1 is the bias coefficient. However, this is not a standard meta-analysis, which is mostly used to estimate the genuine effect after eliminating publication bias across many studies in the existing literature. Instead, in this chapter, the self-meta-analysis is conducted based on a single study, and all the data come from Section 4.5, i.e., from the same study. Thus, by definition, there should not be a publication bias in this case, as the chapter was not published by the time that the meta-analysis was performed. Therefore, the bias in the standard meta-analysis

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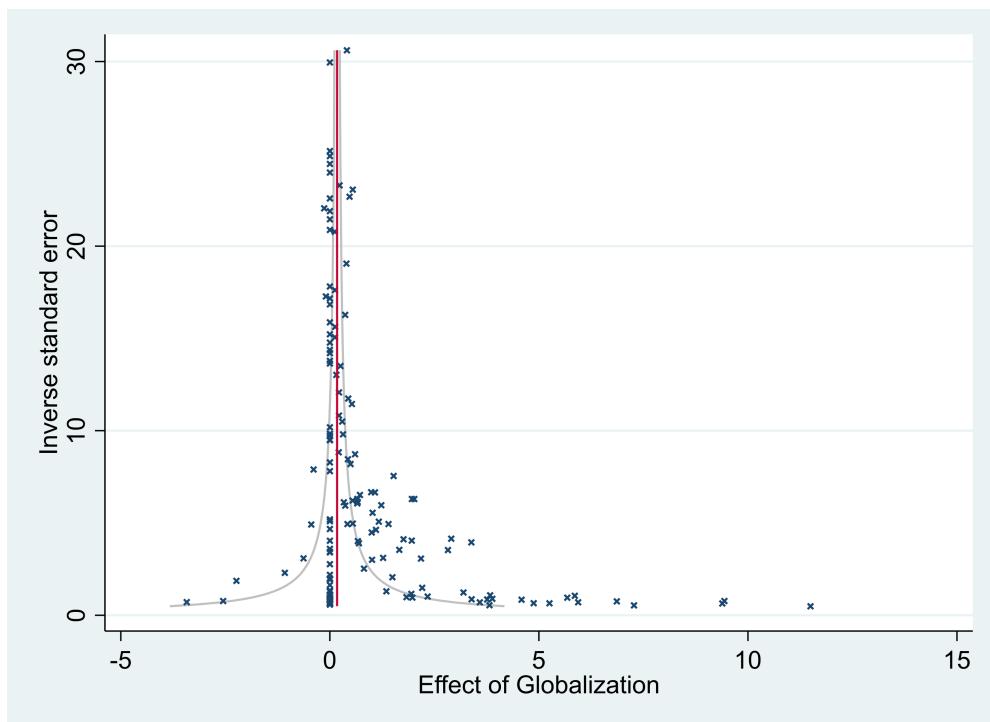
could be considered a self-bias or a tendency in reporting estimated coefficients that in the case of this chapter could be the results of using a multidimensional approach that leads to differences in measurement and to different specifications due to the stepwise procedure that is followed when analyzing Equation (4.1). To explain the differences or the tendency in reporting the effects of globalization and of squared globalization, four potential sources of heterogeneity (X) are considered in the SMA: (1) the sample size, (2) the model specifications (the inclusion of different control variables—differences in the right-hand side of the equation, and the use of different dependent variables—differences in the left-hand side of the equation), (3) the measurement foci of globalization (*overall*, *de facto*, or *de jure*), and (4) the proxy of globalization (general, economic, social, or political globalization). Appendix 4F shows the definitions of all moderator variables as well as their summary statistics.

This chapter contains 180 estimations of the effect of globalization and 144 estimations of the effect of squared globalization (see Appendix 4D for details). For the SMA, thus, only 144 estimations of the effect of both globalization and squared globalization could be considered, as the main purpose is to investigate the validity of a non-linear relation between globalization and sustainable development. The full data set used in this SMA is shown in Appendix 4E, while Appendix 4F displays the definitions and summary statistics (including means and standard deviations) of all explanatory variables. Due to limited data availability, the sample size of these estimations ranges from 2,354 to 4,606 observations. In terms of model specification, 50% of the estimations include lagged values of globalization, while 75% of estimations include per capita income variables. Additionally, 25% control for other variables, as the analysis is performed in a stepwise manner, with income variables being introduced first, followed by lagged variables and, finally, other control variables. Moreover, all three of the measurement foci of globalization (*overall*, *de facto*, and *de jure*) are assigned an equal weight so that each of them accounts for one third of the total estimations. The same goes

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for general globalization and its three dimensions (economic, social, and political globalization)—each of these accounts for one quarter of the total estimations. The Development Index and the Ecological Impact Index also contribute to the multidimensional approach analysis; their weight is therefore the same as that of the Sustainable Development Index, with each of these accounting for one third of the total estimations.

Figure 4.3: Funnel plots of estimates of the effects of globalization



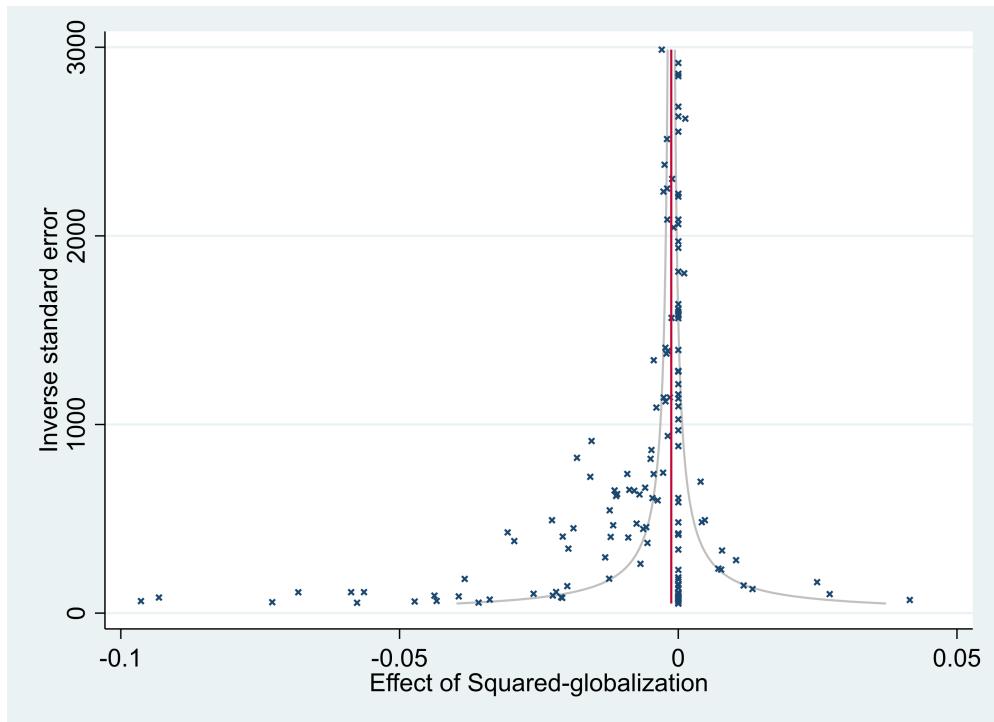
Note. Each point on the graph represents the estimate effect of globalization (and its dimensions) on sustainable development (and its dimensions), obtained from the fixed-effects panel analyses in Section 4.5. The vertical axis shows the inverse standard error as an index of precision, while the horizontal axis shows the estimate values.

After contemplating potential sources of heterogeneity, the SMA starts with diagnostic tests by estimating Equation (4.2) and (4.3), in the absence of the vector of moderator variables (X), for the effects of globalization and squared globalization. In a standard meta-analysis, these bivariate models are called Funnel Asymmetry Test (FAT) and

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Precision Effect Test (PET), respectively. As suggested by Doucouliagos and Stanley (2013), coefficients of the Funnel Asymmetry Test with a magnitude of greater than 2 indicates ‘severe’ publication bias. However, in this chapter, no publication bias can be detected, only a reporting tendency. In addition, as shown in Table 4.9, the coefficients in the Funnel Asymmetry Test are all smaller than 1. Therefore, the tendency observed in Figure 4.3 and Figure 4.4 should not be too severe.

Figure 4.4: Funnel plots of estimates of the effects of squared globalization



Note. Each point on the graph represents the estimate effect of squared values of globalization (and its dimensions) on sustainable development (and its dimensions), obtained from the fixed-effects panel analyses in Section 4.5. The vertical axis shows the inverse standard error as an index of precision, while the horizontal axis shows the estimate values.

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Table 4.8: Estimates of the overall reported coefficients on the effects of globalization and squared globalization

Type of globalization	Effect size	Standard Error	N	95% confidence interval	
Panel A: Effect of globalization					
Simple average effect	1.05***	0.18	144	0.71	1.40
Weighted average effect	0.17***	0.01	144	0.16	0.19
<i>General globalization</i>					
- Simple average effect	1.90***	0.51	36	0.86	2.95
- Weighted average effect	0.44***	0.03	36	0.39	0.49
<i>Economic globalization</i>					
- Simple average effect	0.87***	0.29	36	0.28	1.45
- Weighted average effect	0.06***	0.01	36	0.03	0.09
<i>Social globalization</i>					
- Simple average effect	1.32***	0.30	36	0.71	1.93
- Weighted average effect	0.37***	0.01	36	0.34	0.39
<i>Political globalization</i>					
- Simple average effect	0.13	0.15	36	-0.17	0.42
- Weighted average effect	-0.00	0.02	36	-0.03	0.03
Panel B: Effect of squared globalization					
Simple average effect	-0.01***	0.00	144	-0.01	-0.01
Weighted average effect	-0.00***	0.00	144	-0.00	-0.00
<i>General globalization</i>					
- Simple average effect	-0.02***	0.00	36	-0.02	-0.01
- Weighted average effect	-0.00***	0.00	36	-0.00	-0.00
<i>Economic globalization</i>					
- Simple average effect	-0.01***	0.00	36	-0.01	-0.00
- Weighted average effect	-0.00***	0.00	36	-0.00	-0.00
<i>Social globalization</i>					
- Simple average effect	-0.01***	0.00	36	-0.02	-0.01
- Weighted average effect	-0.00***	0.00	36	-0.00	-0.00
<i>Political globalization</i>					
- Simple average effect	0.00	0.00	36	-0.00	0.00
- Weighted average effect	0.00	0.00	36	-0.00	0.00

Note. The simple average is the unweighted mean of the reported effects. The weighted average is obtained from the fixed-effects model of the meta-analysis summary that uses the inverse variance as weight. *** significant at the 1% level, ** significant at the 5% level, and * significant at the 10% level.

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Table 4.9: Funnel Asymmetry Test (FAT) and Precision Effect Test (PET)

	Coefficient	z-value	Number of observations
Globalization effect			
Bias coefficient (FAT)	0.74***	3.69	144
Genuine effect (PET)	0.03**	2.11	144
Squared globalization effect			
Bias coefficient (FAT)	0.70***	2.83	144
Genuine effect (PET)	0.00**	2.27	144

Note. Multilevel mixed-effects models using restricted maximum-likelihood (REML) estimations with random slopes and intercepts (allowing for correlation) on effect and standard error variables by groups of dependent variables, and random intercepts by focuses of measurement of globalization nested within groups of dependent variables. In the regressions of the effects of globalization, random slopes and intercepts are given to effects of squared globalization variables and its standard error variables, while in the regressions of effects of squared globalization, random slopes and intercepts are given to effects of globalization variables and its standard error variables. *** significant at the 1% level, ** significant at the 5% level, and * significant at the 10% level.

