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(From a Sociopolitical and Economic Perspective)**

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ABSTRACT

Monotheism (From a Sociopolitical and Economic Perspective)*

The Axial Age, which lasted between 800 B. C. E. and 200 B. C. E., covers an era in which the spiritual foundations of humanity were laid simultaneously and independently in various geographic areas, and all three major monotheisms of Judaism, Christianity and Islam were born between 1200 B. C. E. and 622 C. E. in the Middle East. In this paper, I offer a taxonomy to comprehensively characterize the impact of monotheism on early economic development. Monotheist religions produced a paradigm shift in sociopolitical institutions because they (a) involve a strong degree of increasing returns to scale and the natural monopoly powers commensurate with it, (b) not only personalize the spiritual exchange relationship between the individual and the one deity, but also, due to the fact that this relationship extends into the afterlife as well, enhance individual accountability, and (c) expand their adherents' time horizon beyond biological life and impact the time discount between one's lifetime and the after-life. Taken together, these features suggest that the spread of monotheism ought to have promoted sociopolitical stability. Utilizing original historical data between 2500 B. C. E. and 1750 C. E. on 105 limited access orders, such as dynasties, kingdoms and empires, I show that monotheism had a positive and statistically significant impact on the length of reign as well as the average geographical size of social orders. Thus, I find empirical evidence that the birth and adoption of monotheistic religions aided early development both in the West and the Near East until the advent of the Industrial Revolution.

JEL Classification: C72, D74, N33, N43, O10

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“If God does not exist, all is permitted.”

Ivan in *The Brothers Karamazov* (1880), Fyodor Dostoyevsky.

1. Introduction

The spiritual foundations of human societies were laid in various different geographic regions of the world fairly simultaneously during what is defined as the Axial Age, which lasted between 800 B. C. E. and 200 B. C. E. All three major monotheisms were born around this age between 1200 B. C. E. and 622 C. E. in the Middle East and they spread fairly rapidly to Europe, Africa and Asia subsequently. By the year 2000, 161 countries subscribed predominantly to one or more of the three monotheistic faiths, representing 86 percent of the 188 countries for which data exist and close to 3.3 billion people or roughly 55 percent of the world population. In the words of Diamond (1997, pp. 266-67), “At the end of the last Ice Age, much of the world’s population lived in [hunter-gatherer societies] and no people then lived in a much more complex society. As recently as 1500 A. D., less than 20 percent of the world’s land area was marked off by boundaries into states run by bureaucrats and governed by laws. Today, all land except Antarctica’s is so divided. Descendants of those societies that achieved *centralized government* and *organized religion* earliest ended up dominating the modern world. The combination of *government* and *religion* functioned, together with germs, writing, and technology, as one of the four main sets of proximate agents leading to history’s broadest pattern.”

Sociologists and political scientists have long been intrigued by how religion, governments and politics might have influenced each other historically. Various Enlightenment and early-20th century, post-Enlightenment scholars, such as David Hume, Auguste Comte, and Emile Durkheim, believed that faith and religion would experience an inevitable decline in the face of scientific and technological advances (see Hume, 1911, and Comte, 1855). But they also articulated in detail the social functions of faith and religion. According to Hume (1911), for example, benevolence and moral considerations associated with religion are the pillars of social harmony and stability. And Durkheim (1912) saw in group and social cohesion the manifestations of religious practices, norms and rituals. In the 1930s, the *structural-functionalist* school, led by Talcott Parsons began to assert that the cohesion of societies depended on their members sharing a common

purpose, conceptions of morality and an identity. In this, they were adhering to Emile Durkheim who saw in religion these social necessities. The validity of this line of thought has been called into question more recently, mostly on account of countries like the United States which were and are able to sustain social cohesion as well as a national identity in conjunction with religious pluralism and tolerance.¹ Still, the structural-functionalist concept can apply more generally at the level of not one particular faith but according to the (mono)theistic attribute of a plurality of faiths to which members of a society adhere. Along these lines, Stark (2001) has provided a sociological “theory of Gods” in which he identifies personalized supernatural exchange relations and otherworldly rewards as two features of monotheism that impact social organization and sociopolitical stability.

In contrast, economists have been fairly mute on this issue despite the fact that Adam Smith had a section in *The Wealth of Nations* (1776) devoted to how religious affiliation or lack thereof could impact national and political stability via its influence on conflict and cooperation.²

In this paper, I argue that the birth of monotheism was a major breakthrough in sociopolitical organization and that it had a returns to scale advantage relative to paganistic and polytheist religious traditions. That is, monotheist religions involve a strong degree of increasing returns to scale and the natural monopoly powers commensurate with it. Second, monotheistic faiths are unique in that they not only personalize the spiritual exchange relationship between the individual and the one deity, but due to the fact that this relationship extends into the afterlife as well, they also enhance individual accountability. On that basis, monotheistic faiths expand their adherents’ time horizon beyond biological life and impact the time discount between one’s lifetime and the after-life.

There are two implications of these features: First, due to the fact that institutions of monotheism possessed the ecclesiastical monopoly power to legitimize or undermine the temporal powers of the political elite, they helped produce political and ecclesiastical institutions that were powerful. In particular, the latter derived substantial financial and political benefits from being associated with One God. Thus, the stability of civilizations came to be linked with their respective ecclesiastical institutions. Second, the fact that all monotheist religions hold individuals accountable to God on Judgment Day aided contract enforcement, commitment and respect for private property within social orders.

¹For more details, see Stark (2001, p. 245).

²Interestingly and unfortunately, in many new editions of Smith’s book, this section was omitted (Stark, 2001, p. 116).

The combination of this accountability with the stronger emphasis on the afterlife also complemented military technologies in external conflicts. Both of these observations then imply, in Durkheimian fashion, that monotheist civilizations ought to have endured longer and perhaps even controlled larger geographic domains. As a result, monotheistic faiths should have spread and grown at the expense of paganist and polytheist religions.

Utilizing original historical data between 2500 B. C. E. and 1750 C. E. on 105 limited access orders, such as dynasties, kingdoms and empires, I show that the birth of Judaism, Christianity and Islam and adherence to monotheism had statistically significant effects on the length of reign as well as the average geographical size of civilizations historically.³ Specifically, I demonstrate below that kingdoms, dynasties and empires lasted about 360 years on average during this long time interval. And those historical civilizations that adopted monotheism, regardless of whether it was Judaism, Christianity, or Islam, lasted anywhere between 50 to 80 percent longer than non-monotheist social orders. Beyond the general impact of adherence to monotheism, I cannot find any empirical evidence that Judaism, Christianity or Islam exerted an impact on the length of reign of historical civilizations.

I also confirm that monotheism had a roughly similar effect on the geographic domain over which historical civilizations reigned during their peak influence. That is, monotheist limited access orders controlled about twice the land area of their non-monotheist counterparts. Unlike the results on duration, however, I find that adherence to a specific religion — Islam — did exert an additional positive impact on the geographic domain of civilizations historically. Thus, my findings indicate that the birth and adoption of monotheistic religions seem to have helped early development both in the West and the Near East until the advent of the Industrial Revolution.

One might be bound to think that, since One God faiths are built upon true revelations, they were destined to slowly wipe out the falsities of paganism, polytheism and the like. Be that as it may, such an assessment still lacks an explanation of why monotheisms spread at the expense of other faiths at least partly due to the fact that societies that adhered to monotheism lasted longer and spread wider. Put differently, monotheisms could have become the ecclesiastical norm among the historical societies of the Middle East, North Africa, Europe and Asia without having an effect on the duration

³As I clarify below, I shall define a society as *monotheist* if a majority of its citizens adhered to one of the three main monotheist religions, and/or its government and political organization promoted one of the three monotheist traditions through its social, economic and military policies. I shall also discuss some empirical issues that could complicate our analysis given this definition.

and dominance of civilizations. But the role of monotheisms on empire's durability and dominance seems to have been an important reason why Christianity and Islam spread rapidly in Europe, North Africa and the Middle East between the 4th and 9th centuries.

This paper relates to a strand in economics that emphasizes religion, social norms and culture as important factors in individual behavior and/or social organization. The main focus of some work in this strand is religion and culture in general (e.g., North, 1990, Iannaccone, 1992, Temin, 1997, Landes, 1999, Greif, forthcoming, Glaeser and Sacerdote, 2002, Jones, 2003, Fernandez et al. 2004, Fernandez, 2007, Barro and McCleary, 2003, 2005, Guiso, Sapienza and Zingales, 2003, forthcoming, and Spolaore-Wacziarg, 2005). Others in this line emphasize how individual behavior and the evolution of sociopolitical institutions are driven by a specific religion, such as Judaism, Islam or within different denominations of Christianity (e.g., Botticini and Eckstein, 2005a, 2005b, Kuran, 2004b, 2005, Becker and Woessmann, 2007, Lewis, 2002). Due to its emphasis on the links between ecclesiastical institutions and early development, the work below is also related to the theoretical and empirical literatures on institutions and economic progress (e.g., North, 1990, North et al. 2007, Acemoglu et al. 2001, and Rodrik et al. 2004).

The remainder of this paper is organized as follows: In Section 2, I summarize the role of monotheism in supporting and sustaining limited access orders. In Section 3, I describe my data, present the empirical findings and check for robustness. In Section 4, I conclude.

2. A Simple Taxonomy

Although they are not exclusive to the three main monotheist traditions, there are at least three salient traits of monotheism which impact the economic and sociopolitical realms. To start with, due to its returns to scale advantage, the birth of monotheism was a major breakthrough in social institutional design and it thus had a superiority relative to paganist and polytheist religious traditions. That is, from an economics perspective, monotheist religions involve a strong degree of increasing returns to scale and the natural monopoly powers commensurate with it. Second, monotheistic faiths are unique in that they not only personalize the spiritual exchange relationship between the individual and the one deity, but since this relationship extends into the afterlife as well, they also enhance individual accountability. On that basis, monotheistic faiths expand their adherents' time horizon beyond biological life and impact the time discount

between one's lifetime and the after-life.

There are two implications of these features: First, given that institutions of monotheism possessed the ecclesiastical monopoly power to legitimize or undermine the temporal powers of the political elite, ecclesiastical organizations held significant political power. That is, they derived substantial financial and political benefits from being associated with One God. Thus, the stability of civilizations came to be linked with their respective ecclesiastical institutions. Second, the fact that all monotheist religions hold individuals accountable to God on Judgment Day aided contract enforcement, commitment and respect for private property within social orders, while the combination of this accountability with the stronger emphasis on the afterlife complemented military technologies in external conflicts.

2.1. Returns to Scale & Natural Monopoly

Judaism, Christianity and Islam all acknowledge and promote the “oneness” of God. By nature, this introduces monopoly power and a strong element of increasing returns to scale in the provision of religious services. The monopolization of faith is a defining characteristic of the three monotheistic traditions. Niebuhr (1932, p. 53) points out that “The omnipotence of God, as seen in the world of nature, invests his moral character with the quality of the absolute and transfigures it into holiness... The religious conscience is sensitive not only because its imperfections are judged in the light of the absolute but because its obligations are felt to be obligations toward a person. The holy will is a personal will...”

Emphasizing a related point, Armstrong (1993, p. 49) points out that monotheistic faiths were unique in their mutual exclusivity, especially with respect to the belief in one God. She states, “... hostility toward other gods was a new religious attitude [of monotheism]. Paganism was an essentially tolerant faith: provided that the old cults were not threatened by the arrival of a new deity, there was always room for another god alongside the traditional pantheon. Even where the new ideologies of the Axial Age were replacing the old veneration of the gods, there was no such vitriolic rejection of the ancient deities.”

