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# MONOTHEISM
## (From a Sociopolitical & Economic Perspective)

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**Abstract**

*In this paper, I present a dataset that covers 277 human civilizations over the period between 2900 BCE and 1750 CE. Utilizing data on the duration and peak land mass of these civilizations, I show that societies which adhered to one of the three Abarahamic monotheistic religions had higher survival odds and reigned over larger geographic domains at their peak. Beyond the general impact of adherence to monotheism, I cannot find any evidence that Judaism, Christianity or Islam exerted particular effects on the length of reign of civilizations historically. Unlike the results on duration, however, I find some evidence that adherence to a specific religion—Islam—did exert an additional positive impact on geographic domain.*

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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 BCE and 200 BCE.[1] All three major monotheisms were born roughly around this age between 606 BCE and 622 CE in the Middle East and they spread fairly rapidly in 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, roughly 55 percent of the world population. In the words of Diamond (1997, pp. 266-67), "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."

There are three strands in political science, sociology and economics that, taken together, shed light on how the combination of organized religion and centralized government might have imbued societies with a survival advantage. First, various Enlightenment and early-20th century, post-Enlightenment scholars, such as David Hume, Auguste Comte and Emile Durkheim, 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

[1] Term coined originally by Karl Jaspers (1953). See also Armstrong (2006, p. xvi).

purpose, conceptions of morality and an identity. In this, they were adhering to Emile Durkheim who saw in religion these social necessities.

Second, while the literature on religion and economics is relatively nascent, it does entail some crucial contributions on the interplay between religion, polities and government. For example, Ekelund et al. (1996, 2002) and Barro and McCleary (2003, 2005) claim and show that the fixed setup cost of religion influences the equilibrium number of faiths that can be sustained by a society. Most germane to what follows is the finding that a state religion is more likely to emerge when the cost of establishing a religion is high—that is, when the barriers to entry into providing religion services are high. Various scholars have, in fact, argued that the barriers to entry into the religion market are substantially lower when there are many gods. By contrast, monotheisms entail relatively high costs of entry into the religion market.[2]

The third related strand highlights the argument that there are synergies between political and ecclesiastical authority in maintaining social order and continuity. This idea, which is implicit in Diamond's reasoning, dates back to Niebuhr (1932, pp. 6-7), who elaborated on how the ecclesiastical authority derived from representing God conferred the religious authorities some temporal leverage: "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 dispenses 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." More to the point, in discussing the birth of nation states, Lewis (2008) credits the complementary authorities of the Catholic Church and Charlemagne's monarchy in the late-8th century: "Papal power to loose and bind mere temporal power-holders was a unique asset. That power, combined with the Marchfield muster of twenty thousand Franks, made the team of Charlemagne and [Pope] Adrian

[2]For related discussions, see Armstrong (1993, p. 49), Stark (2001, 2003) and Ekelund et al. (1996, p. 28).

In objection, one could argue that the prolific variety of denominations within Christianity and, to a much lesser extent, Islam too contradicts the argument that monotheisms involve less competitive religion markets. However, as Ekelund et al. (2002) have shown, most of the denominational pluralism within Christianity occured because the Roman Catholic Church began to operate as a price discriminating monopolist. That presumably left room for Lutheranism and its various offshoots to enter the religion market in Europe. In contrast, the Shi'a-Sunni split within Islam is purely an artifact of the disagreement about who the legitimate successor of Prophet Mohammed was.

virtually invincible."[3]

If, indeed, religious adherence is good for sociopolitical stability and monotheisms are easier to sustain as state religions due to the fact that they can equip their affiliated ecclesiastical as well as political institutions with monopoly powers, then monotheist societies should have historically had various political and social advantages vis-a-vis the others. Specifically, if

1. in Durkheimian fashion, moral and ethical considerations associated with *religion* serve as a *foundation for social stability*;

2. as argued by Diamond, *centralized government* and *organized religion* are *complements* in maintaining social order and continuity; and

3. in the spirit of Ekelund et al. as well as Barro-McCleary, *monotheisms* were naturally more effective in maintaining *ecclesiastical dominance* within polities,

   then monotheist civilizations ought to have *endured longer* historically. And, to the extent that such stability conferred military, political and economic benefits as well, monotheist societies ought to have *ruled over larger geographic domains*.

Utilizing data between 2900 BCE and 1750 CE on 277 civilizations, such as dynasties, kingdoms and empires, I show that the births 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.[4] The societies in my sample lasted about 320 years on average during this long time interval. And, controlling for

[3]Along somewhat similar lines, Toynbee (1946, pp. 13-14), stated: "... the Empire fell and the Church survived just because the Church gave leadership and enlisted loyalty whereas the Empire had long failed to do either one or the other. Thus the Church, a survival from the dying society, became the womb from which in due course the new [Empire] was born."

[4]For practical reasons, my focus here is on the three big monotheisms of Judaism, Christianity and Islam either because other monotheisms were not founded within my data timespan or I could not identify any society in which a majority or ruling class adhered to them.

One of the excluded monotheisms is *Zoroastrianism*. While the extent to which it represents a monotheism is in dispute, Zoroastrianism does have a clear hierarchy among its various divine beings, with *Lord Mazda* as the Supreme God followed by seven other deities, *the Holy Immortals.* Nonetheless, precisely due to these distinctions, Zoroastrianism is accepted by some scholars as an early precursor of our modern monotheisms (see Armstrong, 2006, pp. 9 -14). As I elaborate below, there is only one society, the Sassanids, which adhered to this monotheist strand. Due to the ambiguities involved in

other factors such as geographic region and time-period effects, those civilizations that adopted an Abrahamic monotheism lasted about 20 to 25 percent longer. Beyond the general impact of adherence to monotheism, I generally cannot find any evidence that Judaism, Christianity or Islam exerted particular effects on the length of reign of civilizations historically. I also confirm that monotheism had a roughly similar effect on the geographic domain over which civilizations reigned during their peak. In fact, monotheist civilizations controlled about twice the land area of their non-monotheist counterparts. Unlike the results on duration, however, I find some evidence that adherence to a specific religion—Islam—did exert an additional positive impact on geographic domain.

Admittedly, it is not quite clear why monotheistic regimes should be more durable and efficient than non-monotheistic regimes. Indeed, there are many reasons why one could expect, a priori, polytheistic regimes to outperform monotheistic regimes. For instance, a monotheistic religion demands more uniformity and entails no legitimate competition except that provided by other monotheistic faiths. In a polytheistic religion, by contrast, the very multiplicity of gods allows provides fluidity to individual lifestyles. One can make adjustments simply by reordering the hierarchy of existing gods, or their significance to particular activities. And one could argue that, by making it part of the natural order for communities to differ in thought and behavior, polytheism facilitates peaceful coexistence.[5] If such coexistence forms the cornerstone of stable and efficient polities, then it would follow that monotheist societies ought to have endured less and been more fragile than other societies. The upshot of all this, however, is that this is a question that needs to be resolved empirically.

In addition to the works cited above, this paper generally relates to a strand in economics that emphasizes religion, social norms and culture as important factors in individual behavior or social organization. Some papers in this branch focus on religion and culture in general (e.g., North, 1990, Temin, 1997, Landes, 1999, Greif, 1993, 1994, 2006, Jones, 2003, Fernandez et al. 2004, Fernandez, 2007, Barro and McCleary, 2003,

establishing the theistic character of Zoroastrianism, I chose to treat it as non-monotheist, although this classification does not have any bearing on the essence of the empirical results that lie ahead.

*Sikhism,* which was founded by Nanak and nine successive gurus in India during the 15th century, is a monotheist religion with a non-andromorphic God. However, the sample below contains no civilization which 'officially' or as a majority adhered to it. The *Baha'i* faith is another monotheist religious tradition, but it was founded in Persia much later in the 19th century. Hence, there is no society in my sample which adhered to the Baha'i faith.

[5]For further details, see Armstrong (1988, 1993 and 2006).

Guiso, Sapienza and Zingales, 2003, forthcoming, and Spolaore-Wacziarg, forthcoming).

Other papers within this field focus specifically on the demand for religion and, in doing so, help to identify why the *secularization hypothesis*, advocated by the likes of Hume, Durkheim and Comte, did not come to materialize (e.g., Azzi and Ehrenberg, 1975, Finke and Stark, 1992, Glaeser and Sacerdote, 2002).

Yet others in this strand follow the ideas originally motivated by Adam Smith in the *Wealth of Nations* (1776) in emphasizing the importance of the religion market and supply-side forces to understand the evolution of religiosity in societies (e.g., Iannaccone, 1992, 1994, Finke and Iannaccone, 1993, Iannaccone and Stark, 1994, Barro and McCleary, 2005, McCleary and Barro, 2006a, McCleary and van der Kuijp, forthcoming).

Finally, there are also some papers which focus on a specific religion, such as Judaism, Islam or different denominations of Christianity to emphasize how individual behavior and the evolution of sociopolitical institutions were—and in some cases still are—driven by them (e.g., Ekelund et al., 1996, Ekelund et al., 2002, Berman, 2000, Botticini and Eckstein, 2005, 2007, Kuran, 2004a, 2005, Becker and Woessmann, 2009, Lewis, 2002, Abramitzky, 2008 and Iyigun, 2008).

The remainder of this paper is organized as follows: In Section 2, I describe my data and present the baseline empirical findings. In Section 3, I discuss the robustness of those findings and explore some alternative empirical specifications. In Section 4, I conclude.

## 2. The Empirical Analysis

### 2.1. Data Sources, Descriptions & Classifications

Testing the extent to which monotheist civilizations differed from others in endurance and geographic domain requires a working definition of a *civilization*. For this, I simply adhered to the standards employed by the historians, archeologists and anthropologists, whose work I relied upon to gather my primary data. As noted by Haywood (2005, pp. 8-10), for example, the civilizations in *The Penguin Historical Atlas of World Civilizations*, all exhibit the features outlined by the *Childe-Redman criteria*.[6]

[6]According to this criteria, the relevant human civilization traits are broken down into two categories. The primary characteristics involve various aspects of social organization; they encompass settlement in cities, labor specialization, concentration of surplus production, class structure and state organization, such government. The secondary characteristics are about material culture; monumental public works, long-distance trade, artwork, writing and scientific pursuits, such as those in arithmetic, geometry and

Next, we need to establish specifically what is meant by a *monotheist* society. For practical purposes, I defined a society as *monotheist* if one or more of the following three criteria were met:

i. a majority of its citizens adhered to one of the three main Abrahamic monotheist religions;

ii. its government and political organizations promoted one of the three monotheist traditions through their social, economic and military policies;

iii. its form of government was a *theocracy* based on an Abrahamic religion.[7]

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astronomy.

[7] I classify a society as a monotheist theocracy if, as with the Carolignians, the Ottomans or the Arab caliphate dynasties, the ruling political authorities carried an ecclesiastical title or an explicit religious endorsement. In fact, there are various (more or less stringent) ways to define a *theocracy*. For example, according to *The New Lexicon Webster's New Lexicon Dictionary,* theocracy is "government by priests or men claiming to know the will of God; a state thus governed." And in *Merriam-Webster Online* (http://www.m-w.com), it is given as "government of a state by immediate divine guidance or by officials who are regarded as divinely guided; a state governed by a theocracy."

To get a specific sense of which socities are classified as monotheist, consider the Carolingian Empire of Charlemagne, the Ottoman Empire, the Bahmani Sultanate and the Mughal Empire.

The defining characteristic of the Carolingian Empire was that its King Charlemagne was coronated by the Catholic Pope Leo III in 800 CE 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. And 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.

The Bahmani Sultanate, which ruled in southeast India between the early-14th and early-16th centuries, also resembled the Ottoman Empire in that the Muslim groups dominated politically, but the Hindu areas were granted some degree of autonomy and coexistence was facilitated by mutual non-interference. [On two related papers that relate ethno-religious heterogeneity with religious tolerance, see Chaney (2008) and Jha (2008).]

Along these lines, the Muslim Mughal Empire was founded by the Chagatai Turkic ruler Babur and reigned in Northern India between the mid-16th to mid-18th centuries. While it became a politically and religiously intolerant regime later during the leadership of Aurangzeb, to which its seeds of decline is often attributed, by most accounts, the Mughals too were a religiously and politically tolerant society especially during the reign of Akbar.

While this is a relatively crude generalization, the societies classified as monotheist in the sample

One potential objection to our definition is that it treats all individuals of a given society identically. But there exists a great deal of heterogeneity in the individuals' degree to which they adhered to and practiced the state monotheism of their society.[8] Given the historical record, however, we have no hope of coming up with a measure of individuals' overall intensity of *adherence to monotheism*. Nonetheless, the key point here is that, to the extent that adherence to the designated monotheism varied and monotheisms were practiced to some degree in non-monotheist civilizations too, the empirical work below would reflect attenuation bias.

To proceed with our investigation, we need a comprehensive dataset that covers a wide enough historical timespan which envelops the births of the three monotheistic faiths on both ends. With these constraints and demands in mind, I focus on a 4650-year period between 2900 BCE and 1750 CE. The start date of 2900 BCE 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 CE in order to establish the role of monotheism in socio-politics during the pre-Industrial era and prior to the prevalence of nation states.

There are a variety of alternative data sources for our purposes and for the historical record of civilizations, I used the *Oxford Atlas of World History* (2002), the *Rand McNally Historical Atlas of the World* (2005), the *Encyclopedia Britannica*, McEvedy (1992, 2002), Roberts (1976), Haywood (2005), Farrington (2202, 2006) and Anglin and Hamblin (1993). I recorded various facts about these civilizations, the most important of which are their years of foundation and collapse. For geographical information on land areas, I relied on the CIA's *The World Factbook*.

Before we proceed, three data clarifications are in order: First, for all empirical tests below the cap 1750 CE is relevant and, when a civilization terminated past that date, it also generally binding. In other words, I included in my sample only those civilizations which came to exist before 1750 CE and, even if a civilization lasted long past 1750 CE, in some but not all empirical specifications below, I only considered its duration up to that date. I have done this to abstract from the roles of the Industrial Revolution and the rise of nation states on duration and peak land mass attained. But

below either resemble the Carolignian Empire or the Ottomans and the Bahmani Sultanate in terms of the role of religion in their political, administrative and social spheres.

