

## **Labor Ethics according to Religion and Economic Growth**

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### **Abstract**

This paper consists of a comparison of the views on labor in the major religions of the world today and an analysis of the differences in GDP per capita between the groups of states that form each dominant religion. We observed in this study that Christianity offers the most affirmative assessment of labor compared with other religions. Christian states, both Protestant and Catholic, generally produce a GDP per capita that is twice that of non-Christian states. We also found that Protestant and Catholic states in the West have no clear average differences between their values of GDP per capita, but enjoy about 3 to 7 times higher level of GDP per capita than all of the other states compared with them.

**Key words:** labor ethics, religion, economic growth

### **I . Introduction**

According to economists, the three elements of labor, capital, and technology are regarded as the major factors for economic growth. Therefore, it is undoubtedly true that the qualitative and quantitative growth of labor will exert a positive effect upon economic growth if all other conditions are the same. Given that capital and technology are also operated by men in the long run, the

importance of labor in relation with economic growth cannot be emphasized too much.

Max Weber paid attention to the fact that capitalism had developed in Western society, and found that there is a selective affinity between Protestantism – Calvinism in particular – and capitalism. He was also interested in the relationship between capitalism and world religions other than Protestantism. He then concluded that Protestant ethics had made a contribution to the establishment of capitalism, while the ethics of other religions represented an obstruction to, or interfered with, it (Green, 1959: 6–7). In his work *Asian Drama* Gunnar Myrdal, the 1974 Nobel laureate in economics, also cited religion including education and climate as a factor hampering economic development in South Asia (Myrdal, 1971: 48–51).

According to the Bible, God created man in His own image before retiring from the work of creation, and ordered him to continue the work on earth on His behalf. Default view of the Bible is that God has sole ownership of all creatures while mankind is His representative in this world, managing the created world as His steward (Douglas Vickers, 1982: 87). Therefore, as God's agent in this world, man has the responsibility not only of filling the earth to subdue it but also of being fruitful and increasing in number on it (Genesis 1:28). Man's responsibility for labor as mentioned in the Bible requires that man must work to perform God's creation ordinance. According to God's original order, man's labor is a blessing earned from his participation in the activity of creation begun by God. Bernbaum and Simon (1986: 3) pointed out that work is ordained by God and that no other religion worships any supernatural being who works. This shows that the Bible places a high value on labor.

From the above discussion one might want to build a hypothesis that Christian states which stress the importance and value of labor more strongly than other

states maintain a comparatively higher level of income. The purpose of this study is to verify the hypothesis quantitatively via empirical analysis, starting with a brief discussion about the views on labor of each religion. The main discussion consists of two parts, the first of which focuses on ideas about labor in various religions that exerted a strong influence on the attitudes of people who believe in them. In the second part, the discussion is focused on a statistical analysis to verify whether there is any difference in the realization of economic performance between states where different religions predominate, particularly between Christian countries and countries with other religions.

## **II. Comparison of the Views on Labor between Christianity and Other Religions**

The ideas of labor established by each religion have continued to evolve according to the changes of the times. Furthermore, each religion has divided into various denominations and sects that have generated different views of labor. For instance, Christianity is largely divided into two branches, Catholicism and Protestantism, the latter of which is further divided into several denominations – including the Lutheran and Calvinist churches – that have their own views about labor. Even Confucianism can be divided into several schools, including that which prospered during the era of the Hundred Schools of Thought, that which grew to become the state religion of China, and the Neo-Confucian faith established by Zhu Xi under the influence of Buddhism and Taoism. Buddhism, also, is largely divided into two, Mahayana (“Great Vehicle”) and Hinayana (“Small Vehicle”) Buddhism, each with differing views on labor.

Therefore, one might find it meaningless to compare the views of labor from

each religion as a whole without considering their backgrounds, including the times and denominations. Despite that, it is also true that each religion has developed ideas of economy and ethics that are common to all. In this study, however, we do not compare specific topics from the views of labor of each religion according to the times and sects, but offer a general survey of the views that are common to all religions via related literature. The religions dealt with here are the world's five major religions – Buddhism, Hinduism, Islam, Catholicism and Protestantism, and Confucianism – that have had a far-reaching influence upon Far Eastern society.

## **1. Buddhism**

Buddhism in principle is in the position of denying the importance of labor. As a religion Buddhism regards this world as a “bitter sea” and guides Buddhists to aim for entering nirvana by liberating themselves from the sufferings in this world through enlightenment. Buddhism, first of all, comprises a dualistic tendency in which the spiritual world is venerated while the material world is regarded as wicked (Seung-Wook Kim and Ryu, Hae-Shin, 2002: 23-24). Buddhist monks and nuns do not place much value on labor, an essential tool used to satisfy life's material needs, because they need only the least amount of commodities for their ascetic life.

Buddhism discourages followers from engaging in physical labor because it may lead them to violate the commandments. If you dig the ground or cut down a tree you might have to kill life living under the ground or in the tree, violating the commandment not to kill any living thing. In the code of ethics for bhikkhus, accordingly, the act of digging the ground is equated with the act of killing (Byeong-sik Yun and Yu, In-hui, 1985: 13).

The tolerance of Buddhism toward other religions helped to promote mixing with

traditional folk religions, fast turning it into “fortune-inviting religion”; the characteristic features of the fortune-inviting religion are particularly strong in popular Buddhism. One distinctive feature of fortune-inviting religion is a strong tendency towards maintaining, rather than reforming, the existing condition of the world. One might conclude then that such a tendency to refuse active involvement in reality led Buddhists to adopt passive attitudes about labor.

History shows that in the times of Shakyamuni, Buddhist monks and nuns were prohibited from engaging in the commercial activities of selling and buying goods as well as the agricultural tasks of digging and seeding. The following precept from the Posthumous Teachings Sutra shows how the early Buddhist followers were taught: “Those who keep clean rules should not sell or buy goods, engage in trade, have a house or farming lands, hire servants, or raise cattle. You should avoid wealth as if to avoid a fire pit, and do not chop plants or dig up the land.” The monks and nuns in Buddha’s time led an extremely austere lifestyle, eating just one meal a day with food begged from the people (Gyeong-jun Park: 2004). It is not, however, that Buddhism denies the labor of laymen and women. One might conclude then that for Buddhism labor is an activity of a subordinate level that should aim at giving offerings for the practice of monks and nuns engaging in the transcendental realm. As shown so far, the Buddhist view of labor is characterized by dualistic and self-contradicting features (Jae-yeong Kim, 2003: 32).