Table 4.10 displays the estimate results of Equation (4.3) for the effects of globalization on sustainable development, while Table 4.11 presents the estimate results for the effects of squared globalization on sustainable development. As discussed earlier, four potential sources of heterogeneity (X) can be discerned. Accordingly, in these two tables, the potential influence of moderator variables is tested by group based on their characteristics. First, only the sample size is considered (Column 1). The second group of moderators stem from the observation that across the 144 estimations in the SMA data set, model specifications are substantially different. For the left-hand side of the equation, this is the result of the use of different dependent variables (sustainable development, human-economic development, ecological impact). For the right-hand side of the equation, this is the result of the stepwise procedure causing differences in the inclusion of control variables (lags, income variables, and the group of *Democracy*, *Education*, and *PopGrowth* variables). Hence, for this second group of moderators, the left-hand-side effect is investigated in Column 2, while the same is done for the right-hand side effect in Column

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3. The third group of moderator variables arising from the use of different foci of measurement of globalization (*de facto* or *de jure* globalization) and their potential effects are tested in Column 4. The last column in Table 4.10 and 4.11 looks at how the proxies of globalization (economic, social, or political) would affect the reporting coefficients of the effects of globalization and of squared globalization.

From Table 4.10, we can see that the variation in sample size across estimations in Section 4.5 might not be associated with the tendency of skewed reporting coefficients of globalization. For the second group of moderators, the inclusion of the pair of log GDP per capita and its square variables in the equation tends to reduce the reported effect of globalization by 0.04, while on the other side of the equation (the left-hand side), estimations using the Ecological Impact Index as the dependent variable report a 0.94 higher effect of globalization than those using the Sustainable Development Index. Next, using *de facto* measures of globalization reduces the reported effect of globalization on average by 0.07 compared to using the *overall* measures. And in the final group of moderators, using economic and political dimensions as proxies for globalization leads to a 0.09 and 0.06 reduction, respectively, in the reported coefficients of globalization compared to the results from the estimations using general globalization. Likewise, compared with the results of the Precision Effect Test in Table 4.9, the magnitude and significant level of the genuine effect increase substantially (in the cases of Column 2, 4, and 5), which stresses the importance of moderator variables in this SMA.

Table 4.10: Determinants of heterogeneity in the effects of globalization

	(1)	(2)	(3)	(4)	(5)
Genuine effect (coefficient of inverse standard error)	0.05	0.09***	0.04	0.08***	0.15***
Bias coefficient (intercept)	2.44***	2.80***	0.91***	2.99***	4.37***
Sample size	-0.00				
Model specifications					
Inclusion of lagged variables		-0.01			
Inclusion of income variables		-0.04*			
Inclusion of other control variables		0.02			
Development Index as dependent variable			0.02		
Ecological Impact Index as dependent variable			0.94***		
Focus of measurement of globalization					
<i>De facto</i>				-0.07***	
<i>De jure</i>				0.01	
Proxy of globalization					
Economic globalization					-0.09***
Social globalization					-0.03
Political globalization					-0.06**
Number of observations	144	144	144	144	144
Wald chi-squared	8.35	15.88	21.08	26.26	30.90
Prob > chi-squared	0.02	0.00	0.00	0.00	0.00

Note. The dependent variable is the t-value of the estimated effect of globalization. Multilevel mixed-effects models using restricted maximum-likelihood (REML) estimations with random slopes and intercepts (allowing for correlation) on effect and standard error variables by groups of dependent variables, and random intercepts by focuses of measurement of globalization nested within groups of dependent variables. In the regressions of the effects of globalization, random slopes and intercepts are given to effects of squared globalization variables and its standard error variables. *** significant at the 1% level, ** significant at the 5% level, and * significant at the 10% level.

Table 4.11: Determinants of heterogeneity in the effects of squared globalization

	(1)	(2)	(3)	(4)	(5)
Genuine effect (coefficient of inverse standard error)	0.00*	0.00*	0.00	0.00*	0.00*
Bias coefficient (intercept)	-2.29***	-2.34***	-0.77***	-2.39***	-2.81***
Sample size	0.00				
Model specifications					
Inclusion of lagged variables		-0.00			
Inclusion of income variables		0.00			
Inclusion of other control variables		0.00			
Development Index as dependent variable			-0.00		
Ecological Impact Index as dependent variable			0.01***		
Focus of measurement of globalization					
<i>De facto</i>				-0.00	
<i>De jure</i>				0.00	
Proxy of globalization					
Economic globalization					-0.00
Social globalization					-0.00
Political globalization					-0.00
Number of observations	144	144	144	144	144
Wald chi-squared	6.18	6.67	25.15	8.43	12.02
Prob > chi-squared	0.05	0.15	0.00	0.04	0.02

Note. The dependent variable is the t-value of the estimated effect of globalization. Multilevel mixed-effects models using restricted maximum-likelihood (REML) estimations with random slopes and intercepts (allowing for correlation) on effect and standard error variables by groups of dependent variables, and random intercepts by foci of measurement of globalization nested within groups of dependent variables. In the regressions of effects of Squared globalization, random slopes and intercepts are given to effects of globalization variables and its standard error variables. *** significant at the 1% level, ** significant at the 5% level, and * significant at the 10% level.

For the effect of squared globalization, in Table 4.11, we can see that only the use of the Ecological Impact Index as the dependent variable yields a 0.01 higher effect of squared globalization in comparison with those using the Sustainable Development Index. For other moderator variables, no significant impact is found. On the other hand, the magnitude and significant level of the genuine effect in Table 4.11 are not improved compared to the results of the Precision Effect Test in Table 4.9. Thus, most of the tested moderators have failed to explain the heterogeneity in the effects of squared globalization. However, most of the models in Table 4.11 suggest the existence of a genuine effect of squared globalization on sustainable development. Therefore, the non-linear relation between globalization and sustainable development suggested by the majority of the results in Section 4.5 might be valid and genuine despite the observed shortcomings of the panel analysis in this chapter.

In summary, Table 4.10 and Table 4.11 indicate that there are significant genuine effects of globalization and squared globalization on sustainable development after controlling for different characteristics in the modeling of globalization and sustainable development. In other words, there could be a parabolic type of relation between globalization and sustainable development. Besides, the SMA in this chapter offers a way of overcoming the difficulties created by the multidimensional approach when investigating this relation, as the differences in the focus of measure and proxies of globalization and sustainable development appear to be either magnified or to reduce the estimate effects, especially in the case of the effects of globalization.

4.7 Conclusion

This chapter investigated the link between sustainable development and globalization for a sample of 160 countries for the period 1990–2018. Substantial evidence was found of a non-linear relation both between

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general globalization and sustainable development (inverted-U-shape) and between the two dimensions of the latter, namely the Development Index (inverted-U-shape) and the Ecological Impact Index (U-shape). This relation was especially evident when the lags of globalization and its square were considered. Further analyses of dimensional globalization showed that both economic and social globalization (and their lags) tend to have U-shaped-type relations with sustainable development and its two dimensions. The directions of the relations appear to be consistent with the corresponding directions of the relations between general globalization and sustainable development, the Development Index, and the Ecological Impact Index. Unlike the other two dimensions of globalization, the relation between political globalization and sustainable development and its two dimensions tends to be U-shaped but moves in the opposite direction with relation between general globalization and sustainable development. This highlights the necessity of using a multidimensional approach when analyzing the relation between globalization and sustainable development.

This chapter in addition briefly revisits the Kuznets hypothesis, which by means of the Kuznets curve and the Kuznets environmental curve proposes that an increase in income would initially hinder sustainable development but that as income levels keep increasing, living standards and the demand for sustainability increase. The results obtained from the analyses in this chapter support the notion of a non-linear relation between sustainable development and income. However, this inverted-U-shaped relation contradicts the ideas contained in the Kuznets curves by suggesting that an increase in income would first enhance sustainable development but then hinder it after passing the local maximum. The estimate results in this chapter moreover suggest that higher income levels would initially enable increased consumption, with negative environmental impacts at this stage not yet outweighing the benefits of increased consumption, but that as income levels keep increasing and lead to a larger demand for commodities, while the environmental

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degradation becomes impossible to ignore. In the final phase, where conscious consumption is brought up, yet environmental harm seems irreversible.

Then, enabled by the large number of estimations and in order to overcome distortions caused by the multidimensional approach, this chapter went a step further by including a self-meta-analysis (SMA). Unlike a standard meta-analysis that aims to capture and eliminate publication bias, the SMA in this chapter attempts to detect the genuine effects of globalization and squared globalization on sustainable development after accounting for the tendency of skewed reporting coefficients due to four potential sources of heterogeneity, namely the sample size, model specifications, the measurement foci of globalization, and the proxy of globalization. The outcomes of this SMA provide further evidence of a non-linear (U-shaped-type) relation between globalization and sustainable development, as genuine effects are found in both the cases of globalization and squared globalization.

Regarding limitations, this chapter investigated the relation between globalization and sustainable development using a multidimensional approach, which resulted in a large number of estimations that together make the studied relation difficult to effectively trace, summarize, and interpret. In addition, this chapter is ambitious in including up to 160 countries in the panel analysis while data on the different control variables are not simultaneously available. This explains the variation in sample size across many estimations. Meanwhile, globalization and sustainable development, as conceptualized in the existing academic literature, have seemingly innumerable drivers that make the set of control variables in this chapter appear limited. This drawback of the panel analysis is reflected in the adjusted R-squared of about 0.5 in the Sustainable Development Index models. In an effort to diminish the effects of these shortcomings, this chapter made use of a SMA, which is based on the standard meta-analysis technique, to identify the genuine effects. This

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may be the first time a SMA is used in an econometric study; hence, it lacks input and guidance from similar existing studies. Nevertheless, this method appears to be very helpful in the context of this chapter.

Finally, given the inclusion of such a large number of countries in the analysis, further and future research could use the same multidimensional approach for analyzing smaller samples that pay more attention to countries' characteristics, for instance sub-samples of high-, middle-, low-income countries or sub-samples of countries based on their geographical or political characteristics. Moreover, as mentioned, the set of control variables in this chapter appears to be limited, and further research may wish to control for other drivers of globalization and sustainable development. Another suggestion for future research is using a different indicator of globalization that covers a longer period, as the KOF Globalization Index includes data on globalization dating only as far back as the 1970s.

