Culture, institutions, and long-run performance

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Abstract

If institutions are essential for long-run performance, why don't developing countries adopt institutions in developed countries to become rich? In this dynamic model, culture affects a ruler's institutional choice, while culture itself evolves endogenously. Multiple stable steady states are possible, and even similar initial conditions can lead to dramatically different steady states. The state of Qin's unification of China in 221 BC is used to illustrate the model. In one steady state, consistent with what happened in the state of Qin, individuals value material incentives. Qin did not strictly practice the patriarchal clan system advocated by Confucianism. Qin adopted Legalist institutions under which government officials were chosen by merit, and Qin culture was further shaped by Legalism. In another steady state, consistent with what happened in states other than Qin, individuals value loyalty and family values. Those states chose not to adopt Legalist institutions comprehensively for fearing that inconsistencies between culture and institutions could lead to internal rebellions even though institutional reforms would increase their military power. Other cases of how the interdependence between culture and institutions affects performance are also discussed.

Keywords: Culture and institutions, Chinese history, economic development, political economy, path dependence

JEL Classification Numbers: D02, N45, O53, Z10

1. Introduction

Scholars have debated the relative importance of geography, culture, and institutions in affecting a country's long-run performance (North, 1990; Diamond, 1997; Iannaccone, 1998; Zhou, 2011a).[1] Many economists believe that institutions are essential. Then one question is the following: why don't developing countries adopt institutions in developed countries to become rich?[2] To shed light on this question, we can gather hints from historical events in ancient China.

Hundreds of political units competed in the Spring and Autumn period (770 BC- 476 BC) and the Warring States period (476 BC -221 BC) of China. Regional populations were growing (Zhou, 2009), and vassals extended their authority beyond their original fief centered on a town,

[1] Diamond (1997) has argued that geographical conditions can affect possibilities of the domestication of large animals, the kind of contagious diseases, the development of agriculture, thus a region's long-run performance. Gallup, Sachs, and Mellinger (1999) have tested how geographical conditions affect the spread of diseases and economic development. Iannaccone (1998) illustrates the impact of religion (an aspect of culture) on economic performance. Zhou (2011a) compares growth rates for a market economy and a planned economy.

[2] A country's sustained growth depends on technical progress and China's strong state capacity helps developing technological capabilities in the last four decades (Zhou, 2018b).

bringing the countryside into the fold. That is, providing citizenship or land rights to peasants in the countryside in exchange for taxes and military services (Hui, 2005). During this process, stronger states frequently annexed weaker ones. Near the end of the Warring States period, there were still seven major states competing with one another. In 221 BC, the state of Qin completed conquering others and unified China. This is the first time that China became unified and is a historical event with great significance.[3] Why was the state of Qin the eventual winner in the competition to unify China?

Confucianism and Legalism were the two prominent philosophies at that time. As illustrated in Zhou (2011b), Confucianism emphasizes family value and views the country as an extended family. This school believes that human nature is good. While material incentives are despised, loyalty and filial piety are viewed as important virtues. Confucianism idealizes tradition and is associated with the system of enfeoffment under which nobles controlled politics. This school does not value the buildup of military capacities because Confucianism believes that moral persuasion is a better tool than military strength in handling international affairs. Legalism gets its name because this school argues that law should be applied equally to all citizens rather than treating nobles and commoners differently. The main purpose of Legalism is to help the ruler to win wars. Under Legalism, individuals are encouraged to be loyal to the ruler rather than to families or clans. This school assumes that persons are selfish (rational). Instead of seeking officials with high morale, this school emphasizes institution-building.[4] Legalism endeavors to solve real-world problems, does not try to find inspirations from the past, and is associated with the commandery-county system under which merits rather than blood are the criterion to select government officials. It is generally agreed that Legalist institutions introduced through the Reforms of Shang Yang played the most significant role in determining Qin's unification of China (Li, 1977, p. xiii; An, 2014, p. 6).[5]

The Qin dynasty did not last very long. Shang Yang and Legalism have received quite divergent assessments in China's history (Li, 1977, Introduction). In the following Han dynasty,

[3] The unification of China affected China's institutions and culture fundamentally (Zhou, 2018a). After unification, Qin Shihuang established a common language, measure, currency, and behavioral mode in China more than two thousand years ago.