## **2. Confucianism**

According to Marshall (1982), Max Weber once pointed out that there is a fundamental ideological difference between Eastern religions and Christianity, and that the latter coincides with capitalism whereas the former does not (Gorden Marshall, 1982: 59–60). He went on to say that the economic retardation of China

largely resulted from the teachings of Confucianism. In this chapter we will discuss the Confucian view of labor and try to explicate how they hampered economic progress in China.

Firstly, Chinese Confucian scholars tended to look down on physical labor, although it is true that the educational zeal of Confucianism helped create the quality of labor. Kongzi and Mengzi, two of the greatest Confucian thinkers, despised physical labor as an activity for low-class people, as is clearly seen in the traditional hierarchy of literary elites, farmers, manufacturers and merchants in Chinese society. As for Confucius, people could be divided into two groups: the superior men (Junzi) who formed the ruling class and the inferior men (Xiaoren) who were responsible for the production of goods for their superiors. Mencius complemented the ideas of the senior philosopher and tried to bring harmony to the relationship between the two groups via the sublation of the conflicts between them, but failed to establish any significantly different views as far as labor is concerned (Jae-yeong Kim, 2003: 33-34).

Secondly, junzi as the Confucian ideal man was a man of harmony, an ethical man or a cultured man rather than a professional man. Unlike the Western elites in modern times who were keenly interested in pragmatic topics such as natural science, Confucian elites were more interested in finding a position within the government through state-run civil examinations. The tradition resulted in a tendency to make light of men with special practical knowledge, which became the core of the capitalist societies in the West, limiting the development of in-depth ideas concerning labor and professionals (Gyu-sik Gwon, 1983: 209-217).

It was during the period in which East Asia began to enjoy remarkable economic growth that discussions began to emerge concerning the relationship between Confucianism and capitalism. The term “Confucian capitalism” was introduced by the Japanese scholar Michio Morishima (1978: 186-187) who believed that the

tradition of Confucianism in East Asia played a positive role in the development of capitalism in the region. In his work, *Great Britain and Japan Revised*, he argued that Japan was able to develop nationalistic capitalism on the basis of the traditional Confucian virtues of patriotism, filial piety, trust and respect for the elders, whereas Britain gave birth to capitalism on the basis of Protestant ethics: “We might refer to the capitalism of Japan as Confucian Capitalism if we can coin such a term, and to the capitalism Britain as Puritan Capitalism.”

The discussion about Confucian Capitalism, however, lost its driving force with the long-term recession in Japan that began in the early 1990s and the financial turmoil that overwhelmed Korea in the late 1990s. What followed them was the advent of terms such as “moral hazard” and “crony capitalism” by which Confucian ethics, which had once been regarded as a powerful engine for the remarkable economic development in East Asia, were singled out as an obstacle to further development in the region. After that, people’s attention was drawn to the idea of “Asian Value” proposed by two political leaders of Southeast Asia, Lee Kuan Yew of Singapore and Mahathir of Malaysia. It is true that Confucianism forms an important part of the Asian Value, but it will not be true to say that all Asian values are directly related with Confucianism. In other words, Confucian capitalism is certainly related with the notion of Asian Value, but only in a different context (Seok-geun Kim, 1999: 197–228).

Max Weber gave a negative assessment concerning Taoism, too, which constituted a major folk religion in China, Japan, and Korea. Taoism developed an idea that is comparable with *laissez-faire*, a doctrine that became a firm foundation for the development of the capitalist economy in the West. Weber argued that the idea of *laissez-faire* in Taoism failed to evolve into free competition or positive professional ethics that would guarantee free exploration of profits, and fell into religious and meditative mysticism. Weber (1922: 226–249)

concluded that Confucianism and Taoism, although they had grown into two of the major philosophies of East Asia, never succeeded in creating elements that can back up capitalist development.

### **3. Hinduism**

Also known as Indian Religion, Hinduism is a predominant religion in India and some of her neighboring countries including Nepal (Gavin D. Flood, 1996: 1–5). With origins dating back to Brahmanism, Hinduism became the religious system as it is maintained today by reforming the contents and forms of Brahmanism after Buddhism separated from it. Unlike other major world religions, Hinduism was not established by a specific founder at a specific time but developed through a union of many religions formed by many Aryan and native tribes that settled in the Indian subcontinent over a period of several thousand years. It was in about 1500 BC that the Arians moved from Central Asia to the plains in today's northern India, eventually seizing Hindu territory (Gavin D. Flood, 1996: 30). The immigrants gradually created the well-known caste system as part of the effort to maintain their superiority over the natives, dividing the society into four castes: Brahmin, the highest class, consisting of priests, teachers and philosophers engaged in the study of scriptures and the performance of rites; Kshatriya, consisting of administrators and warriors engaged in state affairs, including politics and economy; Vaisya, the class of commoners engaged in farming, manufacturing, and trade; and Sudra, the lowest class of slaves (Jr. George W. Braswell, 1994: 34–35). The traditional caste system is still influential in Indian society where the great majority of people are Hindus, guiding people to engage in works according to their status within the system. As in Confucian society, where people worked according to their status in a hierarchy of literary elites, farmers, manufacturers,



and merchants, upper-class Indians under the caste system tended to disregard physical labor.<sup>1)</sup>

In Hinduism, the life of man is often divided into four stages, those of apprenticeship, family life, retirement, and sanyasin (Houston Smith, 1991/2001: 35–38). The first two stages are related to life in this world whereas the last two concern the quest for eternal life. It is in the stage of sanyasin that Hindus gain salvation following their leaving – or “giving up” – this world. In Hinduism, the greatest virtue is the quest that follows the abandonment of this world via meditation and ascetic practice, which means that Hindus see the physical world not as a subject to develop but an illusion to avoid. They give up this world by giving up the stewardship of nature. This shows Hinduism as a religion of escapism and anti-culture without a cultural mandate.

#### **4. Islam**

Originating from the same background as Judaism and Christianity, Islam exhibits similar theological concepts, religious values and practices with the latter in particular: monotheism, revelation, salvation, doom’s day, and eschatology (Jr. George W. Braswell, 1994: 186–189). While Islam began in the Middle East, its reach is worldwide. Islam has been maintained an economic system based on Islamic teachings (David Levinson, 1996: 91). In most of the Islamic societies, politics is not separated from religion, and accordingly, Islamic teachings exert a strong influence on all aspects of society – its politics, economy, and culture (Roland Machatschke, 1995: 42). This is why Muslims exhibit a stronger sense of

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1) In India, there is tradition that people of the upper class impose labor on those of the lower class, which tends to slow the progress of work. The caste system in the country often generates an exclusive attitude between the classes, becoming a major obstacle to unity between workers. See Yeong-beom Park and U, Seok-hun (2003: 87–91).

community and religious duty than the followers of other religions.