Stark (2001, p. 19, 34) draws a critical distinction between the individual's relationship with one God under monotheism and that with multiple deities in polytheism, according to which competition between various divine beings played a role in shortening the interactions between the adherents and their gods:

“Polytheistic religions sustain only short-term exchanges, as humans seek specific and quite immediate benefits from the Gods and spread their risks by shopping around and patronizing multiple suppliers. If there is only one God, this necessitates an *exclusive* exchange relationship, there being no logical alternatives... It is illogical to deal with a flock of specialized Gods if there is One God of unlimited scope and capacity. An exclusive relationship with One God is also an *extended* relationship—usually lifelong. No longer are humans able to go “God shopping” or to pit one God against another. This results in extremely strong organizations possessed of immense resources, consistent with a God of unlimited power and concern.”

Furthermore, monotheisms differ from one another in the extent to which they are ‘clerical’ or ‘congregational’ although, in this regard, the heterogeneity within Christianity — which for the most part is due to the Protestant Reformation and its offshoots — is unique.⁴ Naturally, the clerical system enabled more of a fusion between ecclesiastical authority and temporal political power. That is, the extent to which the clergy had ecclesiastical authority often influenced the political sphere because the clergy could use their powers to bolster or undermine the legitimacy of secular authorities. On this, Niebuhr (1932, pp. 6-7) notes “The two most obvious types of power are the military and the economic, though in primitive society the power of the priest, partly because he dis-

⁴In Islam, which by construction is congregationalist, the Caliphate was at least at times used to legitimize political authority. During its early tenure, the Caliphate represented a powerful religious and political authority for both the *Sunni* and the *Shi’a*. According to Armstrong (1988, p. 585). “The *Caliph* was the successor and deputy of the Prophet Mohammed and he was recognized as the supreme authority of the Muslims by the Sunni until the Mongolian invasions in the late thirteenth century. According to the Sharia, the caliph exercised full authority in both spiritual and political matters, but in fact, his position was weak. After the period of the *rashidun*, the first four Rightly Guided Caliphs, and the rise of the sultans and amirs throughout the huge Islamic empire, the caliph lost credibility and became a figurehead.”

Even during the later era, however, the Sunni Caliphate represented a medium of legitimizing political authority: the Ottoman Emperor Yavuz Sultan Selim conquered the Arabian peninsula in 1517 and assumed the Sunni Caliphate, a title which all the Ottoman Sultans carried until 1924 when the fledgling Turkish Republic abolished it.

In contrast, for the Shi’a, there were twelve Caliphs who possessed religious and political authority. According to Shi’a liturgy, the Prophet Mohammed wanted his cousin Ali to succeed the first Caliph, Abu Bakr. Thus, after *rashidun* (which represents the reign of the first four caliphs recognized as legitimate by both the Sunni and the Shi’a), the descendants of Ali began to offer an alternative rule to the Sunni caliphs. When Ali’s bloodline died out after the twelfth Caliph, the Shi’a declared that he would eventually return as their Messiah.

penses supernatural benefits and partly because he establishes public order by methods less arduous than those of the soldier, vies with that of the soldier and the landlord.”

There are a couple of points that needs to be emphasized here: First, these increasing returns and the associated powers of monopoly are what help to explain the prominent monopoly roles of the Roman Catholic Church in Western Europe during the common era, the Greek Orthodox Church in Eastern Europe between 4th century and the 19th centuries C. E., as well as that of the Caliphate in the Ummayyad and Abbasid dynasties between 600 C. E. and 900 C. E. and the Ottoman Empire between 1517 and 1924. As Stark explains the fact that individuals are held accountable by *one* God for their temporal deeds and that his rewards are often delayed until after death, “is a major factor allowing Godly religions to generate the long-term levels of commitment necessary to sustain strong religious organizations.” Second, monopoly power in religious affairs coupled with state and government organization carried a profound impact in the economic and sociopolitical realms: Due to the fact that monotheism involves strong increasing returns to scale that help to sustain powerful (ecclesiastical) institutions, they spread rapidly over vast geographic areas.

2.2. Personalized Spiritual Exchange and Accountability

Human spirituality is pillared on the desire to grasp the meaning of human existence and rationalize, at least to an extent, natural phenomena that are incomprehensible to the human mind. With atheistic spiritual movements, explanations of such phenomena typically involve supernatural powers that do not have the conscious will that is required for personalized involvement and communication. With polytheistic faiths, there are multiple deities who rule various aspects of temporal life, but there exists none with the omnipotence to control all aspects of temporal and spiritual existence. In contrast, monotheistic faiths involve one omnipotent divine being who has not only control over the whole universe, but also desires he wishes humans to fulfill which he can communicate them.

Stark (2001, p. 15-19) observes that, by personalizing the spiritual exchange and reinforcing accountability, theology and faith provide a very effective means to deal with human wants and desires that are often fleeting and inherently in short supply, such as survival, health, financial security, etc.:

“Because Gods are conscious beings, they are potential exchange partners because all beings are assumed to want something for which they might

be induced to give something valuable. Indeed, the core of Godly religious doctrines consists of explanations about what Gods want and what one must do to earn their blessings... That is, Godly religions assume that divine beings not only have desires they wish humans to fulfill, but that they can communicate them... If theology, in effect, tells us what God wants, it is equally important that we understand the other side of this exchange relationship: what do people want from God? To answer, we must acknowledge the most fundamental aspect of the human predicament, namely that rewards are always in limited supply and some are entirely unavailable... In response, humans tend to seek alternative means to overcome limited supplies or complete unavailability, [such as miracles and otherworldly rewards.]”

By nature, otherworldly rewards are compensation for individuals’ temporal deeds and, to an extent, they substitute for temporal needs and wants that are in limited supply or that are entirely unavailable.

2.3. Time Horizon & Time Discounting

The belief in afterlife is not unique to monotheist traditions but, the Judgement Day, when individuals are held accountable for their deeds and are judged by God accordingly, is a central tenet of all three major monotheist traditions. This is typically lacking in religions that involve reincarnation.

In Jewish liturgy there is significant prayer and talk of a “book of life” that one is written into, indicating that God judges each person each year even after death. This annual judgment occurs on *Rosh Hashanah*. In Christianity, the Last Judgment or *Day of the Lord* is the simultaneous judgment of every person when, after the resurrection of the dead, Christ will return to judge the living and the dead. Those positively judged will be saved and live in God’s presence in Heaven and those who are negatively judged will be cast to eternal Hell. In Islam, the *Day of Judgment* is described in the Quran and the Hadith. The Islamic Judgment day starts 30 years before the end of the earth, and sees the return of prophet Jesus to the earth. The last 30 years on earth will be a line of events that will see the resurrection of the deceased. This is followed by judgment day beyond the universe involving Hell and Heaven and the weighing of Good and Evil. In contrast, religions that include reincarnation (e.g., Hinduism) lack a Day of Judgment; the determination of how an individual is to be reborn being a particular judgment on the merit of the life just lived.

A belief in the afterlife and a day of judgement which determines one's well-being in it impacts a vast array of temporal economic and social decisions. These include, but are not confined to, production, legal and extra-legal appropriation, consumption, saving, investment, altruism and even the decision to engage in violent conflicts. Furthermore, while religious beliefs, the oneness of God and a day of judgement foster commitment, contract enforcement and acceptance of private property within social orders, the belief in the afterlife complements and augments military power and has historically helped the vigor with which social orders defended themselves against external threats. Hence, some of the same central tenets of monotheism that bred social order domestically helped to enhance military defense externally.

In essence, monotheist traditions were the main impetus for stability in the transition between primitive social orders, such as hunter/gatherer societies, to limited access social orders. For our purposes, then, we can categorize the various effects of a personalized spiritual exchange between the individual and God in addition to the belief in the afterlife and the Judgement Day according to whether they are intra-social or extra-social in nature.

2.4. Intra-Social Effects

Scholars of theology, psychology, sociology and, to some extent, economics too have recognized the moral, ethical and egalitarian aspects of religion, in general, and monotheist traditions, in particular.

For example, while being dismissive of religion in general and arguing that it belonged to relatively primitive states of social order, such as the pre-Industrial era, Sigmund Freud recognized that it promoted ethical values and moral codes essential to a society's functioning. Karl Marx, who also had no room for faith in his vision of socialism, stated that it was "...the opium of the people, which made this suffering bearable." According to Armstrong (1993, p. 48) "It has to be said that this imaginative portrayal of God in human terms has inspired a social concern that has not been present in Hinduism. All three of the God-religions have shared the egalitarian and socialist ethic of Amos and Isaiah. The Jews would be the first people in the ancient world to establish a welfare system that was the admiration of their pagan neighbors." Along the same lines, Farrington (2002) notes that, while for some empires religion was the main impetus for their existence, for most of them it served as a means of social stability and control.

With respect to the impact of each monotheist religion on its adherent societies, the

economic history literature is fairly well-developed with regard to the impact of various Christian denominations — in particular, those of the Protestant Reformation and its offshoots — on the European economic takeoff. Moreover, in recent years, there has been a fledgling body of work which has begun to focus on the link between faith-related institutions and economic development within Jewish and Muslim societies.

As is very well known, the impact of Protestantism on European sociopolitical and economic evolution has been extensively debated. The origins of this debate can be traced back to Weber (1930) who subscribed to the view that Protestantism — particularly its offshoot Calvinism — had “cultivated an intense devotion to one’s work or ‘calling’ in order to assure oneself that one had in fact been selected for salvation.” Rosenberg and Birzdell (1986, p. 129) are sympathetic to this view and discuss it in detail. But various scholars dispute it strongly. For instance, Mokyr (1990 and 2002) dismisses this link by noting that the Counter-Reformation era was probably as bigoted a period as the pre-Reformation era.

One of the main thrusts of Martin Luther was his emphasis on the laity’s responsibility to study and personally examine the Scripture for themselves. As such, Protestantism had two discernible, long-term effects on the European society and its organization. First, it clearly empowered the individual and emphasized his personal responsibility as superior over ecclesiastical regulations and regimentations (see Hillerbrand, 1968, p. xxiv). Second, the Lutheran calls for individuals to study and read the Bible themselves spurred a greater emphasis on literacy as well as various interpretations of the Scripture with the translation and the printing of the Bible in the vernacular instead of its original Latin.

This last point is emphasized by Becker and Woessmann (2007) who find empirical support for the idea that the Protestant Reforms spurred human capital accumulation among the followers of the Protestant reformers. In expounding on this idea, Hillerbrand (1968) notes that about one million copies of Luther’s tracts had been published by 1523 and that the literature produced by the Reformation scholarship — led by the preeminent figures of the time such as Luther, Zwingli and Calvin as well as other minor reformers such as Bucer, Melancthon and Carlstadt — would not have been published had there not been sufficient demand.

Botticini and Eckstein (2005, 2007) make this same argument with respect to Judaism: the reading of the Torah and the Talmud became a requirement of Judaism following the burning of the Jewish Temple in Jerusalem in 64 C. E., thereby leading

to advanced literacy and a steep path of human capital accumulation in the Jewish communities of the Middle East between 64 C. E. and 200 C. E.

Others have emphasized that perhaps the most important legacy of the recognition of Protestantism and its various offshoots by the Catholic Church in the 16th century was greater social cohabitation in Europe (see, MucColloch, 2003, p. 652).

With regard to Islam, Armstrong (1993) and Lewis (2003) discuss in some detail various institutional features of Islam and the impact of the latter on ancient Arab civilizations, such as the Abbasids, Umayyads, and Mamluks. Kuran (2004a, 2004b) and Lewis (2002) also elaborate on how Islam and its interactions with Christianity and Judaism influenced the institutions of the Ottoman Empire. The common thread among these works is that the Islamic culture helped promote stability in social, political and the economic realms, although in the case of the Ottoman Empire some of the very institutional traits that promoted stability came at the cost of dynamic flexibility.