4.8 Appendix

4.8.1 Appendix 4A: List of countries in the main regression sample (160 countries)

-Afghanistan ⁵	-Bulgaria	-Eritrea ⁴	-Japan ⁵
-Albania	-Burkina Faso	-Estonia	-Jordan
-Algeria	-Burundi	-Ethiopia	-Kazakhstan
-Angola	-Cambodia	-Fiji	-Kenya
-Antigua & Barbuda ^{1,5}	-Cameroon	-Finland	-Korea, Rep.
-Argentina	-Canada	-France	-Kuwait
-Armenia	-Cape Verde	-Gabon	-Kyrgyz
-Australia	-Central African Rep.	-Gambia, The	Republic
-Austria	-Chad	-Georgia	-Lao PDR
-Azerbaijan	-Chile	-Germany	-Latvia
-Bahamas, The ^{1,5}	-China	-Ghana	-Lebanon ⁵
-Bahrain	-Colombia	-Greece	-Lesotho
-Bangladesh	-Congo, Rep.	-Guatemala	-Liberia
-Barbados ^{1,5}	-Costa Rica	-Guinea	-Libya ⁵
-Belgium	-Cote d'Ivoire	-Haiti	-Lithuania
-Belize ^{1,5}	-Croatia	-Honduras	-Macedonia,
-Benin	-Cuba ^{3,4}	-Hungary	FYR
-Bhutan	-Cyprus	-Iceland ^{1,5}	-Madagascar
-Bolivia	-Czech Republic	-India	-Malawi
-Bosnia & Herzegovina ⁵	-Denmark	-Indonesia	-Malaysia
-Brunei Darussalam ^{1,5}	-Dominican Republic	-Iran, Islamic Rep.	-Maldives ^{1,5}
-Botswana	-Egypt, Arab Rep.	-Iraq	-Mali
-Brazil	-Ecuador	-Ireland	-Mauritania
-Brunei Darussalam ^{1,5}	-El Salvador	-Israel	-Mauritius
		-Italy	-Mexico
		-Jamaica	-Moldova

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-Mongolia	-Peru	Republic	Turkmenistan ^{4,5}
-Morocco	-Philippines	-Slovenia	-Uganda
-Mozambique	-Poland	-South Africa	-Ukraine
-Myanmar	-Portugal	-Spain	-United Arab
-Namibia	-Qatar	-Sri Lanka	Emirates ^{1,5}
-Nepal	-Russian	-Suriname	-United
-Netherlands	Federation	-Swaziland	Kingdom
-New Zealand	-Rwanda	-Sweden	-United States
-Nicaragua	-Samoa ^{1,5}	-Switzerland	-Uruguay
-Niger	-São Tomé &	-Tajikistan	-Uzbekistan
-Nigeria	Príncipe ^{1,5}	-Tanzania	-Vanuatu ^{1,5}
-Norway	-Saudi Arabia	-Thailand	-Venezuela,
-Oman	-Senegal	-Togo	RB ^{2,5}
-Pakistan	-Serbia	-Trinidad &	-Vietnam
-Panama	-Seychelles ^{1,5}	Tobago	-Yemen, Rep.
-Papua New Guinea	-Sierra Leone	-Tunisia	-Zambia
-Paraguay	-Singapore	-Turkey	-Zimbabwe
	-Slovak	-	

Note.

¹ Due to the lack of Polity5 data for the United Arab Emirates, Antigua and Barbuda, The Bahamas, Belize, Barbados, Brunei Darussalam, Iceland, the Maldives, Malta, São Tomé & Príncipe, the Seychelles, Vanuatu, and Samoa, these 13 countries are not included in regressions where Polity5 serves as an explanatory variable.

² Due to the lack of GDP per capita data for Venezuela, this country is not included in regressions where any variables deriving from GDP per capita serve as an explanatory variable.

³ Due to the lack of economic globalization data for Cuba, this country is not included in regressions where economic globalization serves as an explanatory variable.

⁴ Due to the lack of *de jure* economic globalization data for Cuba, Eritrea, and

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Turkmenistan, these countries are not included in regressions where *de jure* economic globalization serves as an explanatory variable.

⁵ Due to the lack of simultaneous data on GDP per capita, democracy, education, and population growth for Afghanistan, Antigua and Barbuda, The Bahamas, Barbados, Belize, Bosnia & Herzegovina, Brunei Darussalam, Iceland, Japan, Lebanon, Libya, the Maldives, Malta, Samoa, São Tomé & Príncipe, the Seychelles, Turkmenistan, the United Arab Emirates, Vanuatu, and Venezuela, these 20 countries are not included in regressions where these four control variables are included.

4.8.2 Appendix 4B: Variable definitions and data sources

Variable	Source	Definition
<i>SusDev</i> (Sustainable Development Index)	Hickel (2020)	Measures how ecologically efficient human-economic development in a country is
<i>SDIDev</i> (Development Index)		Sub-indicator of sustainable development; measures the human-economic development
<i>SDIEco</i> (Ecological Impact Index)		Sub-indicator of sustainable development; measures the ecological impact

Note.

$$\text{Sustainable Development Index} = \frac{\text{Development Index}}{\text{Ecological Impact Index}}$$

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Variable	Source	Definition
<i>Glob</i> (General globalization)	KOF Globalization Index	Measures general globalization as the average of three dimensional sub-indexes of globalization: economic, social, and political
<i>GlobEcon</i> (Economic globalization)		Sub-indicator of general globalization; measures the actual economic flows and economic restrictions
<i>GlobSoc</i> (Social globalization)		Sub-indicator of general globalization; measures information flows, personal contact, and cultural proximity
<i>GlobPol</i> (Political globalization)		Sub-indicator of general globalization; measures the diffusion of government policies and engagement in international political cooperation

Note.

$$Glob = \frac{GlobEcon + GlobSoc + GlobPol}{3}$$

Variable	Source	Definition
<i>GDPpc</i> (GDP per capita)	World Development Indicators	Gross domestic product divided by mid-year population, in constant 2010 U.S. dollar
<i>Education</i>		The percentage of children of official primary school age enrolled in school as part of the total population of the official primary school enrollment age
<i>PopGrowth</i> (Population growth)		Annual population growth rate
<i>Democracy</i>	The Polity5 Project	Captures the level of democracy in a country

4.8.3 Appendix 4C: Variable pairwise correlations

	<i>SusDev</i>	<i>SDIDev</i>	<i>SDIEco</i>	<i>Glob</i>	<i>GlobEcon</i>	<i>GlobSoc</i>	<i>GlobPol</i>	<i>InGDPpc</i>	<i>Democracy</i>	<i>Education</i>	<i>PopGrowth</i>
<i>SusDev</i>	1.00 (4337)										
<i>SDIDev</i>	0.17 (4337)	1.00 (4370)									
<i>SDIEco</i>	-0.65 (4337)	0.42 (4359)	1.00 (4627)								
<i>Glob</i>	-0.02 (4332)	0.85 (4355)	0.44 (4606)	1.00 (4615)							
<i>GlobEcon</i>	-0.11 (4303)	0.74 (4326)	0.48 (4577)	0.85 (4586)	1.00 (4586)						
<i>GlobSoc</i>	0.00 (4332)	0.91 (4355)	0.47 (4606)	0.88 (4615)	0.80 (4586)	1.00 (4615)					
<i>GlobPol</i>	0.03 (4332)	0.50 (4355)	0.20 (4606)	0.78 (4615)	0.42 (4586)	0.46 (4615)	1.00 (4615)				
<i>InGDPpc</i>	-0.10 (4209)	0.90 (4228)	0.56 (4473)	0.81 (4463)	0.75 (4434)	0.87 (4463)	0.44 (4463)	1.00 (4478)			
<i>Democracy</i>	0.14 (4006)	0.44 (4016)	0.04 (4209)	0.54 (4218)	0.36 (4189)	0.52 (4218)	0.50 (4218)	0.39 (4097)	1.00 (4221)		
<i>Education</i>	0.27 (2662)	0.75 (2668)	0.21 (2738)	0.58 (2743)	0.51 (2714)	0.64 (2743)	0.33 (2743)	0.60 (2698)	0.32 (2540)	1.00 (2744)	
<i>PopGrowth</i>	-0.27 (4336)	-0.38 (4369)	0.09 (4626)	-0.31 (4614)	-0.22 (4585)	-0.33 (4614)	-0.22 (4614)	-0.24 (4477)	-0.33 (4220)	-0.39 (2743)	1.00 (4639)

Note. The number of pairwise observations is shown in parentheses.

4.8.4 Appendix 4D: Panel data analysis full results

Due to its excessive length, Appendix 4D is not included in the main text and is available online at <https://figshare.com/s/44eabaf57555fd17a2b7>

4.8.5 Appendix 4E: Data set of the self-meta-analysis

Due to its excessive length, Appendix 4E is not included in the main text and is available online at <https://figshare.com/s/44eabaf57555fd17a2b7>

4.8.6 Appendix 4F: Definition and summary statistics of self-meta-analysis explanatory variables

Variable	Definition	Obs.	Mean	Std. dev.	Min	Max
<i>pet_glob</i>	Inverse standard error of effect of globalization	144	7.52	7.45	0.49	30.61
<i>pet_sq_glob</i>	Inverse standard error of effect of squared globalization	144	824.77	810.38	50.86	2987.75
<i>N</i>	Sample size	144	3817.48	832.96	2354	4606
<i>dummy_lag</i>	=1 if lag1 variables are included	144	0.50	0.50	0	1
<i>dummy_income</i>	=1 if income variables are included	144	0.75	0.43	0	1
<i>dummy_control</i>	=1 if institution variable is included	144	0.25	0.43	0	1
<i>dummy_de_facto</i>	=1 if <i>de facto</i> measures are used	144	0.33	0.47	0	1
<i>dummy_de_jure</i>	=1 if <i>de jure</i> measures are used	144	0.33	0.47	0	1
<i>dummy_GlobEcon</i>	=1 if proxy for globalization is economic globalization	144	0.25	0.43	0	1
<i>dummy_GlobSoc</i>	=1 if proxy for globalization is social globalization	144	0.25	0.43	0	1
<i>dummy_GlobPol</i>	=1 if proxy for globalization is political globalization	144	0.25	0.43	0	1
<i>dummy_dev</i>	=1 if dependent variable is the Development Index	144	0.33	0.47	0	1
<i>dummy_ecoimpact</i>	=1 if dependent variable is the Ecological Impact Index	144	0.33	0.47	0	1

Chapter 5

Religion and sustainable development: Direct and indirect effects¹

5.1 Introduction

Once considered a taboo topic in development studies (Ver Beek, 2000), since the turn of the century, religion has slowly been making its way into development discourses and practice (Lunn, 2009). Tomalin et al. (2019, p. 107) for example observed that the last two decades witnessed “the ‘turn to religion’ by development studies, policy, and practice.”² Thus, greater efforts have been made in recent years to determine what role

¹The analysis and results contained in this chapter were presented in the form of a working paper at the 9th Annual Duck Family Graduate Workshop in Environmental Politics and Governance in May 2023 and at the Economy of Francesco Summer School in June 2023. The useful comments by participants are greatly appreciated.

²Jansen et al. (2019) surveyed 15 Dutch institutions, who report their activities by the Sustainable Development Goals (SDGs), and reported a growing national and international interest in the relation between religion and philosophy and SDGs (p. 5). It is also worth noting that this survey has a multi-religion approach including Atheism, Buddhism, Judaism, Islam, and different branches of Christianity.