Islam maintains a similar standpoint with Christianity where ownership is concerned, as is clearly defined in its sacred text, “Everything in the universe belongs to God the Almighty. Koran, 2:284)”<sup>2)</sup> What is emphasized is the justice of distribution, because all of the resources on earth are gifts given by God to human beings (Koran, 2:29). In an Islamic society, the accumulation of wealth is allowed if it is acquired by lawful means, but wealth cannot be consumed in a completely free manner. Islam prohibits wealth spent for the pleasure or luxurious lifestyle of an individual. According to the third duty of the Five Pillars of Islam, almsgiving, or *zakat* is considered a way of improving one’s chances of entering heaven (David Levinson, 1996: 94).

Compared with the typical Christian society, Islamic society is characterized by a far stronger religious binding force that operates for the entire gamut of society. By the same token, the distribution of wealth seems to be sought after more persistently than in Christian society. In a society where the public demand for distributive justice is very strong, the people’s desire for labor will be much weaker.

## 5. Catholicism and Protestantism

In the classical period labor was understood as a curse inflicted by the gods. According to Greek mythology, labor was imposed upon men by Zeus to avenge the sinful deed committed by Prometheus: that of giving fire to men. Men were condemned to the hard work of producing food from soil for their survival. The great Greek philosophers such as Plato and Aristotle tried to explicate the necessity and role of labor but never used any affirmative notions. A familiar example is ancient

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2) See The Holy Qur'an, trans. by M. H. Shakir and published by Tahrike Tarsile Qur'an, Inc. in 1983, accessed at <http://www.hti.umich.edu/k/koran> on Dec. 10, 2005.

Platonism, which considered a “working god” unacceptable. Its followers regarded Jehovah God, who is in charge of materials, as the lowest ranking god called demiourgos (Margaret Barker, 1992: 168). On the other hand, the Gnostics who lived in the same period as Jesus advocated the idea of the spirit being “noble and beautiful,” and the body, “humble and dirty” while belittling the importance of labor (David R. Ruppe, 1988: 77–83).

In the Christian world before the Reformation, human life was often divided into two – a life of action and a life of contemplation – under the influence of Greek and Roman cultures. For St. Augustine, for instance, this world is nothing but a school in which people are taught to prepare for the permanent life, and *vita contemplativa* is a nobler way of living in this world than *vita activa*. He, and St. Aquinas after him, saw labor as a burden. The views of the saints and other Christians resulted in the classification of labor into two categories: sacred labor and secular labor. The work of serving God was regarded as the first category, whereas the rest of the works undertaken for everyday living were viewed as something to be conducted by spiritually inferior commoners.

Under such circumstances, no one could have anticipated the development of commerce and industry that would become the foundation of capitalism. The Puritans who came after the Reformation, among them Calvinists, held a different view. They defined labor as an act to reveal the glory of God in this world. Since 1904, when Max Weber discussed the work ethics of Protestants and the spirit of capitalism in *The Protestant Ethic and the Spirit of Capitalism*, social scientists have argued that cultural activity, including religious practice, is one of the main factors in determining the soundness of the economy. Weber saw that the spiritual essence of capitalism exists not in the quest for money arising from an individual desire to make profit, but in the spiritual activity committed to the restriction of the individual by ascetic ethics and the quest for profit through professional labor. He

stressed the importance of labor, the sense of God's calling based on determinism, the diligent, frugal, and simple life, the fulfillment of one's responsibilities, and the rational quest for values. He concluded that the Protestant ethic which stressed the importance of labor had a powerful impact on the growth of capitalism.

It is necessary at this stage to discuss the relationship between the theological determinism of Calvin and labor. Max Weber raised the question why Calvinists saw labor as a religious action, and argued that the answer lies in theological determinism. According to the theory, not all men are chosen to reveal the glory of God, and that only those predetermined by God in the Permanent Past are allowed to apprehend and receive the grace of redemption. Protestants under the influence of Calvin's teaching in the early phase of the Reformation, however, faced a serious question: that of how one as a Christian was able to know whether he or she had been chosen by God? Calvin's answer to the question was that all Christians should have confidence that they were chosen and do their best to reveal and heighten the glory of God. The awareness of the importance of labor was strengthened in the consciousness of early Protestants through Calvin, who insisted that one can be confident that he or she was chosen by God when he or she is able to reveal the glory of God through the accomplishment of the job, whatever that job may be (Max Weber, 1904: 109-112). In this way, Calvinism was able to nurture a sense of calling regarding work among its followers. Work now became a tool for revealing God's glory, so Christians necessarily had to be sincere about and faithful to their work. Calvin also taught that the wealth accumulated through work should never be used for physical comfort or pleasure because that would be a sin against God. Calvin stressed the importance of ascetic life and taught his followers to live according to practical ethics by which the wealth, knowledge or skill gained from work should be used to reveal God's

glory by engaging in activities to serve the community and help the needy.

Luther, unlike Calvin, maintained a critical stance concerning capitalism, but stressed the importance of secular tasks as a means to meet the economical needs of neighbors (Max Weber, 1904: 108). One of his greatest achievements is that he removed the discrimination between the sacred and the secular by considering, for instance, that labor in the everyday world is a task granted by God: "God achieves everything through you. He milks a cow and does even the most humble work through you." (Kemper Fullerton, 1928: 163–191). His view helped promote the status of daily labor, and spread the notion that all labors are equally valuable before God. What distinguishes Calvin from Luther is that Luther insisted the doctrine of justification by faith, but Calvin regarded professional labor as the best means to be confident of one's predetermined salvation by God. He believed that only professional labor could remove any doubt about faith and guarantee one's salvation.

Protestants' perception of daily labor brought about changes in their sense of calling. The divinely inspired professions include any line of work performed on a daily basis. Because God called man to work, all men who work are now stewards serving God, and the rewards gleaned from the work constitute not just materialistic but spiritual and ethical gains as well. Work brings glory to God and virtue to human society. The goal of work is not simply to ensure the family livelihood but to serve God by serving people in their workplace.<sup>3)</sup>

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3) The Protestant view of labor was officially accepted by Catholics. In 1981, Pope John Paul II promulgated *Laborem Exercens* (Encyclical on Human Work), 90 years after the publication of *Rerum Novarum* by Leo XIII. The encyclical contains views corresponding to those of Protestants on labor, including the idea that work is sacred, that all men have a duty to work, and that there is no difference between the holy and the secular in life. See *Encyclical on Human Work* by Pope John Paul II accessed at <http://www.labor.or.kr/nohun.htm> on Dec. 10, 2005.