[8] See, for example, Finke and Stark (1992).

bear in mind that, since a state was more likely to have been predominantly monotheist later in my time span, capping the duration of societies this way introduces a data construction bias against finding a positive influence of monotheism on endurance. In any case, I shall review below some empirical evidence based on estimates for which the 1750 CE cap is binding (as in a variety of right-censored duration analyses) as well as specifications where I considered termination dates that weren't bound by the 1750 CE date (such as a variety of survival estimates without right censoring).

Second, this is a data construction exercise from scratch. As such, it takes as a starting point the information available in the main sources. The data are intended to be as comprehensive as possible, but to the extent that I could not verify relevant crucial data on the foundation and extinction dates, peak land mass, etc., of the civilizations in question from reliable sources, there are some non-systematic data omissions.

Finally and along the same lines, this is meant to be comprehensive data on ancient, medieval and pre-Industrial era civilizations that had some *autonomy* and *scale*. This is the reason why the data encompass kingdoms, dynasties and empires, as well as early American civilizations about which we have less-specific information about government structure, state organization and social life. This is also the reason why, in some alternative specifications, I have excluded from my sample feudal principalities, medieval fiefdoms, suzeranities, and the Anatolian derebeyliks and various city-states. As I shall explain in some detail below, this effectively yielded sovereigns that ruled over at least about 10,000 $km^2$, although the data yielded some outlier states with only a 1,650 $km^2$ domain (more on which below).

In the end, I was able to identify 277 civilizations which inhabited one or more of the five habitable continents. I also ended up with roughly 110 civilizations which I had to omit for a variety of reasons, such as issues of scale, autonomy or insufficient information. Appendix A presents the core data and Appendix B lists the omitted observations as well as the reason for their omission.

The top three panels of Table 1 present some descriptive statistics. On average, monotheist civilizations lasted significantly less than non-monotheist societies, with a typical non-monotheist civilization enduring about 360 years and a monotheist society lasting about 260 years. The monotheist societies attained a peak land mass of about 1.2 million $km^2$, which was roughly 400,000 $km^2$ smaller than non-monotheist soci-

eties. For comparison purposes, when the non-monotheist civilizations of the Americas are excluded, monotheist civilizations lasted about six decades short of non-monotheist civilizations, whereas their peak land mass was about 600,000 $km^2$ smaller than non-monotheist societies. Hence, the early American civilizations lasted much longer than average (about 640 years) but they occupied more concentrated areas during their reign. Monotheist societies were distributed fairly evenly between Africa and Asia, but there were a lot more of them in Europe and the Middle East. In contrast, non-monotheist establishments were predominantly centered in 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 lasted for close to 1600 years between 2200 BCE and 644 BCE. The Muslim Nubian Kingdoms of Northeast Africa, which survived about 1200 years; the Byzantine Empire, which survived 113 decades in Asia Minor, Middle East and the Balkans; and 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. Among these most durable societies only the Nubian Kingdoms and the Byzantine Empire adhered to a monotheism.

In terms of the land mass achieved during the peak of empire, the Arab Umayyad dynasty tops the list, with about 14 million $km^2$. That was followed by the Ottomans, various Chinese dynasties, such as Xia, Qin, Han and Song, as well as the Macedonian Empire. The Ottoman Empire and the Chinese dynasties spread as large as about 6 million $km^2$ and the Macedonian Empire exceeded 5 million $km^2$.[9] In contrast, the smallest geographies in my sample were covered by the Sultanate of Melaka (of northern Sumatra, with about 1650 $km^2$), the Sharqi Dynasty (of Jaunpur in northern India, with about 4,000 $km^2$), the Anatolian derebeyliks and Greek city-states (typically with somewhere between 10,000 to 30,000 $km^2$), Israel and the Kingdom of Judah (with 26,000 $km^2$ land mass) as well as the various North and Central American ancient civilizations, such as Mochica, Chavin and Chimu, each controlling about 60,000 $km^2$ around the Andes

[9]Here I consider the contiguous land mass of civilizations and exclude, in particular, the colonial conquests of maritime empires of the British, Spanish and the Portuguese.

Furthermore, although the Golden Horde and Mongol raids covered a vast geographic belt with an area of 33 million $km^2$ that stretched from the China Sea to central Europe, I treat these as outliers in that the era of the Golden Horde and Mongol raids did not typically culminate in stable government and state organization.

region.[10] Of those outliers in peak land mass, the societies which attained the largest land masses were all monotheists with the exception of the various Chinese dynasties and the Macedonian Empire.

Of the 168 non-monotheist civilizations in my sample, 26 were in the Middle East, 68 in Asia, 36 in Europe, 16 in Africa, and 22 were in the Americas. Some of the notable non-monotheist civilizations 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); Indian dynasties (Shakas, Guptas, Viyajanagar, etc.); early American civilizations (Aztecs, Incas and Mayans) as well as Alexander the Great's fleeting Macedonian Empire.

Of the 109 monotheist civilizations, 35 were in the Middle East, 38 in Europe, 17 in Africa and 19 were in Asia. Of those, 46 were Christian, 61 were Muslim and only two were Jewish (Israel/Judah Kingdom, r. 1200 BCE – 584 BCE and Khazaria, r. 650 CE – 965 CE). Besides Israel and the Judah Kingdom, among the notable monotheist civilizations were the Axum Empire, the Byzantine Empire, the Holy Roman Empire, the Carolignian Empire, the Portuguese and British Empires (all Christian); the Arab Caliphate dynasties of the Abbasid, the Ummayad, the Tulunid, the Fatimid, the Ayyubid dynasties, the Mamluks, the Seljuk Empire, the Ottoman Empire, the Sultanate of Delhi, and the Safavids (all Muslim).

The Roman Empire, the Ilkhanate Dynasty (of the Mongols), Khazaria, Takrur, the Qarakhanids, the Axum Empire, Cumans, Bulgars, Nubian Kingdoms, Merovingians, and the Kievan Rus provide the 11 mixed cases where the sovereigns adopted a monotheist tradition after the empire or kingdom was founded.[11] Although the exclusion of these observations from the empirical analysis does not affect the results in any material way, I chose to include them in the baseline sample after determining their theistic classification on a case-by-case basis.

[10] McCleary and van der Kuijp (forthcoming), in fact, point out that smaller but higher population denisty geographies were more prone to possess state religions. Coupled with the hypothesis that monotheisms had a comparative advantage in becoming state religions, this is consistent with the negative correlation between peak land mass and monotheism shown in Table 2.

[11] See Section 3 for more details.

To start with, the Roman Empire formally converted to Christianity in 313 CE during the reign of Constantine. The Ilkhanate Dynasty adopted Islam when Khan Ghazan and his subjects converted to Islam in the late-13th century immediately following the foundation of the Khanate in 1260. Given the timing of the exact conversion of these societies to monotheism, I shall classify the Roman Empire as a non-monotheist civilization; the Empire lasted only seventeen years after Constantine declared Christianity the official religion of his Empire. In contrast, I will treat the Ilkhanate as a Muslim civilization.

Khazaria was a Turkic civilization that occupied a swath of land in the Caucasus to the northeast of the Black Sea between 650 CE and 965 CE. During the early reign of their state, Khazars practiced Turkic shamanism, but, either around 740 CE or 861 CE, the Khazar ruling classes converted to Judaism. The extent to which the rest of the population adopted Judaism is subject to debate, but some archeological evidence seems to suggest that there were widespread shifts in the burial practices of the wider population consistent with high rates of conversion to Judaism.[12] In the analysis below, I will assume that Khazaria was a Jewish state. This is more appealing than assuming that the Khazar state was non-monotheist because it lasted slightly less than average (about 32 decades versus the average of 34) and occupied a smaller-than-average geographic region too (about 850,000 $km^2$ as opposed to 1.5 million $km^2$).

Takrur, an ancient Western African civilization which lasted about half a millennium, converted to Islam around 1030. This is just about halfway through its reign but, given that Takrur lasted longer than average, I shall treat it as a non-monotheist civilization. Cumans reigned in Transylvania from 1060 CE to 1237 CE, but they converted to Christianity (Roman Catholicism) during Prince Barc's tenure only in 1227. As such, I consider them non-monotheist. Bulgars reigned in the Balkans between 679 CE and 1018 CE and they converted to Orthodox Christianity much later during the reign of Boris I in 869. This is why I categorize them non-monotheist. And while a precise date is harder to pin down for the conversion of the Qarakhanids, the available sources suggest it was rather early on. Thus, I classify them as a Muslim civilization. Nubian Kingdoms (of Nobatia, Pachoras and Alwah) converted to Christianity between 543 CE and 575 CE, due primarily to the work of two missionaries, Julian and his successor Longinus.

[12]For further details, see Brook (2006) and Golden (1980).

But they were all founded in the 4th century CE and existed for over a millennia in east central Africa until the early 16th century. Thus, I consider them to be Christian. The Merovingian King Clovis I converted to Christianity in 496 CE or 506 CE, which is immediately subsequent to the foundation of his kingdom in 476 CE. Hence, I classify the Merovingian Kingdom as Christian. Kievan Rus reigned between 860 CE and 1150 CE and converted to Orthodox Christianity in 988. Using the same reasoning above regarding the classification of Takrur, Qarakhanids, and the Nubian Kingdoms, I shall classify Kievan Rus as Christian.[13]

Among the civilizations that turned monotheist sometime during their reign, 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 CE to 960 CE) in what is modern-day Ethiopia and parts of Yemen. 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 CE 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 to 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 CE the Arab Umayyad dynasty began to conquer Northern Africa and convert the local populations to Islam. Since Axum's conversion to Christianity is very early on during its tenure, I classify it as monotheist.

In all that follows, Israel/Judah Kingdom also has a peculiar role in that it represents the only historic civilization that adhered—unlike Khazaria, without a doubt—to Judaism. Nonetheless, 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 BCE, although as the sole Jewish monotheist order in the sample, it usually ends up being an outlier which robust regression techniques typically omit.

The Sassanian Empire, which ruled in parts of modern day Iran and Mesopotamia between 208 CE and 651 CE, provides another interesting case. Its ruling class, nobil-

[13]For an excellent review of the (ecclesiastical) histories of various ancient and medieval civilizations, see Findlay and O'Rourke (2007, Ch. 1).

ity and, for the most part, population subscribed to *Zoroastrianism*. As noted above, whether or not Zoroastrianism can be deemed monotheist is subject to some debate which is why I designated Sassanians as non-monotheist. However, it is less contentious to acknowledge that Zoroastrianism represents an early precursor of modern monotheistic faiths.

**2.2. Summary Statistics**

In the bottom panel of Table 1, I provide a breakdown of civilizations according to their theistic attributes by century. The data confirm the steady rise of monotheistic societies and the displacement of others starting in the fourth century. In particular, there was only one monotheist state (the Christian Axum Empire in sub-Saharan Africa) in the fourth century, which accounts for only 7 percent of the sample for that period. By the eighth century, however, about one sixth of all sovereign countries were monotheist, with one being Jewish (Khazaria) and three being Christian (Axum Empire, Byzantine Empires and the Nubian Kingdom). By the twelfth century more than fifty percent of all countries in the sample was monotheist, while in the seventeenth century it was close to 90 percent.

[Table 1 about here.]

I now empirically explore whether the birth of monotheist religions and their adoption by civilizations had an impact on their duration and geographic domains.

To this end, I formulate a baseline dataset in which a cross-section of 277 civilizations is covered over a timespan of 465 decades between 2900 BCE and 1750 CE. Table 2 presents the key summary statistics of the variables used in the empirical analyses. As can be seen in both panels, the average civilization lasted about 32 decades; there was a positive correlation between the duration of a civilization and the births of the three monotheist religions; the reign of a civilization was longer among Christian and Jewish establishments whereas this relationship was negative for a Muslim civilization; the peak land mass of a civilization was smaller for Christian and Jewish societies, while it was positively linked in the case of Muslim societies. As shown in the top panel, the average land mass reached a peak of about 1.5 million square-kilometers although this statistic rose over time. In the cross-country sample of 277 total countries, 109 subscribed to one of the three monotheist religions (i.e. the 98 that were monotheist from the start

plus Roman Empire, the Ilkhanate Dynasty (of the Mongols), Khazaria, Takrur, the Qarakhanids, the Axum Empire, Cumans, Bulgars, Nubian Kingdoms, Merovingians, and the Kievan Rus). This corresponds to about 40 percent the whole sample.

[Table 2 about here.]

Using this dataset, I first carry out some multivariate duration analyses in order to isolate the influence of monotheism on the survival of civilizations. Then, I explore the impact of the theistic attributes of civilizations on their duration as well as peak land mass using some OLS and robust regression specifications. For some alternative estimates and as robustness checks, I also rely on a more restricted subsample of the data covering 243 observations, omitting 34 small-scale civilizations, such as city-states and derebeyliks.

### 2.3. Multivariate Survival Analysis

My baseline empirical analyses involves hazard function estimates using both the exponential and the Weibull hazard rate specifications. When I use the exponential hazard function, I estimate

$$\log h_{i,t} = \beta_0 + \beta_1 MONOTHEIST_i + \beta_2 MONOTHEIST_i * BIRTHYEAR_i + \beta_3 X_i + \upsilon_i, \tag{1}$$

where $h_{i,t}$ represents the survival hazard of civilization $i$ at time $t$; the variable $MONO - THEIST_i$ controls for whether $i$ was monotheist or not; $BIRTHYEAR_i$ denotes the year in which civilization $i$ was founded; and $X_i$ represents a vector of additional control variables.[14]

In all estimates that follow, the control variables in $X_i$ include $BIRTHYEAR$ separately and the geographic dummy variables for the central domain of the civilizations, $MIDDLEAST$, $EUROPE$, $AFRICA$, $ASIA$, and $AMERICA$. In less parsimonious estimates, I also control for whether civilization $i$ was founded before or after the births of Judaism, Christianity and Islam, denoted respectively as $MONOBIRTH$, $CHRISTBIRTH$ and $ISLAMBIRTH$.

[14]For notational ease, I shall denote the interactive term, $MONOTHEIST * BIRTHYEAR$, as $MONOTIME$ in all of the tables and most of the discussions that follow.