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religion can play in development research and practice, and especially in sustainable development (Narayanan, 2016). However, existing studies on the role of religion in sustainable development processes typically use a theoretical and/or case-study approach. Moreover, empirical studies tend to consider only a single dimension of sustainable development, which in fact is multidimensional, and tend to focus only on the direct effect of religion on sustainable development. Hence, the relation between religion and sustainable development, which in reality is much more complex, remains obscured and the mechanism of such a relation seems to be a black box. There is thus scope for an econometric analysis of religion's effects on sustainable development in which sustainable development is treated as a multidimensional concept.

In the same vein, there is room for especially empirically examining the possible indirect effects of religion on sustainable development and their transmission channels. As both religion and development have long been part and parcel of society, their relation should not and cannot be captured in a crude model that only deals with direct effects. Of the many potential transmission channels, globalization and (per capita) income are proposed and tested in this chapter. Globalization is prioritized because the concept itself can be considered perhaps just as old as religion,³ while income can be considered a fundamental element strongly affecting most, if not all, aspects of modern human life. As a first exploration of the transmission channels linking religion to sustainable development, the analysis in this chapter is narrowed down to a focus on these two channels; it is hoped that it will inspire future studies that consider other possible transmission channels.

This chapter proposes that globalization and per capita income are potential channels through which religion can indirectly affect sustainable development. Through an empirical analysis of the effects of different

³See Chapter 2 for discussions on the long history of interactions between religion and globalization.

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religions on sustainable development using a system of simultaneous equations, it seeks to find evidence for or against this proposition. Such a model of simultaneous equations allows for the observation of possible reciprocal causality and interdependence relations between religion, sustainable development, globalization, and per capita income. Although this model cannot consider more control variables or lagged influences, it offers an opportunity to investigate not only the direct effects but also the indirect effects of religion on sustainable development. The estimates indicate the existence and importance of indirect effects via the two proposed channels, which calls for attention on (other) potential indirect effect channels in future research on this topic.

This chapter seeks to fill a knowledge gap on empirical analysis of religion's direct and indirect effects on (multidimensional) sustainable development by analyzing a system of four simultaneous equations, linking sustainable development, religions/Atheism, globalization, and per capita income with democracy, country-id, and time as exogenous instruments. The dataset used for this analysis covers 146 countries (see Appendix 5A for the full list of countries) for the period 1990–2015 and facilitates the empirical analyses of seven models of religion: Buddhism, Christianity, Confucianism, Hinduism, Islam, Atheism, and non-Atheism (general believers). The chapter is structured as follows: Section 5.2 considers the lack of attention pays to religion in development discourses, Section 5.3 introduces the system of equations, the estimators, and gives more information about the dataset and its data sources, Section 5.4 displays and discusses the empirical results, and Section 5.5 concludes the chapter.

5.2 Religion in the sustainable development literature

A general observation made by scholars on the role of religion in development as topic of study is that religion (or spirituality) has been ignored, neglected, or viewed with suspicion. Ver Beek in 2000 for example surveyed three leading journals in the development field, *World Development*, the *Journal of Development Studies*, and the *Journal of Developing Areas*, for the years 1982–1998, inclusive; and found that “two of these journals contain not one article during this period in which the relation between development and religion or spirituality was the central theme” (Ver Beek, 2000, p. 31). He further observed that “the only article in the three journals surveyed that might fit this category was on the role of magic and witchcraft in development and was published in *World Development*”⁴ (Ver Beek, 2000, p. 42). Ver Beek (2000) also reviewed the policy of three influential development organizations in the United States—the US Agency for International Development (USAID), CARE, and the Catholic Relief Services (CRS)—and concluded that these organizations at the time of the survey not only lacked policies dealing with religion’s effects but also actively and consciously avoided associating their activities with religion, even in the case of the Catholic Relief Services, which is actually run by the US Catholic Church (Ver Beek, 2000, p. 38). Ver Beek’s findings have been cited by numerous scholars (including Selinger, 2004; Lunn, 2009; Deneulin and Rakodi, 2011; and Öhlmann et al., 2020),⁵ who pointed out the absence of religion in development research and practice in an attempt to draw more attention to the topic.

⁴In fact, *World Development* had a special issue on the topic of religion and development in 1980, but this was eventually discontinued (Deneulin and Rakodi, 2011).

⁵Ver Beek’s paper “Spirituality: A development taboo” has been cited more than 400 times as of March 28, 2023, according to Google Scholar.

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Development is now being understood in a broader sense, shifting away from its equation with economic growth and being viewed as more multifaceted. The notion of sustainable development has also gained traction; development research has started to consider many non-classic factors (including religion) in analyses of (sustainable) development. This inclusion of religion in development research has been called a “turn to religion” (Tomalin et al., 2019) or “religion turn” (Kaag and Saint-Lary, 2011). This turn has been accompanied by an increase of studies focusing on the relation between religion and development as well as a greater willingness by development organizations to become involved in activities in the religious sphere (Deneulin and Rakodi, 2011). However, the literature on religion and sustainable development to date has largely been confined to the following topics of study: (1) reasons for neglecting religion as research topic (see for example Marshall, 2001; Selinger, 2004; Stenmark, 2015; Tomalin et al., 2019; Öhlmann et al., 2020), (2) theoretical arguments for religion’s potential role in sustainable development (see for example Selinger, 2004; Lunn, 2009; Rakodi, 2012; Stenmark, 2015; Narayanan, 2013, 2016; Tomalin et al., 2019; Öhlmann et al., 2020), and (3) evidence of the central role of religion in sustainable development projects (see for example Ter Haar and Ellis, 2006; Ogbonnaya, 2012; Tomalin et al., 2019). This part of the literature tends to argue in favor of the influence of religion on sustainable development processes, while the troubling consequences of ignoring religion in development research and practice are also emphasized. However, these studies barely capture the heterogeneity among different religions and/or their roles in the process of development, which could be attributed to the lack of data sets covering multiple religions simultaneously.

Meanwhile, the empirical literature on religion’s effects on sustainable development is characterized by complexity and ambiguity. Basedau et al. (2017) for instance acknowledged sustainable development as a multidimensional concept and reviewed empirical studies on the effects

of religion on sustainable development published since 2005 (with a few influential studies conducted before 2005 included in the review). The authors arranged their review into sections on the effects of religion on different sub-dimensions of sustainable development, including its economic, social, and environmental dimensions. Within each dimension, several aspects were considered: (1) poverty, income, growth, employment, and innovation as indicators of economic development; (2) mental health, physical health, education, gender inequality, income inequality, governance, social capital, and conflict and peace as indicators of social development; and (3) environmental attitudes and behaviors as indicators of environmental dimension of development. However, the works reviewed did not consider sustainable development a multidimensional concept and focused on the direct effects of religion without considering its possible indirect effects. In conclusion, the authors of this review declared that “the relation is sometimes positive and sometimes negative, sometimes strong and sometimes weak” (Basedau et al., 2017, p. 35) and that future studies on religion’s effects on sustainable development need to be “more rigorous methodological and theoretical investigations” with “better availability and coverage of data” as a precondition (Basedau et al., 2017, p. 37). This chapter contributes to existing efforts to investigate the role of religion in the process of (sustainable) development by studying this relation in a more rigorous and empirical manner.

5.3 Data and research strategy

This chapter proposes that religion not only has direct effects but also indirect effects on sustainable development. Based on a review of the literature on the role of religion in the process of development discussed above, it seems appropriate to expect religion to have a direct effect on sustainable development. However, due to the complexity of the two concepts (religion and development) and their long history

of co-evolution, this chapter proposes that the effects of religion on (sustainable) development may be transmitted through several other channels (its indirect effects). Chapter 3 reveals that different types of Granger causal relations between globalization and religions can be discerned, while Chapter 4 suggests a correlation between globalization and sustainable development. Moreover, in both of the previous chapters, per capita income also has strong correlation with the three mentioned variables.⁶ Taking these findings into consideration, it is reasonable to believe that globalization, religion, and per capita income can all have an effect on sustainable development, while there may also be correlations between these variables.

Taking into account the possibility of religion having indirect effects on sustainable development, this chapter considers two potential channels that may facilitate this process: globalization and per capita income. The direct and indirect effects of religion on sustainable development are examined for the period 1990–2015 for 146 countries (a list of countries can be found in Appendix 5A) using a model that consists of four simultaneous equations as follows:

$$SusDev_{it} = \alpha_0 + \alpha_1 Glob_{it} + \alpha_2 lnGDPpc_{it} + \alpha_3 lnReligion_{it} + \alpha_4 I_{it} + \varepsilon_{it} \quad (5.1)$$

$$Glob_{it} = \beta_0 + \beta_1 lnGDPpc_{it} + \beta_2 lnReligion_{it} + \beta_3 I_{it} + \epsilon_{it} \quad (5.2)$$

$$lnGDPpc_{it} = \gamma_0 + \gamma_1 Glob_{it} + \gamma_2 lnReligion_{it} + \gamma_3 I_{it} + \mu_{it} \quad (5.3)$$

$$lnReligion_{it} = \delta_0 + \delta_1 Glob_{it} + \delta_2 lnGDPpc_{it} + \delta_3 I_{it} + \vartheta_{it} \quad (5.4)$$

⁶Bettendorf and Dijkgraaf (2011) found a bi-causal relation between religion (Christianity) and income in the Netherlands under the single-equation approach, but such effects turn statistically insignificant following the simultaneous estimations of the equations.

where $SusDev_{it}$, $Glob_{it}$, and $\ln GDPpc_{it}$ are, respectively, the level of sustainable development, the level of globalization, and the per capita gross domestic product measured under the natural log form of country i in year t (for detailed definitions and data sources, see Appendix 5B). $\ln Religion_{it}$ represents the natural log value of each of the major religious groups (Buddhism, Christianity, Confucianism, Hinduism, and Islam), Atheism, and total believers (non-Atheists) as a share of the total population of country i in year t , while I_{it} is a vector of the exogenous determinants that include other variables related to religion, democracy, country and time variants. Last, ε_{it} , ϵ_{it} , μ_{it} , and ϑ_{it} are the error terms.

As (sustainable) development, globalization, and religion, all linked to the establishment of society, have co-evolved for at least several centuries, they have become more closely and more strongly related. It is possible that the three concepts are reciprocally causal and interdependent. By using this system of simultaneous equations, this chapter attempts to capture the effects of religion on sustainable development without being obliged to the strict exogeneity condition that ordinary least squares estimate requires. In addition, using a simultaneous equations model allows for the investigation of the indirect effects of religion on sustainable development through the two proposed channels (globalization and per capita income), which is not possible for vector autoregression models that are also suitable for examining endogenous variables.

On the other hand, while the system of simultaneous equations considers the contemporaneous influences of the variables on each other, it does not account for lagged influences. This is a limitation of this chapter that arises due to the complexity of the estimators (panel two-stage least-squares, panel three-stage least-squares, and generalized method of moments panel three-stage least-squares – to be discussed below) that have been used to estimate the simultaneous equations model. Indeed, the analyses in this chapter should be seen as the first explorational work that takes into account endogeneity and indirect channels in the analysis

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of religion's effects on sustainable development.