## 6. Comparison of the Views on Labor between Religions

Among the various religions discussed above, Hinduism, Buddhism, and Confucianism developed in the East. It is interesting to note that these Eastern religions nurtured negative attitudes toward labor, while Christianity and Islam have formed comparatively affirmative views.

Equally interesting is that Christianity and Islam, although they share similar historical backgrounds, created states that exhibit widely different social structures from one another. Most Christian countries have developed a social system in which the separation between politics and religion is relatively strict, whereas many Islamic countries maintain a system in which religion exerts a powerful influence upon all aspects of society. Another significant difference between the two groups is that Christian countries display a highly developed sense of individualism while Islam countries stress the importance of communal life. Such differences have tended to keep Muslims more strongly bound to religious doctrine than Christians. Members of an Islam society tend to regard distributive justice as particularly important, although too much emphasis on this can reduce people's desire for work.

History shows that Christianity, too, has developed divergent views on labor. The difference between the Catholicism of the medieval period and Protestantism is particularly significant. Prior to the Reformation the Catholic Church regarded contemplative life as being nobler than active life, resulting in the view that the work of serving God is sacred while everyday works are secular and thus less important. This distorted view of labor was later revised by the proponents of the Reformation – John Calvin and Martin Luther – who abolished the sacred–secular division and spread the idea that all forms of labor are equally important before God. As

discussed above, the view of labor in Catholicism is today not very different from that of Protestantism.

Meanwhile, in the Eastern religions of Hinduism, Buddhism and Confucianism, intellectual labor is regarded as more valuable than physical labor, as it was in Catholicism during the medieval era. Among the three Eastern religions, Hinduism and Confucianism established societies characterized by a strict hierarchy, the caste system in India and the *bansang* (aristocracy–commoner) system in China, in which only people of the lower class engaged in various works, usually for the benefit of the ruling class. Buddhism, unlike Hinduism and Confucianism, has been in the position of opposing a class–based society while supporting an equal society (Heung–guk Song, 1971: 55). Despite that, Buddhist thinkers tended to perceive labor as a low level activity required to support the priests, who were committed in the transcendental realm. However, they did not regard the labor of lay people in a negative manner, thus displaying a somewhat contradictory view.

Historically, Korean society has been under the strong influence of the three Eastern religions: Confucianism, Buddhism, and Taoism. Any discussion of the Korean people's view of labor accordingly cannot be properly done without mentioning these influences. The traditional religious ideas evolved in Korea led Korean people to form a social system centered on a few intellectual elites and based on a fortune–inviting faith for the life in this world as well as the dualistic view of labor. These ideas resulted in the tendency to make light of physical labor, which was eventually found to be a major obstacle to economic development. As Robert J. Barro and Rachel M. McCleary (2003) pointed out, however, Korea has recently seen a dramatic increase in the population, who converted from the traditional religions of Confucianism, Buddhism and Taoism to Christianity and has achieved remarkable economic growth. One might conclude that this constitutes tangible evidence that Christianity places a higher value on labor compared with

other religions.

### III. Comparison of Economic Growth between States According to Religion

Culture is usually thought to influence economic consequences through the introduction of virtues such as frugality, honesty and work ethic. Religion is also one indispensable factor of culture, but for all that economists have rarely handled religion or culture as important factors of economic growth excepting few researchers, such as Weber (1930), Myrdal (1971), Huntington (1996), Landes (1999), and Inglehart and Baker (2000).

The latest study on the relationship between religion and economic growth is an empirical analysis of 59 countries across the world by two Harvard professors, Robert J. Barro and Rachel M. McCleary (2003), using the data of six surveys by Gallup, World Bank and Michigan University. Barro and McCleary (2003) insisted that as a general rule a society becomes more secularized as its economy becomes more developed, although such a theory does not apply to the USA, the most religious country in the world.<sup>4)</sup> They pointed out that in the newly emerging economies of East Asia, including Korea, Malaysia, and Singapore, the spread of Christianity occurred side by side with rapid economic growth. They were particularly interested in Korea, whose soaring population was converted from the traditional religions developed in East Asia (such as Confucianism) to Christianity: “Korea provides a great example of how rapid economic growth took place side by

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4) The secularization hypothesis that economic growth causes individuals to become less religious has remained controversial until now. See Martin (1978) and Chaves (1994) for more discussions about the secularization hypothesis.



side with the spread of Christianity.” The only difference between the study by Barro and McCleary and earlier studies by Max Weber and Gunnar Myrdal is that the first is based upon a more elaborate analysis of a huge amount of data collected from research in cultural anthropology, sociology, and politics. Barro and McCleary (2003) insisted concluded in the study that the religious belief resulted in economic consequences by affecting personal traits such as honesty, work ethic, frugality, and openness to outsiders.

The existence of a variety of explanatory variables affecting an economic variable is assumed, but in this study we used only the data for GDP and the religion of each state in order to focus on the direct relationship between religion and economy. The study is also based upon the premise that each religion has a different view on labor. Due to a general understanding that an economic outcome in a country is under the multifold influence of such factors as politics, society, culture, education, and resources, many people might suspect the effect of religion on economy to be insignificant if a lot of explanatory variables besides religion are added on to the model. For the verification of this fact, taking such variables as industry enhancement ratio, inflation rate, unemployment rate, school life expectancy, life expectancy, and climate including religion as explanatory variables affecting economic growth, we run a multiple regression model. Admitting the existence of a variety of explanatory variables affecting economic growth we found that there is a strong causal relationship between religion and economy in Appendix.

The following shows the results of an empirical analysis conducted to ascertain whether the differing views of labor originating from each religious belief are reflected in the economic achievements of a given society assuming other conditions are the same. This study contains several different aspects compared with the study of Barro and McCleary. Firstly, we refer only to GDP figures and the religion of each

country in this study, whereas Barro and McCleary used an extensive amount of socio-economic indices including the frequency of participation in religious meetings, religious beliefs, GDP, education of adults, urbanization rate, and life expectancy. Secondly, this study treats a total of 185 countries, whereas Barro and McCleary treated just 59 countries.