2.5. Extra-Social Effects

There is a well-established strand in the political science literature that focuses on religion in explaining the historical patterns of violent conflict and cooperation; it shows that differences in religious beliefs have historically induced violent conflicts. For instance, in compiling a data set with over 300 violent conflicts around the world between 1820 and 1949, Richardson (1960) reveals that differences of religion, especially those of Christianity and Islam, have been causes of wars and that, to a weaker extent, “Christianity incited war between its adherents.” In addition, Richardson finds that war alliances had subdued and prevented wars between former allies, although this influence declined with the passage of time since the alliance. As Wilkinson (1980) points out, Richardson’s analysis applies more broadly in the sense that “the propensity of any two groups to fight increases as the differences between them (in language, religion, race, and cultural style) increase.”

The fall of Jerusalem to Islamic civilizations instigated (depending on how you count, about nine) Holy Crusades that had a profound impact on how the Christian, Muslim and Jewish civilizations interacted subsequently. With reference to the confrontations of Ottomans and Europeans, in particular, Faroghi (2004, pp. 41-42) notes “...these rivalries did not prevent Christians from both western and south-eastern Europe from seeing themselves as belonging to one and the same religion, and this sentiment was especially strong when they were confronted with a Muslim ruler.” And in a com-

panian paper, Iyigun (2006), I have shown how the conflict between the Muslim Ottoman Empire and European secular and ecclesiastical powers aided and abetted Protestants' rise. Such evidence lends further credence to the arguments that religious affiliation has historically been a key determinant of international conflicts and cooperation.

Niebuhr (1932, pp. 65-66) accepts that stroking patriotic notions of identity was important for galvanizing a society in external conflicts too. But what made religion especially effective as a complementary component of national defense was the "absolute" nature of its claims, rewards and punishments:

"There is a moral and social imagination in religion which invests the life of other nations with a significance as great as that which is claimed for one's own nation. But it is not as powerful and not as frequently expressed as the imagination which makes one's own nation the peculiar instrument of transcendent and divine purposes... It is not only religion which gives a special dignity and worth to the life of the nation to which one belongs. Patriotism is a form of piety which exists partly through the limitation of the imagination, and limitation may be expressed by savants as well as by saints. The wise men of the nations were just as sedulous in proving, during the late Word War, that their particular nation had a peculiar mission to "culture" and "civilization" as were the religious leaders in asserting that the will of God was being fulfilled in the policy of their state. But since the claims of religion are more absolute than those of any secular culture the danger of sharpening the self-will of nations through religion is correspondingly greater."

Stark (2001, p. 35) in fact ties this aspect of monotheism to its more benign forms, such as its adherents extensive missionary zeal and desire to spread the word of one true God:

"When we examine history, we find no massive mobilizations on behalf of *the Gods*. Polytheistic societies are capable of prodigies of effort including those of conquest. But the armies of Rome, imperial China, or ancient Egypt did not march on behalf of divine will—unlike the armies of Islam or those enlisted by popes for Crusades to the Holy Land. Granted, many Christian crusaders and Islamic conquerors also had nonreligious motives, and some may even have been irreligious. But, lacking the powerful religious justification of doing God's Will, these events would not have taken place. Only

One True God can generate great undertakings out of primarily religious motivations, chief among these is the desire, indeed the duty, to spread the knowledge of the One True God...”

3. The Empirical Analysis

3.1. Data Sources & Descriptions

Testing the theory of monotheism I outlined above, in particular, the idea that monotheism produced sociopolitical stability, requires establishing specifically what is meant by a *monotheist* society. Thus, for practical purposes, I shall define a society as *monotheist* if a majority of its citizens adhered to one of the three main monotheist religions and/or its government and political organizations promoted one of the three monotheist traditions through their social, economic and military policies.

One potential objection to our definition of a monotheist society could be that it treats all individuals of a given society identically. But as we clearly know, there exists a great deal of heterogeneity in the individuals’ degree to which they adhered to and practiced the majority monotheism of their society. Even in the case of forced conversions following conquest and subversive campaigns, there was no guarantee that the converts practiced the dictated state monotheism. A relevant example in this regard is the plight of the Jewish converts in al-Andalus prior and subsequent to the pogroms of 1391. The conversion of many Jews (the *conversos*) during this era in order to avoid massacre in Christian hands was not enough to quell suspicions that they were in fact ‘closet Jews’ and those coreligionists who dared not to have converted were also promoting Judaism at the expense of Christianity. Thus began the infamous *Spanish Inquisition* which was the design of Ferdinand of Aragon and Isabella of Castile to purge Iberia of all non-Christian elements (for more details, see Iyigun, 2008). In light of this potential concern, let us make the following observations: First, the main emphasis here is on whether the state and government apparatuses promoted one of the monotheisms — be it via its conquests and trades or through its imperial, colonial and missionary activities. The emphasis is not so much on whether individuals properly and uniformly adhered to their state’s monotheism. True, for monotheisms to have imparted the internal and external sociopolitical benefits that we discussed above, a majority of a society’s members would have had to have practiced monotheism. But this brings us to the second point which is that this is ultimately an empirical matter. Since we cannot hope to have an accurate measure of individuals’ overall intensity of *adherence to monotheism* and we

use a definition which, for the most part, classifies each civilization according to its state and government attitudes regarding monotheism, if the former was what really mattered and not our definition, the empirical work below would refute any effects of monotheism on societies. Finally and related to our second point, we should acknowledge that any such variation and heterogeneity within societies would produce attenuation bias.

To review some examples regarding our definition, consider the Carolingian Empire of Charlemagne and the Ottoman Empire. The defining characteristic of the Carolingian Empire was that its King Charlemagne was coronated by the Catholic Pope Leo III in 800 C. E. as the political leader of western Europe crowned by God. During all of his reign, Charlemagne was driven by his desire to conquer lands to his north and east with the intent to spread Christianity and he was quite successful in this endeavour. In contrast, the Ottoman Empire was orders of magnitude more pluralistic in its sociopolitical and imperial policies, at least judged by the norms of its era. Conquered peoples were free to practice their religion as long as they paid the levied taxes. The Greek, Armenian, Jewish and Frankish minorities practiced their trade and commerce and lived in their more or less isolated communities throughout the empire in relative peace. But rising in the bureaucratic or military ranks required a Muslim identity. The *devşirme* system, which was introduced by Sultan Murad I in the early 15th century, was the act of gathering and converting to Islam the young boys of the non-Muslim Ottoman populations who were raised in palaces or military barracks with the sole intent of employing them in their adulthood in military or government posts.

To proceed with our investigation, we need a comprehensive historical dataset on empires, kingdoms and dynasties that cover a wide enough historical timespan which envelops the birth of the three monotheistic faiths on both ends. With these constraints and demands in mind, I focus on a 4250-year period between 2500 B. C. E. and 1750 C. E. The start date of 2500 B. C. E. is purely due to data limitations as a systematic record of historical civilizations only dates thus far back. And I chose to cap the sample dates at 1750 C. E. in order to establish the role of monotheism in sociopolitics during the pre-Industrial era and prior to the rise of nation states.

There are a variety of alternative sources of data for our purposes and for the historical record of empires, dynasties, and kingdoms, I used Rand McNally & Co.'s *Historical Atlas of the World* (1997), Anglin and Hamblin (1993), and Farrington (2002, 2006). As I provide more detail below, I recorded various facts about these civilizations, the most important of which are their years of foundation and collapse (if they did so

before 1750 C. E.). For geographical information on land areas, I relied on the C. I. A.'s *The World Factbook*. And for the population estimates, I used MacEvedy and Jones (1978). For geographic classification, I divided Europe, the Middle East, North Africa, Asia, and America into thirty three regions according to their historical significance and as classified by Anglin and Hamblin. Using these historical records and various sources, I was able to identify 105 civilizations which inhabited one of the five continents. Appendix A presents the 105 limited access orders included in my dataset and lists my geographic categorizations and Appendix B summarizes their land areas as compiled from *The World Factbook*.

There were some key differences and similarities between monotheist limited access orders and others: On average, monotheist civilizations lasted about five and a half decades less than non-monotheist social orders, with a typical non-monotheist civilization enduring about 375 years and a monotheist society lasting about 320 years. The monotheist societies attained a peak land mass of about 2.4 million km^2 , which was roughly half a million km^2 larger than non-monotheist societies. For comparison purposes, when civilizations in the Americas are excluded, monotheist civilizations lasted about two and a half decades longer, whereas their peak land mass was about 120,000 km^2 smaller than non-monotheist orders. Hence, the early American civilizations lasted much longer than average (about 600 years) but they occupied more concentrated areas during their reign. Monotheist societies were distributed fairly evenly between the Middle East, Europe and North Africa, although there were more of them in the Middle East. In contrast, non-monotheist establishments were predominantly centered in the Middle East, Asia and America.

In the whole sample, the civilization that lasted longest was Kingdom of Elam, a polytheist culture in what is now regions of Iran. It is one of the oldest recorded civilizations that existed between 2200 B. C. E. and 644 B. C. E. It lasted for close to 1600 years. The Byzantine Empire, which survived 113 decades in Asia Minor, Middle East and the Balkans followed by two civilizations of the Americas, Adena in the Mississippi Delta and Olmecs in the Gulf of Mexico, which both lasted 1100 years, were some of the other durable civilizations. It is noteworthy to point out that among these most durable societies only the Byzantine Empire adhered to a monotheism.

In terms of the land mass achieved during the peak of empire, the Ottomans, various Chinese dynasties, such as Xia, Qin, Han and Song, as well as the Mongol and Macedonian Empire top the list; the Ottoman Empire and the Chinese dynasties

spreading as large as about 9 million km^2 during their peak followed by the Macedonian and Mongolian Empires both of which easily exceeded 4 million km^2 . And the smallest geography in my sample is the Kingdom of Atropatene which occupied an area about 15,000 km^2 that is now part of modern day Armenia bordering on Northern Iran. Of those outliers in peak land mass, only the Ottomans and the Mongols adhered to a monotheistic faith — that is, Islam.

Of the 79 non-monotheist limited access order in my sample, 26 were in the Middle East, 23 in Asia, 2 in Europe, 7 in Africa, and 21 were in the Americas. Some of the notable non-monotheist limited access orders in my data include the Egyptian Kingdoms (Old, Middle and New); the early Anatolian civilizations (Hittites, Luvians, and Lydians); the Mesopotamian Empires (such as Akkadians, Old Babylonian Kingdom, and Assyrian Empire); Iranian Empires (Seleucid, Parthian, and the Persian Empire); various Northern and Southern Chinese Dynasties (such as Xiongnu, Xian-bi, Xia, Shang, Song, and Ming); early American civilizations (Aztecs, Incas and Mayans) as well as Alexander the Great's fleeting Macedonian Empire.

Of the 26 monotheist limited access orders, 10 were in the Middle East, 6 in Europe, 4 in North Africa and 6 were in Asia. Of those, 14 were Christian, 11 were Muslim and only one was Jewish (Israel/Judah Kingdom, 1200 B. C. E. - 584 B. C. E.). Besides Israel and the Judah Kingdom, among the monotheist limited access orders were the Axum Empire, the Byzantine Empire, the Holy Roman Empire, the Carolignian Empire, and the Spanish, Portuguese and British Empires (all Christian); the Arab Empire of Abbasids and Ummayyads, the Tulunids, Fatimids, Ayyubids, the Mamluks, the Seljuk Empire, the Ottoman Empire, and the Safavids (all Muslim). Appendices C and D respectively summarize some basic characteristics of the monotheist and non-monotheist civilizations in my data.

The Roman Empire and the Mongol Hordes provide the only two mixed cases where the sovereigns officially adopted a monotheist tradition after the empire began: The Roman Empire formally converted to Christianity in 313 C. E. during the reign of Constantine. The Mongol Empire adopted Islam in 1252 when the Mongol Khan Ghazan and his subjects converted to Islam. Given the timing of the exact conversion of these societies to monotheism, I shall classify the Roman Empire as a non-monotheist civilization when I need to treat the Roman Empire as one single observation as I do with the cross-section aggregated data. This is due to the fact that the Empire lasted only another seventeen years after Constantine declared Christianity the official religion of

his Empire. In contrast, I will treat the Mongol Empire as a Muslim civilization because Ghazan Khan's adoption of Islam is within 46 years of the foundation of the empire, which by various accounts lasted until the early-16th century.