[4] Han Fei argues that institutions should be designed in such a way that they can be operated even by a ruler with average abilities. That is, performance of institutions should not rely on superb abilities of a ruler.

[5] For example, Jia Yi in the Han dynasty has argued that the rise and fall of Qin was a result of the practice of Legalist institutions (Li, 1977, p. xxvii).

Emperor Liu Che adopted Confucianism as the national philosophy. This adoption does not mean Legalism became irrelevant in China's history. Emperor Liu Che engaged in large-scale military campaigns, inconsistent with Confucianism. Actually, the national strategy of governance at that time can be viewed as Confucianism appearance with Legalism essence (Zhou, 2011b; An, 2014, p. 2; Zhao, 2015): Confucianism was used to cover the cold-blood image of Legalism.[6] The following dialogue between Emperor Liu Xun and his crown prince Liu Shi in the Han dynasty illustrates this point. Liu Shi suggested to his father to rely more on Confucianism and less on punishments to rule. Liu Xun was angry and scorned his son by stating that the rule of Han dynasty relies on a combination of forces and benevolence. Liu Xun was upset that his son's strong belief in Confucianism might lead to a decline of the rule by the royal family (Ban, 1997). It is generally agreed that institutions of all following Chinese dynasties were built on Qin institutions (Li, 1977, p. lxi; An, 2014, p. 13). For example, Han dynasty adopted almost all Qin institutions intact (An, 2014, p. 57).

Even though we agree that the adoption of Legalist institutions was crucial for Qin's unification of China, there are still some important questions to be addressed. First, if institutions were so vital for a state's fate, why didn't other states such as Wei (魏) reform to adopt Qin's institutions more suitable for survival?[7] One reasonable answer to this question is that a state's culture affects its choice of institutions. Since cultures in other states were different from that in Qin, adoption of Qin's institutions could lead to internal rebellions, and rulers in other states thus chose not to do so. Second, however, culture itself is not exogenously given and is evolving over time. Why didn't culture in other states evolve in such a way to make the adoption of Qin's institutions more likely? Overall, a dynamic model with culture and institutions endogenously determined is needed to understand long-run performance of states.

In this paper, we use a model on the interdependence between culture and institutions to explain issues such as Qin's unification of China. In this model, to handle internal rebellions and

[6] Legalists argue that punishment should be severe so that violations of law will be deterred. Many people view Legalists as being cold-blooded. Han Fei, a brilliant scholar and the synthesizer of Legalist ideas, illustrates the ideas of Legalism clearly. To win wars, scarce resources should not be wasted. Thus, the ruler should reward desired behavior and punish undesirable behavior. Han Fei applies the above principle to synthesize Legalist ideas. As a great scholar, he avoids internal contradiction of his theory. However, this principle implies that poor and starving people should not be helped by the government because merits rather than poverty should be rewarded.

[7] Wei could mean either 魏 or 卫 in Chinese, and both 魏 and 卫 were names of states in the Spring Autumn and Warring States periods. Chinese characters will be added when there may be confusion about the meaning of words.

external threats, a ruler chooses between two types of institutions to adopt: Confucianism and Legalism. The adoption of Legalist institutions means inherited positions will be eliminated and government officials are appointed by merit. On the one hand, culture affects the ruler's choice of institutions because an increase in the level of inconsistency between culture and institutions will increase the possibility of internal rebellions. On the other hand, culture evolves endogenously in this model and its evolution is determined by direct socialization with parents and indirect socialization with social environment (Bisin and Verdier, 2001).