The reasons for including some of these right-hand-side variables are self explanatory: For example, I include $BIRTHYEAR$ to see if there are observation-specific time effects on the dependent variables and I consider its interaction with $MONOTHEIST$ 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.

When I estimate the hazard rates using the Weibull distribution instead, then the empirical specification is similar to the one in (1) with the exception that all coefficients are scaled up or down by the factor of acceleration or deceleration, $p - 1$, which is also estimated.

In Table 3, I report the initial findings, where columns (1) through (3) list the hazard rate estimates using the exponential distribution and columns (4) through (6) show the estimates derived using the Weibull distribution. In columns (1) and (4), we see the most parsimonious specification that controls only for the theistic attributes of civilizations, their foundation dates and geographic locations. The estimates in columns (2) and (5) add the birth of monotheism in 606 BCE as a control and those in columns (3) and (6) include the births of Christianity (year 0) and Islam (622 CE) as well.

As shown in all columns, there are systematic regional differences in survival: being located in Africa reduced survival likelihoods the most, followed by being located in America and Europe (Figure 1 plots the impact of geographic location on survival rates). In contrast, being in the Middle East had a statistically significant and positive effect in all six specifications. The positive coefficients on $BIRTHYEAR$ in the exponential hazard rate estimates, shown in columns (1) through (3), suggest that hazard rates rose and survival declined over time. But, since the Weibull estimates incorporate such a secular trend by construction, $BIRTHYEAR$ is not statistically significant in columns (4) through (6). The variables of primary interest, of course, are $MONOTHEIST$ and $MONOTIME$. As shown in Table 3, all survival estimates that rely on an exponential hazard rate specification produce a negative and statistically significant effect of $MONOTHEIST$ and a statistically positive one of $MONOTIME$ on survival rates. Taken together, these estimates suggest that, starting around 1100 CE, those civilizations that were monotheist began to have higher survival probability than non-monotheist societies. And, as shown in the final three columns of the table, the Weibull specifications are roughly in line with these estimates, although they are a bit weaker statistically.

[Table 3 and Figure 1 about here.]

In Table 4, I replicate Table 3 with the one exception that the data are right censored. As I have discussed in the introduction, there are reasons to believe that the survival of societies underwent a systematic change with the advent of nation states and the Industrial Revolution. The results shown here are stronger when the Weibull distribution is used for the hazard rate estimates: in columns (4) and (5) we get negative and significant coefficients on $MONOTHEIST$ and positive and significant ones on $MONOTIME$. And although the estimates in the final column do not yield a statistically significant effect of $MONOTIME$ on survival, it is positive with a p-value of 12 percent. As in Table 3, the two estimates shown in columns (4) and (5) yield a net positive effect of adherence to monotheism starting around 1100 CE. Finally, note that the exponential hazard rate specifications, shown in the first three columns of Table 4, are weaker than those reported in Table 3, although they are directionally consistent.

[Table 4 about here.]

### 2.4. Cross-Section OLS Estimates

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

$$CIV_i = \lambda_0 + \lambda_1 MONOTHEIST_i + \lambda_2 MONOTHEIST_i * BIRTHYEAR_i + \lambda_3 X_i + \varepsilon_i \tag{2}$$

where, depending on the empirical specification, $CIV_i$ is either the duration (in decades) of civilization $i$ or its peak land mass (in square kilometers); the explanatory variable $MONOTHEIST_i$ controls for whether $i$ was monotheist or not; $BIRTHYEAR_i$ denotes the year in which civilization $i$ was founded; and the additional control variables, $X_i$, are the same ones I relied upon in subsection 2.3.

The main results I report below rely on two alternative estimation techniques: ordinary least squares regressions (OLS) with errors clustered geographically and robust regressions.[15] First, as in Section 2.3, I examined the degree to which the duration of civilizations cross-sectionally depended on their theistic characteristics. In Table 5, I

[15]Robust 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.

present estimates where the dependent variable is the duration of civilization $i$ in decades. As shown in columns (1) through (5), we verify that the theistic attribute of a society, $MONOTHEIST$, did have a positive, statistically significant and meaningful impact on length of reign: for example, around the year 1200 CE, the estimates range from a low of about 6 extra decades (an impact of more than 18 percent on duration) to a high of about 7.5 decades (an impact of over 23 percent).[16] In the first three columns, we see some evidence that the impact of adherence to monotheism declined over time, although on net the effect of monotheism was positive throughout the 17th century. Moreover, the negative coefficient of $MONOTIME$ turns insignificant in the last three estimates that employ robust regression techniques. Nevertheless, we do find that there was a negative and secular trend over time, as indicated by the effect of $BIRTHYEAR$ on the duration of civilizations in all of the six estimates shown. Finally, we do confirm that civilizations in America lasted much longer than others, followed by those in Africa, Asia and the Middle East. When the empirical tests control for the advent of monotheism in general, as they do in columns (2) and (5), or the birth of the three Abrahamic monotheistic religions, as in columns (3) and (6), they yield mixed results, although $BIRTHMONO$ and $CHRISTBIRTH$ produce positive coefficients whereas $ISLAMBIRTH$ generates negative coefficients.

[Table 5 about here.]

In Table 6, I present empirical estimates where the dependent variable is the land mass (in square kilometers) of civilization $i$ at its imperial or political peak. As shown in all columns, I do not find that the theistic attribute of the society, $MONOTHEIST$, had a positive impact on peak land mass. But, I do find in all estimates that the birth of monotheism in the early-7th century BCE provides a common structural break in the peak land mass attained by civilizations historically. Taking the lower estimates provided in the robust regression columns of (4) and (6), we see that societies which were founded after 606 BCE had about 380,000 $km^2$ or roughly 25 percent larger land mass. In all of the estimates, the continental dummy variable for $AFRICA$ is positive and significant.

[16] The first figure comes from the column (2) estimates. The coefficient on $MONOTHEIST$ is 59.3 and netting out the negative time-varying effect of $MONOTIME$, which equals $-.013 * 4,100 = 53.3$, we get a 6 decade positive impact (since I measure time in absolute terms from the start in 2900 BCE, the year 1200 CE corresponds to 4100). The second figure is derived from column (3) in similar fashion.

But being on the American continent also provided a territorial advantage, as shown by the estimates involving $AMERICA$ in the final three columns and despite the fact that there were many small sovereign establishments on that continent, such as the Mochica, Chavin and Chimu. Still, the strongest positive and significant geographic effect was being in $ASIA$: whereas on average societies in the dataset attained about 1.5 million $km^2$, all else equal, being in Asia generated a size of about 4 million $km^2$, which is about a 170 percent impact.

In columns (2) and (5), I add control variables for the births of Christianity and Islam to see of they could provide additional explanatory power. With the robust regression estimate in column (5), I find that the birth of Christianity might have had an adverse statistically significant effect on peak land mass, but not enough to offset the positive and significant impact of the birth of monotheism (read: Judaism).

[Table 6 about here.]

**3. Alternative Specifications & Robustness**

A preliminary robustness check involves the extent to which some of the small-scale civilizations included in the dataset influence these findings. In order to check into that, Table 7 replicates Table 3 with the sole exception that 34 small-scale city states and Anatolian derebeyliks are excluded from the analyses. As shown in columns (1) through (3) and (5), the results are pretty much in line with those we have already seen in Table 3.

[Table 7 about here.]

In Tables 8 and 9, I report results generated with some alternative control variables included in the cross-section empirical specifications. For example, in Table 8, I dissect $MONOTHEIST$ into the three Abrahamic religions to see if they had differential effects on $DURATION$. That is, instead of controlling for $MONOTHEIST$, I include $JEWISH$, $CHRISTIAN$, and $MUSLIM$. And, in lieu of $MONOTIME$, I control for the interaction of the foundation of each civilization with $JEWISH$, $CHRISTIAN$, and $MUSLIM$. As in all of the earlier cross-section tables, I still control for $BIRTHMONO$ in columns (2) and (5), and for the birth of Christianity and Islam, $CHRISTBIRTH$ and $ISLAMBIRTH$, in columns (3) and (6). As seen in Table 8, the most robust effect on duration is supplied by $CHRISTIAN$ which, taken together with the negative

and significant coefficients on $CHRISTIME$, suggests that the net effect of adherence to Christianity produced positive effects on duration throughout the 16th century. In contrast, the net positive effect of adherence to Islam on duration is weaker although, even in the specifications shown in columns (3) and (6) where both $MUSLIM$ and $MUSLIMTIME$ carry statistically significant effects, the net positive impact of Islam kicks in only after 1370 CE and remains positive thereafter.

[Table 8 about here.]

Another interesting modification is provided in Table 9, where the code variable $RELIGION$ has replaced $MONOTHEIST$. This new variable is in part intended to capture the impact of religious rivalry among the Abrahamic monotheist strands. In particular, it is intended to explore if the sequence of their advents impart any differential effects on duration as well as the peak land mass attained. Thus, $RELIGION$ takes on the value of 1 if the civilization was affiliated with Judaism, 2 if it was related to Christianity, 3 if associated with Islam and 0 otherwise.

In columns (1) and (4) of Table 9, I report the results where only $RELIGION$ and the geographic location dummies are controlled for. In columns (2) and (5), I include $BIRTHYEAR$ and add the interaction of $RELIGION$ with $BIRTHYEAR$, labeled as $RELITIME$. As shown in columns (1) and (4), $RELIGION$ exerts a positive and significant impact on peak land mass and a negative and significant impact on duration. In effect, this suggests that peak land mass (duration) grew progressively larger (shorter) as the monotheism in question went from Judaism to Christianity and Islam. The estimates in columns (2) and (5) also suggest this result is robust to the inclusion of a time-interaction effect of religion only with respect to the impact of religion on peak land mass, i.e., in columns (5) and (6). In columns (3) and (6), I add $MONOBIRTH$, $CHRISTBIRTH$ and $ISLAMBIRTH$. And as shown in columns (3) and (6), their inclusion does not alter the results obtained with peak land mass. Taken as a whole, these results imply that Muslim civilizations typically conquered more land than Christian societies but they did not necessarily last as long.

[Table 9 about here.]

The interesting result is that, while Jewish and Christian civilizations might have attained smaller geographic land masses on average, their impact is not robust to the

adjustment for the role of outliers. But Islam seems to have exerted a positive and robust influence on the peak land mass attained, as shown in columns (5) and (6). Moreover, the estimate in the final column still implies that the birth of monotheism in 606 BCE had a positive and significant role in leading to larger land mass for all civilizations in general, although the advent of Christianity almost fully offset that general effect.

Figure 2 is derived from hazard-rate analyses in which the set of explanatory variables included separate controls for $JEWISH$, $CHRISTIAN$, and $MUSLIM$ as well as their interactions with the foundation dates of each civilization, $JEWISHTIME$, $CHRISTIME$, and $MUSLIMTIME$. As shown, while the impact of Judaism and Christianity on survival is positive, the effect of Islam does not seem to be. Still, it is important to bear in mind that my cross-section estimates suggest that the time trend of the impact of Islam on duration was positive whereas that of Christianity was negative. This may be, in part, why the positive influence of Islam on survival rates does not show in the survival analyses.

[Figure 2 about here.]

Omitted variable biases and reverse causality could be potential problems for the estimates shown in Table 5 and 6, and even for those in Tables 3 and 4. Nevertheless, there are two factors which attenuate these concerns to some degree: First, one would have to bear in mind that, by 9th century CE, 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 monotheisms. Thus, there is a structural time break in the adoption of monotheism in these geographic areas, roughly covering the period between 313 CE, when the Roman Emperor Constantine I issued the Edict of Milan which legalized Christian worship turning the Roman Empire monotheist, and the 751 CE. Talas War between the Asian Turks and the Abbasid Muslims, which exposed Turks to Islam and led to their adoption of monotheism as well as its spread in Asia subsequently. Second, recall that, in eleven civilizations in the dataset, the rulers—and in some cases, most of the populations—converted to a monotheism *after* the civilization was founded. In the case of all of these societies except Khazaria, Takrur, Cumans, Bulgars, and Kievan Rus, the conversions occurred sufficiently late or early so as to enable us to classify Romans as non-monotheist and the others as monotheist. In the case of

Khazaria, Takrur and Kievan Rus, there is a great deal more uncertainty about the date and extent of conversions which took place neither early nor late enough to aid with classification. In eight of the 11 cases, however, the classification employed was in the direction of attenuation. In any case, I reran all the empirical tests above by excluding these 11 societies and verified that neither of the findings reported here rides on this classification issue.[17]

An important coding issue revolves around how to systematically account for the dates of foundation and termination. This issue is most relevant in the treatment of the various Chinese dynasties, such as the Ming, Song, Shang, or Xia, the various Indian Dynasties which make up the Magadha Empire, such as the Brihadrathas, Pradyotas, Shishunagas, Kanvas, Nandas, Guptas, etc. All of these Indian and Chinese dynasties are traditionally classified as independent and separate entities. These classifications stand in contrast to those of the various Western and Northern European kingdoms, such as the British, Portuguese Empires, the Kingdoms of Sweden, Norway, Denmark, etc., or other Middle Eastern civilizations like the Ottoman and Selçuk Empires, among which no distinction is made in dynastic or ruling class transitions. To assess whether this distinction is important, I combined all the sequential Chinese dynasties to represent three independent civilizations (the first starting with the Xia in 1994 BCE and running through Shang, Zhou, Qin, to Han in 220 CE, the second comprising of the era of the Sui and Tang between 581 CE and 907 CE and the third one beginning with the Song in 960 CE, running through Liao, Jin, Yuan, Ming, and terminating with the Qing dynasty in 1911 CE). I did the same for the Indian dynasties that made up the Magadha Empire (r. 545 BCE to 320 BCE). Then, I reestimated my specifications using the combined Chinese Empires and the Indian Magadha Empire and treating the sequential Arab Muslim empires (of the Rashidun, Umayyads, Abbasids, Tulunids, Fatimids, Ayyubids and the Mamluks) as one too. Neither of these reclassification changes altered the results in any significant way. Thus, I do not report them here.

A similar complication arises from the fact that a number of the civilizations in the data had periods of interregnum; for instance, Kingdom of Portugal between 1580 and 1640 after it was occupied by the Kingdom of Castille; the Ottoman Empire between 1402 and 1413 after Timurids defeated Yildirim (Thunderbolt) Beyazit in the Battle of

[17]Of course, all results discussed but not shown are available upon request.