## **1. Statistical Data**

In this study we classified 185 states into several groups according to their religions – Protestantism, Catholicism, Buddhism, Islam and Hinduism – and tried to ascertain whether the Christian countries generate greater economic growth than the countries with non-Christian religions. The religions dealt with here are the world's five major religions – Buddhism, Hinduism, Islam, Catholicism and Protestantism. Although Confucianism and Taoism have had a great influence upon Far Eastern society, we have excluded them from this paper, since no country now has these religions as dominant beliefs. The group of Christian countries was then subdivided into two: Christian countries in West including Europe and North America, and the countries in the other regions. We conjectured that the economies of the states in the first subgroup have been greatly influenced by the dominance of Christianity in their societies over the last several hundred years, while the economies of the states in the second subgroup have not been thus influenced because their experience of Christianity is significantly shorter than that of the first subgroup. The Christian states in the second subgroup include those of South America, Africa, Asia, Oceania, the Caribbean, and the Pacific. Even though Australia and New Zealand belonging to the Oceania countries, they are not classified as other regions, but west countries because of their rapid modernizing (See Table 1).

In this paper, as of October, 2009, the statistical materials of *The World Factbook* periodically published by CIA (Central Intelligence Agency) were mainly used. The utilized statistics are locations, religions, independence, GDP – per capita reduced in PPP (purchasing power parity) deduced from the chapter of Geography, People, Government, Economy, respectively.

What should be noted here is that we excluded from the study those countries where the difference in terms of population between the largest and the second largest religions is less than 5% point,<sup>5)</sup> since we found it difficult to regard religion as a dominant force in the countries concerned. We also excluded from the analysis the countries whose largest religion is other than the major religions discussed here,<sup>6)</sup> and where the ratios of religion population are not distinct.<sup>7)</sup>

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5) The following countries show great examples: Cameroon (indigenous beliefs 40%, Christian 40%), Guyana (Protestant 30.5%, Hindu 28.4%), Hong Kong (eclectic mixture of local religions 90%, Christian 10%), Liberia (Indigenous beliefs 40%, Christian 40%), Nauru (Congregational 35.4%, Catholic 33.2%), Republic of the Congo (Christian 50%, animist 48%), Russia (Russian Orthodox 15–20%, Muslim 10–15%), South Korea (Buddhist 23.2%, Protestant 19.7%), Suriname (Hindu 27.4%, Protestant 25.2%), Tanzania (Muslim 35%, indigenous beliefs 35%), Trinidad and Tobago (Catholic 26%, Hindu 22.5%), and Vietnam (Buddhist 9.3%, Catholic 6.7%).

6) The following countries provide good examples: Japan (Shintoism), China (Mixture of Taoist and Buddhist), Jewish (Jewish), Macedonia (Orthodox), Belarus (Orthodox), Bulgaria (Orthodox), Ethiopia (Orthodox), Greece (Orthodox), Moldova (Orthodox), Montenegro (Orthodox), Serbia (Orthodox), Ukraine (Orthodox), Cyprus (Orthodox), Romania (Orthodox), Georgia (Orthodox), Angola (Indigenous beliefs), Togo (Indigenous beliefs), Madagascar (Indigenous beliefs), Central African Republic (Indigenous beliefs), Swaziland (Indigenous beliefs), and Zimbabwe (Indigenous beliefs).

7) The following countries have not clearly announced the ratios of religion population: Falkland Islands (Islas Malvinas), Gabon, Lesotho, Malawi, North Korea, Tonga, Tuvalu, and Zambia.

〈Table 1〉 States by Religion

Dominant Religion		State Name	Others
Christianity	West	Australia, Bermuda, Denmark, Estonia, Faroe Islands, Finland, Greenland, Guernsey, Iceland, Isle of Man, Jersey, Latvia, New Zealand, Norway, Sweden, UK, USA	Protestantism
		Andorra, Austria, Belgium, Canada, Croatia, Czech Republic, France, Gibraltar, Hungary, Ireland, Italy, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Switzerland	Catholicism
		Germany	N/A*
	Other Regions	American Samoa, Anguilla, Antigua and Barbuda, Armenia, Bahamas, Barbados, Benin, Botswana, British Virgin Islands, Cayman Islands, Cook Islands, Fiji, French Polynesia, Ghana, Jamaica, Kenya, Marshall Islands, Montserrat, Namibia, Niue, Papua New Guinea, Saint Helena, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Samoa, Solomon Islands, South Africa, Tokelau, Turks and Caicos Islands, Vanuatu, Virgin Islands	Protestantism
		Argentina, Aruba, Belize, Bolivia, Brazil, Burundi, Cape Verde, Chile, Colombia, Congo (Democratic Republic of the), Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Grenada, Guatemala, Haiti, Honduras, Kiribati, Mexico, Netherlands Antilles, New Caledonia, Nicaragua, Northern Mariana Islands, Palau, Panama, Paraguay, Peru, Philippines, Puerto Rico, Rwanda, Saint Lucia, Saint Pierre and Miquelon, Sao Tome and Principe, Seychelles, Timor-Leste, Uruguay, Venezuela, Wallis and Futuna	Catholicism
		Federated States of Micronesia, Uganda	N/A*
Buddhism	Bhutan, Burma, Cambodia, Laos, Macau, Mongolia, Singapore, Sri Lanka, Taiwan, Thailand		
Islam	Afghanistan, Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei, Burkina Faso, Chad, Comoros, Cote d'Ivoire, Djibouti, Egypt, Eritrea, Gambia, Gaza Strip, Guinea, Guinea-Bissau, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kosovo, Kuwait, Kyrgyzstan, Lebanon, Libya, Malaysia, Maldives, Mali, Mauritania, Mayotte, Morocco, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Sierra Leone, Somalia, Sudan, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, West Bank, Western Sahara, Yemen		
Hinduism	India, Mauritius, Nepal		

Note: \* The states marked N/A represents the fact that while they are Christian countries the difference in numbers between Catholics and Protestants is less than 5% point (Germany: Protestant 34% and Catholic 34%; Federated States of Micronesia: Catholic 50% and Protestant 47%; Uganda: Protestant 42% and Catholic 42%).

Source: CIA, *The World Factbook* accessed at <http://www.cia.gov/index.html> on October 14, 2009.

The goal of this study is to investigate through empirical analysis whether Christian countries in the West, where Christian teachings tend to stress the importance of labor, have achieved a higher level of economic growth compared with the states whose dominant religion is something other than Christianity. The first part of the analysis involved the classification of the states into two groups, Christian and non-Christian groups, and a comparison of GDP per capita was undertaken to ascertain whether there is any meaningful difference between the two groups. The second part of the analysis begins with the classification of Christian countries into two groups – Protestant and Catholic – and the classification of the two faiths according to region: the countries in Western and non-Western countries. As for the states where other religions predominate, no distinctions were made according to region. Consequently, we divide all of the states under study into seven groups: Protestant and Catholic states in the West; Protestant and Catholic states in the other regions; Buddhist states; Islamic states; and Hindu states, and verify whether a mean difference of GDP per capita of these groups exists.