The direct effects of globalization, per capita income, and religion according to this system of equations are captured in Equation (5.1) as α_1 , α_2 , and α_3 , respectively. The indirect effects are distributed in the other three equations where:

$\alpha_1\beta_2$, $\alpha_2\gamma_2$ captures the indirect effects of selected religions through globalization and per capita income, respectively;

$\alpha_2\gamma_1$, $\alpha_3\delta_1$ captures the indirect effects of globalization through per capita income and selected religions; and

$\alpha_1\beta_1$, $\alpha_3\delta_2$ captures the indirect effects of per capita income through globalization and selected religions.

The total effect, for example in the case of a religion, is the sum of its direct and indirect effects: $\alpha_3 + \alpha_1\beta_2 + \alpha_2\gamma_2$.

To estimate this system of simultaneous equations, the instrumental panel fixed effects (FE) model, the panel two-stage least-squares (2SLS) estimator as well as the panel three-stage least-squares (3SLS) estimator are used. The main difference between 2SLS and 3SLS estimators is that the 2SLS approach estimates each structural equation in the system separately while 3SLS estimates them simultaneously. Moreover, as the three main explanatory variables may be reciprocally causal, to deal with potential endogeneity problems and allow for heteroscedasticity and autocorrelation, the 3SLS estimator is extended with a generalized method of moments (GMM) framework; so, the estimator is then called GMM–3SLS. A technical note regarding the use of statistical software Stata for the analyses in this chapter is that there, at time of writing, is no simple command for panel 2SLS, 3SLS, and GMM–3SLS. Hence, the analyses involving these estimators use the *reg3* command, and the country fixed effect is controlled by using country–id (each country is given a number as their identification number in the dataset) as one of

the exogenous variables in all 2SLS, 3SLS, and GMM–3SLS regressions. As for the instrumental panel fixed effects model, the *xtivreg* command⁷ is used for the original data set. However, each of the equations (5.1 to 5.4) is regressed separately, not interactively, as in the case of the other three models.

Table 5.1: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>SusDev</i>	3,465	56.89	16.14	8.20	84.10
<i>Glob</i>	3,465	56.76	16.19	21.09	90.65
<i>lnGDPpc</i>	3,465	8.31	1.46	5.21	11.35
<i>Democracy</i>	3,465	3.72	6.32	-10	10
<i>Atheist</i>	3,465	1.08	2.06	0.00	31.73
<i>Believer</i>	3,465	98.92	2.06	68.27	100.00
<i>Buddhist</i>	3,465	4.65	16.34	0.00	88.37
<i>Christian</i>	3,465	49.06	35.57	0.07	99.30
<i>Confucianist</i>	3,465	0.02	0.12	0.00	1.58
<i>Hindu</i>	3,465	2.57	11.18	0.00	86.76
<i>Muslim</i>	3,465	25.31	36.02	0.00	99.74

The general KOF Globalization Index (Gygli et al., 2019; last accessed on March 4, 2022) is used for the analysis due to general acceptance of the index, its good coverage, and its long timespan. For religion, the Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0; last accessed on February 14, 2022) provides a good match for the KOF Index in terms of its coverage, timespan, and frequency. From the Religious Characteristics of States Dataset, data on the share (expressed as percentage) of the population following one of the five major religions (Buddhism – *Buddhist*, Christianity – *Christian*, Confucianism – *Confucian*, Hinduism – *Hindu*, and Islam – *Muslim*) or Atheism – *Atheist* are extracted. An additional variable named Believer is generated by subtracting the share of Atheists from the total population (*Believer* = 100 – *Atheist*), which means capturing the segment of the population

⁷Software: Stata 17 (64-bit).

who are either religious or spiritual.⁸ For sustainable development, the Sustainable Development Index of Hickel (2020) is used. This index takes into account both human-economic and ecological factors of sustainable development, making it suitable for calculating the level of sustainable development, multidimensionally. Besides, its data coverage mirrors those of the general KOF Index and the religious population data set in terms of its range and scope. In addition, gross domestic product data were extracted from the World Development Indicators Database (World Bank, 2021, last accessed on March 4, 2022). Then, for the analysis, the real gross domestic product per capita in 2015 constant United States (US) dollar is used. Finally, data on *Democracy* is extracted from the Polity5 Project, 2018 version (Marshall and Gurr, 2020; last accessed on March 11, 2022). Table 5.1 provides an overview of the descriptive statistics of all variables, while their pairwise correlations are shown in Appendix 5C. As shown in this table, the segment of atheists is smaller than the segment of believers. Of the five major religions studied in this chapter, Christianity and Islam appear to have a greater potential of being the dominant religion in a country in comparison with the other three religions.

5.4 Empirical results

This chapter is based on the proposition that religion can directly and indirectly affect sustainable development; it also seems possible that believers and atheists could differently affect sustainable development processes owing to their different relations with trade (see Chapter 3, for example). Hence, this section besides analyzing the five religion models (*Buddhist*, *Christian*, *Confucianist*, *Hindu*, and *Muslim*) also

⁸The doctrine of Agnosticism suggests that the existence of existence of God or the divine is unknowable. Hence, Agnosticism could not be considered associated with either religions or Atheism. However, there is no category of Agnosticism in the Religious Characteristics of States Dataset Project - Demographics v. 2.0 and the data description does not mention how the Agnostic population was handle in the dataset. Hence, Agnosticism is not considered counted in either Atheist or Believer, nor the scope of this chapter.

compares the results of the *Atheist* and *Believer* models, starting with a discussion of the differences between believers and atheists in their contribution towards sustainable development in sub-section 5.4.1. Sub-section 5.4.2 then proceeds to discuss the results from the five religion models as well as the heterogeneity among these religions in terms of their effects on sustainable development. Both sub-sections pay attention not only to the direct but also the indirect effects of religion/Atheism and show the calculated total (potential) effect for each model.

Moreover, as discussed in the previous section, the system of simultaneous equations is analyzed using instrumental panel fixed effects (IV–FE), panel two-stage least-squares (2SLS), panel three-stage least-squares (3SLS), and panel generalized method of moments three-stage least-squares (GMM–3SLS) estimators. Across the seven models (*Atheist*, *Believer*, and the five religions), a clear trend is visible, namely that coefficients' significance either persists or increases, moving from IV–FE to GMM–3SLS, with the final two estimators (3SLS and GMM–3SLS) producing similar coefficients. In addition, the signs of the coefficients of globalization and income variables are mostly consistent across the models. Thus, for an efficient display of results, in the main text of this chapter, only results from the GMM–3SLS estimator are presented. Results from the other three estimators are shown in Appendix 5D.

The direct and indirect effects can then be calculated using coefficients from the GMM–3SLS estimator. As shown later in the sub-sections, in the Sustainable Development equation (Equation 5.1 of the GMM–3SLS estimator) globalization, except for the case of *Believer*, has a significant negative effect on sustainable development ($\alpha_1 < 0$), while income has a significant positive effect ($\alpha_2 > 0$). The direct effects (α_3), indirect effects via globalization ($\alpha_1\beta_2$), and indirect effects via per capita income ($\alpha_2\gamma_2$) are different per model due to the heterogeneity among religions.

5.4.1 Atheists/believers and sustainable development

We will first look at the relations between sustainable development and atheists and believers, respectively, before delving into the results for the five individual religions. First, the results in Table 5.2 suggest that the size of the atheist population as a share of the total population can have a substantial negative direct effect (-8.19) on sustainable development, while the size of the group of believers as a share of the total population shows no statistically significant direct effect. As discussed in the following sub-section, the ‘no-direct-effect’ result may refer to the differentiated direct effects of the studied religions both in terms of size and direction, which for the group of believers (*Believer*) may result in a statistical effect amounting to zero. It is more challenging to explain the mechanism behind the negative direct effect of Atheism on sustainable development because (a) atheists usually and normally would not establish associations to organize social activities based on their nonbeliefs; (b) being an atheist could simply mean that the person does not believe in the existence of god(s) or spiritual power(s), meaning that not all atheists necessarily share the same attitude towards different topics such as sustainability; and (c) according to the data in this chapter, countries with a larger atheist population are mostly former Soviet Union countries and developing (Communist) countries,⁹ which appear not yet to have achieved very high scores on the Sustainable Development Index.

⁹The only high-income countries of which more than 5% of the total population are atheists are the Czech Republic, Hungary, Sweden, and Uruguay.

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Table 5.2: Atheists/believers and sustainable development (GMM–3SLS estimator) (N = 3,465)

Model	<i>Atheist</i>	<i>Believer</i>
Sustainable Development equation – Equation 5.1; dependent variable: <i>SusDev</i>		
Globalization equation – Equation 5.2; dependent variable: <i>Glob</i>		
<i>Glob</i>	-1.25*** (0.11)	-0.16 (0.12)
<i>lnGDPpc</i>	25.56*** (1.83)	5.95** (2.63)
<i>Atheist</i>	-8.19*** (0.43)	
<i>Believer</i>		-0.93 (1.97)
Constant	-75.46*** (10.11)	108.41 (208.75)
Income equation – Equation 5.3; dependent variable: <i>lnGDPpc</i>		
<i>Glob</i>	0.07*** (0.00)	0.05*** (0.00)
<i>Atheist</i>	0.26*** (0.00)	
<i>Believer</i>		-0.70*** (0.01)
Constant	4.29*** (0.03)	74.33*** (0.66)
Religion equation – Equation 5.4		
<i>Dependent variable</i>		
<i>Glob</i>	-0.17*** (0.01)	0.07*** (0.00)
<i>lnGDPpc</i>	2.87*** (0.08)	-1.41*** (0.01)
Constant	-13.14*** (0.44)	106.47*** (0.07)

Note. Robust (cluster *panelvar*) standard errors are shown in parentheses.

*** significant at the 1% level, ** significant at the 5% level, and * significant at the 10% level.

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In addition, the results from the third column in Table 5.2 suggest that an increase in the atheist population has a negative effect on globalization, while believers appear to have a positive and relatively larger effect on globalization in comparison with the former group. Moreover, the results of the last equation (Religion equation – Equation 5.4) show a statistically significant effect running from (general) globalization to the Atheist (negative effect) and Believer (positive effect) groups that have similar signs to their paired religious effects. This finding suggests that the group of believers in general appears to boost and also benefit from (general) globalization, which may be one reason why religion is far from disappearing.¹⁰

Next, for the Income equation (Equation 5.3), Table 5.2 shows evidence supporting the idea of Atheism boosting per capita income, while the opposite seems to be the case for the Believer group. These results may indicate that the atheist population tends to focus more on the material aspects in life (in this case income), while their counterparts may be less interested in attaining material prosperity and more in the spiritual dimension of life.