Ankara, the Byzantine Empire between 1204 and 1261 after Constantinople was sacked by the Fourth Crusaders, and the Kingdom of England between 1649 and 1660 following the English Civil War. I have essentially ignored these periods of interruption in autonomy on the basis of the fact that the societies in question recovered from the loss of sovereignty, typically with in a decade or two. Nonetheless, excluding these observations from the sample does not alter the main results.

Using the cross-country data, I also explored whether denominations within Christianity and Islam produced differential effects on duration and peak land mass. In particular, I replaced the monotheist and religion dummies above with separate control variables for Catholicism, Roman Orthodoxy, Protestantism, Aryanism within Christianity and for Shi'a and Sunni denominations within Islam. While I do not report these results below, doing so showed some evidence for a statistically significant and positive role only of Catholicism and Roman Orthodoxy on duration. In contrast, I could not find any robust influence on peak land mass of the other denominations within Christianity and Islam.

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 civilizations. And despite the fact that ancient civilizations typically lasted longer than their younger brethren, this very fact makes its less likely that we lack a large enough chunk of systematic archeological/anthropological evidence on ancient civilizations that could bias the results above.

## 4. Conclusion

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

The births of the three main monotheistic religions is particularly relevant in this regard, because they spread rapidly and eventually came to dominate other religions.

Recent work in economic history suggests that the transition of various civilizations into polities in which the political and economic rights of the whole population are 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 civilizations came to be strongly intertwined historically and ascertain whether monotheism promoted a modicum of sociopolitical and economic stability within societies.

In this paper, I argue that the birth of monotheism was a major breakthrough in social institutional design and that its various salient features were the main impetus for sociopolitical stability and, to some extent, geographic expansion.

Using historical data between 2900 BCE and 1750 CE on 277 civilizations, such as dynasties, kingdoms and empires, I have shown above that the births of Judaism, Christianity and Islam and the adoption of monotheism by civilizations had statistically significant effects on the length of reign as well as the average geographical size of all civilizations. Specifically, kingdoms, dynasties and empires lasted about 320 years on average during this interval. But those historical civilizations that adopted monotheism, regardless of whether it was Judaism, Christianity or Islam, lasted about 20 percent longer than non-monotheist social orders and they had about 10 percent higher likelihood to survive an extra century. Beyond the general impact of adherence to monotheism, I could not find any empirical evidence that Judaism, Christianity or Islam exerted an impact on the length of reign of historical civilizations. I also confirmed that monotheism had a roughly similar effect on the geographic domain over which historical civilizations reigned during their peak influence. That is, monotheist civilizations controlled about twice the land area of their non-monotheist counterparts. Unlike the results on duration, however, I found that adherence to a specific religion—Islam—did exert somewhat of an additional positive impact on the geographic domain of civilizations historically.

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**Table 1:** Some Descriptive Statistics

Monotheist Dynasties, Kingdoms & Empires (109 obs.)

| Duration | Land | Europe | Africa | M. East | Asia | Jewish | Christian | Muslim |
|---|---|---|---|---|---|---|---|---|
| 25.6 | 1,217,531 | 38 | 17 | 35 | 19 | 2 | 46 | 61 |
| As share of total in region: | | 51 % | 51 % | 58 % | 22 % | ... | ... | ... |
| Jewish | | 0 % | 0 % | 3 % | 5 % | ... | ... | ... |
| Christian | | 92 % | 35 % | 3 % | 21 % | ... | ... | ... |
| Muslim | | 8 % | 65 % | 96 % | 74 % | ... | ... | ... |

Non-Monotheist Dynasties, Kingdoms & Empires

All: (168 obs.)

| Duration | Peak Land | Europe | Africa | M. East | Asia | America |
|---|---|---|---|---|---|---|
| 35.8 | 1,621,008 | 36 | 16 | 26 | 68 | 22 |
| As share of total in region: | | 49 % | 49 % | 42 % | 78 % | 100 % |

Excluding the Americas: (146 obs.)

| Duration | Peak Land |
|---|---|
| 31.6 | 1,820,441 |

| | Total | Monoth. | | Jewish | | Christian | | Muslim | |
|---|---|---|---|---|---|---|---|---|---|
| Century | no. | no. | % | no. | % | no. | % | no. | % |
| 300 - 399 CE | 16 | 1 | 7 | 0 | 0 | 1 | 6 | 0 | 0 |
| 500 - 599 CE | 16 | 5 | 33 | 0 | 0 | 5 | 33 | 0 | 0 |
| 700 - 799 CE | 20 | 4 | 15 | 1 | 4 | 3 | 11 | 0 | 0 |
| 900 - 999 CE | 28 | 14 | 50 | 0 | 0 | 11 | 39 | 3 | 11 |
| 1100 - 1199 CE | 39 | 21 | 53 | 0 | 0 | 19 | 48 | 2 | 5 |
| 1400 - 1499 CE | 26 | 19 | 73 | 0 | 0 | 11 | 42 | 8 | 31 |
| 1600 - 1699 C.E. | 18 | 16 | 89 | 0 | 0 | 12 | 71 | 4 | 18 |

* Restricted sample (243 obs.)

**Table 2:** Summary Statistics and the Correlation Matrix

| 2500 B. C. E. - 1750 C. E. | | | *The Correlation Matrix (Panel Data)* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| $n = 103,518$ | *Mean* | *St. Dev.* | *CIV* | *MONO* | *JUDAISM* | *CHRS.* | *ISLAM* | *REL* | *DEC* | *MTIME* |
| *CIV* | .082 | .274 | 1 | ... | ... | ... | ... | ... | ... | ... |
| *MONOTHEIST* | .383 | .486 | −.053 | 1 | ... | ... | ... | ... | ... | ... |
| *JUDAISM* | .695 | .460 | .138 | −.0001 | 1 | ... | ... | ... | ... | ... |
| *CHRISTIANITY* | .413 | .492 | .172 | −.0001 | .556 | 1 | ... | ... | ... | ... |
| *ISLAM* | .268 | .443 | .168 | −.0001 | .400 | .720 | 1 | ... | ... | ... |
| *RELIGION* | .926 | 1.23 | −.065 | .955 | −.0001 | −.0000 | −.0001 | 1 | ... | ... |
| *DECADE* | 2125 | 1230 | .181 | −.0001 | .798 | .853 | .766 | −.000 | 1 | ... |
| *MONOTIME* | 813.2 | 1283 | .061 | .805 | .293 | .313 | .281 | .769 | .367 | 1 |

| 2500 B. C. E. - 1750 C. E. | | | *The Correlation Matrix (Cross-Section Data)* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| $n = 243$ | *Mean* | *St. Dev.* | *DUR* | *PLMASS* | *MONO* | *JWSH* | *CHRS* | *MSLM* | *BYEAR* | *MTIME* |
| *DURATION* | 32.9 | 26.8 | 1 | ... | ... | ... | ... | ... | ... | ... |
| *PLMASS* | $1,663,956$ | $3,226,529$ | −.131 | 1 | ... | ... | ... | ... | ... | ... |
| *MONOTHE.* | .383 | .487 | −.195 | −.064 | 1 | ... | ... | ... | ... | ... |
| *JEWISH* | .008 | .091 | .051 | −.029 | .106 | 1 | ... | ... | ... | ... |
| *CHRISTIAN* | .189 | .393 | .122 | −.096 | .554 | −.038 | 1 | ... | ... | ... |
| *MUSLIM* | .189 | .383 | −.350 | .012 | .667 | −.046 | −.216 | 1 | ... | ... |
| *BIRTHYEAR* | 326.2 | 1045 | −.301 | .055 | .565 | −.051 | .289 | .418 | 1 | ... |
| *MONOTIME* | 394.1 | 560.0 | −.274 | −.073 | .908 | −.104 | .460 | .680 | .611 | 1 |

**Table 3:** Multivariate Survival Analyses with Extended data, 2900 BCE - 1750 CE

| | Hazard Rate Since Date of Foundation | | | | | |
|---|---|---|---|---|---|---|
| | Exponential Distribution | | | Weibull Distribution | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *MONOTHEIST* | $-1.59^{*}$ | $-1.59^{*}$ | $-1.24^{*}$ | $-3.11$ | $-2.63^{**}$ | $-2.41$ |
| | (.747) | (.747) | (.519) | (2.02) | (1.60) | (1.50) |
| *MONOTIME* | $.00038^{*}$ | $.00038^{*}$ | $.00029^{*}$ | .00078 | $.00065^{**}$ | $.00058^{**}$ |
| | (.00018) | (.0008) | (.00013) | (.00045) | (.00037) | (.00035) |
| *MIDDLEAST* | $.453^{*}$ | $.453^{*}$ | $.449^{*}$ | $.481^{*}$ | $.484^{*}$ | $.479^{*}$ |
| | (.048) | (.048) | (.048) | (.091) | (.095) | (.098) |
| *AFRICA* | $-6.60^{*}$ | $-6.60^{*}$ | $-6.76^{*}$ | $-23.6^{**}$ | $-25.3^{**}$ | $-25.9^{**}$ |
| | (.199) | (.199) | (.270) | (13.1) | (14.6) | (14.6) |
| *EUROPE* | $-.124^{*}$ | $-.124^{*}$ | $-.120^{*}$ | $-.171^{*}$ | $-.196^{*}$ | $-.182^{*}$ |
| | (.011) | (.011) | (.014) | (.026) | (.034) | (.032) |
| *ASIA* | .053 | .053 | .056 | $-.0069$ | $-.015$ | .012 |
| | (.107) | (.107) | (.106) | (.136) | (.126) | (.124) |
| *AMERICA* | $-.654^{*}$ | $-.654^{*}$ | $-.617^{*}$ | $-.894^{*}$ | $-.875^{*}$ | $-.848^{*}$ |
| | (.129) | (.129) | (.134) | (.253) | (.241) | (.243) |
| *BIRTHYEAR* | $.00036^{*}$ | $.00036^{*}$ | $.00046^{*}$ | $-.00058$ | $-.00045$ | $-.00054$ |
| | (.0001) | (.0001) | (.00013) | (.00051) | (.00049) | (.0043) |
| *BIRTHMONO* | ... | $-.340^{*}$ | $-.273^{*}$ | ... | $-.492^{*}$ | $-.340^{**}$ |
| | | (.148) | (.139) | | (.209) | (.191) |
| *CHRISTBIRTH* | ... | ... | $-.367^{*}$ | ... | ... | $-.225^{**}$ |
| | | | (.047) | | | (.125) |
| *ISLAMBIRTH* | ... | ... | .067 | ... | ... | .309 |
| | | | (.185) | | | (.193) |
| *No. of obs.* | 277 | 277 | 277 | 277 | 277 | 277 |
| *Time at Risk* | 89513 | 89513 | 89513 | 89513 | 89513 | 89513 |
| $p$ | ... | ... | ... | 3.29 | 3.48 | 3.59 |
| $H_0 : \ln p = 0$ | ... | ... | ... | Reject | Reject | Reject |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (6) dependent variable: duration of civilization $i$ from its foundation to disintergation or termination (in years). Cols. (1) - (3): OLS estimates with heteroskedasticity error corrections. Cols. (4) - (6): robust regression estimates.

**Table 4:** Right-Censored Multivariate Survival Analyses with Extended Sample, 2900 BCE - 1750 CE

| | Hazard Rate Since Date of Foundation | | | | | |
|---|---|---|---|---|---|---|
| | Exponential Distribution | | | Weibull Distribution | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *MONOTHEIST* | $-.879^{**}$ | $-.879^{**}$ | $-.631$ | $-2.04^{**}$ | $-1.78^{**}$ | $-1.60^{**}$ |
| | (.496) | (.496) | (.397) | (1.25) | (.963) | (.887) |
| *MONOTIME* | .00019 | .00019 | .00013 | $.00051^{**}$ | $.00044^{**}$ | .00037 |
| | (.00019) | (.00019) | (.00016) | (.00031) | (.00025) | (.00024) |
| *MIDDLEAST* | $.523^{*}$ | $.523^{*}$ | $.516^{*}$ | $.553^{*}$ | $.552^{*}$ | $.539^{*}$ |
| | (.057) | (.057) | (.056) | (.099) | (.101) | (.101) |
| *AFRICA* | $-6.51^{*}$ | $-6.51^{*}$ | $-6.61^{*}$ | $-22.5^{**}$ | $-23.6^{**}$ | $-24.2^{**}$ |
| | (.242) | (.242) | (.247) | (11.8) | (13.0) | (11.9) |
| *EUROPE* | $-.126^{*}$ | $-.126^{*}$ | $-.121^{*}$ | $-.179^{*}$ | $-.198^{*}$ | $-.185^{*}$ |
| | (.013) | (.013) | (.015) | (.032) | (.041) | (.037) |
| *ASIA* | .090 | .090 | .091 | .038 | .051 | .042 |
| | (.138) | (.138) | (.137) | (.162) | (.154) | (.153) |
| *AMERICA* | $-.592^{*}$ | $-.592^{*}$ | $-.563^{*}$ | $-.810^{*}$ | $-.800^{*}$ | $-.783^{*}$ |
| | (.167) | (.167) | (.171) | (.272) | (.262) | (.267) |
| *BIRTHYEAR* | $.00027^{*}$ | $.00027^{*}$ | $.00034^{*}$ | $-.00057$ | $-.00048$ | $-.00062$ |
| | (.0001) | (.0001) | (.00013) | (.00046) | (.00044) | (.0044) |
| *BIRTHMONO* | ... | $-.198$ | $-.128$ | ... | $-.331^{**}$ | $-.167$ |
| | | (.170) | (.154) | | (.176) | (.150) |
| *CHRISTBIRTH* | ... | ... | $-.297^{*}$ | ... | ... | $-.149^{**}$ |
| | | | (.023) | | | (.081) |
| *ISLAMBIRTH* | ... | ... | .092 | ... | ... | $.342^{*}$ |
| | | | (.154) | | | (.173) |
| *No. of obs.* | 277 | 277 | 277 | 277 | 277 | 277 |
| *Time at Risk* | 89513 | 89513 | 89513 | 89513 | 89513 | 89513 |
| $p$ | ... | ... | ... | 3.15 | 3.28 | 3.39 |
| $H_0 : \ln p = 0$ | ... | ... | ... | Reject | Reject | Reject |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (6) dependent variable: duration of civilization $i$ from its foundation to disintergation or termination (in years). Cols. (1) - (3): OLS estimates with heteroskedasticity error corrections. Cols. (4) - (6): robust regression estimates.