In all that follows, Israel/Judah Kingdom also has a peculiar role in that it represents the only historic civilization that adhered to Judaism. It is also one society for which the exact date when it began to subscribe to the unambiguously monotheist version of Judaism is in question (see, for example, Armstrong, 1993, and Stark, 2001). In any case, none of the results I discuss below are influenced by whether Israel/Judah Kingdom is classified as monotheist before or after 606 B. C. E., although as the sole Jewish monotheist order in the sample, it usually ends up being an outlier which robust regression techniques typically omit.

Before we get to the empirical work, it is worth pointing out some similarities and differences among the social orders in the dataset. Take for instance the civilizations of the Americas where the indigenous cultures of Mesa Verde survived 800 years in what is now a confined region in the state of New Mexico; Adena lasted 1100 years in the Mississippi Delta; Hohokam lived a half a millennium in roughly the same geographic region. Down in South and Central America, The Chavin culture reigned for a millennium in the Andes region and the Classic Maya civilization survived for 650 years in Yucatan. On average, the historical social orders of the Americas controlled limited geographic territories over typically long periods of time. And none of these civilizations were monotheist.

Next examine the kingdoms, dynasties and empires of Asia where you find that only the Xia and Shang Dynasties lasted more than 400 years, but all of the Chinese dynasties controlled a vast geographic landscape in what is now mostly China. And the Gupta Empire ruled for a little over two centuries in India.

Then take note of some interesting civilizations that literally lived, prospered and died by the swords of their founders and rulers. The Macedonian Empire lasted only 40 years but under the rule of Alexander the Great it became a vast and mighty empire that extended from the Balkans to all of Persia, parts of Egypt and the Middle East. The Mongol Empire lasted longer for about three centuries, but during the reign of Genghis Khan it raided territories in the West and East so effectively and brutally that between 1205 C. E. and 1260 C. E. it had managed to stretch between the China Sea and central Europe. The Islamic Seljuk Empire lasted only 157 years but moving west from their geographic origins in central Asia, they were able to enter Asia Minor in 1071 C. E. which

marked the beginning of the Turkish presence in Anatolia that continues to this day. And the Arab Umayyad Dynasty was able to spread so rapidly between 632 C. E. and 750 C. E. that, by the time it fell in the middle of the 8th century to another Arab dynasty of the Abbasids, the Arab Empires controlled all of the Arabian Peninsula, Middle East, most of southeastern Anatolia, Persia, North Africa and the Iberian Peninsula.

Among the monotheist civilizations, the Axum Empire stands out due to its isolated geography vis-a-vis other monotheistic civilizations as well as its endurance too. It lasted for about seven centuries (270 C. E. to 960 C. E.) in what is modern-day Ethiopia and parts of Yemen. Some folklore has it that the *Ark of the Covenant* in the *Old Testament* was actually stored in a monastery of Axum, although there are some alternative theories as to how it ended up in Ethiopia. The first rulers of Axum were pagans and polytheists and the empire grew to be an important trading center of Africa. It converted to Christianity in the fourth century C. E. after a “Christian philosopher by the name of Meropius, bound for India, was shipwrecked on the coast. Although he died, his two companions survived and when they began to spread the word of the gospels, they found a receptive audience,” (Farrington, 2006, p. 64). Interestingly, Axum remained the only monotheist culture in Africa for another three centuries when in the 7th century C. E. the Arab Umayyad dynasty began to conquer Northern Africa and convert the local populations to Islam.

3.2. Summary Statistics

I now empirically explore whether the birth of monotheist religions and their adoption by limited access orders had an impact on the duration and the geographic domain of the latter. To this end, I formulate two empirical specifications: the main one, which is a panel of 426 decades and 105 limited access societies and an alternative cross-section series aggregated over the whole time span covering the 105 limited access orders. For each of the 426 decades in my timespan, I created dummy variables for the timespan of each limited access order as well as dummy variables for whether a limited access order reigned in each of the thirty three geographic regions. On the basis of this information, I also constructed derivative data on the number of limited access orders that existed, the number of geographic regions under the control of limited access orders during each decade and the average number of regions within the control of each limited access order during every decade. Table 1 lists and defines all variables used in the empirical analysis.

Table 2 presents the key summary statistics. As can be seen in the bottom panel,

the average limited access order lasted for a little over 36 decades; there was a positive correlation between the duration length of a limited access order and the birth of the three monotheist religions; the duration of a limited access order was longer among Christian and Jewish establishments whereas this relationship was negative for a Muslim limited access order; the peak land mass of a limited access order was smaller for Christian and Jewish societies, while it was positively linked in the case of Muslim limited access civilizations. In both samples, the duration of limited access orders is linked positively with the time period, suggesting that limited access orders lasted longer later in history. As shown in the bottom panel, the average land mass of limited access societies reached a peak of 2 million square-kilometers although this statistic rose over time as well. In the cross-country sample of 105 total countries, 26 were subscribed to one of the three monotheist religions, which corresponds to a quarter of the whole sample.

[Tables 1 and 2 about here.]

3.3. Panel-Data Estimates

My baseline estimates are derived from the panel data using the following specification:

$$\begin{aligned}
 LAO_{i,t} = & \lambda_i + \mu_t + \lambda_1 MONOTHEISTLAO_i \\
 & + \lambda_2 JUDAISM_t + \lambda_3 CHRISTIANITY_t + \lambda_4 ISLAM_t + \lambda_5 X_{i,t} + \varepsilon_t,
 \end{aligned}
 \tag{1}$$

where the left-hand-side variable $LAO_{i,t}$ denotes a dummy variable for the i th limited access order at time t (measured in decades); it takes on the value of one if i exists at time t and zero otherwise. The explanatory variables in this specification include time and limited access order fixed effects, respectively given by μ_t and λ_i , a dummy variable for whether the limited access order was characterized by a monotheistic governance structure, $MONOTHEISTLAO_i$ and the interaction of the latter with the time dummy, $MONOTIME_i$. Depending on the parsimony of the empirical specification, the control variables in $X_{i,t}$ include variables for which of the main three monotheistic religious faiths had been founded at time t , $JUDAISM_t$, $CHRISTIANITY_t$ or $ISLAM_t$, as well as controls for the numbers of limited access orders in different geographic regions at time

t and the total numbers of geographic regions which were under the control of limited access order i at t .

In Table 3, I present my baseline estimates. They are derived with two estimation alternatives: ordinary least squares with robust errors (OLS) and Probit regressions with robust errors. In columns (1) and (4), I present the estimates from the most parsimonious specification. As shown, whether a the limited access order was associated with one of the three main monotheistic faiths exerted a statistically significant and positive effect on the likelihood that a kingdom, dynasty or empire existed in any decade. This impact was quantitatively very large: according to the OLS estimates, the likelihood that a dynasty, empire or kingdom existed one more decade is close to 88 percent higher if it was associated with Judaism, Christianity or Islam. With the Probit estimation, this effect is smaller but still quite large standing at roughly 53 percent.⁵

In columns (2) and (5) I add, as additional controls, dummy variables for which of the main three monotheistic religious faiths, $JUDAISM_t$, $CHRISTIANITY_t$ or $ISLAM_t$ existed at t . Interestingly, the impact of the *birth* of monotheistic faiths on the likelihood of existence of the limited access orders varied between the three religions, with Judaism providing the only robust positive impact, and Islam generating a negative effect. Note, however, an important distinction between the variable $MONOTHEISTLAO$ and the three religion dummies $JUDAISM$, $CHRISTIANITY$, and $ISLAM$. The former variable is specific to each limited access order while the latter three are variables which attain one after their respective religions are born and zero before. Hence, the asymmetry may be suggestive of intensified competition between the monotheistic faiths as more of them coexisted later in time (I shall explore this idea further below). According to these baseline estimates, there was also a statistically significant positive but mild time trend in the survival of monotheistic limited access orders.

In columns (3) and (6), I include geographic variables which account for how many limited access orders existed there at any given time. As shown, when more limited access order civilizations lasted longer in Asia, Africa and America, each one endured longer, whereas they typically lasted shorter periods of time if there were more limited access orders in Europe or the Middle East. Importantly, the inclusion of such controls have no

⁵I calculate these effects by taking into account the positive and significant interaction effect due to $MONOTIME$. In particular, according to the estimate in column (1), the aggregate effect of $MONOTHEISTLAO$ around year 0 is equal to $.860 + .00007 * 250 = .878$. Doing the same using the estimates in column (4) generates $.433 + .0004 * 250 = .533$.

impact on the positive effect of *MONOTHEISTLAO*; it still comes in significant and positive, with the OLS estimate generating an impact of 88 percent (which is in line with the estimate in the column (1) specification) and the Probit estimate yielding about a 40 percent impact of monotheism on the survival of limited access orders an extra decade. Interestingly, in these expanded specifications, the birth of *JUDAISM* still impacts the survival of limited access orders positively and that of Christianity affects it negatively, but that of Islam has no statistically significant impact.⁶

Finally, I added an alternative religion variable, *LAORELIGION_i*, which takes on the value of 1 if the limited access order was associated with Judaism, 2 if it was linked with Christianity, 3 with Islam and 0 otherwise. With all these control variables in place, I replicated my baseline findings with adherence to a monotheistic religious faith producing a statistically significant and positive impact on the likelihood of survival of empires, dynasties and kingdoms. Given this I have chosen not to report these empirical findings.

[Table 3 about here.]

In sum, these panel data estimates provide strong support for the idea that monotheistic empires, kingdoms and dynasties that existed in the Middle East, North Africa, Europe, Asia and the Americas between 2500 B. C. E. and 1750 C. E. did survive longer than others that were not associated with monotheistic religions. Furthermore, the birth of Judaism in particular had a positive impact on this survival likelihood, whereas there is some evidence to suggest that the birth of Christianity and Islam did not. I interpret this latter finding to be consistent with more intense competition between the three religious traditions as they started to coexist over time.

3.4. Cross-Section Estimates

In the cross-section version of the analysis, I estimate

$$\begin{aligned} \log LAO_i = & \lambda_0 + \lambda_1 MONOTHEISTLAO_i + \\ & + \lambda_2 JEWISH_i + \lambda_3 CHRISTIAN_i + \lambda_4 MUSLIM_i + \lambda_5 X_i + \varepsilon_i, \end{aligned} \quad (2)$$

⁶The p-value on the variable *ISLAM* is around 18 percent.

where, depending on the empirical specification, $\log LAO_i$ is either the log of the duration (in decades) of limited access order i or the log of its peak land mass (in square kilometers). The explanatory variable $MONOTHEISTLAO_i$ controls for whether i was monotheist or not, and $JEWISH_i$, $CHRISTIAN_i$, $MUSLIM_i$ are dummy variables which account for the specific religion of limited access order i .

In the baseline parsimonious estimates reported first, I exclude *JEWISH*, *CHRISTIAN*, and *MUSLIM* and the only control variables in X_i include geographic dummy variables for the capital of the limited access orders, *MIDDLEAST*, *EUROPE*, *NAFRICA*, *ASIA*, and *AMERICA*. In less parsimonious estimates, other variables I include are *JEWISH*, *CHRISTIAN*, and *MUSLIM* as well as the year in which the limited access order was founded, *BIRTHYEAR*; and the interaction of *BIRTHYEAR* with *MONOTHEISTLAO*, which I label *MONOTIME*. The motivations for including some of these right-hand-side variables are self explanatory: I include *BIRTHYEAR* to see if there are observation-specific time effects on the dependent variables and I consider its interaction with *MONOTHEISTLAO* to check if monotheism had systematically different effects on the left-hand side variables depending on the year in which the empire, kingdom or dynasty was founded.