We show that multiple steady states may exist. In one steady state, a high percentage of the population values material incentives and the ruler adopts Legalist institutions. This steady state is consistent with what happened in the state of Qin, which did not strictly practice the patriarchal clan system advocated by Confucianism and where officials were appointed by merits. In another steady state, a low percentage of the population values material incentives and the ruler adopts mainly Confucian institutions. The second type of steady state is consistent with what happened in the other six states. The practice of patriarchal clan system in those states led to powerful elites and nobles' monopoly of government positions. Adoption of Legalist institutions would imply elimination of inherited positions for nobles and would lead to internal rebellions. Thus, rulers in those states chose not to adopt Legalist institutions as comprehensively as Qin.

While the state of Qin succeeded in unifying China, we are not arguing that Qin's culture was superior to cultures in other states. Military strength and cultural sophistication are two different things. In China's history, King Wu of Zhou succeeded in overthrowing the rule of Shang. However, it is believed that culture in Zhou lagged that of Shang (Creel, 1970).

In this paper, we refer to institutions only as formal rules in order to differentiate institutions from culture and norms (Alesina and Giuliano, 2015). The literature on culture, institutions, and economic performance is growing quickly, as illustrated in Guiso, Sapienza, and Zingales (2006) and Alesina and Giuliano (2015). One issue that scholars have studied intensively is how generalized trust affects economic performance (Francois and Zabojnik, 2005; Tabellini, 2010; Gorodnichendo and Roland, 2017). This paper is directly related to models studying the interaction between culture and institutions, such as Tabellini (2008) and Binder and Francois (2011). Tabellini (2008) has addressed the interaction between values and formal enforcement. In his model, distance between individuals affects the benefit of cooperation. Strategic complementarities in terms of the parents' education of children into cooperative type exist. When

institutions are chosen through majority voting, he shows that an economy may be trapped in a state with inefficient institutions. Binder and Francois (2011) have examined the interaction between trust and institutions. In their model, individuals may be rational, honest, or dishonest. A rational individual will cheat if it is beneficial to do so and the quality of institutions determines the probability that cheating is detected. The focus of their model is significantly different from that of this paper. To motivate their empirical research, they are mainly interested in how country size affects the choice of institutions. To understand whether rulers in states other than Qin were rational because they did not adopt Legalist institutions as comprehensively as Qin, we are mainly interested in whether multiple stable steady states exist. In their theoretical model, Bisin and Verdier (2017) have established conditions such that culture and institutions complement each other. This paper contributes to the literature on the interdependence between culture and institutions by focusing on a novel dimension-the basis upon which individuals are appointed to government positions (merit versus inheritance) and individuals' attitudes toward this.

The plan of the paper is as follows. Section 2 presents and compares major institutional reforms in the Warring States periods. To motivate the model, cultural differences between the state of Qin and other states are illustrated to explain why other states did not follow the Reforms of Shang Yang in reforming their institutions. Section 3 sets up the model and studies the existence of multiple stable steady states. Section 4 uses the period of Northern and Southern dynasties (386 - 589) in ancient China and the fall of King Pahlavi in Iran to illustrate how the interdependence between culture and institutions affects long-run performance. Section 5 concludes.

2. Culture, institutions, and Qin's unification of China

In this section, we discuss major institutional reforms in the Warring States periods and the role of culture and institutions in Qin's unification of China.

2.1. Major institution reforms in the Warring States period

During the Spring and Autumn and the Warring States periods, the adoption of iron in agriculture led to large increases in productivities and population (Yang, 1955). A larger population increased the demand for land and led to inter-state wars. To avoid annexation, states

engaged in reforms to increase military power (Hui, 2005, pp. 178-190).[8] For example, with the new emphasis on infantry rather than chariots in fighting, military service was extended to peasants. This undercut the power and privileges of the aristocracy and led to their oppositions. For instance, when Zichan reformed in the state of Zheng, inhabitants of the capital town opposed the extension of military levy into the countryside. In this subsection, we briefly illustrate and compare major institutional reforms in the Warring States period.

First, Marquis Wen (472 BC -396 BC), the first ruler of the state of Wei (魏), conducted reforms in Wei. Wei's location did not benefit its defense because enemies could come from all directions. Faced with significant external threats, Marquis Wen tried to reform. Li Kui, a pioneering Legalist, became a high-ranking official. He eliminated prerogatives of nobles and used incentives to elicit desired behaviors. With the reforms, the state of Wei was the first superpower in the Warring States period and maintained its position for more than one hundred years, until it was defeated by the state of Qi during the Battle of Maling in 342 BC.