**Table 5:** Cross-Section Estimates, 2900 BCE - 1750 CE

| Dependent Variable: Duration | | | | | | |
|---|---|---|---|---|---|---|
| | OLS | | | Robust Regressions | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *MONOTHEIST* | 67.9* | 59.3* | 48.5* | 36.3* | 33.3** | 28.6 |
| | (33.1) | (25.2) | (21.7) | (19.3) | (19.9) | (20.7) |
| *MONOTIME* | −.015** | −.013* | −.010** | −.0088** | −.0079 | −.0065 |
| | (.0082) | (.0062) | (.005) | (.0052) | (.0052) | (.0053) |
| *MIDDLEAST* | −46.3* | −45.1* | −43.6* | −42.3* | −42.3* | −41.5* |
| | (4.57) | (4.86) | (5.31) | (5.25) | (5.25) | (5.32) |
| *AFRICA* | −39.6* | −38.3* | −37.0* | −36.7* | −36.7* | −36.0* |
| | (3.97) | (4.27) | (3.60) | (5.61) | (5.61) | (5.66) |
| *EUROPE* | −32.4* | −31.1* | −30.4* | −30.6* | −30.6* | −30.3* |
| | (3.35) | (3.40) | (3.35) | (4.91) | (4.91) | (4.97) |
| *ASIA* | −35.4* | −35.1* | −34.0* | −34.9* | −34.9* | −34.2* |
| | (1.13) | (1.03) | (1.19) | (4.57) | (4.57) | (4.62) |
| *AMERICA* | 93.1* | 95.7* | 57.5* | 82.9* | 82.9* | 84.9* |
| | (10.7) | (10.4) | (15.4) | (6.59) | (6.59) | (7.53) |
| *BIRTHYEAR* | −.009* | −.013* | −.015* | −.0056* | −.0087* | −.010* |
| | (.0034) | (.0026) | (.006) | (.0016) | (.0024) | (.0034) |
| *BIRTHMONO* | ... | 10.8* | 7.79 | ... | 7.99 | 5.74 |
| | | (5.29) | (5.90) | | (5.30) | (5.63) |
| *CHRISTBIRTH* | ... | ... | 11.2* | ... | ... | 8.08 |
| | | | (2.13) | | | (5.16) |
| *ISLAMBIRTH* | ... | ... | −4.83 | ... | ... | −3.01 |
| | | | (9.83) | | | (4.37) |
| *No. of obs.* | 277 | 277 | 277 | 277 | 277 | 277 |
| $R^2$ | .290 | .300 | .309 | ... | ... | ... |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (6) dependent variable: duration of civilization $i$ from its foundation to disintergation or termination (in years). Cols. (1) - (3): OLS estimates with errors clustered at the geograhic region level. Cols. (4) - (6): robust regression estimates.

**Table 6:** Cross-Section Estimates, 2900 BCE - 1750 CE

| Dependent Variable: Peak Land Mass | | | | | | |
|---|---|---|---|---|---|---|
| | OLS | | | Robust Regressions | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *MONOTHEIST* | 3.15 | 2.13 | 2.59 | .387 | .128 | .437 |
| | (2.80) | (2.54) | (2.54) | (.513) | (.520) | (.548) |
| *MONOTIME* | −.0010 | −.00071 | −.00082 | −.00007 | .000002 | −.00007 |
| | (.0008) | (.00092) | (.00074) | (.00013) | (.00013) | (.00014) |
| *MIDDLEAST* | 1.84* | 1.98* | 1.93* | .031 | .065 | .075 |
| | (.395) | (.408) | (.450) | (.137) | (.137) | (.141) |
| *AFRICA* | .841* | 1.01* | .959* | .378* | .410* | .393* |
| | (.345) | (.357) | (.393) | (.146) | (.146) | (.150) |
| *EUROPE* | .692* | .848* | .798* | −.053 | −.012 | −.020 |
| | (.301) | (.290) | (.325) | (.128) | (.128) | (.132) |
| *ASIA* | 2.39* | 2.42* | 2.38 | .345* | .367* | .359* |
| | (.119) | (.108) | (.143) | (.120) | (.119) | (.122) |
| *AMERICA* | −.910 | −.596 | −.812 | .469* | .557* | .435* |
| | (.630) | (.623) | (.506) | (.170) | (.172) | (.199) |
| *BIRTHYEAR* | .0004** | .00007 | .00009 | −.00008** | −.00019* | −.00011 |
| | (.0002) | (.00018) | (.00038) | (.00004) | (.00006) | (.00009) |
| *BIRTHMONO* | ... | 1.29** | 1.35** | ... | .299* | .436* |
| | | (.557) | (.673) | | (.138) | (.149) |
| *CHRISTBIRTH* | ... | ... | −.490 | ... | ... | −.370* |
| | | | (.659) | | | (.137) |
| *ISLAMBIRTH* | ... | ... | .019 | ... | ... | .050 |
| | | | (.312) | | | (.116) |
| *No. of obs.* | 277 | 277 | 277 | 277 | 277 | 277 |
| $R^2$ | .093 | .101 | .102 | ... | ... | ... |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (6) dependent variable: duration of civilization $i$ from its foundation to disintergation or termination (in years). Cols. (1) - (3): OLS estimates with errors clustered at the geograhic region level. Cols. (4) - (6): robust regression estimates.

**Table 7:** Multivariate Survival Analyses, 2900 BCE - 1750 CE

| | Hazard Rate Since Date of Foundation | | | | | |
|---|---|---|---|---|---|---|
| | Exponential Distribution | | | Weibull Distribution | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *MONOTHEIST* | $-1.81^{**}$ | $-1.57^{*}$ | $-1.17^{*}$ | $-2.83$ | $-2.46^{**}$ | $-2.17$ |
| | (1.04) | (.804) | (.532) | (1.87) | (1.49) | (1.38) |
| *MONOTIME* | $.0004^{**}$ | $.0004^{**}$ | $.0004^{**}$ | .0007 | $.0006^{**}$ | .0005 |
| | (.00025) | (.0002) | (.00025) | (.00045) | (.00035) | (.0003) |
| *MIDDLEAST* | $.369^{*}$ | $.360^{*}$ | $.351^{*}$ | $.381^{*}$ | $.374^{*}$ | $-.365^{*}$ |
| | (.068) | (.073) | (.073) | (.118) | (.120) | (.118) |
| *AFRICA* | $-6.44^{*}$ | $-6.54^{*}$ | $-6.69^{*}$ | $-20.4^{**}$ | $-21.6^{**}$ | $-22.3^{**}$ |
| | (.263) | (.196) | (7.20) | (10.6) | (11.7) | (11.9) |
| *EUROPE* | $-.133^{*}$ | $-.131^{*}$ | $-38.1^{*}$ | $-.183^{*}$ | $-.186^{*}$ | $-.199^{*}$ |
| | (.037) | (.037) | (6.95) | (.033) | (.037) | (.046) |
| *ASIA* | .030 | .040 | $-34.6^{*}$ | $-.013$ | $-.0001$ | .012 |
| | (.124) | (.124) | (5.99) | (.139) | (.135) | (.124) |
| *AMERICA* | $-.695^{*}$ | $-.676^{*}$ | $-.628^{*}$ | $-.876^{*}$ | $-.866^{*}$ | $-.820^{*}$ |
| | (.152) | (.149) | (.152) | (.219) | (.210) | (.208) |
| *BIRTHYEAR* | $.0002^{*}$ | $.0003^{*}$ | $.0004^{*}$ | $-.0004$ | $-.0003$ | $-.0004$ |
| | (.0001) | (.0001) | (.00015) | (.0004) | (.0004) | (.0037) |
| *BIRTHMONO* | ... | $-.305$ | $-.266$ | ... | $-.444^{**}$ | $-.284$ |
| | | (.224) | (.226) | | (.232) | (.220) |
| *CHRISTBIRTH* | ... | ... | $-.382^{*}$ | ... | ... | $-.245^{*}$ |
| | | | (.047) | | | (.086) |
| *ISLAMBIRTH* | ... | ... | .090 | ... | ... | .329 |
| | | | (.220) | | | (.234) |
| *No. of obs.* | 243 | 243 | 243 | 243 | 243 | 243 |
| *Time at Risk* | 81358 | 81358 | 81358 | 81358 | 81358 | 81358 |
| $p$ | ... | ... | ... | 2.86 | 3.00 | 3.12 |
| $H_0 : \ln p = 0$ | ... | ... | ... | Reject | Reject | Reject |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (6) dependent variable: duration of civilization $i$ from its foundation to disintergation or termination (in years). Cols. (1) - (3): OLS estimates with heteroskedasticity error corrections. Cols. (4) - (6): robust regression estimates.

**Table 8:** Cross-Section Regressions with Independent Religion Controls, 2900 BCE - 1750 CE

| | Dependent Variable: Duration | | | | | |
|---|---|---|---|---|---|---|
| | OLS Regressions | | | Robust Regressions | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *JEWISH* | 54.3 | 59.9 | 59.3 | 54.3 | 59.9 | 59.3 |
| | (39.9) | (39.8) | (39.6) | (39.9) | (39.8) | (39.6) |
| *CHRISTIAN* | 144.7* | 139.1* | 178.7* | 144.7* | 139.1* | 178.7* |
| | (29.0) | (29.7) | (30.9) | (29.0) | (29.7) | (30.9) |
| *MUSLIM* | −49.9 | −63.6 | −72.6** | −49.9 | −63.6 | −72.6** |
| | (40.2) | (40.7) | (41.7) | (40.2) | (40.7) | (41.7) |
| *BIRTHYEAR* | −.0047* | −.0081* | −.0099* | −.0047* | −.0081* | −.0099* |
| | (.0015) | (.0024) | (.0034) | (.0015) | (.0024) | (.0034) |
| *JEWISHTIME* | −.013 | −.015 | −.015 | −.013 | −.015 | −.015 |
| | (.014) | (.014) | (.014) | (.014) | (.014) | (.014) |
| *CHRISTIME* | −.034* | −.032* | −.041** | −.034* | −.032* | −.041** |
| | (.0075) | (.0076) | (.0080) | (.0075) | (.0076) | (.0080) |
| *MUSLIMTIME* | .011 | .014 | .017** | .011 | .014 | .017** |
| | (.010) | (.010) | (.010) | (.010) | (.010) | (.010) |
| *MIDDLEAST* | −40.1* | −36.4* | −35.3* | −40.1* | −36.4* | −35.3* |
| | (5.22) | (5.20) | (5.19) | (5.22) | (5.20) | (5.19) |
| *AFRICA* | −36.2* | −32.1* | −31.2* | −36.2* | −32.1* | −31.2* |
| | (5.43) | (5.44) | (5.43) | (5.43) | (5.44) | (5.43) |
| *EUROPE* | −33.7* | −29.2* | −28.6* | −33.7* | −29.2* | −28.6* |
| | (4.85) | (4.88) | (4.89) | (4.85) | (4.88) | (4.89) |
| *ASIA* | −37.4* | −33.9* | −33.0* | −37.4* | −33.9* | −33.0* |
| | (4.47) | (4.44) | (4.44) | (4.47) | (4.44) | (4.44) |
| *AMERICA* | 77.9* | 77.3* | 79.7* | 77.9* | 77.3* | 79.7* |
| | (6.30) | (6.40) | (7.32) | (6.30) | (6.40) | (7.32) |
| *MONOBIRTH* | ... | 9.77** | 6.92 | ... | 9.77** | 6.92 |
| | | (5.31) | (5.55) | | (5.31) | (5.55) |
| *CHRISTBIRTH* | ... | ... | 11.1* | ... | ... | 11.1* |
| | | | (5.05) | | | (5.05) |
| *ISLAMBIRTH* | ... | ... | −4.89 | ... | ... | −4.89 |
| | | | (4.35) | | | (4.35) |
| *No. of obs.* | 277 | 277 | 277 | 277 | 277 | 277 |
| $R^2$ | .346 | .352 | .360 | ... | ... | ... |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (3) dependent variable: land mass of civilization $i$ at its peak (in square kms.). Cols (4) - (6): duration of civilization $i$ from its foundation to disintergation or termination (in years).

**Table 9:** Some More Cross-Section Regression Estimates, 2900 BCE - 1750 CE

Dependent Variable: (1) - (3) Duration; (4) - (6) Peak Land Mass

| | Robust Regressions | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *RELIGION* | −3.62* | .920 | −1.49 | .0046** | .157** | .182* |
| | (.954) | (2.81) | (3.03) | (.027) | (.075) | (.083) |
| *RELITIME* | ... | −.0016 | .00065 | ... | −.00009 | −.00011 |
| | | (.0024) | (.0026) | | (.00006) | (.00007) |
| *MIDDLEAST* | −36.5* | −41.6* | −37.9* | .143 | .031 | .071 |
| | (4.95) | (5.24) | (5.30) | (.138) | (.141) | (.145) |
| *AFRICA* | −33.3* | −37.5* | −33.2* | .444* | .367* | .371** |
| | (5.33) | (5.48) | (5.55) | (.148) | (.147) | (.152) |
| *EUROPE* | −30.0* | −32.2* | −28.1* | −.0049 | −.052 | −.026 |
| | (4.66) | (4.69) | (4.77) | (.130) | (.126) | (.130) |
| *ASIA* | −36.3* | −36.5* | −32.9* | .358* | .348* | .358* |
| | (4.51) | (4.49) | (4.52) | (.129) | (.120) | (.124) |
| *AMERICA* | 63.1* | 78.9* | 83.5* | .231* | .458* | .406* |
| | (4.00) | (6.35) | (7.45) | (.112) | (.133) | (.204) |
| *BIRTHYEAR* | ... | −.0050* | −.0111* | ... | −.00008** | −.00008 |
| | | (.0016) | (.0035) | | (.00004) | (.00009) |
| *MONOBIRTH* | ... | ... | 7.11 | ... | ... | .411* |
| | | | (5.58) | | | (.153) |
| *CHRISTBIRTH* | ... | ... | 10.0* | ... | ... | −.408* |
| | | | (5.08) | | | (.139) |
| *ISLAMBIRTH* | ... | ... | −1.10 | ... | ... | .059 |
| | | | (4.24) | | | (.116) |
| *No. of obs.* | 277 | 277 | 277 | 277 | 277 | 277 |

Note: * and ** respectively denote significance at the 5 percent and 10 percent levels. Cols. (1) - (3) dependent variable: land mass of civilization $i$ at its peak (in square kms.). Cols (4) - (6): duration of civilization $i$ from its foundation to disintergation or termination (in years).