## **2. Analysis of the Difference in GDP between Christian and non-Christian States**

For this study we conducted a T test of independent samples in order to ascertain whether there is any difference in population mean between the entire Christian and non-Christian states. The two populations, Christian states (1) and non-Christian states (2), are assumed to follow the normal distribution of  $N_1 (\mu_1, \sigma_1^2)$  and  $N_2 (\mu_2, \sigma_2^2)$  respectively. Here  $\mu$  represents the average GDP per capita, and  $\sigma^2$  population variance. The mean difference ( $\mu_1 - \mu_2$ ) in the GDP per capita of the two populations is expressed by the following hypotheses.

Null hypothesis: There is no mean difference in GDP per capita between Christian and non-Christian states.

Alternative hypothesis: There is a mean difference in GDP per capita between Christian and non-Christian states.

The test can be divided into two, when the population variances are the same ( $\sigma_1^2 = \sigma_2^2$ ) and when they are different ( $\sigma_1^2 \neq \sigma_2^2$ ), where we define the existence of a mean difference between the two populations if the value of significance probability is lower than the significance level of 0.05, Levene's test for equal variances in the analysis of the T-test of independent samples in <Table 2> was conducted to test whether the variances of the two groups are equal. We can instantly see from the significance probability of 0.067, which is higher than the significance level of 0.05, that it does not reject the hypothesis that the variances of both groups are equal. Accordingly, we can use the result attained when equal variance is assumed by accepting the hypothesis that the variances are the same from each other. The test statistic is  $t = 3.381$  when equal variance is assumed, and because the significance probability (0.001) is far lower than the significance level (0.05), the null hypothesis that there is no difference in the average between the two groups is rejected. We can then safely say from the above that the Christian states produce a clearly higher amount of GDP per capita than the non-Christian states. Specifically, the average GDP per capita of the Christian states is 19,591 dollars, while that of the non-Christian is 10,213 dollars, thus revealing that people of Christian states earn twice the money made by people of non-Christian states (see Table 3).

<Table 2> Test of Independent Samples

		Levene' s Test for Equal Var.		T Test for Equality of Means						
		F	Sig.	t	d.f.	Sig. (Both)	Mean Dif.	Standard Error of Dif.	Confidence Interval of Dif. (95%)	
									Lower	Upper
GDP per capita	Assumption of Equal Var.	3,394	.067	3,381	183	.001	5848	9377	3906	14849
	Non-assumption of Equal Var.			3,451	149	.001	5848	9377	4007	14747

<Table 3> Group Statistics

Religion (Christianity / Non-Christianity)	N	Average	Standard Deviation	Standard Error of Means
GDP per capita in Christian States	117	19590,60	18676,44	1726,64
GDP per capita in Non-Christian States	68	10213,24	17304,89	2098,53

### 3. Difference in GDP between States According to Religion

In this analysis the universe is divided into seven groups: Protestant and Catholic states in the regions of Europe and North America; Protestant and Catholic states in the non-Western regions including South America, Africa, Asia, Oceania, the Caribbean, and the Pacific; Buddhist states; Islamic states; and Hindu states, in order to compare GDP per capita between the groups. Given that the number of the groups under analysis is over three and that the target of the analysis is the average difference between the levels of the statistical factors, we used the One-way Analysis of Variance.

As <Table 4> shows, a test of the homogeneity of variance revealed that the significance probability is 0.060, and which is higher than the significance level of 0.05. This result shows that the state groups have the same variance from one another.

〈Table 4〉 Test on the Homogeneity of Variance

Levene Statistic	Degree of Freedom 1	Degree of Freedom 2	Significance Probability
2.062	6	175	.060

We made the following hypothesis with a significance level of 0.05 to test whether there is a mean difference in GDP per capita for the states in each group.

**Null hypothesis:** There exists no difference in the GDP per capita between the groups.

**Alternative hypothesis:** There exists a difference in the GDP per capita between the groups.

<Table 5> shows the results of a variance analysis of one-way layout. Because the significance probability of F (the test statistics for the test to determine whether the average of the seven groups is the same) is 0.000, which is lower than the significance level of 0.05, we can conclude by rejecting the null hypothesis at 5% of the significance level that there exists a difference in the GDP per capita between the groups according to religion.

〈Table 5〉 Analysis of Variance

	Sum of Squares	Degree of Freedom	Mean Square	F (Sig.)
Between Groups	24,575,152,233	6	4,095,858,705	18.396 (.000)
Within Groups	38,962,777,712	175	222,644,444	
Total	63,537,929,945	181		

<Table 5> contains the result of the analysis of variance, showing that there exist differences in GDP per capita between the groups, though it does not show specifically where such differences occur. To settle the problem, we conducted a post hoc analysis – a multiple comparison – by using the LSD (Least Significant



Difference) method. <Table 6> shows how much difference exists in the average GDP per capita between the groups under the significance level of 5%. The levels that are estimated to generate differences at the significance level of 5% are marked by asterisks (\*).

The average GDP per capita of the Protestant states in Europe and North America is about 38 thousand US dollars, displaying an average gap of about 1 thousand dollar at the significance level of 75.3% when compared with the Catholic states in the same regions. Therefore, the Protestant states in Europe and North America show no meaningful difference at the significance level of 5% compared with the Catholic states of the same regions.

Meanwhile, the average GDP per capita of the former Protestant countries has a clear average difference at the significance level of 5% compared with the other states except the Catholic states in the same regions. A closer look shows that the difference stands at 24 thousand dollars when the Protestant countries in Europe and North America are compared with Buddhist states, 29 thousand dollars when compared with Islamic states, 33 thousand dollars when compared with Hindu states, 28 thousand dollars when compared with Protestant states in Other regions, and 29 thousand dollars when compared with Catholic states in Other regions.