Second, Wu Qi, a professional trying everything (such as killing his wife to win trust) to get opportunities to use his skills and to establish his fame, reformed in the state of Chu.[9] Wu Qi initially provided his service in the state of Wei under Marquis Wen. Envied by a member of the noble family (Gong Shu Zuo), Wu Qi escaped from the state of Wei during the rule of Marquis Wu to the state of Chu (Sima, 1988, pp. 523-525). From 386 BC to 381 BC, King Dao of Chu employed Wu Qi as prime minister to reform. To concentrate scarce resources on military purposes, Wu Qi reduced the stipends of nobles and eliminated redundant government positions. Since their interests were harmed, nobles killed Wu Qi after King Dao died from a disease. To appease the nobles, the new king reversed some reform measures. With reform aborted, noble families again controlled important government positions in Chu.

[8] Guan Zhong (approximately 720 BC- 645 BC) conducted an early institutional reform in the state of Qi under Duke Huan. To increase state's direct control of citizens, Guan Zhong placed citizens into an organizational framework not necessarily associated with clans. He also took measures such as producing salt from sea and opening mines to produce metals to make Qi richer. With the reforms, the state of Qi became a hegemony (Sima, 1988, pp. 257-259). Compared with the Reforms of Shang Yang about three centuries later, the reforms in Qi did not focus on increasing military power. Actually, Guan Zhong tried to use moral rather than military power to help Duke Huan to win hegemony.

[9] As pointed out by a referee, the central government's ability to control the country was helped by the lack of a consistent powerful challenge to the central government in the Chu territories. Relative to some states, there were few powerful aristocratic families with fiefs in Chu. The kinship system and hereditary traditions were relatively weak in Chu and the Chu king took lands away from aristocrats and moved them around with some ease (Creel, 1964).

Third and finally, Shang Yang conducted his milestone reforms in the state of Qin. Before the Reforms of Shang Yang, Qin lost large tracts of territory along the west bank of the Yellow River to the state of Wei (Hui, 2005, p. 65). This loss opened Qin to further invasions and increased Qin's incentives to reform. Under Duke Xiao who ruled from 361 BC to 338 BC, Shang Yang, an important Legalist, introduced historical reforms in the state of Qin (Lin, 1981a, p. 175). The Reforms lasted for about twenty years. Compared with the above reforms, Reforms of Shang Yang in Qin came later, but were much more comprehensive and successful (Hui, 2005, chap. 2).

Duke Xian of Qin (father of Duke Xiao) took various measures to reform, which laid the foundations of the Reforms of Shang Yang. Duke Xian was a refugee living in the state of Wei for almost thirty years and was well informed of Wei's reform. Under Duke Xian, first, Qin moved its capital from Yongcheng to Yueyang. At the new capital, the influence of nobles who might oppose reforms was smaller. Second, Duke Xian introduced the tax system in which the amount of land determined the amount of tax, regardless of whether land was privately or public owned. Third, Duke Xian established counties in some regions near Qin borders. Since Qin did not have counties previously, this was an organizational reform. This reform prepared the further adoption of counties throughout the state of Qin by Shang Yang.

Shang Yang also lived in the state of Wei before moving to Qin to pursue his fortune, and he was also well informed of the reforms in the state of Wei. During the Reforms, Qin moved its capital further from Yueyang to Xianyang (Lin, 1981a, p. 189). In addition to unifying measure, Shang Yang implemented various policies. First, individuals could keep privately claimed land. Incentives such as providing tax benefits were provided to attract immigrants from other states to engage in agricultural production, so that Qin natives could specialize on military campaigns. Second, Legalism was adopted as the national philosophy which emphasized institution-building and the usage of incentives in eliciting behavior desired by the state. Shang Yang eliminated inherited positions for nobles and individuals needed military achievements to get promotions. Third, before the Reforms, some regions were organized as counties while other regions were ruled by Great Officers. During the Reforms, Shang Yang organized those regions into counties (Lin, 1981a, p. 188). Since county officials were appointed by the ruler of Qin while Great Officers were

inherited positions, the adoption of the county system throughout the whole state reduced the power of nobles and increased the ruler's direct control of resources.[10]