The main results I report below rely on two alternative estimation techniques: ordinary least squares with robust errors (OLS) and robust regressions.⁷ In Table 4, I present the robust-error OLS estimates where the dependent variable is the log of the land mass (in square kilometers) of limited access order i at its imperial peak. As shown in columns (1) and (4), when only regional dummies are used as control variables, *MONOTHEISTLAO* has a positive impact on the peak land mass of limited access orders, although this effect is significant only when outliers are down-weighted as in column (4). According to the estimates presented there, a monotheist kingdom, dynasty or empire had about 71 percent larger log land mass during its peak than a non-monotheist limited access order (which transforms into roughly 105 percent and about 2,150,000 km^2 larger land mass in levels). The coefficient of *MONOTHEISTLAO* is significant (at the 1 percent level) only when robust regression estimation is employed. In both estimates, all continental dummy variables are insignificant except *ASIA* which is primarily reflective of the historically larger sovereign establishments on that continent, such as the Indian Gupta Kingdom and various Chinese dynasties. This is also true to a weaker

⁷Robust regressions first eliminate outlier observations (for which Cook's $D > 1$) then iteratively selects weights for the remaining observations to reduce the absolute value of the residuals.

extent in the case of *AMERICA*, a continent on which more localized limited access orders, such as the Mayans, Incas and Aztecs, existed historically. According to the robust regression estimate in column (4), limited access orders in Asia were roughly 80 percent larger in log land mass than their counterparts elsewhere (which corresponds to about 130 percent or equivalently 3 million km^2 larger land mass in levels). And those in America were much smaller in geographical area controlling about 150,000 square-kilometers or equivalently less than 10 percent of the average land mass of limited access orders.

Next, I dissect *MONOTHEISTLAO* into the three religions to see if they had differential effects on log *PEAKLANDMASS*. In columns (2) and (5), I drop *MONOTHEISTLAO* and add *JEWISH*, *CHRISTIAN*, and *MUSLIM*. As shown only *MUSLIM* exerts a statistically significant and positive impact and *JEWISH* has a negative influence although this is based on the one outlier observation of the sole Jewish limited access order, Israel and the Judah Kingdom (which covered the modern day Israeli territories and the Palestinian authority region, or about 26,330 km^2 of space relative to the 2,624,813 km^2 on average in the sample).

In columns (3) and (6) I add the two other remaining control variables listed above, *BIRTHYEAR*; and *MONOTIME*, to the original specifications in columns (1) and (4). As shown, when *BIRTHYEAR* and *MONOTIME* are added to the specifications, the results derived are similar to those in (1) and (4) but even stronger. Now, both the OLS and robust regression estimates produce a similar, positive and statistically significant impact of *MONOTHEISTLAO* on log *PEAKLANDMASS*. Furthermore, these two estimates reveal that the impact of monotheism on the land mass of limited access civilizations was decreasing over time with the coefficient on *MONOTIME* coming in significantly positive. For example, the net effect of *MONOTHEISTLAO* on log *PEAKLANDMASS* was about $-.86$ around the year 1,000 C. E. (calculated as $-1.06 + .0002 * 1,000 = -.86$).

[Table 4 about here.]

Next I examined the degree to which the duration of limited access orders over time depended on their theistic characteristics. This also helps us verify the robustness of the findings reported in Section 3.3. In Table 5, I present estimates where the dependent variable is the log of the duration (in decades) of limited access order i . As

shown in columns (1) and (4), when only regional dummies are used as control variables, *MONOTHEISTLAO* has an insignificant impact on the duration of limited access orders, although both estimates yield positive coefficients. Once I control for the religious faith of each limited access order as I do in columns (2) and (5), however, I find that the duration of Jewish and Christian orders were positively and statistically significantly influenced by their monotheist nature. But the estimate in (5) suggests that this result may not be robust to the exclusion of outliers, in particular that of the only Jewish limited access order in the sample. In columns (3) and (6), I add the two other control variables *BIRTHYEAR* and *MONOTIME* to the mix and find that the impact of monotheism on the duration of the limited access orders is positive, although as before this impact looks to be somewhat specification sensitive.

[Table 5 about here.]

Before I turn to the robustness of these findings in general, it is important to take note of the fact that, using an alternative cross-section dataset covering 105 kingdoms, dynasties and empires, we find that monotheism exerted a positive and somewhat statistically robust influence on the geographic land areas controlled by limited access orders at their historical peaks. It is also possible to weakly verify the strong positive impact of monotheism on the duration of limited access orders originally identified in section 3.2 where instead of the cross-section data utilized here, panel data was used.

3.5. Robustness

At the outset, we can readily discard the reverse causality argument, which generally plagues these kinds of estimates. The reason for this is that, by 9th century C. E., a vast majority of North Africa, the European continent and the Middle East had become monotheist with the local populations having subscribed to one of the three main monotheist strands. Thus, there is a structural time break in the adoption of monotheism in these geographic areas, roughly covering the period between 313 C. E., when the Roman Emperor Constantine I issued the Edict of Milan which legalized Christian worship turning the Roman Empire monotheist, and the 751 C. E. Talas War between the Asian Turks and the Abbasid Muslims, which exposed Turks to Islam and led to their adoption of monotheism subsequently.

Now consider some issues related to the robustness of the panel-data estimates.

An obvious check involves controlling for the lagged-value of the dummy variable for the left hand side, $LAO_{i,t}$. In Table 6, I report estimates where the one-period lagged value of the left-hand side variable, $LAO_{i,t-1}$, is included. In column (1) and (4), I add this variable to a specification which is similar to the ones in columns (3) and (6) of Table 3. As shown, the inclusion of this lagged dependent variable greatly improves the fit of the specification, but it does not render insignificant the impact of the key variable of interest, $MONOTHEISTLAO$, on the duration of limited access orders: The impact of $MONOTHEISTLAO$ is much smaller than those reported in Table 3 when the lagged value of the left-hand side variable is controlled for (producing about 5 to 15 percent smaller impact than it did in Table 3), but it still generates a statistically significant and positive effect. What is important to note, however, is that neither of the religion dummies, $JUDAISM$ and $ISLAM$, are now statistically significant. In columns (2), (3), (5) and (6), I also add the interaction of $MONOTHEISTLAO$ with the time fixed effect μ_t to account for a time-variable impact of the former. Once this effect is taken into account, I find that monotheism still exerts a positive and statistically significant impact on the duration of limited access orders after around 1,350 B. C. E. (that is, using column (5) estimates, $0.077/0.0002 = 385$ decades into the sample period), even when $LAO_{i,t-1}$ is accounted for.

[Table 6 about here.]

As far as the main robustness concerns related to the cross-section estimates, in Table 7, I report results generated with some alternative control variables included in the empirical specifications.⁸ For example, an interesting modification is provided in columns (1) and (4) where the dummy variables for the religion of the monotheist order, $JEWISH$, $CHRISTIAN$, and $MUSLIM$, are replaced with the code variable $RELIGION$, which takes on the value of 1 if the kingdom is affiliated with Judaism, 2 if it is related to Christianity, 3 if associated with Islam and 0 otherwise. As shown in column (1), $RELIGION$ enters positively and significantly, suggesting that the peak land mass of limited access civilizations became progressively larger with limited access orders in turn being $JEWISH$, $CHRISTIAN$ and $MUSLIM$. In contrast, the estimate in column (4) reveals no impact of $RELIGION$ on the duration of limited access orders. In columns (2) and (5), I add the interaction of $RELIGION$ with $BIRTHYEAR$, labeled

⁸All of the results reported are from the robust regression estimates.

as *RELITIME*, which renders the impact of *RELIGION* statistically insignificant, although in both columns the impact is still positive and with p-values of 16 percent and 14 percent respectively. Finally, in columns (3) and (6), I add *MONOTHEIST* and drop *RELITIME* and *BIRTHYEAR* with the objective of identifying if monotheism or one of its main three traditions mattered more. As shown in columns (3) and (6), the impact of religion on the peak land mass of limited access orders was relatively more positive for Islam than it was for Christianity, which in turn was more positive than Judaism. For the duration specification in column (6), this finding is reversed with the impact of religion on the duration of limited access orders being relatively more positive for Judaism than it was for Christianity, which in turn was more positive than Islam. These results imply that Muslim civilizations typically conquered more land than Christian societies but they did not last as long.

[Table 7 about here.]

Finally, a word on a potential sample selection bias: Given the extremely long time horizon involved here, one could be concerned about antique civilizations that have not been included in the study because of incomplete or lacking data. If such civilizations also lasted long and spread large geographically, the results above could suffer from a bias of sample selection. This is a valid concern although there is a significant positive time trend in the peak land mass of limited access orders. And despite the fact that ancient civilizations typically lasted longer than their younger brethren, this very fact makes it less likely that we lack a large enough chunk of systematic archeological/anthropological evidence on ancient limited access orders that could bias the results above.

4. Conclusion

Economists have made significant strides in understanding the links between institutions and economic development. Despite the fact that they also long acknowledge religion as an important component of the institutional infrastructure, explicit analyses of the role of religion in sociopolitical and economic development remain scant.

The birth of the three main monotheistic religions is particularly relevant in this regard, because they spread rapidly and eventually came to dominate other religious traditions. Recent work in economic history suggests that the transition from limited access orders to open access orders, in which the political and economic rights of the

whole population is well-defined and political rents-seeking has been minimized, has typically been precipitated by prolonged periods of sociopolitical and economic stability (North et al., 2007). Thus, it is imperative to resolve how monotheism and limited access orders came to be strongly intertwined historically and ascertain whether monotheism promoted a modicum of sociopolitical and economic stability in limited access orders.

In this paper, I argue that the birth of monotheism was a major breakthrough in social institutional design and that, due to its returns to scale advantage relative to polytheist religious traditions and paganist societies, the rise of monotheism was inevitable. Furthermore, I emphasize that there are some important differences between the three monotheistic traditions in the degree to which innovations in religious practice could have been carried out. To this end, I argue that monotheist religions involve a strong degree of increasing returns to scale and the natural monopoly powers commensurate with it. Monotheistic faiths are also unique in that they not only personalize the spiritual exchange relationship between the individual and the one deity, but also, due to the fact that this relationship extends into the afterlife as well, they enhance individual accountability. In conjunction with the latter, they have the ability to impact the time discount between one's lifetime and in the after-life. There are two implications of these features: First, due to the fact that institutions of monotheism possessed the ecclesiastical monopoly power to legitimize or undermine the temporal powers of the political elite, religious organizations had at their disposal significant political power. Second, the fact that all monotheist religions hold individuals accountable to God on Judgment Day aided contract enforcement, commitment and respect for private property within social orders, while the combination of this accountability with the stronger emphasis on the afterlife complemented military technologies in external conflicts. On this basis. I argue that monotheist traditions were the main impetus for sociopolitical stability.

Then, using historical data between 2500 B. C. E. and 1750 C. E. on 105 limited access orders, such as dynasties, kingdoms and empires, I show that the birth of Judaism, Christianity and Islam and the adoption of monotheism by limited access orders had statistically significant effects on the length of reign as well as the average geographical size of all limited access orders. Specifically, kingdoms, dynasties and empires lasted about 360 years on average during this interval. But those historical civilizations that adopted monotheism, regardless of whether it was Judaism, Christianity, or Islam, lasted anywhere between 50 to 80 percent longer than non-monotheist social orders. Beyond the general impact of adherence to monotheism, I cannot find any empirical evidence

that Judaism, Christianity or Islam exerted an impact on the length of reign of historical civilizations. I also confirm that monotheism had a roughly similar effect on the geographic domain over which historical civilizations reigned during their peak influence. That is, monotheist limited access orders controlled about twice the land area of their non-monotheist counterparts. Unlike the results on duration, however, I find that adherence to a specific religion — Islam — did exert an additional positive impact on the geographic domain of civilizations historically. This is an important results which implies that Muslim civilizations typically conquered more land than Christian societies but they did not last as long. In general, these findings indicate that the birth and adoption of monotheistic religions seem to have helped early development both in the West and the Near East until the advent of the Industrial Revolution.