〈Table 6〉 Multiple Comparisons

Religion (I)	Religion (J)	Mean Difference (I-J)	Standard Error	Significance Probability	95% Confidence Interval	
					Lower Bound	Upper Bound
1,1	1,2	1488,24	4730,07	,753	-7847,09	10823,56
	2,1	27872,11*	4503,20	,000	18984,53	36759,68
	2,2	29378,71*	4289,26	,000	20913,37	37844,06
	3	24408,24*	5946,53	,000	12672,10	36144,37
	4	28711,87*	4140,63	,000	20539,87	36883,87
1,2	5	33154,90*	9344,06	,000	14713,34	51596,46
	1,1	-1488,24	4730,07	,753	-10823,56	7847,09
	2,1	26383,87*	4056,96	,000	18377,00	34390,74
	2,2	27890,48*	3818,10	,000	20355,02	35425,93
	3	22920,00*	5616,16	,000	11835,87	34004,13
2,1	4	27223,64*	3650,33	,000	20019,29	34427,98
	5	31666,67*	9137,38	,001	13633,02	49700,31
	1,1	-27872,11*	4503,20	,000	-36759,68	-18984,53
	1,2	-26383,87*	4056,96	,000	-34390,74	-18377,00
	2,2	1506,61	3533,15	,670	-5466,46	8479,67
2,2	3	-3463,87	5426,47	,524	-14173,61	7245,87
	4	839,77	3351,14	,802	-5774,09	7453,62
	5	5282,80	9022,02	,559	-12523,18	23088,77
	1,1	-29378,71*	4289,26	,000	-37844,06	-20913,37
	1,2	-27890,48*	3818,10	,000	-35425,93	-20355,02
3	2,1	-1506,61	3533,15	,670	-8479,67	5466,46
	3	-4970,48	5250,29	,345	-15332,51	5391,55
	4	-666,84	3057,64	,828	-6701,43	5367,75
	5	3776,19	8917,17	,672	-13822,84	21375,22
	1,1	-24408,24*	5946,53	,000	-36144,37	-12672,10
4	1,2	-22920,00*	5616,16	,000	-34004,13	-11835,87
	2,1	3463,87	5426,47	,524	-7245,87	14173,61
	2,2	4970,48	5250,29	,345	-5391,55	15332,51
	4	4303,64	5129,57	,403	-5820,15	14427,43
	5	8746,67	9822,39	,374	-10638,92	28132,25
5	1,1	-28711,87*	4140,63	,000	-36883,87	-20539,87
	1,2	-27223,64*	3650,33	,000	-34427,98	-20019,29
	2,1	-839,77	3351,14	,802	-7453,62	5774,09
	2,2	666,84	3057,64	,828	-5367,75	6701,43
	3	-4303,64	5129,57	,403	-14427,43	5820,15
5	5	4443,03	8846,63	,616	-13016,79	21902,85
	1,1	-33154,90*	9344,06	,000	-51596,46	-14713,34
	1,2	-31666,67*	9137,38	,001	-49700,31	-13633,02
	2,1	-5282,80	9022,02	,559	-23088,77	12523,18
	2,2	-3776,19	8917,17	,672	-21375,22	13822,84
5	3	-8746,67	9822,39	,374	-28132,25	10638,92
	4	-4443,03	8846,63	,616	-21902,85	13016,79

\* Mean difference exists at the significance level of 0,05

Notes. 1,1: Protestantism (West), 1,2: Catholicism (West), 2,1: Protestantism (other regions), 2,2: Catholicism (Other regions), 3: Buddhism, 4: Islam, 5: Hinduism

## **IV. Conclusion**

The discussions in this study, where the main topic is the relationship between labor and religion, began with a brief introduction of the ideas about labor in the world's major religions in the first part. The second part of the paper was given over to an investigation – through statistical analysis – to determine whether there is any difference in the economic growth gained by the different groups of countries.

We observed in this study that Christianity offers the most affirmative assessment of labor compared with other religions. As mentioned above, Christianity and Islam have nurtured affirmative attitudes toward labor, while Eastern religions including Hinduism, Buddhism, and Confucianism have formed comparatively negative views. Although Christianity and Islam share similar historical backgrounds, Islamic countries have, for the most part, maintained a system in which religion exerts a powerful influence upon all aspects of society and where communal life and distributive justice are too much emphasized. Such a social system seems to have reduced people's desire for work. On the other hand, most Christian countries have developed a social system in which the strict separation between politics and religion and sense of individualism is highly appraised. Christians regard labor itself as valuable and insist that labor is not only man's responsibility but his privilege. The Bible states that man needs to sweat for work and earn reward by painful toil. Here, intellectual labor is also not separated from physical labor.

We also found using empirical analysis that Christian states, which give a higher appreciation of labor, create a much higher level of GDP per capita than the states in which a non-Christian religion is dominant. A closer look shows that Protestant and Catholic states in the West have no clear average differences between their values of GDP per capita, but enjoy about 3 to 7 times higher level of GDP per

capita than all of the other states compared with them in this study. If one divides a population into Christian and non-Christian states and makes a comparison between the two, it will be clearly seen that Christian states enjoy a higher income than non-Christian states: the first group enjoys an income that is twice that of the second group.

## Appendix

This Appendix verifies whether the effect of religion on economy is significant or not if lots of explanatory variables besides religion are added on to the model. Taking such a variety of variables as *IER* (industry enhancement ratio measured in the percentage distribution of the services industry), *IR* (inflation rate in consumer prices), *UR* (unemployment rate), *SLE* (school life expectancy in the total number of years of schooling primary to tertiary), *LE* (life expectancy at birth), and *CL* (climate) including *RE* (religion) as explanatory variables affecting *GDP* (GDP per capita on a purchasing power parity), we first considered a multiple regression model as follows:

$$GDP = \beta_0 + \beta_1 IER + \beta_2 IR + \beta_3 UR + \beta_4 SLE + \beta_5 LE + \beta_6 CL + \beta_7 RE + \varepsilon,$$

where *CL* and *RE* are categorical variables. We take the *CL* indicator variable to be one if the country belongs to the temperate zone and zero if it does not. We also take the *RE* indicator variable to be one if the dominant religion in a state is Christianity and zero if it is not. Having run the above regression model by the stepwise method, we found four variables including *RE* are entered. Below is the stepwise multiple regression equation obtained for the model.

$$\text{GDP} = - 17632.085 + 172.352\text{IER} + 353.741\text{LE} - 486.796\text{IR} + 14845.605\text{RE}$$

There is no multicollinearity problem and the assumption of independence of errors is also satisfied in the model. The assumptions of normality and homoscedasticity, however, are not satisfied in the Normal Probability Plot and the Scatter plot of Residuals respectively. After removing two outliers that have absolute values of standardized residuals more than 3.0, we re-ran the regression model for the natural logarithm of the model and obtained the following regression output:

⟨Table A-1⟩ Variables Entered <sup>a</sup>

Model	Variables Entered	Method
1	ln_SLE	Stepwise (Criteria: Prob-of-F-to-enter ≤ .050, Prob-of-F-to-remove ≥ .100)
2	ln_IR	Stepwise (Criteria: Prob-of-F-to-enter ≤ .050, Prob-of-F-to-remove ≥ .100)
3	ln_IER	Stepwise (Criteria: Prob-of-F-to-enter ≤ .050, Prob-of-F-to-remove ≥ .100)
4	ln_UR	Stepwise (Criteria: Prob-of-F-to-enter ≤ .050, Prob-of-F-to-remove ≥ .100)
5	RE	Stepwise (Criteria: Prob-of-F-to-enter ≤ .050, Prob-of-F-to-remove ≥ .100)

a. Dependant Variable: ln\_GDP

⟨Table A-2⟩ Model Summary <sup>f</sup>

Model	R	R Square	Adjusted R Sq.	Standard Error	Durbin-Watson
1	.796 <sup>a</sup>	.633	.631	.7214	
2	.842 <sup>b</sup>	.709	.705	.6452	
3	.886 <sup>c</sup>	.785	.780	.5566	
4	.902 <sup>d</sup>	.814	.808	.5200	
5	.912 <sup>e</sup>	.832	.826	.4952	1.958

a. Predictors: (Constant), ln\_SLE

b. Predictors: (Constant), ln\_SLE, ln\_IR

c. Predictors: (Constant), ln\_SLE, ln\_IR, ln\_IER

d. Predictors: (Constant), ln\_SLE, ln\_IR, ln\_IER, ln\_UR

e. Predictors: (Constant), ln\_SLE, ln\_IR, ln\_IER, ln\_UR, RE

f. Dependant Variable: ln\_GDP

〈Table A-3〉 ANOVA for Model 5<sup>b</sup>

Model	Sum of Squares	d.f.	Mean Square	F	Sig. F
Regression	157,182	5	31,436	128,211	.000 <sup>a</sup>
Residual	31,630	129	.245		
Total	188,812	134			

a. Predictors: (Constant), ln\_SLE, ln\_IR, ln\_IER, ln\_UR, RE

b. Dependant Variable: ln\_GDP

〈Table A-4〉 Coefficients for Model 5<sup>a</sup>

Model 5	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3,669	.616		5,956	.000		
ln_SLE	1,222	.323	.246	3,787	.000	.307	3,253
ln_IR	-.434	.059	-.283	-7,307	.000	.864	1,157
ln_IER	.888	.129	.402	6,884	.000	.380	2,632
ln_UR	-.174	.044	-.156	-3,955	.000	.855	1,170
RE	.441	.116	.173	3,792	.000	.625	1,599

a. Dependant Variable: ln\_GDP

〈Table A-5〉 Multicollinearity Diagnostics for Model 5<sup>a</sup>

Dimension	Eigen value	Condition index	Variance Proportions					
			Constant	ln_SLE	ln_IR	ln_IER	ln_UR	RE
1	4,996	1,000	.00	.00	.00	.00	.01	.01
2	.720	2,634	.00	.00	.01	.00	.03	.50
3	.182	5,233	.00	.00	.11	.00	.78	.06
4	9,272E-02	7,340	.00	.00	.75	.01	.04	.24
5	6,546E-03	27,626	.34	.01	.07	.55	.15	.02
6	1,773E-03	53,083	.65	.99	.06	.43	.00	.17

a. Dependant Variable: ln\_GDP

The collinearity diagnostics output for our data is shown in <Table A-4> and <Table A-5>. The first method to detect multicollinearity is to check Variance Inflation Factor (VIF) and tolerance. It is suggested that when VIF is greater than 10 or tolerance is small than 0.1, then the regression coefficients are poorly estimated. As none of the tolerance values for ln\_SLE, ln\_IR, ln\_IER, ln\_UR, and RE is smaller than 0.1 (Table A-4), there is no evidence of multicollinearity in our data

based on the tolerance values alone. The Multicollinearity Diagnostics in <Table A-5> is an alternative method of assessing if there is too much multicollinearity in the model. A rule of thumb is that a condition index over 30 may suggest serious collinearity problems and an index over 15 may indicate possible collinearity problems. If a dimension has a high condition index, one looks in the variance proportions column. If two or more variables have a variance proportion of 0.50 or higher on a factor with a high condition index, these variables have high linear dependence. <Table A-5> shows that one of the condition indices is 53.083. Although Dimension 6 in <Table A-5> has a high condition index larger than 30, multicollinearity is not a problem, because only one variable (ln\_SLE) has a sizable proportion of variance larger than 0.50 in the variance proportions. Considering the variance proportions, the tolerance values as well as the condition index, no multicollinearity is evident. We found that the assumption of independence of errors is satisfied as  $D. W. = 1.958$  (Table A-2). The assumptions of normality and homoscedasticity are also satisfied in the Normal Probability Plot and the Scatter plot of Residuals: the normal probability plot was close to a 45-degree line under perfect normality and heteroscedasticity was shown by a cluster of points that is fairly homoscedastic as the values for the standardized predicted dependant variable get larger.

We found that a religion variable is not excluded in the regression models and that Christianity has a plus effect on an economic variable. Although admitting the existence of a variety of explanatory variables affecting economic variables, we conclude that there is a strong causal relationship between religion and economy based on the above discussion.

“이 논문은 다른 학술지 또는 간행물에 게재되었거나 게재 신청되지 않았음을 확인함”

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## 논문초록

### 종교별 노동윤리 및 경제성장

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본 논문에서는 세계 주요 종교를 대상으로 각 종교별 노동윤리를 정성적으로 비교 분석한 후, 각 종교 국가군 별로 일인당 평균 국민총생산액에서 차이가 나는지를 평균 차이 검증을 통하여 정량적으로 분석하였다. 문헌분석을 통하여 개신교와 천주교를 아우르는 기독교는 타 종교에 비하여 노동에 대하여 상대적으로 높은 가치를 부여하고 있다는 사실을 발견하였다. 실증분석 결과에서도 기독교 국가군이 비기독교 국가군에 비하여 일인당 소득에 있어서 통계적으로 확실한 평균 차이가 있음을 알 수 있었으며, 그 차이는 약 2배로 나타났다. 북미와 유럽의 개신교 및 천주교 국가군의 일인당 평균 국민총생산액 비교에서는 개신교 국가군이 약간 높은 것으로 나타났으나, 통계적으로는 유의한 평균 차이가 존재하지 않았다. 그러나 이들 국가군들은 기타 비교 종교 국가군들과는 의미 있는 평균 차이를 보였으며, 적게는 3배 크게는 7배의 높은 소득수준 차이를 시현하였다.

**주제어:** 노동윤리, 종교, 경제성장