With interests harmed, nobles opposed Shang Yang's reforms. Even the crown prince violated the law, and his two teachers were punished by Shang Yang (Sima, 1988, pp. 545-549). After Duke Xiao's death, the crown prince became the new ruler: King Hui of Qin. After a failed escape, Shang Yang was captured and killed by King Hui, but King Hui kept the reform measures. After Qin unified China, Qin institutions spread to other parts of China. While the Qin dynasty did not last long, later dynasties either adopted Qin's institutions or their institutions were built on Qin's institutions (An, 2014, p. 13). In this sense, Shang Yang is frequently viewed as the chief architect of the Chinese state (Li, 1977, p. xiv).

Before the Reforms of Shang Yang, without the practice of patriarchal clan system in Qin, even slaves in other states could become high-ranking officials in Qin. One example is Baili Xi, who was a slave in the state of Jin, served as a prime minister in Qin (Sima, 1988, p. 41). After the Reforms of Shang Yang, Qin further opened its door and attracted talented individuals from other states. Many high-ranking officials in Qin such as Fan Ju and Li Si came from other states. Those talented foreigners helped Qin to develop first-class strategies.[11] A frequent problem faced by the states was that talented persons serving the same ruler could be envy of each other. Even though high-ranking officials in Qin might also sabotage one another, Shang Yang eliminated inherited positions and further opened many slots for ambitious individuals trying to improve their fortunes, and Qin could keep on attracting talents from other states.

While inter-state wars and coalition strategies among states had important direct effects (Hui, 2005, chap. 2), institutions introduced through the Reforms laid the foundations for Qin to unify China. With the introduction of iron in producing weapons, wars became large-scale at that

[10] Creel (1964) argues that Chu was the first state to adopt counties. Chu's relatively stronger central authority (i.e. the relatively weaker lineage families throughout the country) might have contributed to this early appearance of a county system. Before the adoption of the county system, the power of Great officers was high. There are numerous cases that power struggle between the ruler and Great Officers led to regime changes in the Warring States period. For example, in the state of Qi, a Great Officer usurped the power even though the name of the state was kept. In the county system, local officials were rotated every few years and might not be allowed to serve in their hometown area (Edwards, 2009).

[11] For example, Fan Ju suggested the strategy of befriending states far away from Qin while attacking those nearby, thus avoiding useless occupation of territories not adjacent to the state of Qin (Lin, 1981a, p. 260). Li Si established the order of conquering other states by pointing out that the state of Han (韩) should be conquered first. Han was next to Qin and was the weakest among the other six states. The conquest of Han made it easier for Qin to attack other states.

time. In the Warring States period, the seven major states had soldiers ranging from 300,000 to one million (Yang, 1955). Without a strong economy, it would be impossible to maintain a large standing army. To win wars, soldiers need to be supplied with food. Thus, it is essential to increase food production and to ensure that the produced food is not wasted. After the Reforms, with more land and people, agricultural production in Qin increased, and the government directed agricultural output effectively to military purposes. The impact of the Reforms of Shang Yang can be seen from the evolution of the size of the region ruled by Qin. In year 350 BC, the region ruled by Qin during the Reforms was smaller than that ruled by the state of Chu (Tan, 1982, pp. 33-34). After the Reforms, the region ruled by Qin increased over time and began to be larger than that ruled by Chu. Eventually, Qin annexed all other states.[12]