Table 5.3: Direct, indirect, and total effects of atheists versus believers on sustainable development (based on results from GMM–3SLS estimator)

	Direct effect α_3	Indirect effect via globalization $\alpha_1\beta_2$	Indirect effect via per capita income $\alpha_2\gamma_2$	Total effect
<i>Atheist</i>	-8.19	(-1.25) x (-3.79)	25.56 x 0.26	3.19
<i>Believer</i>	0.00	0.00 x 13.15	5.95 x (-0.70)	-4.17

Table 5.3 shows the calculations of the total (potential) effects for the *Atheist* and *Believer* models. In terms of direct effects, the estimate results suggest that Atheism may directly hinder sustainable development, while the believers group appear to have no direct effect. However, when indirect effects are considered, the atheist population

¹⁰See Chapter 3 for discussions on the ‘secularization thesis’.

seems to enhance sustainable development indirectly by reducing the negative effect of globalization and magnifying the positive effect of income. Then, these positive indirect effects outweigh the negative direct effect, resulting in a sizable positive total effect of Atheism on sustainable development. In the case of the believers group, no indirect effect via globalization is found; however, a considerable negative indirect effect via per capita income is proven to be statistically significant. Thus, the *Believer* can be seen as having a sizable negative total effect on sustainable development, but this may only be the result of its indirect effect through income as transmission channel.

5.4.2 The five religions and sustainable development

Dissimilarities are observed for the five religion models in terms of the signs and magnitudes of their direct effects on sustainable development. While the Buddhist, Christian, and Hindu populations as shares of the total population show relatively small (coefficients less than 1) and negative direct effects on sustainable development; the share of Confucianist population shows a much larger and positive direct effect (the GMM–3SLS estimator returns a coefficient of 18.25). Moreover, the share of Muslim population may be considered to have little direct effect on sustainable development due to (1) the tiny absolute value of its coefficient (0.02) compared to those of the other religions and (2) the fact the its coefficient is statistically significant only at 7.6% level (GMM–3SLS estimator). As shown in Table 5.4 (results from Equation 5.1), an increase of one percentage point in the share of Buddhists or Christians in the total population could decrease the country's performance on the Sustainable Development Index by 0.18 point. Meanwhile, the same increase in the share of Hindus in the total population could reduce the Sustainable Development Index score by 0.58 point. Likewise, when the share of Muslims in the total population increases by one percent point, the Sustai-

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Table 5.4: Religions and sustainable development (GMM–3SLS estimator) (N=3,465)

	<i>Buddhist</i> (1)	<i>Christian</i> (2)	<i>Confucianist</i> (3)	<i>Hindu</i> (4)	<i>Muslim</i> (5)
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Sustainable Development equation – Equation 5.1;

dependent variable: *SusDev*

<i>Glob</i>	-0.65*** (0.07)	-0.78*** (0.08)	-0.75*** (0.08)	-0.61*** (0.08)	-0.39*** (0.07)
<i>lnGDPpc</i>	12.49*** (1.12)	17.23*** (1.28)	15.53*** (1.16)	12.22*** (1.23)	8.00*** (1.16)
<i>Share of religious population</i>	-0.18*** (0.03)	-0.18*** (0.01)	18.25** (7.23)	-0.58*** (0.07)	-0.02* (0.01)
Constant	-8.90 (5.95)	-32.95*** (6.69)	-29.83*** (6.09)	-8.51 (6.34)	13.29** (6.35)

Globalization equation – Equation 5.2; dependent variable: *Glob*

<i>lnGDPpc</i>	14.01*** (0.06)	14.66*** (0.07)	13.92*** (0.09)	14.09*** (0.06)	14.85*** (0.07)
<i>Share of religious population</i>	0.18*** (0.01)	-0.16*** (0.00)	-13.24*** (3.90)	0.36*** (0.02)	0.16*** (0.00)
Constant	-60.39*** (0.62)	-57.30*** (0.71)	-58.60*** (0.82)	-61.20*** (0.58)	-70.58*** (0.65)

Income equation – Equation 5.3; dependent variable: *lnGDPpc*

<i>Glob</i>	0.07*** (0.00)	0.07*** (0.00)	0.07*** (0.00)	0.07*** (0.00)	0.07*** (0.00)
<i>Share of religious population</i>	-0.02*** (0.00)	0.01*** (0.00)	0.29 (0.28)	-0.03*** (0.00)	-0.01*** (0.00)
Constant	4.36*** (0.02)	3.94*** (0.03)	4.27*** (0.03)	4.36*** (0.02)	4.86*** (0.02)

Religion equation – Equation 5.4

dependent variable: *Share of religious population*

<i>Glob</i>	0.47*** (0.06)	-3.48*** (0.08)	-0.002*** (0.00)	0.48*** (0.04)	4.02*** (0.08)
<i>lnGDPpc</i>	-10.25*** (0.92)	60.87*** (1.01)	0.01 (0.01)	-8.20*** (0.61)	-67.76*** (0.93)
Constant	63.31*** (4.79)	-259.20*** (5.62)	0.05 (0.05)	43.66*** (2.97)	360.23*** (5.48)

Note. Robust (cluster *panelvar*) standard errors are shown in parentheses.

*** significant at the 1% level, ** significant at the 5% level, and * significant at the 10% level.

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-nable Development Index score decreases by 0.02 point. On the other hand, an equal increase of the share of Confucians in the total population could boost the Sustainable Development Index score by 18.25 points. The differences between the direct effect of Confucianism on sustainable development and those of the other religions are remarkable and require deeper investigation. However, it is worth noting that Confucianism in many aspects is more of a philosophy of life than a religion and that its cornerstone is the belief in the ultimate importance of education.

The negative direct effects of the different religions on sustainable development may be due to the fact that one of the two components of the Sustainable Development Index is environmental impact, a topic not explicitly addressed in Buddhist, Christian, Hindu, and Islamic teachings. Instead, humans (versus nature) are at the heart of their teachings, which could be considered an argument in favor of human supremacy or the domination of non-humans by humans. For example, White (1967, p. 1204) in attempting to explain the historical roots of the contemporary ecological crisis argued that Christianity “not only established a dualism of man and nature but also insisted that it is God’s will that man exploit nature for his proper ends”. Different aspects of White’s thesis have since been criticized, ranging from the fact that he only bases his argument on the text in Genesis 1:28 which states that “[b]e fruitful and increase in number, fill the earth and subdue it, and rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground”; to pointing out many church-led environmental movements. The results presented in this chapter seem to support White’s thesis that Christianity seems to have a direct link to the separation of humans and nature in favor of the former. In the same work, White also suggested that Asian religions are more environmentally conscious in comparison with Christianity but didn’t substantiate his argument. Studies of the relation between Buddhism or Hinduism and ecology often paint a picture of these two religions as aware of and seeking to address ecological problems as well as of their conception of the relation between

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humans and nature as a moral issue that is addressed through the many religion-based environmental movements arising from these religions.¹¹ However, scholars such as Nand (2005) and Tomalin (2016) consider such accounts a romanticization and overinterpretation of the religious faith and teachings. Estimate results in this chapter suggest that despite the emergence of many religious-led ecological movements in the past few decades, the world-building perspective that places humans at the center of development possibly downplays the environmental aspects of sustainable development.

The first Equation (5.1) in the simultaneous system is the Sustainable Development equation that captures the direct effect of religion on sustainable development. The results of this equation in Table 5.4 demonstrate negative direct effects in most the cases. The results of the second equation (5.2), the Globalization equation, once again echo the discussions in Chapter 2 and the empirical findings in Chapter 3 and confirm that the studied religions have different impacts on globalization. The results in Table 5.4 show that Buddhism, Hinduism, and Islam may enhance (general) globalization while Christianity and Confucianism tend to hinder it. Considerable differences are also found in the sizes of the effects: the absolute value of the coefficient in the case of Confucianism is well above 10, while that of the other all lie under 0.50. Hence, religion and globalization are closely correlated,¹² which makes using a simultaneous system of equations a suitable approach.

Finally, results from the Income equation (5.3) echo earlier observations of dissimilarities between the studied religions, with Table 5.4 suggesting a positive effect of Christianity on income, a statistically zero effect of Confucianism on income, and small negative effects of

¹¹See for example De Silva and Ishigaki (2002), Darlington (2003), Jones (2003), Loy (2003, 2008), and Cooper and James (2017) on Buddhism, and Frawley (2004), Findly (2008), and Nugteren (2018) on Hinduism.

¹²Chapter 3 shows bidirectional Granger causality effects between many but not all of the studied religions and (general and dimensional) globalization.

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Buddhism, Hinduism, and Islam on income. Although the size of the effects on per capita income generally are much smaller than those of the effects on globalization and of the direct effects of religion on sustainable development, they are still important due to their contribution to the total effects. Furthermore, it is remarkable that once again, Confucianism is the odd one out in this equation, which makes it stand out from other religions in the whole system of equations—a reminder that it is considered more of a philosophy of life and less of a religion. The final equation in the system is the Religion equation (5.4), which captures the effects of globalization and per capita income on the share of the religious population as part of the total population. The results shown in Table 5.4 indicate sizeable differences between the effects of globalization and income on different religions.

Table 5.5: Direct, indirect, and total effects of atheists versus believers on sustainable development (based on results from GMM–3SLS estimator)

	Direct effect α_3	Indirect effect via globalization $\alpha_1\beta_2$	Indirect effect via per capita income $\alpha_2\gamma_2$	Total effect
<i>Buddhist</i>	-0.18	(-0.65) x 0.18	12.49 x (-0.02)	-0.55
<i>Christian</i>	-0.18	(-0.78) x (-0.16)	17.23 x 0.01	0.12
<i>Confucianist</i>	18.25	(-0.75) x (-13.24)	15.53 x 0.00	28.18
<i>Hindu</i>	-0.58	(-0.61) x 0.36	12.22 x (-0.03)	-1.17
<i>Muslim</i>	-0.02	(-0.39) x 0.16	8.00 x (-0.01)	-0.16

By way of the summary presented in Table 5.5, we can see that the direct effects are negative in most of the cases, except for the *Confucianist* model, which has a positive direct effect. However, fewer negative effects can be discerned in the column of overall effect. First, results from *Buddhist* and *Hindu* models suggest both negative direct and indirect effects via globalization and per capita income, which then produces a larger negative total effect. On the other hand, despite having the same direct effect as Buddhism (in terms of sign and magnitude), Christianity appears to have positive indirect effects via both globalization and income.

It therefore ends up having a relatively small positive total effect on sustainable development. Thus, in this case, the sum of the two positive indirect effects seem to outweigh the negative direct effect. In contrast, the direct effect of Islam is much smaller compared to those for other religions, with a low level of significance; however, the indirect effects increase in the same direction, leading to a negative total effect that is considerably larger than the direct effect of Islam on sustainable development. Then, Confucianism as the only religion to have a positive direct effect (of a large magnitude in comparison to the other religions) also has a positive indirect effect via globalization, while no indirect effect via per capita income could be found. This combination produces an even larger positive total effect of Confucianism on sustainable development.

5.5 Conclusion

This chapter sought to examine the direct and indirect effects of religions on (multidimensionally measured) sustainable development using a sample of 146 countries for the period 1990–2015 for five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam) and the atheist and believer groups, more generally. Four different types of estimators—instrumental fixed effects, two-stages least-squares, three-stages least-squares, and generalized method of moments three-stage least-squares—were used to examine a system of four simultaneous equations connecting sustainable development, religion, globalization, and per capita income. The empirical results suggest that religion in most cases has both direct and indirect effects on sustainable development (Confucianism being the exception in terms of indirect effects channeled through per capita income, and the population of believers being the exception in terms of both direct and indirect effects through globalization). The chapter also provides calculations of the total (potential) effect of religion on sustainable development for all seven models. The results suggest heterogeneity among religions as well as

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differences between the direct effect and total effect of each religion. Hence, when investigating the relation between religion and sustainable development, it is reasonable to consider and include factors potentially channeling the indirect effects of the former to the latter.