**Figure 1:**

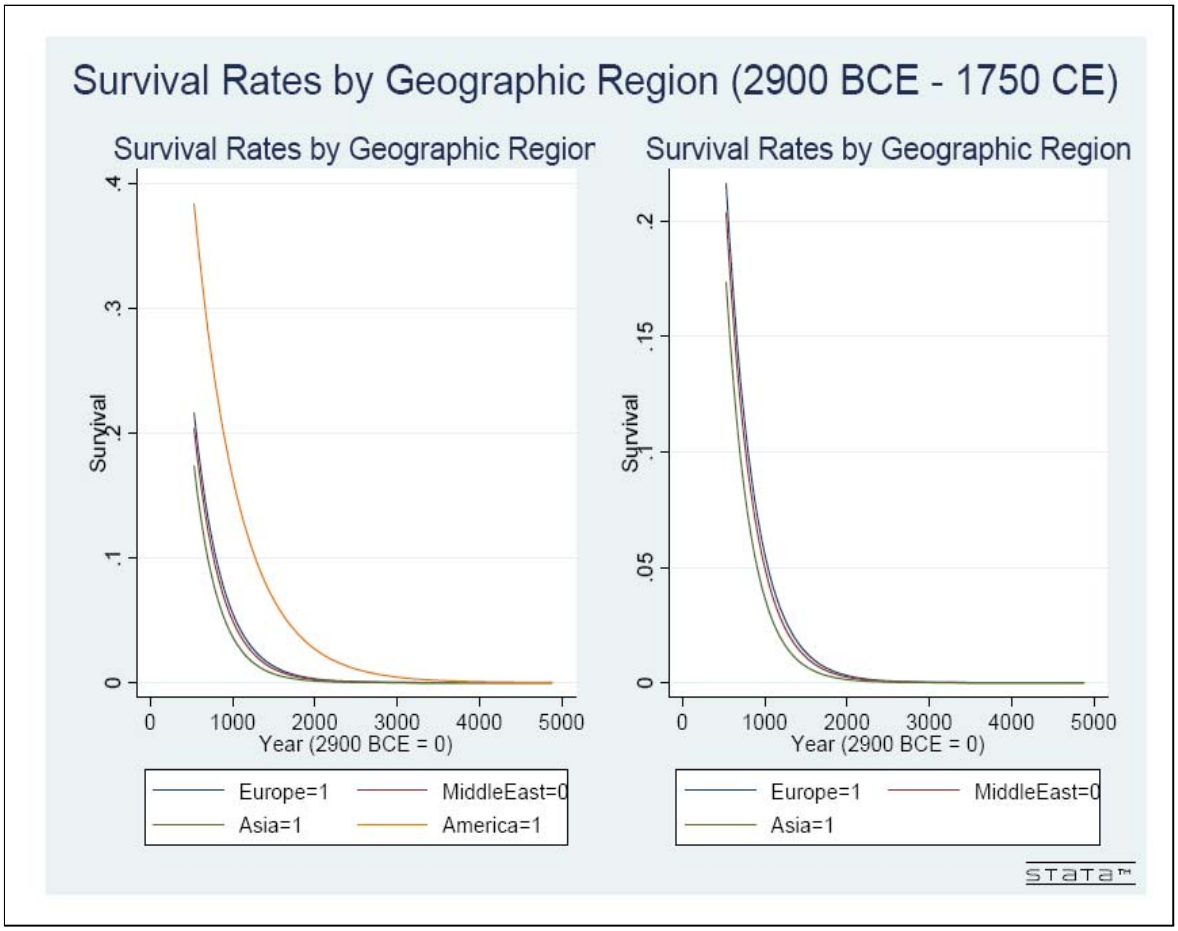
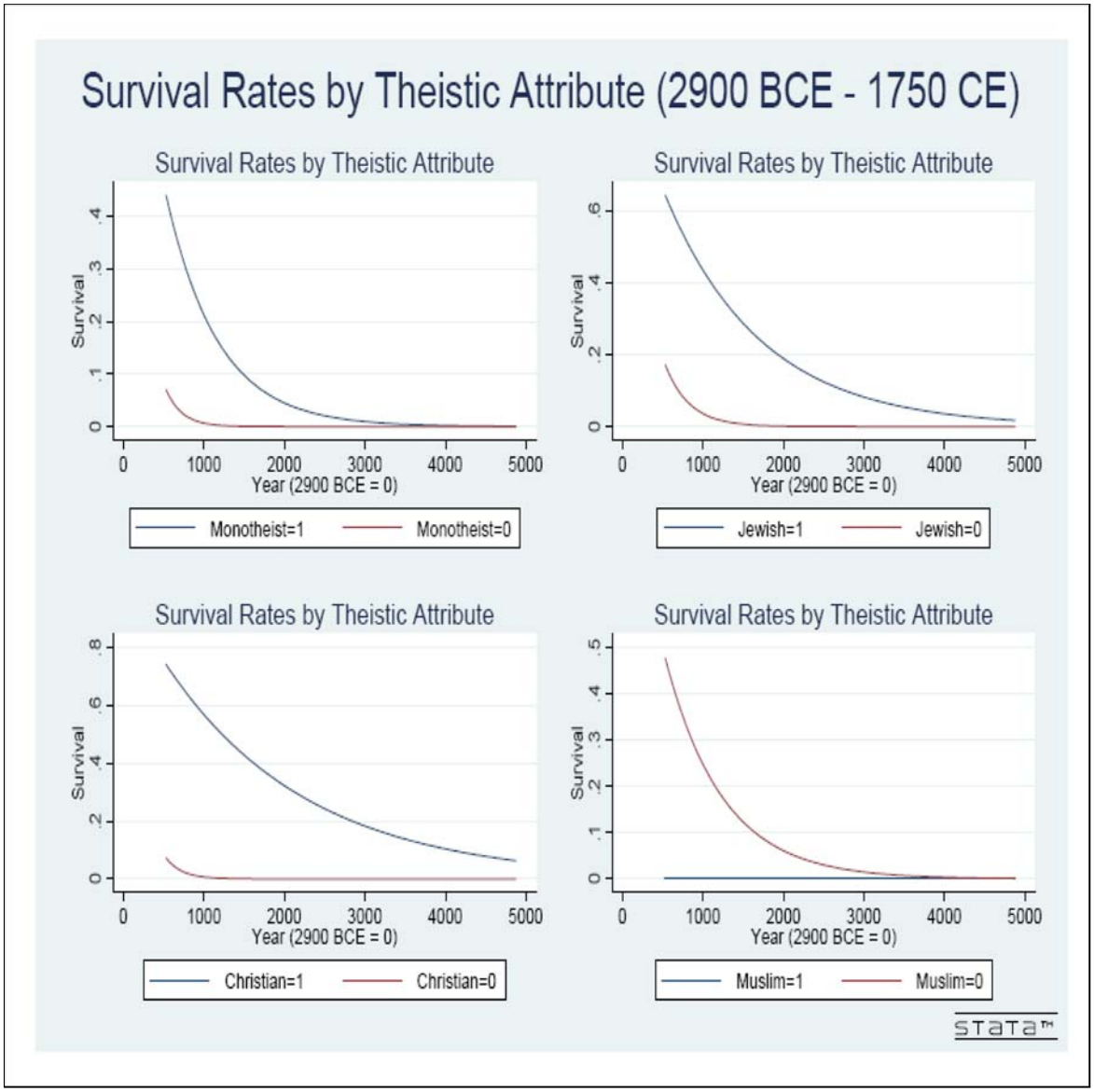

Survival Rates by Geographic Region (2900 BCE - 1750 CE)
Survival Rates by Geographic Regior
Survival Rates by Geographic Region
Survival
0
.1
.2
.3
.4
0
1000
2000
3000
4000
5000
Year (2900 BCE = 0)
Europe=1
MiddleEast=0
Asia=1
America=1
Survival
0
.05
.1
.15
.2
0
1000
2000
3000
4000
5000
Year (2900 BCE = 0)
Europe=1
MiddleEast=0
Asia=1
stata

**Figure 2:**


Survival Rates by Theistic Attribute (2900 BCE - 1750 CE)
Survival Rates by Theistic Attribute
Survival
Year (2900 BCE = 0)
Monotheist=1
Monotheist=0
Survival Rates by Theistic Attribute
Survival
Year (2900 BCE = 0)
Jewish=1
Jewish=0
Survival Rates by Theistic Attribute
Survival
Year (2900 BCE = 0)
Christian=1
Christian=0
Survival Rates by Theistic Attribute
Survival
Year (2900 BCE = 0)
Muslim=1
Muslim=0
Stata

**Appendix A:** Dynasties, Kingdoms & Empires — 2900 BCE to 1750 CE
(j : Jewish; c: Christian; m: Muslim)
(Peak Land Mass, PLM, in millions of km$^2$)

| **MIDDLE EAST:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 1 | Early Dynasty | 2900 B.C.E. | 2371 B.C.E. | 1 | Mesopotamia |
| 2 | Ebla | 2400 B.C.E. | 2250 B.C.E. | 0.09 | Syria |
| 3 | Akkadian Empire | 2371 B.C.E. | 2230 B.C.E. | .65 | Mesopotamia |
| 4 | Gutains | 2230 B.C.E. | 2112 B.C.E. | .43 | ” |
| 5 | Kingdom of Elam | 2200 B.C.E. | 644 B.C.E. | .50 | Iran |
| 6 | Ur Dynasty | 2112 B.C.E. | 2004 B.C.E. | .43 | Mesopotamia |
| 7 | Isin, Larsa & Mari | 2002 B.C.E. | 1792 B.C.E. | .43 | ” |
| 8 | Old Babylonian | 1792 B.C.E. | 1595 B.C.E. | .50 | ” |
| 9 | Mittani-Kassite | 1595 B.C.E. | 1200 B.C.E. | .43 | Mesopotamia |
| 10 | Kassites | 1570 B.C.E. | 1154 B.C.E. | .50 | Babylonia |
| 11 | Hittites | 1450 B.C.E. | 1200 B.C.E. | .75 | Anatolia |
| 12 | Aramean Kingdom | 1350 B.C.E. | 850 B.C.E. | .185 | Syria |
| 13 | Assyrians | 1305 B.C.E. | 609 B.C.E. | 1.4 | Mesopotamia |
| 14 | Israel[j] | 1200 B.C.E. | 584 B.C.E. | .026 | Isael/Palestine |
| 15 | Luvians | 1200 B.C.E. | 680 B.C.E. | .75 | Anatolia |
| 16 | Phrygians | 1000 B.C.E. | 690 B.C.E. | .20 | ” |
| 17 | Urartu | 880 B.C.E. | 590 B.C.E. | .15 | Armenia |
| 18 | Lydia | 680 B.C.E. | 547 B.C.E. | .08 | Anatolia |
| 19 | Babylonia | 626 B.C.E. | 539 B.C.E. | .50 | Mesopotamia |
| 20 | Empire of the Medes | 625 B.C.E. | 549 B.C.E. | 1.5 | Eastern Turkey Western Iran |
| 21 | Media | 728 B.C.E. | 559 B.C.E. | 1.64 | Iran |
| 22 | Achaemenid Empire | 559 B.C.E. | 330 B.C.E. | 4 | Iran, Anatolia, Mesopotamia, Egypt, Armenia, Isreal/Palestine Syria. |
| 23 | Empire of Antigonus | 323 B.C.E. | 301 B.C.E. | .50 | Israel/Palestine Syria Anatolia |
| 24 | K. of Atropatene | 323 B.C.E. | 20 B.C.E. | .25 | Armenia |

**Appendix A (continued):**

| MIDDLE EAST (continued) | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 25 | Kingdom of Lysimachus | 308 B.C.E. | 281 B.C.E. | .30 | Thrace<br>Asia Minor<br>Macedonia |
| 26 | Seleucid Empire | 305 B.C.E. | 64 B.C.E. | 3.9 | Mesopotamia,<br>Iran. |
| 27 | Parthian Empire | 250 B.C.E. | 226 CE | 2.5 | Mesopotamia,<br>Iran. |
| 28 | Sasanian Empire | 208 CE | 651 CE | 7.9 | Mesopotamia,<br>Iran. |
| 29 | Rashidun[m] | 632 CE | 661 CE | 9 | Arab pen.,<br>Mesopotamia,<br>N. Africa |
| 30 | Umayyads[m] | 661 CE | 750 CE | 13.2 | Arab pen.,<br>Mesopotamia,<br>N. Africa<br>Iberian Pen. |
| 31 | Abbasids[m] | 750 CE | 861 C.E. | 11 | Arab pen.,<br>Mesopotamia,<br>N. Africa<br>Iberian Pen. |
| 32 | Qarmatians[m] | 819 CE | 1005 CE | 1.7 | Arabian pen.,<br>Mesopotamia. |
| 33 | Tulunids[m] | 868 CE | 905 CE | 3 | Arabian pen.,<br>Mesopotamia,<br>Egypt,<br>N. Africa. |
| 34 | Hamdanids[m] | 905 CE | 1004 CE | .20 | Mesopotamia,<br>Syria,<br>Iraq. |
| 35 | Fatimids[m] | 909 CE | 1171 CE | 5 | Arabian pen.,<br>Mesopotamia,<br>Egypt,<br>N. Africa. |
| 36 | Buyids[m] | 945 CE | 1055 CE | 1.5 | Iran,<br>C. Asia<br>Anatolia. |