5. References

- Acemoglu, D., S. Johnson, and J. Robinson.** (2001). "The Colonial Origins of Comparative Development," *American Economic Review*, 91, 1369-1401.
- Alesina, A. and E. Spolaore.** (2006). "Conflict, Defense Spending, and the Number of Nations," *European Economic Review*, forthcoming.
- Anglin, J. P. and W. J. Hamblin** (1993). *World History to 1648*, HarperCollins College Outline, (New York, NY: HarperResource).
- Armstrong, K.** (1988). *Holy War: Crusades and their Impact on Today's World*, (New York, NY: Anchor Books).
- Armstrong, K.** (1993). *A History of God: The 4,000 Year Quest of Judaism, Christianity and Islam*, (New York, NY: Ballantine Books).
- Barro, R. and R. McCleary.** (2003). "Religion and Economic Growth," *American Sociological Review*, October.
- Barro, R. and R. McCleary.** (2005). "Which Countries Have State Religions?," *Quarterly Journal of Economics*, forthcoming.
- Becker, O. S. and L. Woessmann.** (2007). "Was Weber Wrong?: A Human Capital Theory of Protestant Economic History," University of Munich, unpublished manuscript, January.
- Botticini, M. and Z. Eckstein.** (2005a). "Jewish Occupational Selection: Education, Restrictions, or Minorities?," *Journal of Economic History*, 65:4, December.
- Botticini, M. and Z. Eckstein.** (2005b). "From Farmers to Merchants, Voluntary Conversions and Diaspora: A Human Capital Interpretation of Jewish History," University of Minnesota, unpublished manuscript.
- Comte, A.** (1974). *The Positive Philosophy*, (New York: A. M. S. Press), reprint of the 1855 translation of *Cours de Philosophie Positive*, (New York, C. Blanchard).
- Diamond, J.** (1997). *Guns, Germs and Steel: The Fates of Human Societies*, (New York, NY: W. W. Norton & Co.).

- Durkheim, E.** (1912). *The Elementary Forms of the Religious Life*, (English translation by Joseph Swain: 1915), (New York, NY: The Free Press).
- Faroghi, S.** (2004). *The Ottoman Empire and the World Around It*, (London: I. B. Tauris Publishers).
- Farrington, K.** (2002). *Historical Atlas of Empires*, (London: Thalamus Publishing).
- Farrington, K.** (2006). *Historical Atlas of Religions*, (London: Thalamus Publishing).
- Fernandez, R., A. Fogli and C. Olivetti.** (2004). “Mothers and Sons: Preference Formation and Female Labor Force Dynamics,” *Quarterly Journal of Economics*, 119 (4), 1249-1299, 2004.
- Fernandez, R.** (2007). “Culture and Economics,” in the *New Palgrave Dictionary of Economics*, 2nd edition, edited by Steven N. Durlauf and Lawrence E. Blume, Palgrave Macmillan (Basingstoke and New York).
- Glaeser, E. L., and B. I. Sacerdote.** (2002). “Education and Religion.” Harvard University, unpublished manuscript.
- Glaeser, E. L., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer.** (2004). “Do Institutions Cause Growth?” *Journal of Economic Growth* 9(3): 271-303.
- Greif, A.** (forthcoming). *Institutions: Theory and History*, (Cambridge: Cambridge University Press).
- Guiso, L., P. Sapienza, and L. Zingales.** (2003). “People’s Opium? Religion and Economic Attitudes.” *Journal of Monetary Economics*, 50 (1), 225—82.
- Guiso, L., P. Sapienza, and L. Zingales.** (forthcoming). “Does Culture Affect Economic Outcomes?” *Journal of Economic Perspectives*.
- Hill, C.** (1967). *Reformation to Industrial Revolution: The Making of Modern English Society, Vol. I, 1530-1780*, (New York: Random House).
- Hillerbrand, H.** (1968). *The Protestant Reformation*, (New York: Harper Collins).
- Hirshleifer, J.** (1991). “The Paradox of Power,” *Economics & Politics*, 3:3, November, 177-200.

- Hotelling, H.** (1929). “Stability in Competition,” *Economic Journal*, 39:1, March, 41-57.
- Hume, D.** (1911). *A Treatise of Human Nature*, (London: J. M. Dent and Sons Ltd.).
- Iannaccone, L. R.** (1992). “Sacrifices and Stigma: Reducing the Free-Riding in Cults, Communes and Other Collectives.” *Journal of Political Economy* 100 (2), April, 271—91.
- Iyigun, M.** (2006). “Luther and Suleyman,” unpublished manuscript, University of Colorado, November.
- Iyigun, M.** (2008). *Tales of Faith in Socioeconomic Progress*, book manuscript in preparation, Fall, (Chicago, IL: The University of Chicago Press).
- Jones, E. J.** (2003). *The European Miracle: Environments, Economies and Geopolitics in the History of Europe and Asia*, (Cambridge: Cambridge University Press.).
- Kuran, T.** (2004a). “The Economic Ascent of the Middle East’s Religious Minorities: The Role of Islamic Legal Pluralism,” *Journal of Legal Studies*, 33, June, 2003, 475-515.
- Kuran, T.** (2004b). “Why the Middle East Is Economically Underdeveloped: Historical Mechanisms of Institutional Stagnation,” *Journal of Economic Perspectives*, 18, Summer, 71-90.
- Kuran, T.** (2005). “The Logic of Financial Westernization in the Middle East,” *Journal of Economic Behavior and Organization*, 56 (April 2005): 593-615.
- Landes, D. S** (1999). *The Wealth and Poverty of Nations*, (New York, NY: W. W. Norton & Co.).
- Lewis, B.** (2002). *What Went Wrong? Western Impact and Middle Eastern Response*, (London: Phoenix).
- MacCulloch, D.** (2003). *The Reformation: A History*, (New York, NY: Viking).
- McEvedy C, Jones R** (1978) *Atlas of World Population History*. Facts on File, New York.
- McNeill, W.** (1984). *The Pursuit of Power : Technology, Armed Force, and Society since A.D. 1000*, (Chicago, IL: University of Chicago Press).

- Mokyr, J.** (1990). *The Lever of Riches*, (New York: Oxford University Press).
- Mokyr, J.** (2002). “The Enduring Riddle of the European Miracle: the Enlightenment and the Industrial Revolution,” Northwestern University, unpublished manuscript.
- Niebuhr, R.** (1932). *Moral Man & Immoral Society: A Study in Ethics and Politics*, Library of Theological Ethics, (Kentucky: Westminster John Knox Press).
- North, D. C.** (1990). *Institutions, Institutional Change and Economic Performance (Political Economy of Institutions and Decisions)*, (Cambridge: Cambridge University Press).
- North, D. C., J. J. Wallis and B. R. Weingast.** (2006). “A Conceptual Framework for Interpreting Recorded History,” NBER Working Paper No: 12795, December.
- Rand McNally & Co.** (1997). *Historical Atlas of the World*.
- Richardson, L. F.** (1960). *Statistics of Deadly Quarrels*, (Pittsburgh, PA: The Boxwood Press).
- Rodrik, D., A. Subramanian, and F. Trebbi.** (2004). “Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development,” *Journal of Economic Growth*, 9.
- Rosenberg, N. and L. E. Birdzell, Jr.** (1986). *How the West Grew Rich: The Economic Transformation of the Industrial World*, (New York, NY: Basic Books).
- Spolaore, E. and R. Wacziarg.** (2006). “The Diffusion of Development,” Stanford University, unpublished manuscript.
- Smith, A.** (1776) *The Wealth of Nations*, Complete and Unabridged Edition, (2000 ed., introduction by Robert Reich), (New York, NY: Modern Library Classics).
- Stark, R.** (2001). *One True God: Historical Consequences of Monotheism*, (Princeton, NJ: Princeton University Press).
- Temin, P.** (1997). “Is it Kosher to Talk about Culture?” *Journal of Economic History*, 57 (2), June, 267—87.

Weber, M. (1930). *Protestant Ethic and the Spirit of Capitalism*, trans. T. Parsons (New York: Scribner and Sons).

Wilkinson, D. (1980). *Deadly Quarrels: Lewis F. Richardson and the Statistical Study of War*, (Berkeley, CA: University of California Press).

Woods, F. A. and A. Baltzly. (1915). *Is War Diminishing? A Study of the Prevalence of War in Europe from 1450 to the Present Day*, (Boston, MA: Houghton Mifflin Co.).

Table 1.a: Variable Definitions for Panel Data

- $LAO_{i,t}$: Dummy variable for limited access order i if it exists at t .
- $MONOTHEIST_{i,t}$: Dummy variable for limited access order i if monotheist at t .
- $JUDAISM$: Dummy variable; 0 on or before 1200 B. C. E. and 1 thereafter.
- $CHRISTIANITY$: Dummy variable; 0 on or before year 0 and 1 thereafter.
- $ISLAM$: Dummy variable; 0 on or before 622 C. E. and 1 thereafter.
- $DECADE$: Decade t .
- $MONOTIME$: $MONOTHEIST * DECADE$.
- $\left. \begin{array}{l} EUROLAO_t : \\ MIDEASTLAO_t : \\ ASIALAO_t : \\ AFRICALAO_t : \\ AMERICALLAO_t : \end{array} \right\}$ Dummy for the existence of an LAO in region at t .

Table 1.b: Variable Definitions for Cross-Section Data

- $\log LAO_i : \left\{ \begin{array}{l} DURATION_i : \text{Number of new violent conflicts initiated among} \\ \text{and within continental European countries.} \\ PEAKLANDMASS_i : \text{Number of religiously motivated, violent} \\ \text{conflicts between Protestants and Catholics.} \end{array} \right.$
- $MONOTHEIST$: Dummy variable for a monotheist LAO .
- $JEWISH$: Dummy variable for a Jewish LAO .
- $CHRISTIAN$: Dummy variable for a Christian LAO .
- $MUSLIM$: Dummy variable for a Muslim LAO .
- $BIRTHYEAR$: Decade in which LAO was founded.
- $MONOTIME$: $MONOTHEIST * BIRTHYEAR$

- *RELIGION* : 1 for Jewish *LAO*; 2 for Christian *LAO*, 3 for Muslim *LAO*; 0 otherwise.
- *RELITIME* : *RELIGION* * *BIRTHYEAR*
- $\left. \begin{array}{l} \textit{MIDDLEAST} : \\ \textit{NAFRICA} : \\ \textit{EUROPE} : \\ \textit{ASIA} : \\ \textit{AMERICA} : \end{array} \right\}$ Continental dummies for political capitals of *LAO*'s.