The system of equations in this chapter indicates two channels through which religion can indirectly affect sustainable development: globalization and per capita income. In all models, globalization is found to have a negative effect on sustainable development, except for the *Believer* model, where globalization appears to have no statistical effect. On the other hand, per capita income is suggested by the estimate results to have a positive effect on sustainable development. The direction of the indirect effect therefore depends on the direction of religion's effect on globalization and income. Thus, when the indirect effects are combined with the direct effect, the size and sign of the total effect as a result of this sum may vary, as discrepancy among religions is found in all four equations of the model. There are cases where the total effect and the direct effect move in the same direction, such as for Buddhism, Confucianism, Hinduism, and Islam. In other cases, due to the outperformance of the indirect effects, the total and direct effects move in the opposite direction (opposite signs). This emphasizes the importance of including indirect effect channels in analyses of religion's effects on sustainable development.

Then, in Table 5.5, the size of the effect ranges from relatively small to average to unexpectedly large (in the *Confucianist* model), indicating just how differently separate religions can influence or value sustainable development. This contrasts with the claim of Ver Beek (2000) that religion plays a central role in development; the findings presented in this chapter reveal that this is very much dependent on the religion considered. However, considering five major religions and Atheism for a sample of 146 countries while allowing for the capturing of dissimilarities in views of and effects on sustainable development

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prevented an investigation of the interaction between different religions and Atheism within a country—a study that can shed additional light on the mechanism that links religion to sustainable development in societies with multiple religions. Therefore, given the significant impact of religion on sustainable development illustrated in this chapter, more empirical and theoretical research is needed on this topic, using different angles and contexts so that studies forming part of the ‘turn to religion’ can help further our understanding and contribute to development research and practice.

Finally, using the simultaneous equations model estimated by four different estimators prevented the inclusion of more control variables and lagged influences in the model. In addition, the countries forming part of the sample have diverse geographical, social, and economic characteristics. Although all estimations were controlled for country’s fixed effects, the robustness of the analysis could be increased by using different sub-samples based on the characteristics of selected countries, for example geographical regions or colonial history. However, as a first attempt to examine the direct and indirect effects of religion on sustainable development, this chapter’s shortcomings can be taken into account in further research, which can advance our understanding of this topic for example by expanding the model’s specifications, controlling for more country characteristics, and focusing on the relations that other religions or different branches of the same religion have with sustainable development.

5.6 Appendix

5.6.1 Appendix 5A: List of countries for the full sample (146 countries)

-Afghanistan	Rep.	-Georgia	-Latvia
-Albania	-Chad	-Germany	-Lebanon
-Algeria	-Chile	-Ghana	-Lesotho
-Angola	-China	-Greece	-Liberia
-Argentina	-Colombia	-Guatemala	-Libya
-Armenia	-Congo, Rep.	-Guinea	-Lithuania
-Australia	-Costa Rica	-Haiti	-Macedonia,
-Austria	-Cote d'Ivoire	-Honduras	FYR
-Azerbaijan	-Croatia	-Hungary	-Madagascar
-Bahrain	-Cuba	-India	-Malawi
-Bangladesh	-Cyprus	-Indonesia	-Malaysia
-Belgium	-Czech Republic	-Iran, Islamic	-Mali
-Benin	-Denmark	Rep.	-Mauritania
-Bhutan	-Dominican	-Iraq	-Mauritius
-Bolivia	Republic	-Ireland	-Mexico
-Bosnia &	-Ecuador	-Israel	-Moldova
Herzegovina	-Egypt, Arab	-Italy	-Mongolia
-Botswana	Rep.	-Jamaica	-Morocco
-Brazil	-El Salvador	-Japan	-Mozambique
-Bulgaria	-Eritrea	-Jordan	-Myanmar
-Burkina Faso	-Estonia	-Kazakhstan	-Namibia
-Burundi	-Ethiopia	-Kenya	-Nepal
-Cambodia	-Fiji	-Korea, Rep.	-Netherlands
-Cameroon	-Finland	-Kuwait	-New Zealand
-Canada	-France	-Kyrgyz	-Nicaragua
-Cape Verde	-Gabon	Republic	-Niger
-Central African	-Gambia, The	-Lao PDR	-Nigeria

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-Norway	Federation	-Suriname	-Uganda
-Oman	-Rwanda	-Swaziland	-Ukraine
-Pakistan	-Saudi Arabia	-Sweden	-United
-Panama	-Senegal	-Switzerland	Kingdom
-Papua New Guinea	-Serbia	-Tajikistan	-United States
-Paraguay	-Sierra Leone	-Tanzania	-Uruguay
-Peru	-Singapore	-Thailand	-Uzbekistan
-Philippines	Republic	-Togo	-Vietnam
-Poland	-Slovenia	-Trinidad & Tobago	-Yemen, Rep.
-Portugal	-South Africa	-Tunisia	-Zambia
-Qatar	-Spain	-Turkey	-Zimbabwe
-Russian	-Sri Lanka	-Turkmenistan	

5.6.2 Appendix 5B: Variable definitions and data sources

Variable	Name	Source	Definition
<i>SusDev</i>	Sustainable Development Index	Hickel (2020)	Measures how ecologically efficient human-economic development in a country is
<i>Glob</i>	General globalization	KOF Index of Globalization	Measures globalization in three main dimensions: economic, social, and political
<i>GDPpc</i>	GDP per capita	World Development Indicators	Gross domestic product divided by mid-year population. In constant 2010 U.S. dollar
<i>Buddhist</i>	Buddhist	Religious Characteristics of States Dataset Project - Demographics v. 2.0 (RCS-Dem 2.0)	Share of Buddhist population as part of the total country population
<i>Christian</i>	Christian		Share of Christian population as part of the total country population
<i>Confucianist</i>	Confucianist		Share of Confucianist population as part of the total country population
<i>Hindu</i>	Hindu		Share of Hindu population as part of the total country population
<i>Muslim</i>	Muslim		Share of Muslim population as part of the total country population
<i>Atheist</i>	Atheist		Share of Atheist population as part of the total country population

5.6.3 Appendix 5C: Variable pairwise correlations

	<i>SusDev</i>	<i>Glob</i>	<i>lnGDPpc</i>	<i>Democracy</i>	<i>Atheist</i>	<i>Believer</i>	<i>Buddhist</i>	<i>Christian</i>	<i>Confucianist</i>	<i>Hindu</i>	<i>Muslim</i>
<i>SusDev</i>	1.00 (3551)										
<i>Glob</i>	0.05 (3546)	1.00 (3771)									
<i>lnGDPpc</i>	0.01 (3468)	0.85 (3672)	1.00 (3687)								
<i>Democracy</i>	0.17 (3542)	0.55 (3751)	0.40 (3662)	1.00 (3754)							
<i>Atheist</i>	0.14 (3551)	0.24 (3771)	0.25 (3687)	0.17 (3754)	1.00 (3796)						
<i>Believer</i>	-0.14 (3551)	-0.24 (3771)	-0.25 (3687)	-0.17 (3754)	-1.00 (3796)	1.00 (3796)					
<i>Buddhist</i>	-0.01 (3551)	-0.11 (3771)	-0.08 (3687)	-0.09 (3754)	-0.03 (3796)	0.03 (3796)	1.00 (3796)				
<i>Christian</i>	0.17 (3551)	0.32 (3771)	0.26 (3687)	0.53 (3754)	0.03 (3796)	-0.03 (3796)	-0.33 (3796)	1.00 (3796)			
<i>Confucianist</i>	-0.06 (3551)	-0.08 (3771)	-0.06 (3687)	-0.08 (3754)	-0.01 (3796)	0.01 (3796)	0.37 (3796)	-0.12 (3796)	1.00 (3796)		
<i>Hindu</i>	0.03 (3551)	-0.09 (3771)	-0.09 (3687)	0.06 (3754)	-0.10 (3796)	0.10 (3796)	0.05 (3796)	-0.19 (3796)	-0.02 (3796)	1.00 (3796)	
<i>Muslim</i>	-0.11 (3551)	-0.27 (3771)	-0.23 (3687)	-0.53 (3754)	-0.23 (3796)	0.23 (3796)	-0.17 (3796)	-0.71 (3796)	-0.07 (3796)	-0.06 (3796)	1.00 (3796)

Note. The number of pairwise observations is shown in the parentheses.

**5.6.4 Appendix 5D: Simultaneous equations
model estimate results using instrumental
fixed-effects, panel 2SLS, panel 3SLS, and
GMM–3SLS estimators**

Due to its excessive length, Appendix 5D is not included in the main text and is available online at <https://figshare.com/s/10f85691b260cdfb859f>

Chapter 6

Summary and conclusion

This dissertation comprises four empirical pieces of a larger puzzle on how religion interacts with globalization and sustainable development. The first piece of the puzzle surveys the ways in which international trade was viewed in ancient Asia through the lens of five major philosophies of life. The second piece of the puzzle analyzes the correlation between religion and globalization in the modern world using recent data. The third piece of the puzzle pays attention solely to the relation between globalization and sustainable development using a multidimensional approach. Lastly, the final piece of the puzzle seeks to understand the direct and indirect effects of religion on sustainable development through globalization.

The inquiry into views in ancient Asia of international trade in Chapter 2 is motivated by the lack of non-Western and particularly Asian perspectives in discussions on issues related to trade and religion in the field of the history of economic thought. The chapter reviews and discusses societal attitudes toward merchants and their commercial activities by focusing on a number of key writings for the five selected major philosophies of life (religions and schools of thought) in ancient Asia—the Vedic religion (ancient Brahmanism and Hinduism), Buddhism, Confucianism, Chinese Legalism, and Islam. The written

work linked to each of these philosophies of life that are studied in this chapter reveal dissimilarity and heterogeneity in the stances of ancient Asian societies on the role of merchants and international trade: while Islam promoted trade as the best livelihood and Buddhism saw the traveling of Buddhist monks with trade caravans as a superior way to spread its teachings to new lands, Confucianism on the other hand looked down on merchants, Hinduism although acknowledging the benefits of international trade merely tried to exploit traders whom they considered low-esteem servants, and Chinese Legalism went as far as considering merchants a threat to the nation. These ideas and attitudes toward international trade and globalization underlying in the ancient Asian philosophies of life are believed to have been carried forward to modern societies, which provides a strong motivation for empirically examining the correlation between religion and globalization in the next chapter.