**Appendix A (continued):**

| MIDDLE EAST (continued) | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 37 | Ghaznavids[m] | 977 CE | 1186 CE | 2.2 | Iran, C. Asia. |
| 38 | Seljuk Empire[m] | 1037 CE | 1194 CE | 3.9 | Anatolia, Mesopotamia, Turkestan. |
| 39 | K. of Jerusalem[c] | 1099 CE | 1291 CE | .026 | Israel/Palestine |
| 40 | Anatolian Drbylks.[m] (Çaka Bey, Sökmenli, Artuklu, Danişmend, Inaloğlu, Saruhan Menteşe, Tekke, Saruhan, Saltuklu, Mengücek, Ramazanoğlu, Ertena, Aydin, etc.) | 1071 CE | 1507 CE | .01 - .05 | Anatolia |
| 41 | Ayyubids[m] | 1172 CE | 1250 CE | 3 | Arabian pen., Mesopotamia, Egypt, N. Africa. |
| 42 | Mamluks[m] | 1250 CE | 1517 CE | 1.5 | Arabian pen., Mesopotamia, Egypt, N. Africa. |
| 43 | Ilkhanate Khanate[m] | 1260 CE | 1324 CE | 2.2 | Iran |
| 44 | Ottoman Empire[m] | 1299 CE | 1923 CE | 5.5 | Anatolia, Mesopotamia, Balkans, E. Europe, N. Africa Arabian Pen. |

**Appendix A (continued):**

| MIDDLE EAST (continued) | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 45 | Ak Koyunlu[m] | 1378 CE | 1508 CE | .60 | Anatolia<br>Iran. |
| 46 | Kara Koyunlu[m] | 1390 CE | 1468 CE | .50 | Anatolia<br>Mesopotamia,<br>Iran,<br>Iraq. |
| 47 | Safavid Empire[m] | 1492 CE | 1736 CE | 2.9 | Iran<br>Arabian pen.,<br>Mesopotamia,<br>Egypt,<br>N. Africa. |

**Appendix A (continued):**

| **EUROPE:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 1 | Minoan Civilization | 2000 BCE | 1450 BCE | .07 | Balkan pen. |
| 2 | Unetice Culture | 2000 BCE | 1400 BCE | .35 | Cen. Europe |
| 3 | Wessex Culture | 2000 BCE | 1400 BCE | .30 | British isl. |
| 4 | Etruscans | 1200 BCE | 100 BCE | .07 | Italian pen. |
| 5 | Greek city-states (Arcadia, Phocis, Messania, Argolis, Attica, Laconia, Locris, Epirus, Thessaly, Achaea, Aetolia, etc.) | 750 BCE | 400 BCE | .01 | Balkan pen. |
| 6 | Carthaginian Empire | 714 BCE | 146 BCE | 1 | Iberian pen. |
| 7 | Athenian Empire | 479 BCE | 404 CE | .12 | Balkans |
| 8 | Macedonian Empire | 360 BCE | 320 BCE | 5.4 | Balkans, Anatolia, C. Asia, Iran, NW. India. |
| 9 | Dacia Kingdom | 350 BCE | 40 BCE | .70 | E. Europe |
| 10 | Kingdom of Cassander | | | | |
| 11 | Roman Empire | 200 B.C.E. | 330 CE | 5.7 | Italian pen., Mesopotamia, Anatolia, N. Africa |
| 12 | Sarmatians | 200 BCE | 200 CE | 1 | Balkans, S. Russia. |
| 13 | Byzantine Empire[c] | 330 CE | 1453 CE | 4.5 | Anatolia, Balkans, E. Europe, Mesopotamia, N. Africa. |

**Appendix A (continued):**

| **EUROPE:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 14 | Visigoths[c] | 382 CE | 711 CE | .50 | N. C. Europe |
| 15 | Merovingian Kingdom[c] | 476 CE | 750 CE | .45 | W. Europe |
| 16 | K. of Italy (Odoacer)[c] | 476 CE | 493 CE | .30 | S. C. Europe |
| 17 | K. of Italy (Ostrogothic)[c] | 493 CE | 100 CE | .45 | Italian pen. |
| 18 | Thuringian Kingdom | 500 CE | 730 CE | .02 | C. Europe |
| 19 | Eng. Heptarchy Kgms.[c] (EastAnglia, Essex, Kent, Mercia, Northumbria, Sussex, Wessex) | 500 CE | 850 CE | .04 to .06 | British isl. |
| 20 | Avars | 562 C.E. | 805 C.E. | .10 | Balkans |
| 21 | K. of Italy (Lombard)[c] | 568 CE | 774 CE | .30 | Italian pen. |
| 22 | Bulgars (1st Empire) | 679 C.E. | 1018 C.E. | .11 | Balkans |
| 23 | Kingdom of Denmark[c] | 737 CE | 1397 CE | .04 | N. C. Europe |
| 24 | Carolignian Empire[c] | 750 CE | 887 CE | 1.2 | W. Europe C. Europe |
| 25 | Caliphate of Cordoba[m] | 755 CE | 1009 CE | .46 | Iberian pen. |
| 26 | K. of Pamplona (Navarre)[c] | 824 CE | 1513 CE | .70 | Iberian pen. |
| 27 | Kingdom of Alba[c] | 843 CE | 1286 CE | .06 | N. W. Europe |
| 28 | Kingdom of Scotland[c] | 843 C.E. | 1707 C.E. | .08 | N. W. Europe |
| 29 | Magyars | 850 C.E. | 955 C.E. | .10 | Balkans |
| 30 | Kingdom of Castille[c] | 850 CE | 1479 CE | .15 | Iberian pen. |
| 31 | Moravians | 850 CE | 900 CE | .05 | E. Europe |
| 32 | Kingdom of Norway[c] | 872 CE | 1397 CE | .39 | N. Europe |
| 33 | Pechenegs | 900 CE | 1070 CE | 1.5 | Balkans S. Russia |
| 34 | Kingdom of Leon[c] | 910 CE | 1230 CE | .10 | Iberian pen. |
| 35 | Kingdom of England[c] | 927 CE | 1649 CE | .17 | N. W. Europe |
| 36 | Kingdom of Arles[c] | 933 CE | 1032 CE | .13 | S. W. Europe |
| 37 | Holy Roman Empire[c] | 962 CE | 1806 CE | 1.8 | C. Europe |
| 38 | Capetian Dynasty[c] | 987 CE | 1328 CE | .55 | S. W. Europe |
| 39 | Valencia[m] | 1010 CE | 1238 CE | .02 | Iberian pen. |

**Appendix A (continued):**

| **EUROPE:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 40 | K. of Poland (Piast)[c] | 1025 CE | 1385 CE | .30 | C. Europe |
| 41 | Kingdom of Naples[c] | 1130 CE | 1860 CE | .10 | Italian pen. |
| 42 | Kingdom of Aragon[c] | 1035 CE | 1707 CE | .10 | W. Europe |
| 43 | Cumans | 1060 CE | 1237 CE | 1 | Transylvania |
| 44 | Kingdom of Sicily[c] | 1130 CE | 1282 CE | .07 | Mediterranean |
| 45 | Kingdom of Portugal[c] | 1139 CE | 1910 CE | .09 | W. Europe |
| 46 | Angevin Dynasty[c] | 1154 CE | 1399 CE | .82 | W. Europe |
| 47 | Bulgarian Empire ($2^{nd}$)[c] | 1185 CE | 1396 CE | .11 | Balkans |
| 48 | K. of Granada (Nasrid)[m] | 1238 CE | 1492 CE | .07 | Iberian pen. |
| 49 | K. of Lithuania | 1251 CE | 1263 CE | .07 | N. E. Europe |
| 50 | Kingdom of Cyprus[c] | 1291 CE | 1480 CE | .09 | Mediterranean |
| 51 | K. of Poland (Jagiellon)[c] | 1385 CE | 1569 CE | .30 | C. Europe |
| 52 | Kalmar Union[c] | 1397 CE | 1524 CE | .76 | Scandinavia |
| 53 | Khanate of Crimea[c] | 1443 CE | 1783 CE | .03 | N. E. Europe |
| 54 | Muscovy (Russian Emp.)[c] | 1462 CE | 1795 CE | 16.5 | N . E. Europe |
| 55 | Cmw. of Poland-Lithuania[c] | 1569 CE | 1791 CE | .37 | N. E. Europe |
| 56 | Duchy of Savoy[c] | 1559 CE | 1601 CE | .05 | W. Europe |
| 57 | Dutch Kgdm (Untd. Prov.)[c] | 1581 CE | 1795 CE | .03 | N. W. Europe |
| 58 | Empire of Sweden[c] | 1611 CE | 1718 CE | .60 | Scandinavia |
| 59 | Kingdom of Prussia[c] | 1708 CE | 1918 CE | .35 | N. E. Europe |

**Appendix A (continued):**

| **ASIA:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 1 | Xia Dynasty | 1994 BCE | 1523 BCE | 6.5 | N. China S. China |
| 2 | Brihadratha (Magadha E..) | 1700 BCE | 799 BCE | .50 | India |
| 3 | Shang Dynasty | 1523 BCE | 1027 BCE | 6.5 | N. China |
| 4 | Kingdom of Colchis | 1250 BCE | 725 BCE | .06 | C. Asia |
| 5 | Pradyota (Magadha E.) | 799 BCE | 684 BCE | .50 | India |
| 6 | Shishunaga (Magadha E.) | 684 BCE | 424 BCE | .50 | India |
| 7 | Scythians | 500 B.C.E. | 150 CE | 5 | C. Asia S. Russia. |
| 8 | Zhou Dynasty | 403 B.C.E. | 221 B.C.E. | 5.5 | N. China |
| 9 | Nanda Dyn. (Magadha E.) | 343 BCE | 321 BCE | 1.5 | India |
| 10 | Mauryan Empire | 320 B.C.E. | 183 B.C.E. | 5 | India |
| 11 | Qin Dynasty | 247 BCE | 209 BCE | 12 | N. China S. China |
| 12 | Xiongnu | 210 BCE | 155 CE | 4 | Mongolia |
| 13 | Han Empire | 202 B.C.E. | 220 CE | 6 | N. China, S. China. |
| 14 | Shungas | 183 BCE | 73 BCE | 1.5 | India |
| 15 | Toucherans | 162 B. C. E . | 230 CE | 2 | C. Asia |
| 16 | Koguryo | 150 BCE | 668 CE | .20 | Korean pen. |
| 17 | Satavahanas Empire | 100 B.C.E. | 225 CE | 1 | India |
| 18 | Shakas | 90 BCE | 20 CE | 1.5 | India |
| 19 | Kanva (Magadha E.) | 71 BCE | 26 BCE | .50 | India |
| 20 | Kushan Empire | 50 B.C.E. | 240 CE | 6 | C. Asia, NW. India. |
| 21 | Paekche | 18 BCE | 668 CE | .06 | Korean pen. |
| 22 | Funan | 1 CE | 630 CE | .20 | Cambodia |
| 23 | Kaya | 42 CE | 562 | .03 | Korean pen. |
| 24 | Xian-bi | 155 CE | 400 CE | 4 | Mongolia |
| 25 | Three Kingdoms | 220 CE | 265 CE | 6.5 | China |
| 26 | Ganga Dynasty | 250 CE | 1004 CE | .15 | India |
| 27 | Jin (eastern) | 265 CE | 420 CE | 5 | S. China |
| 28 | Vakatakas | 300 CE | 500 CE | 1.5 | India |
| 29 | Sixteen Kingdoms | 302 CE | 589 CE | 6.5 | China |
| 30 | Gupta Empire | 320 CE | 535 CE | 3.5 | India |

**Appendix A (continued):**

| **ASIA:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 31 | Pallavas | 330 CE | 890 CE | 1 | S. India |
| 32 | Hun Empire | 370 CE | 560 CE | 4 | C. Asia, Mongolia, Balkans, E. Europe, S. Russia. |
| 33 | Ruan Ruan | 440 CE | 550 CE | 6.5 | Mongolia |
| 34 | Champa | 550 CE | 1145 CE | .10 | Korean pen. |
| 35 | Dvaravati | 580 CE | 1080 CE | .10 | S. E. Asia |
| 36 | Karluks/Oghuz | 552 CE | 1070 CE | 1 | C. Asia |
| 37 | Siu Dynasty | 589 CE | 628 CE | 6.5 | N. China S. China |
| 38 | Srivijaya Empire | 600 CE | 1200 CE | .47 | Indonesia |
| 39 | T'ang Dynasty | 618 CE | 907 CE | 6.5 | N. China S. China |
| 40 | Chenla | 630 CE | 802 CE | .20 | Cambodia |
| 41 | Khazaria[j] | 650 CE | 965 CE | .85 | Asia Caucasus |
| 42 | Silla | 668 CE | 935 CE | .12 | Korean pen. |
| 43 | Nanzhao | 729 CE | 902 CE | .39 | S. China |
| 44 | Uighars | 745 CE | 840 CE | 1.5 | Mongolia |
| 45 | Kingdom of Abkhazia[c] | 780 CE | 1008 CE | .05 | N. W. Asia |
| 46 | Heian Civilization | 794 CE | 1185 CE | .37 | Japan |
| 47 | Khmer Empire | 802 CE | 1432 CE | .20 | Cambodia |
| 48 | Tahirids[m] | 821 CE | 873 CE | 1.2 | N. E. Iran |
| 49 | Bagan Dynasty | 849 CE | 1287 CE | .66 | Burma |
| 50 | Kievan Rus[c] | 860 CE | 1150 CE | .08 | N. W. Asia |
| 51 | Safavids[m] | 873 CE | 900 CE | 2 | Eastern Iran |
| 52 | Sinkiang | 900 CE | 1050 CE | 1 | N. W. China |
| 53 | Qarakhanids[m] | 900 CE | 1090 CE | 1.5 | C. Asia |
| 54 | Khitan | 907 CE | 1124 CE | 1.5 | Mongolia |
| 55 | Liao | 916 CE | 1125 CE | 2 | N. China |
| 56 | Samanids[m] | 932 CE | 1062 CE | 2 | C. Asia Iran. |
| 57 | Koryo | 935 CE | 1392 CE | .15 | Korean pen. |