Table 2: Descriptive Statistics and the Correlation Matrix

2500 B. C. E. - 1750 C. E.			<i>The Correlation Matrix (Panel Data)</i>							
<i>n</i> = 44,730	<i>Mean</i>	<i>St. Dev.</i>	<i>LAO</i>	<i>MONO</i>	<i>JUDAISM</i>	<i>CHRS.</i>	<i>ISLAM</i>	<i>REL</i>	<i>DEC</i>	<i>MTIME</i>
<i>LAO</i>	.087	.281	1	...	...	...	...	...	...	...
<i>MONOTHEIST</i>	.414	.492	.060	1	...	...	...	...	...	...
<i>JUDAISM</i>	.695	.460	.117	.0001	1	...	...	...	...	...
<i>CHRISTIANITY</i>	.413	.492	.089	.0002	.556	1	...	...	...	...
<i>ISLAM</i>	.268	.443	.061	−.0001	.401	.720	1	...	...	...
<i>RELIGION</i>	.913	1.13	.038	.965	.0001	.0001	−.0001	1	...	...
<i>DECADE</i>	−375	1230	.110	.0001	.798	.853	.767	.0001	1	...
<i>MONOTIME</i>	−155	812	.163	−.227	.499	.534	.480	−.219	.626	1

2500 B. C. E. - 1750 C. E.			<i>The Correlation Matrix (Cross-Section Data)</i>							
<i>n</i> = 105	<i>Mean</i>	<i>St. Dev.</i>	<i>DUR</i>	<i>PLMASS</i>	<i>MONO</i>	<i>JWSH</i>	<i>CHRS</i>	<i>MSLM</i>	<i>BYEAR</i>	<i>MTIME</i>
<i>DURATION</i>	36.2	27.3	1	...	...	...	...	...	...	...
<i>PLMASS</i>	2,032,731	2,751,723	−.208	1	...	...	...	...	...	...
<i>MONOTHE.</i>	.240	.429	−.083	.079	1	...	...	...	...	...
<i>JEWISH</i>	.010	.098	.093	−.072	.175	1	...	...	...	...
<i>CHRISTIAN</i>	.134	.343	.038	−.054	.701	−.039	1	...	...	...
<i>MUSLIM</i>	.092	.296	−.195	.201	.580	−.032	−.129	1	...	...
<i>BIRTHYEAR</i>	−52.1	1123	−.185	.205	.482	−.101	.346	.332	1	...
<i>MONOTIME</i>	217.8	471.6	−.172	.137	.825	−.298	.597	.603	.532	1

Table 3: Fixed Effects, Panel Data Estimates, 2500 B. C. E. - 1750 C. E.

Dependent Variable: Limited Access Order Dummy, LAO						
	OLS			Probit		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>MONOTHEIST_{i,t}</i>	.860* (.156)	.848* (.156)	.857** (.156)	.433* (.084)	.351* (.072)	.280* (.071)
<i>DECADE</i>	−.000003* (.000001)	−.000003* (.000004)	−.000003* (.000005)	−.000002* (.000001)	−.00001* (.000004)	−.00002 (.000004)
<i>MONOTIME</i>	.000007* (.0000002)	.000007* (.0000002)	.000007* (.0000002)	.00004* (.000002)	.00005* (.000002)	.00005* (.000002)
<i>JUDAISM</i>	...	.048* (.006)	.045* (.007)	...	.467* (.044)	.439 (.048)
<i>CHRISTIANITY</i>	...	.013* (.006)	−.008* (.007)	...	.024 (.034)	−.079* (.040)
<i>ISLAM</i>	...	−.012* (.006)	.001 (.008)	...	−.173* (.034)	−.070 (.049)
<i>EUROLAO</i>	...	...	−.002* (.002)	...	...	−.034* (.011)
<i>MIDEASTLAO</i>	...	...	−.006* (.001)	...	...	−.025* (.007)
<i>ASIALAO</i>	...	...	.010* (.001)	...	...	.067* (.007)
<i>AFRICALAO</i>	...	...	.011* (.003)	...	...	.077* (.018)
<i>AMERICALAO</i>	...	...	.007* (.002)	...	...	.044* (.010)
<i>No. of obs.</i>	44,730	44,730	44,730	44,730	44,730	44,730
<i>R²</i>	.01	.01	.01	...	...	...

Note: *, ** respectively denote significance at the 5 percent and 10 percent levels.

Table 4: Cross-Section Estimates, 2500 B. C. E. - 1750 C. E.

Dependent Variable: log Peak Land Mass						
	OLS			Robust Regressions		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>MONOTHEIST_{i,t}</i>	.110 (.426)	...	-1.46* (.488)	.712* (.235)	...	-1.06* (.411)
<i>MIDDLEAST</i>	.790 (1.11)	.359 (1.16)	1.16 (1.04)	-.760 (.517)	-1.16* (.521)	-.407 (.549)
<i>NAFRICA</i>	.887 (.945)	.549 (1.04)	1.13 (.914)	-.673 (.497)	-.902** (.494)	-.228 (.526)
<i>EUROPE</i>	1.69 (1.18)	1.95** (1.17)	1.41 (1.06)	-.312 (.612)	-.150 (.610)	-.160 (.646)
<i>ASIA</i>	1.86** (1.03)	1.62 (1.11)	1.80** (.980)	.803** (.494)	.499 (.588)	.789 (.520)
<i>AMERICA</i>	-1.18 (1.07)	-1.49 (1.14)	-1.28 (1.01)	-2.73* (.530)	-3.05* (.527)	-2.73* (.561)
<i>JEWISH</i>	...	-3.14* (.226)	...	...	-3.17* (.923)	...
<i>CHRISTIAN</i>	...	-.661 (.527)	...	...	.072 (.316)	...
<i>MUSLIM</i>	...	1.27* (.356)	...	...	1.24* (.322)	...
<i>BIRTHYEAR</i>	...	...	.0003* (.00015)	...	...	.0002* (.00012)
<i>MONOTIME</i>	...	...	.001* (.0003)	...	...	.001* (.0004)
<i>No. of obs.</i>	105	105	105	105	105	105
<i>R</i> ²	.450	.314	.926	...	...	...

Note: *, ** respectively denote significance at the 5 percent and 10 percent levels.

Table 5: Cross-Section Estimates, 2500 B. C. E. - 1750 C. E.

Dependent Variable: log Duration						
	OLS			Robust Regressions		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>MONOTHEIST_{i,t}</i>	.114 (.206)	...	.631* (.233)	.035 (.179)	...	.465** (.293)
<i>MIDDLEAST</i>	−.408 (.281)	−.196 (.216)	−.581* (.252)	−.362 (.395)	−.193 (.396)	−.470 (.391)
<i>NAFRICA</i>	−.286 (.241)	−.142 (.157)	−.414* (.204)	−.299 (.380)	−.158 (.375)	−.379 (.375)
<i>EUROPE</i>	−.571 (.407)	−.720* (.369)	−.504 (.406)	−.451 (.468)	−.740** (.463)	−.244 (.460)
<i>ASIA</i>	−.627* (.243)	−.524* (.141)	−.567* (.202)	−.571 (.377)	−.501 (.371)	−.520 (.370)
<i>AMERICA</i>	.332 (.229)	.475* (.198)	.423* (.220)	.381 (.405)	.504* (.370)	.417 (.399)
<i>JEWISH</i>	...	.854* (.165)	...	...	.782 (.709)	...
<i>CHRISTIAN</i>	...	.504* (.264)	...	...	.404** (.242)	...
<i>MUSLIM</i>	...	−.379 (.235)	...	...	−.372 (.247)	...
<i>BIRTHYEAR</i>	...	...	−.00019* (.00009)	...	...	−.0001 (.00009)
<i>MONOTIME</i>	...	...	−.00027 (.0002)	...	...	−.0004 (.0003)
<i>No. of obs.</i>	105	105	105	105	105	105
<i>R²</i>	.182	.245	.235	...	...	...

Note: *, ** respectively denote significance at the 5 percent and 10 percent levels.

Table 6: Fixed Effects, Panel Data Estimates, 2500 B. C. E. - 1750 C. E.

Dependent Variable: Limited Access Order Dummy, LAO						
	OLS			Probit		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>MONOTHEIST_{i,t}</i>	.027* (.005)	.030* (.006)	.028* (.005)	.068* (.022)	.077* (.028)	.072* (.026)
<i>DECADE</i>	.0000002* (.0000001)	-.00004 (.00003)	-.000002* (.000001)	-.0001 (.0001)	-.0003* (.0001)	-.0002* (.00007)
<i>JUDAISM</i>	.002 (.002)	.001 (.002)	...	.154 (.177)	.247 (.184)	...
<i>CHRISTIANITY</i>	-.002 (.002)	.00004 (.003)	...	-.167 (.135)	-.174 (.133)	...
<i>ISLAM</i>	.002 (.002)	.007* (.0036)	...	.081 (.185)	.075 (.191)	...
<i>MONOTIME</i>	...	.000004* (.000001)	.000002* (.0000005)	...	.0002* (.000072)	.0002* (.00006)
<i>LAO_{i,t-1}</i>	.969* (.003)	.961* (.004)	.968* (.003)	4.93* (.074)	4.89* (.066)	4.92* (.066)
<i>EUROLAO</i>	-.0008 (.0005)	-.006* (.0037)	-.0001* (.0005)	-.078** (.048)	-.089** (.048)	-.110* (.049)
<i>MIDEASTLAO</i>	-.0002 (.0003)	-.002 (.002)	-.0001 (.0002)	-.007 (.028)	-.008 (.029)	.009 (.024)
<i>ASIALAO</i>	.001* (.0003)	.005 (.003)	.001* (.0003)	.079* (.032)	.088* (.032)	.082* (.030)
<i>AFRICALAO</i>	.002* (.0007)	-.003 (.006)	.002* (.0006)	.178* (.073)	.196* (.072)	.126* (.063)
<i>AMERICALAO</i>	.0008* (.0003)	.002* (.001)	.0008* (.0003)	.031 (.028)	.050 (.032)	.055** (.032)
<i>No. of obs.</i>	44,625	44,625	44,625	44,625	44,625	44,625
<i>R²</i>	.929	.929	.926	...	...	...

Note: *, ** respectively denote significance at the 5 percent and 10 percent levels.

Table 7: Cross-Section Estimates, 2500 B. C. E. - 1750 C. E.

Dependent Variable: (1) - (3) log Peak Land Mass; (4) - (6) log Duration						
	(1)	(2)	(3)	(4)	(5)	(6)
<i>MONOTHEIST_{i,t}</i>	...	...	-4.12* (.910)	...	...	1.74* (.657)
<i>MIDDLEAST</i>	-.886** (.516)	-.769 (.528)	-1.48* (.538)	-.322 (.392)	-.476 (.398)	-.237 (.388)
<i>NAFRICA</i>	-.755* (.497)	-.673 (.503)	-1.04* (.515)	-.255 (.377)	-.390 (.380)	-.171 (.372)
<i>EUROPE</i>	-.318 (.604)	-.331 (.600)	-.039 (.631)	-.310 (.458)	-.213 (.453)	-.661 (.456)
<i>ASIA</i>	.721 (.493)	.643 (.494)	.254 (.509)	-.525 (.373)	-.557 (.373)	-.508 (.368)
<i>AMERICA</i>	-2.80* (.529)	-2.90* (.530)	-3.29* (.548)	.392 (.400)	.369 (.400)	.482 (.396)
<i>RELIGION</i>	.317* (.093)	.345 (.234)	1.85* (.364)	-.046 (.071)	.267 (.184)	-.645* (.262)
<i>RELITIME</i>	...	-.0001 (.0002)	...	...	-.0003 (.00017)	...
<i>BIRTHYEAR</i>	...	.0001 (.0001)	...	...	-.0001 (.0001)	...
<i>No. of obs.</i>	105	105	105	105	105	105
<i>R²</i>	...	...	...	...	...	...

Note: *, ** respectively denote significance at the 5 percent and 10 percent levels.

Appendix A: Dynasties, Kingdoms & Empires
Middle East, N. Africa, Europe, Asia
(2500 B. C. E. to 1750 C. E.)