2.2. Why was the state of Qin the eventual winner to unify China?

Geography, culture, and institutions played important roles in affecting states' fates during the Warring States period. A combination of these factors provides a satisfactory explanation of why the state of Qin was the eventual unifier of China. First, in terms of geography, Qin was located in an easily defensible area in western China. After Qin conquered nomadic groups on its west, enemies mainly came from the east side. Qin's topological conditions made the state easy to defend and hard to conquer (Lin, 1981a, p. 237). This advantage is clear when compared with the state of Han (韩). Han was surrounded by other powers from all sides and frequently got attacked. However, geographical conditions alone could not provide a satisfactory answer in explaining Qin's success: while geographical conditions were relatively fixed, which state was strongest changed hands several times in the Spring and Autumn and the Warring States periods. Qin's dominance over other states was firmly established only after the Reforms of Shang Yang (An, 2014, p. 13). In addition, states such as Chu (located in the southern part of China) and Yan (located in the northern part of China) might also have enjoyed geographical advantages. Geographical conditions may also affect performance through affecting culture and institutions. However, for simplicity we do not study the impact of geography in this model. Second, Qin's culture was different from other six states'. During prolonged periods of wars with nomadic groups, Qin

[12] Qin's unification of China lasted for less than twenty years. The Qin state was established to support fighting wars. While laws and rules were strict and harsh, rewards from performing well in battle were also high. After Qin unified China, there was no more large pieces of fertile land to take over and the people lived under a harsh state without the previous benefits. This led to the collapse of the Qin when peasants rebelled (Hui, 2005).

developed a culture that emphasized performance rather than ideology (Ran, 1957). Influence of Confucianism such as the practice of primogeniture was less in Qin than that in other states. Lack of practice of primogeniture reduced the power of nobles and made the Reforms of Shang Yang possible and successful. Third, for the role of institutions, as discussed previously, the Reforms of Shang Yang laid the foundation for Qin to unify China.

While Qin could imitate Wei in reforming institutions, why didn't other states follow Qin in reforming their institutions? For example, the state of Wei might have introduced another round of reforms by imitating Qin's practice. In terms of the amount of time needed to respond, reforms by other states were possible because more than one hundred years passed between the Reforms of Shang Yang and Qin's unification of China. For a period lasting more than one hundred years, other states obviously recognized threats from Qin. There are some examples that institutional adoptions were feasible during this period. First, after the Reforms of Shang Yang, the state of Zhao engaged in a reform to adopt habits of nomadic groups in fighting wars. Second, in the state of Yan, King Zhao engaged in reforms, attracted capable foreigners such as Le Yi, and succeeded in defeating the state of Qi (Sima, 1988, pp. 632-633). While all other six states during the Warring States period engaged in some reforms (otherwise they might have already been annexed much earlier), none of them adopted institutional reforms as comprehensively as Qin did.

Difference in culture was a key factor that can be used to explain why other states did not introduce reforms as comprehensively as the Reforms of Shang Yang. Initially Qin ancestors raised horses for the Zhou ruling house (Sima, 1988, p. 41), and the development of Qin culture lagged that of other states (Lin, 1981a, p. 26; An, 2014, p. 7). In fact, none of the first-class scholars at that time (such as Han Fei) was a native of Qin (Lin, 1987). Language and religion are important aspects of culture and language and religion in Qin were different from other states (Lin, 1987; Liu, 1990; He, 1999). Languages in Qin and other six states originated from language in the Zhou dynasty. While there were regional variations of languages in the other six states, they still belonged to the same system. However, the Qin language was a separate system. Compared with the other six states, development of religion in Qin was at a lower level, focusing more on deities related to daily lives. Consistent with Confucianism, religions in the other six states focused more on deities related to ancestries (He, 1999).