**Appendix A (continued):**

| **ASIA:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 58 | Song Dynasty | 960 CE | 1279 CE | 6.5 | N. China S. China |
| 59 | Airlangga | 991 CE | 1049 CE | .04 | Java |
| 60 | Hoysala Empire[m] | 1006 CE | 1346 CE | .30 | India |
| 61 | Kingdom of Georgia[c] | 1008 CE | 1466 CE | .07 | C. Asia |
| 62 | Naimans & Keraits[c] | 1009 CE | 1300 CE | .40 | C. Asia |
| 63 | Kalinga Dynasty | 1028 CE | 1434 CE | .25 | India |
| 64 | Kediri | 1049 CE | 1290 CE | .02 | Java |
| 65 | Singharasi | 1049 CE | 1290 CE | .02 | Java |
| 66 | Jin (late) | 1115 CE | 1234 CE | 8 | N. China |
| 67 | Ghurids[m] | 1173 CE | 1215 CE | 3 | C. Asia |
| 68 | Kamakura Period | 1185 CE | 1335 CE | .37 | Japan |
| 69 | G. Horde/Mongols | 1206 CE | 1502 CE | 33.2 | C. Asia, Turkestan, Mongolia Balkans, E. Europe, S. Russia. |
| 70 | Sultanate of Delhi[m] | 1211 CE | 1398 CE | 1.5 | India |
| 71 | Chaghatai Khanate | 1260 CE | 1324 CE | 2.2 | C. Asia |
| 72 | Yuan Dynasty | 1279 CE | 1368 CE | 6.5 | N. China S. China |
| 73 | Majapahit Empire | 1293 CE | 1500 CE | .13 | Java Isl. |
| 74 | Ashikaga (Muachi) Period | 1335 CE | 1573 CE | .37 | Japan |
| 75 | Vijayanagar Kingdom | 1336 CE | 1646 CE | .60 | S. India |
| 76 | Bahmani Sultanate[m] | 1347 CE | 1518 CE | .70 | India |
| 77 | Ming Dynasty | 1368 CE | 1644 CE | 6.5 | N. China S. China |
| 78 | Sharqi Dyn. (Jaunpur)[m] | 1394 CE | 1479 CE | .004 | India |
| 79 | Timurids[m] | 1401 CE | 1505 CE | 4 | C. Asia |
| 80 | Sultanate of Melaka[m] | 1403 CE | 1511 CE | .002 | S. E. Asia |
| 81 | Toungoo Dynasty | 1486 CE | 1752 CE | .66 | Burma |
| 82 | Mughal Empire[m] | 1526 CE | 1765 CE | 1.5 | India |
| 83 | Sur Dynasty[m] | 1540 CE | 1556 CE | .60 | India |

**Appendix A (continued):**

| **ASIA:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 84 | Azuchi-Momoyama Period | 1573 CE | 1613 CE | .37 | Japan |
| 85 | Sultanate of Mataram[m] | 1590 CE | 1749 CE | .127 | Java Island |
| 86 | Tokugawa Period | 1613 CE | 1867 CE | .37 | Japan |
| 87 | Qing | 1644 CE | 1911 CE | 12 | N. China<br>S. China |

**Appendix A (continued):**

| **AMERICA:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 1 | Olmecs | 1500 BCE | 400 BCE | .12 | G. of Mexico |
| 2 | Chavin | 1200 BCE | 200 BCE | .06 | Andes |
| 3 | Adena | 1000 BCE | 100 CE | .08 | Mississippi $\triangle$ |
| 4 | Nazca | 400 BCE | 450 CE | .07 | Andes |
| 5 | Kaminaljuyu & Izapa | 300 BCE | 300 CE | .07 | Guatemala |
| 6 | Hopewell | 200 BCE | 400 CE | .12 | Mississippi $\Delta$ |
| 7 | Mochica | 1 CE | 650 CE | .06 | Andes |
| 8 | Teotihuacan | 1 CE | 650 CE | .20 | Mexico Guatemala |
| 9 | Mogollon | 150 CE | 1350 CE | .60 | S. W. America |
| 10 | Classic Maya | 200 CE | 850 CE | .50 | Yucatan |
| 11 | Monte Alban | 200 CE | 700 CE | .08 | Mexico |
| 12 | Mesa Verde | 500 CE | 1300 CE | .08 | SW. America |
| 13 | Huari & Tiahuan. | 500 CE | 900 CE | .10 | Andes |
| 14 | Anasazi | 500 CE | 1450 CE | .50 | S. W. America |
| 15 | Mississippi Culture | 800 CE | 1500 CE | .12 | Mississippi $\Delta$ |
| 16 | Chimu | 900 CE | 1476 CE | .06 | Andes |
| 17 | Chaco Canyon | 900 CE | 1150 CE | .08 | SW. America |
| 18 | Hohokam | 900 CE | 1400 CE | .08 | Mississippi $\Delta$ |
| 19 | Toltecs | 900 CE | 1156 CE | .50 | Mexico |
| 20 | Mayapan | 987 CE | 1446 CE | .30 | Yucatan |
| 21 | Inca | 1463 CE | 1533 CE | .09 | Andes |
| 22 | Aztecs | 1325 CE | 1519 CE | .90 | Mexico |

**Appendix A (continued):**

| **AFRICA:** | | | | | |
|---|---|---|---|---|---|
| | **Name** | **Birth Year** | **Death Year** | **PLM** | **Region** |
| 1 | Old Kingdom | 2686 BCE | 656 BCE | 1 | Egypt |
| 2 | 1st Interm. Period; Kgdm 1 | 2134 B.C.E. | 2040 B.C.E. | .50 | ” |
| 3 | 1st Interm. Period; Kgdm 2 | 2134 B.C.E. | 2040 B.C.E. | .50 | ” |
| 4 | Middle Kingdom | 2040 B.C.E. | 1786 B.C.E. | 1 | Egypt |
| 5 | Kingdom of Kerma | 1700 B.C.E. | 1550 B.C.E. | .15 | ” |
| 6 | New Kingdom | 1552 B.C.E. | 1069 B.C.E. | 1 | Egypt |
| 7 | Late Period | 1069 BCE | 730 BCE | 1 | Egypt |
| 8 | Kushites | 730 B.C.E. | 656 B.C.E. | 1 | Egypt |
| 9 | Saite | 668 B.C.E. | 525 B.C.E. | 1 | ” |
| 10 | Ptolemaic Empire | 323 B.C.E. | 20 B.C.E. | 1 | Egypt, Isreal/Palestine |
| 11 | Meroe | 295 BCE | 320 CE | .59 | N. Africa |
| 12 | Axum Empire[c] | 270 CE | 960 CE | 1.11 | Ethiopia |
| 13 | Nubian Kingdoms[c] | 320 CE | 1504 CE | 1.1 | NE. Africa |
| 14 | Soninke Dynasty | 770 CE | 1240 CE | .25 | Ghana |
| 15 | Rustamids[m] | 776 CE | 909 CE | .80 | N. W. Africa |
| 16 | Idrisids[m] | 789 CE | 906 CE | .45 | ” |
| 17 | Aghlabids[m] | 800 CE | 909 CE | .16 | ” |
| 18 | Takrur | 800 CE | 1285 CE | .07 | W. Africa |
| 19 | Ethiopian Empire[c] | 961 CE | 1450 CE | .20 | SusSah. Africa |
| 20 | Almoravids[m] | 1056 CE | 1147 CE | 1 | N. Africa |
| 21 | Abyssinia[c] | 1117 CE | 1974 CE | 1.1 | Ethiopia |
| 22 | Almohadids[m] | 1130 C.E. | 1269 C.E. | 1 | N. Africa |
| 23 | Hafsids[m] | 1229 CE | 1574 CE | .16 | N. W. Africa |
| 24 | Mali[m] | 1235 CE | 1400 CE | 1.1 | West Africa |
| 25 | Zayyanids (Abd al-Wadid)[m] | 1236 CE | 1550 CE | 2 | N. W. Africa |
| 26 | Marinids (Banu Marin)[m] | 1248 CE | 1548 CE | .60 | N. W. Africa |
| 27 | Djolof Empire[m] | 1350 CE | 1556 CE | .19 | SubSah. Africa |
| 28 | Oyo Empire | 1400 CE | 1835. CE | .20 | W. Africa |
| 29 | Songhai[m] | 1464 CE | 1591 CE | 1.1 | West Africa |
| 30 | Kongo[c] | 1490 CE | 1718 CE | .13 | Central Africa |
| 31 | Bunyoro[c] | 1550 CE | 1850 CE | .15 | SubSah Africa. |

**Appendix B:** Omitted Civilizations (due to autonomy, scale or data issues)

| **ASIA:** | | | |
|---|---|---|---|
| | **Name** | **Notes** | **Region** |
| 1 | Longshan Neolithic Culture | 3200B.C.E.-1800B.C.E.<br>transitioned into the Xia Dynasty | China |
| 2 | Asian Nomad Cultures | 6000 BCE - 500 CE<br>info n. a.<br>(Andronovo, Srubnaya Cultures,<br>Kizil Kum, Kara Kum,<br>Pamris, Cimmerians,<br>Yuezhi, Massagatae,<br>Dahae, Alans, Hunas, etc.) | Central Asia |
| 3 | Xixia | info n.a. | China |
| 4 | Dai Vet | ” | Vietnam |
| 5 | Chiao-chih | ” | ” |
| 6 | Chiu-chen | ” | ” |
| 7 | Lan Chang | ” | Burma |
| 8 | Pegu | ” | ” |
| 9 | Chiengmai | ” | ” |
| 10 | Arakan | ” | ” |
| 11 | Ahom | ” | ” |
| 12 | Sultanate of Sulu | info n.a.<br>1450 C.E. - 1899 C.E. | Indonesia |
| 13 | Sultanate of Macassar-Gowa | info n.a. | ” |
| 14 | Angkor | ” | Thailand |
| 15 | Silla | ” | |
| 16 | Gondwana | ” | India |
| 17 | Telingana | ” | ” |
| 18 | Gujarat | ” | ” |
| 19 | Orissa | ” | ” |
| 20 | Malwa | ” | ” |
| 21 | Chin | ” | China |
| 22 | Yen | ” | ” |
| 23 | Cheng | ” | ” |
| 24 | Sogdiana | Tang Dynasty suzerainty | ” |
| 25 | Uighur Turks | Tang Dynasty auxiallry | ” |
| 26 | Sung | info n.a. | S. China |
| 27 | Nan Chao (Taj) | ” | ” |

**Appendix B:** (continued)

| **ASIA:** | | | |
|---|---|---|---|
| | **Name** | **Notes** | **Region** |
| 28 | Gurjarat | ” | India |
| 29 | Gauda | ” | ” |
| 30 | Lanna | ” | ” |
| 31 | Annam | ” | ” |
| 32 | Gangga Negara | ” | Malaysia |
| 33 | Langkasuka | ” | ” |
| 34 | Pan Pan | ” | ” |
| 35 | Kedah Sultanate | 1136 CE - present | ” |
| 36 | Johor Sultanate | 1528 CE - 1899 CE | ” |
| 37 | Hsiung-nu Empire | info n.a. | ” |
| 38 | Ayutthaya | Chinese suzerainty | Siam |
| 39 | Yadava Dynasty | vassals of Sul. of Delhi | India |
| 40 | Pandya Dynasty | info n.a. | ” |
| 41 | Calukya Dynasty | info n.a. | ” |
| 42 | Chola Dynasty | unknown antiquity (start date) | ” |
| 43 | Kanva | Magadha Emp. dynasty | India |
| 44 | Indus Civilization | 2500 B CE - end date uncertain | S. E. Asia |
| 45 | Pre-Mauryan Indian civ. | info n. a.<br>Pancalas, Kashis,<br>Kurus, Vitihotras | S. India |
| 46 | Sultanate of Bantam | city-state | Java Island |
| 46 | Khanate of Kazan | info n. a. | Central Asia |
| 47 | Khanate of Sibir | ” | ” |
| 48 | Khanate of Astrakhan | ” | ” |

**Appendix B:** (continued)

| **MIDDLE EAST:** | | | |
|---|---|---|---|
| | **Name** | **Notes** | **Region** |
| 1 | Nicaea Empire | Byzantine principality | ” |
| 2 | Sumerians | City-states until Sargon I & Akkadian Emp. | Mesopotamia |
| 3 | Phoenicians | uncertain start and end dates | Israel, Palestine coastal Syria |
| 4 | Canaanites | uncertain start and end dates | Israel, Palestine West Bank |

| **EUROPE:** | | | |
|---|---|---|---|
| | **Name** | **Notes** | **Region** |
| 1 | Mycenaean Civilization | info n.a. | Balkan pen. |
| 2 | Early Germanic tribes | Chamavi, Marcomani, Harii, Cherusci, Vandals, etc. | N. C. Europe |
| 3 | Genoans | scale | Italian pen. |
| 4 | Venetians | ” | ” |
| 5 | Medieval Germanic groups | Bavarians, Thuringians, Alemanni, Saxons, Burgundians, Salians, etc. | N. C. Europe |
| 6 | Peoples of the European Steppe | Gepids, Sueves, Rugians | ” |
| 7 | Ancient Celtic Cultures | uncertain start and end dates Hallstatt & LeTéne Cul. | Ireland |

**Appendix B:** (continued)

| **AMERICA:** | | | |
|---|---|---|---|
| | **Name** | **Notes** | **Region** |
| 1 | Native American Tribes | scale, info n.a.<br>500 C.E.-1500 C.E.<br>(Nootka, Chinook, Yurok, Pomo, Kaska, Inuit, Sioux, Cheyenne, Arapaho, Apache, Cherokee, Algonkin Nations, etc.) | N. America |
| 2 | Zapotec | info n.a. | Meso America |
| 3 | Mixtec | ” | ” |
| 4 | Tarascan | ” | ” |

| **AFRICA:** | | | |
|---|---|---|---|
| | **Name** | **Notes** | **Region** |
| 1 | Lunda Empire | info n.a. | SubSah. Africa |
| 2 | Borno Kanem | ” | ” |
| 3 | Great Zimbabwe | city-state | ” |
| 4 | Banu Hilal | no settlement<br>nomadic Bedouin tribe | N. W. Africa |
| 5 | Zirids | did not gain full control<br>splinter from Fatimids | ” |
| 6 | Nabataeans | uncertain start and end dates | coastal N. African pen. |