	Name	Birth Year	Death Year	Region
1	Old Kingdom	2686 B.C.E.	2181 B.C.E.	Egypt
2	Early Dynasty	2900 B.C.E.	2371 B.C.E.	Mesopotamia
3	Ebla	2400 B.C.E.	2250 B.C.E.	Syria
4	Akkadian Empire	2371 B.C.E.	2230 B.C.E.	Mesopotamia
5	Gutians	2230 B.C.E.	2112 B.C.E.	”
6	Ur Dynasty	2112 B.C.E.	2004 B.C.E.	”
7	Middle Kingdom	2040 B.C.E.	1786 B.C.E.	Egypt
8	Isin, Larsa & Mari	2002 B.C.E.	1792 B.C.E.	Mesopotamia
9	Old Babylonian	1792 B.C.E.	1595 B.C.E.	”
10	Hittites	1450 B.C.E.	1200 B.C.E.	Anatolia
11	Kingdom of Elam	2200 B.C.E.	644 B.C.E.	Iran
12	New Kingdom	1552 B.C.E.	1069 B.C.E.	Egypt
13	Mittani-Kassite	1595 B.C.E.	1200 B.C.E.	Mesopotamia
14	Israel	1200 B.C.E.	584 B.C.E.	Israel/Palestine
15	Aramean Kingdom	1350 B.C.E.	850 B.C.E.	Syria
16	Luvians	1200 B.C.E.	680 B.C.E.	Anatolia
17	Assyrians	1305 B.C.E.	609 B.C.E.	Mesopotamia
18	Urartu	880 B.C.E.	590 B.C.E.	Armenia
19	Kushites	730 B.C.E.	656 B.C.E.	Egypt
20	Saite	668 B.C.E.	525 B.C.E.	”
21	Lydia	680 B.C.E.	547 B.C.E.	Anatolia
22	Media	728 B.C.E.	559 B.C.E.	Iran
23	Babylonia	626 B.C.E.	539 B.C.E.	Mesopotamia
24	Persian Empire	559 B.C.E.	330 B.C.E.	Iran, Anatolia, Mesopotamia, Egypt, Armenia, Israel/Palestine Syria.
25	Ptolemaic Empire	323 B.C.E.	20 B.C.E.	Egypt, Israel/Palestine
26	Seleucid Empire	305 B.C.E.	64 B.C.E.	Mesopotamia, Iran.

Appendix B (continued):

	Name	Birth Year	Death Year	Region
27	Kingdom of Armenia	323 B.C.E.	20 B.C.E.	Armenia
28	Roman Empire	200 B.C.E.	330 C. E.	Italian Pen., Mesopotamia, Anatolia, N. Africa
29	Parthian Empire	250 B.C.E.	226 C. E.	Mesopotamia, Iran.
30	Byzantine Empire	330 C. E.	1453 C. E.	Anatolia, Balkans, E. Europe, Mesopotamia, N. Africa.
31	Sasanian Empire	208 C. E.	651 C. E.	Mesopotamia, Iran.
32	Arab Empire	632 C. E.	861 C. E.	Arab Pen., Mesopotamia, N. Africa Iberian Pen.
33	Scythians	500 B.C.E.	150 C. E.	Balkans, S. Russia.
34	Zhou Dynasty	403 B.C.E.	221 B.C.E.	N. China
35	Mauryan Empire	320 B.C.E.	183 B.C.E.	India
36	Han Empire	202 B.C.E.	220 C. E.	N. China, S. China.
37	Kushan Empire	50 B.C.E.	240 C. E.	C. Asia, NW. India.
38	Satavahanas Empire	100 B.C.E.	225 C. E.	India
39	Gupta Empire	320 C. E.	535 C. E.	India
40	Kgdm. of Atropatene	323 B.C.E.	50 B.C.E.	Armenia
41	Empire of Antigonus	323 B.C.E.	301 B.C.E.	Israel/Palestine, Anatolia, Syria.
42	Ruan Ruan	440 C. E.	550 C. E.	Mongolia
43	Tulunids	868 C. E.	905 C. E.	Arabian Pen., Mesopotamia, Egypt, N. Africa.

Appendix B (continued):

	Name	Birth Year	Death Year	Region
44	Fatimids	909 C. E.	1171 C. E.	Arabian Pen., Mesopotamia, Egypt, N. Africa.
45	Ayyubids	1172 C. E.	1250 C. E.	Arabian Pen., Mesopotamia, Egypt, N. Africa.
46	Mamluks	1250 C. E.	1517 C. E.	Arabian Pen., Mesopotamia, Egypt, N. Africa.
47	Ottoman Empire	1299 C. E.	1923 C. E.	Anatolia, Mesopotamia, Balkans, E. Europe, N. Africa Arabian Pen.
48	Sonike Dynasty	770 C. E.	1240 C. E.	Ghana
49	Seljuk Empire	1037 C. E.	1194 C. E.	Anatolia, Mesopotamia, Turkestan.
50	Sarmatians	200 B. C. E.	200 C. E.	Balkans, S. Russia.
51	Toucherans	162 B. C. E.	230 C. E.	Turkestan
52	Hun Empire	370 C. E.	560 C. E.	C. Asia, Mongolia, Balkans, E. Europe, S. Russia.
53	Xiongnu	210 B. C. E.	155 C. E.	Mongolia
54	Xian-bi	155 C. E.	400 C. E.	Mongolia
55	Karluks/Oghuz	552 C. E.	1070 C. E.	Turkestan

Appendix B (continued):

	Name	Birth Year	Death Year	Region
56	G. Horde/Mongols	1206 C. E.	1502 C. E.	C. Asia, Turkestan, Mongolia Balkans, E. Europe, S. Russia.
57	Khitan	907 C. E.	1124 C. E.	Mongolia
58	Uighars	745 C. E.	840 C. E.	”
59	Timurids	1401 C. E.	1505 C. E.	Turkestan
60	Safavid Empire	1492 C. E.	1736 C. E.	Arabian Pen., Mesopotamia, Egypt, N. Africa.
61	Spanish Empire	1492 C. E.	1975 C. E.	W. Europe
62	Portuguese Empire	1415 C. E.	1999 C. E.	”
63	British Empire	1497 C. E.	—	W. Europe
64	Carolignian Empire	751 C. E.	870 C. E.	W. Europe C. Europe
65	Holy Roman Empire	919 C. E.	1268 C. E.	C. Europe
66	Macedonian Empire	360 B. C. E.	320 B. C. E.	Balkans, Anatolia, C. Asia, Iran, NW. India.
67	Empire of Antigonus	323 B. C. E.	301 B. C. E.	Israel/Palestine Syria Anatolia
68	Xia Dynasty	1994 B. C. E.	1523 B. C. E.	N. China S. China
69	Shang Dynasty	1523 B. C. E.	1027 B. C. E.	N. China
70	Qin Dynasty	247 B. C. E.	209 B. C. E.	N. China S. China
71	Song Dynasty	960 C. E.	1279 C. E.	N. China S. China

Appendix B (continued):

	Name	Birth Year	Death Year	Region
72	Siu Dynasty	589 C. E.	628 C. E.	N. China S. China
73	T'ang Dynasty	618 C. E.	907 C. E.	N. China S. China
74	Yuan Dynasty	1279 C. E.	1368 C. E.	N. China S. China
75	Ming Dynasty	1368 C. E.	1644 C. E.	N. China S. China
76	Angevin Dynasty	1154 C. E.	1399 C. E.	W. Europe
77	Axum Empire	270 C. E.	960 C. E.	Ethiopia
78	Abyssinia	1117 C. E.	1974 C. E.	"
79	Almoravids	1056 C. E.	1147 C. E.	N. Africa
80	Almohadids	1130 C.E.	1269 C.E.	"
81	Magyars	850 C.E.	955 C.E.	Balkans
82	Avars	562 C.E.	805 C.E.	"
83	Bulghars	679 C.E.	1018 C.E.	"
84	Cumans	1060 C.E.	1237 C.E.	Balkans S. Russia
85	Pechenegs	900 C.E.	1070 C.E.	Balkans S. Russia
86	Chaco Canyon	900 C. E.	1150 C. E.	SW. America
87	Mesa Verde	500 C. E.	1300 C. E.	SW. America
88	Hohokam	900 C. E.	1400 C. E.	Mississippi Δ
89	Adena	1000 B. C. E.	100 C. E.	"
90	Hopewell	200 B. C. E.	400 C. E.	"
91	Mississippi Culture	800 C. E.	1500 C. E.	"
92	Olmes	1500 B. C. E.	400 B. C. E.	G. of Mexico
93	Monte Alban	200 C. E.	700 C. E.	Mexico
94	Toltecs	900 C. E.	1156 C. E.	"
95	Aztecs	1325 C. E.	1519 C. E.	"
96	Teotihuacan	1 C. E.	650 C. E.	Mexico Guatemala
97	Kaminaljuyu & Izapa	300 B. C. E.	300 C. E.	Guatemala

Appendix B (continued):

	Name	Birth Year	Death Year	Region
98	Classic Maya	200 C. E.	850 C. E.	Yucatan
99	Mayapan	987 C. E.	1446 C. E.	Yucatan
100	Nazca	400 B. C. E.	450 C. E.	Andes
101	Mochica	1 C. E.	650 C. E.	”
102	Chavin	1200 B. C. E.	200 B. C. E.	”
103	Inca	1463 C. E.	1533 C. E.	”
104	Chimu	900 C. E.	1476 C. E.	”
105	Huari & Tiahuan.	500 C. E.	900 C. E.	”

Appendix B: Regions of the World and their Land Areas (in km^2)

The Near East:

Anatolia	770,760
Armenia	28,400
Iran	1,636,000
Israel	20,330
Mesopotamia	432,162
Palestinian Territories	6,000
Syria	184,050
The Eastern Mediterranean	200,000

Central Asia:

Afghanistan	647,500
China (South)	4,663,205
China (North)	4,663,205
India	2,229,892
India (Northwest)	743,298
Mongolia	1,564,116
Pakistan	778,720
Southern Russia	2,919,800
Tajikistan	142,700
Turkestan	1,190,900

Europe:

Britain	241,590
Western Continental Europe	1,295,707
Central Continental Europe	765,457
Eastern Continental Europe	553,699
The Balkans	616,769

North Africa:

Egypt	995,450
N. Africa (Northeast exc. Egypt))	1,923,140
N. Africa (West)	2,828,290

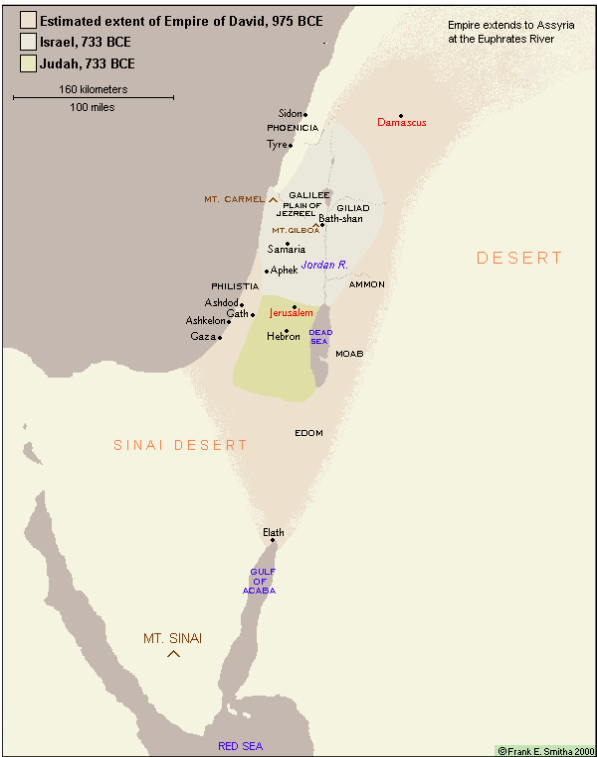
The Americas:

Yucatan	60,000
Andes	60,000

Guatemala	120,000
Mexico	200,000
Gulf of Mexico	150,000
Southwest America	70,000
Mississippi Delta	150,000

Appendix C: Monotheist Dynasties, Kingdoms & Empires

Duration	Land	Europe	N. Africa	M. East	Asia	Jewish	Christian	Muslim
32.2	2,419,330	6	4	9	7	1	14	11











Appendix D: Non-Monotheist Dynasties, Kingdoms & Empires

All:

Duration	Peak Land	Europe	N. Africa	M. East	Asia	America
37.5	1,191,389	2	7	26	23	21

Excluding the Americas:

Duration	Peak Land	Europe	N. Africa	Middle East	Asia
29.8	2,521,877	2	7	25	24