Patriarchal clan system is the most important aspect of Confucianism (Lin, 1987). Under this system, the eldest son of the legal wife of the king inherited the country and other sons of the

king became Great Officers. Similarly, the eldest son of the legal wife of a Great Officer became a Great Officer and other sons became *shi* (士). Under this system, employing individuals of low origins as officials could lead to rebellions and the death of the ruler because only the nobles had the right to rule. The practice of the patriarchal clan system in the six states means that high ranking positions were monopolized by nobles and the placement of foreigners into high-ranking positions was very limited in those states. For example, in the state of Chu, three noble families (Zhao, Qu, and Jing) controlled high-rank positions. All three families were relatives of Chu kings. In the state of Qi, it was also difficult for foreigners to obtain high-ranking positions. The practice of the patriarchal clan system led to powerful nobles because this system led to the existence of Great Officers with their own military forces and inheritable territories. The practice of the patriarchal clan system explains why reforms in other states such as Chu were not so successful. Inherited nobles in Chu were powerful enough to rebel when the introduction of Legalist institutions reduced or eliminated inherited positions. In general, culture in the other six states prevented them from adopting reforms as comprehensive as Qin did. For example, Confucianism had huge influence in the state of Qi. Adoption of Legalist institutions in a comprehensive way would increase possibilities of internal rebellions. Thus, rulers in other states chose not to do so.

A distinct feature of Qin culture is that the patriarchal clan system was not strictly enforced (Ran, 1957; Lin, 1981a, p. 80, p. 85).[13] For this reason, other states referred Qin people as barbarians (Ran, 1957) and Qin was not invited to important meetings among vassals before the Reforms of Shang Yang (Lin, 1981a, p. 176). The decisive factor in selecting the next king in Qin was that the candidate should be brave and strong, and the eldest son of the legal wife might not be favored. For example, for the nine kings from Duke Xiang to Duke Mu, only two of them were the eldest sons. After Duke Mu, Qin still did not practice primogeniture in selecting kings (Lin, 1987). Qin's conflicts with other states during the Warring States period were both military and cultural (Liu, 1990; He, 1999). The other six states regarded Qin as different from them: Qin was viewed as a state of "tigers and wolves", cruel and not to be trusted (Sima, 1988, p. 556).[14] The other six states did not use this nomenclature to refer to one another (He, 1999).

[13] Lin (1981b, p. 18) states that the most important feature of the political system of Qin is that Qin did not practice the patriarchal clan system ("秦国的政治制度最大的特点，就是没有实行分封制"), see also Lin (1981a, p. 80).

[14] The behavior of Shang Yang illustrates the cold-blooded image of Legalists well. When he lived in Wei, he was well treated by Prince Ang of Wei. After Shang Yang moved to Qin, he led an army of Qin fighting with one led by Prince Ang. Shang Yang exploited the trust of Prince Ang to kidnap him and defeated the Wei army (Sima, 1988, p. 547). Later, Shang Yang paid for his cheating: when wanted by King Hui of Qin, Shang Yang ran away to Wei. Wei

The fate of the state of Jin can also be used to illustrate the impact of culture on long-run performance. Since Duke Wu of Jin came from the family of a younger son rather than the oldest son of a king (Sima, 1988, p. 313), the state of Jin then sent princes out of the state to prevent younger princes usurping power from happening again. Like Qin, Jin also rewarded military performance and this led to the rise of powerful clans such as Wei, Zhao, and Han not closely related to the royal family. Jin's culture allowed the land of those clans to be inherited. Over time, Wei, Zhao, and Han became too powerful and divided land of Jin and the state of Jin disappeared (Sima, 1988, p. 334).

Even though Legalism originated outside Qin, with its match with Qin's culture, ideas of this school were widely adopted only in Qin. While culture affected a ruler's choice of institutions, institutions also affected the evolution of culture. Institutions introduced through the Reforms of Shang Yang made the culture of Qin further different from those in other states. The Reforms made residents even more interested in material interests. Residents in Qin were characterized as intolerant, narrow-minded, and more interested in short run gains, while residents in Qi and Lu (hometown of Confucius) were characterized as tolerant and slow (He, 1999). After Qin unified China, Qin culture was promoted throughout China. Cultural conflicts between Legalism and Confucianism eventually led Qin Shihuang to burn non-Legalist literature and to bury Confucian scholars alive (Lin, 1990).

To summarize, Qin's culture affected Qin's institutional choice because lack of the patriarchal clan system made it less likely for nobles to accumulate power over generations and thus Qin could choose officials by merit,[15] while Qin's institutional choice again affected Qin's culture. Similar initial conditions can lead to dramatically different long-run performance. The following model will try to capture the interdependence between culture and institutions.