Inspired by the findings in Chapter 2, Chapter 3 entails the collection and interpretation of data on globalization and the share of different religious populations and the atheist population as part of the total population to examine the existence and direction of possible Granger causality between religion and globalization in the past three decades. The two puzzle pieces (the inquiries of Chapter 2 and Chapter 3) match in that both show heterogeneity in religions when it comes to views on globalization, with Chapter 2 regarding views in the ancient world and Chapter 3 regarding views in the modern world. The Granger causality tests performed in Chapter 3 after each panel VAR analysis with the GMM approach on a sample of 159 countries for the period 1990–2015 suggest a bidirectional Granger causality in the cases of (1) Buddhism and general globalization as well as political globalization, (2) Christianity and general globalization as well as economic globalization, and (3) Hinduism and political globalization. Except for the cases of social globalization in relation to Christianity, Confucianism, and Islam, and except for the case of Hinduism and general globalization, unidirectional Granger causal effects are found. However, such unidirectional Granger causal effects do

not run in the same direction, as some of them run from religion to globalization, while others run in the opposite direction. In terms of the signs of the effects, while Buddhism evidently has a positive effect on globalization (in all four cases: general, economic, social, and political globalization), Atheism appears to hinder globalization (general and political globalization), and general, economic, and political globalization seem to have positive effects on the expansion of Islam. In the remaining cases, mixed Granger causal effects both in terms of direction and sign are found.

Temporarily placing the effects of religion aside, Chapter 4 focuses on another puzzle piece, namely the link between globalization and sustainable development. The chapter includes a self-meta-analysis (SMA) which was enabled by the large number of estimations produced by the multidimensional approach. Panel analyses conducted on a sample of 160 countries for the period 1990–2018 suggest quadratic relations between general globalization and sustainable development (concave) as well as its two dimensions, the Development Index (concave) and the Ecological Impact Index (convex). Further analyses of different proxies of globalization show that both economic and social globalization have quadratic relations with sustainable development and its two dimensions. The trends of their quadratic relations are consistent with those of the relations between general globalization and sustainable development, the Development Index, and Ecological Impact Index. However, the findings for political globalization are surprising and require further discussion, as all the analyses of the effect of political globalization on sustainable development, regardless of its measures (*overall, de facto, or de jure*), fail to provide consistent and solid evidence of the existence and direction of a relation between political globalization and sustainable development. Moreover, as part of the multidimensional approach, Chapter 4 conducts 180 estimations of the effect of globalization and 144 estimations of the effect of squared globalization, which leaves room for a SMA. The SMA's findings support the results of the prior analyses that indicate the

existence of a quadratic relation between globalization and sustainable development while also emphasizing the relevance of examining this relation using a multidimensional approach.

Lastly, Chapter 5 examines the direct and indirect effects of religion on sustainable development. This part of the thesis takes a first step in connecting the respective puzzle pieces by attempting to show how religion, globalization, and development fit together. Using a sample of 146 countries for the period 1990–2015 to investigate the potential effects of the five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam) and Atheism on sustainable development, Chapter 5 studies two channels of indirect effects of religion on sustainable development: globalization and per capita income. Through a system of four simultaneous equations, the chapter then highlights the heterogeneity among the studied religions, in this case in terms of how they affect sustainable development. Although the direct effects are negative in most of the cases except for Confucianism (positive effect), when indirect effects are considered, there are fewer cases of negative effects among the total potential effects.

First, results from the Buddhism and Hinduism models suggest negative direct effects and also negative indirect effects via globalization and per capita income on sustainable development, which then produces larger negative total effects. On the other hand, despite having the same direct effect as Buddhism (in terms of sign and magnitude), Christianity appears to have positive indirect effects via both globalization and income on sustainable development. It therefore ends up having a small positive total effect on sustainable development. In this case, then, the negative direct effect seems to be outweighed by the sum of the two positive indirect effects. In the model of Islam, the direct effect comes at a very small scale with a low level of significance, but the indirect effects increase in the same direction, leading to a negative total effect that is considerably larger than the direct effect. Confucianism, as the only religion that appears to have

a positive direct effect, presents a positive indirect effect via globalization on sustainable development, while no indirect effect via per capita income could be found. This combination produces an even larger positive total effect that Confucianism could have on sustainable development. Regarding Atheism, its negative direct effects are outperformed by its indirect effects, which reduce the negative effect of globalization and magnify the positive effect of income. Thus, the relevance of claiming that religion plays a central role in the process of development (Ver Beek, 2000) could largely depend on which religion is being discussed.

Aimed at drawing attention to the larger puzzle on the ways in which religion, globalization, and development are entwined, this dissertation falls short in several aspects. First, the discussions on ancient Asian views on international trade are limited by language barriers and a narrative reading approach, which cannot be considered a systematic analysis of different views. Second, as the empirical quantitative models used in this thesis prioritize efficiency over predictability, they bear the risk of missing potential explanatory variables. Next, the regression methods chosen for analyzing the relations between religion, globalization, and development all have their own shortcomings and weaknesses. Then, examining globalization in the global context using a world sample has kept the empirical chapters from looking closely at national and regional effects on the studied relations. Finally, the discussions on the potential role of religion are based only on analyses of the five major religions (Buddhism, Christianity, Confucianism, Hinduism, and Islam) while ignoring the importance of other religions and philosophies of life. These limitations could be overcome through future research using more systematic approaches, bigger regression models, more advanced statistic methods for a country or a region or for a group of specific countries, with more religions being considered and included.

Lastly, this thesis makes an important academic contribution in several ways. First, it contributes to the discussion on views on

international trade in the history of economic thought by considering how ancient Asian societies viewed traders, merchants, and their commercial activities across the five studied philosophies of life (religions and schools of thought). Then, it complements existing empirical studies on the interaction of religion and globalization by means of a Granger causality test on the panel VAR models of globalization and five major religions as well as Atheism. It also contributes to the debate on whether globalization is good or bad for sustainable development by drawing on a multidimensional approach followed by a self-meta-analysis, which together support the existence of a quadratic relation between globalization and sustainable development. Finally, it shows why religion is an important topic of study in the field of development by examining the direct and indirect effects of religion on sustainable development, with globalization and per capita income proposed as two indirect effect channels. While the multidimensional approach panel analyses of globalization and sustainable development suggest a quadratic relation between the two concepts, all the readings and empirical results from investigations on religiosity propose consistent heterogeneity across the five major religions considered in this thesis (Buddhism, Christianity, Confucianism, Hinduism, and Islam). However, due to revealing dissimilar effects (direct and indirect) of religion on globalization and sustainable development, the statistical results emphasize the need to pay more attention to religion in the field of research on globalization and development.

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About the author



Kim Tùng Đào was born on May 25, 1991, in Tien Giang, Mekong Delta, Vietnam. After obtaining a degree in International Business Management at the Foreign Trade University in Vietnam, she worked for 3 years in Marketing, yet the question of how our society should develop has always been on her mind. Hence, she went back to school looking for an answer, which then resulted in a Master's degree in

Development Economics at the University of Economics Ho Chi Minh City (the Vietnam – The Netherlands Programme) in Vietnam and a Master's degree in Development Studies at the International Institution of Social Studies, Erasmus University Rotterdam in the Netherlands, both obtained in 2017. She received the 'Best Master Thesis Award' from the University of Economics Ho Chi Minh City and the 'Best Master Research Paper using the Indices of Social Development Data Award' from the International Institution of Social Studies, Erasmus University Rotterdam. During her Master's studies, she co-authored a working paper with Professor Peter A.G. van Bergeijk on the Granger causality between World trade and World trade finance before and after the World trade collapse in 2008-2009. This research project awakened her interest in economic research while she is still in the quest for

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sustainable development. Hence, she started her doctoral studies under the supervision of Professors Peter A.G. van Bergeijk and Mathijs A. van Dijk in 2019, on the project 'The Holy Triad? Religion, Globalization, and Sustainable Development.'

During her doctoral studies, in collaboration with other PhD researchers at the International Institute of Social Studies, she co-organized the 19th Development Dialogue - an annual PhD conference that allows PhD researchers from all over the world to come together and exchange their research in the field of development studies. She contributed as the peer-discussant in her colleagues' Dissertation Design Seminars. She also presented her research at different international conferences and workshops held in the US, Vietnam, the Netherlands, Sweden, and Italy. Besides her academic research, Kim TÙNG ĐÀO also served as a data analysis intern at the Organization for the Prohibition of Chemical Weapons(OPCW).

Her research interests include International Trade, Globalization, Sustainable Development, Cultural Economics, and the History of Economic Thought on International Trade. Besides her desk research, she also has field-level research experience in coordinating primary quantitative and qualitative data collection in developing countries.

Working papers

ĐÀO, Kim TÙNG and van Bergeijk, Peter A.G., Winds from the East: Ancient Asian Views on International Trade (July 20, 2022).

International Institute of Social Studies Working Paper No. 705,
Available at SSRN: <https://ssrn.com/abstract=4167874> or
<http://dx.doi.org/10.2139/ssrn.4167874>

ĐÀO, Kim TÙNG and van Bergeijk, Peter A.G., Global Trade Finance, Trade Collapse and Trade Slowdown: A Granger Causality

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Analysis (January 7, 2018). International Institute of Social Studies Working Paper No. 633, Available at SSRN: <https://ssrn.com/abstract=3135988> or <http://dx.doi.org/10.2139/ssrn.3135988>

Invited presentations

2023

9th Annual Duck Family Graduate Workshop in Environmental Politics and Governance - University of Washington (USA)

2022

Vietnam Economist Annual Meeting - Foreign Trade University, Development and Policies Research Center & French National Center for Scientific Research (Vietnam)

The European Trade Study Group 23rd Annual Conference - The European Trade Study Group & University of Groningen (The Netherlands)

The 2022 Gothenburg International Research Workshop on Sustainable Economic Growth and Decent Work for All - University of Gothenburg (Sweden)

EPG Online seminar (Spring Session) - Environmental Politics and Governance Network (Online)

2021

48th Annual Meeting of the History of Economics Society - Universiteit Utrecht (The Netherlands)

Portfolio

2018

ASEAN Youth Conference 2018 "Unlocking Youth Potential" - ASEAN Youth Organization (Singapore)

Vietnam International Economics Research Symposium 2018 - Saigon South Campus of RMIT Vietnam (Vietnam)

Additional courses taken

2023

Economy of Francesco Summer School - The Economy of Francesco (Italy)

2022

UNCTAD YSI Summer School on Globalization and Development Strategies - United Nations Conference on Trade and Development (UNCTAD) and Institute of New Economic Thinking's Young Scholars Initiative (YSI) (Online)

Data Carpentry for Social Sciences - TU Delft, Leiden CDS, EUR Data Stewards (Online)

2021

UNCTAD YSI Summer School on Globalization and Development Strategies - United Nations Conference on Trade and Development (UNCTAD) and Institute of New Economic Thinking's Young Scholars Initiative (YSI) (Online)

Basic Didactics and Group Dynamics for PhD students of ISS - RISBO, Erasmus University Rotterdam (The Netherlands)

Portfolio

2018

International Summer Course on Social Protection in the Changing Labor Market - Department of Sociology of Universitas Gadjah Mada in partnership with SPRI Belgium, sponsored by BPJS Ketenagakerjaan (Yogyakarta, Indonesia)

Summer Course on Workshop on Experimental Economics Tools for Research - Environment for Development Vietnam administered by Economy and Environment Partnership for Southeast Asia at University of Economics Ho Chi Minh City (Vietnam)