3. The model

still remembered his cheating and did not accept him as a refugee. Shang Yang was thus caught and killed by King Hui.

[15] Qin's emphasis on merit can be seen from the data in He (1996) who presents a table of significant families at that time. While Chu has 20, Qi has 33, Qin has only 3 (p. 112). For notable individuals belonging to powerful clans, Chu has 122 out of 279, Qi has 137 out of 273, while Qin has 8 out of 58 (p. 114). For the ratio between individuals from significant families and others, Chu has a ratio of 122 to 74, Qi has a ratio of 137 to 57, while Qin has a ratio of 8 to 22 (p. 115).

Time is discrete. Variables carry a subscript t. However, frequently subscripts may not be used if there is no confusion from doing this. The size of the population does not change over time and is normalized to one. There are two types of individuals in the population: C-type or L-type. An individual following Confucianism is C-type. For C-type individuals, they believe that government positions should be inherited. An individual following Legalism is L-type. For L-type individuals, they believe that government officials should be chosen by merit. The percentage of L-type individuals in period t is s_t. An individual lives for one period. Each individual has only one parent and only one child. All individuals are risk neutral.

The timing of events is as follows. First, given the percentages of distinct types of individuals, a ruler at the beginning of a period chooses the percentage of officials selected by merit, which is G. Adoption of Legalist institutions means that a higher percentage of officials is chosen by merit. Second, individuals meet and establish projects. The ruler's choice of G affects the payoffs of individuals. Third, individuals decide the level of direct socialization of their children, which will affect the percentage of types of individuals in the next period. Finally, in the next period, a new ruler will choose the percentage of officials chosen by merit.

First, during the Spring and Autumn and the Warring States periods, rulers frequently got killed by their subordinates; many states were conquered by others and disappeared. Thus, internal rebellions and external threats were significant challenges faced by a ruler. Like Zhou (2012), internal rebellions and external threats affect the ruler's payoff in this model. If the ruler handles both successfully, his payoff is a constant normalized to one. Otherwise, his payoff is zero. The ruler chooses the percentage of government officials chosen by merit G to maximize his expected payoff. Thus, $G \in [0,1]$. Since adopting Legalist institutions increases military power, we specify that an increase in G indicates an increase in the military power of the ruler. The level of external threats is Ω, which is a positive constant. Following the literature on rent-seeking, the ruler handles external threats successfully with probability$\frac{G}{G+\Omega}$.

When the percentage of L-type individuals is s_t and the ruler's choice is G, the possibility that internal rebellions happen is$(G - s_t)^2$. The explanation of the possibility is as follows. First, if the percentage of officials chosen by merit is the same as the percentage of L-type persons ($G = s_t$), the ruler's choice is consistent with status quo and there is no internal rebellion. Second, if the ruler tries to increase the percentage of officials chosen by merit ($G > s_t$), new positions would have to be established by eliminating inherited ones. Those whose positions are eliminated may

rebel, and the possibility of internal rebellions increases when more inherited positions are eliminated. That is, the possibility of internal rebellions increases if the difference between the percentage of officials chosen by merit and the percentage of L-type individuals increases. Third, internal rebellions also happen if the ruler chooses a percentage of officials by merit lower than the percentage of L-type individuals ($G < s_t$) because incapable officials will reduce the payoffs of L-type individuals and L-type individuals may rebel. As shown later in Proposition 3, this case that the percentage of officials chosen by merit is lower than the percentage of L-type individuals will not arise in equilibrium. With this specification of the possibility of internal rebellion, if a higher percentage of individuals is L-type, the ruler will have an incentive to choose a higher percentage of officials by merit; If a higher percentage of individuals is C-type, the ruler will have an incentive to have a higher percentage of officials chosen by inheritance. That is, the state of culture in a country determines a ruler's institutional choice.

Since the possibility that the ruler survives internal rebellions is $1-(G-s_t)^2$ and his possibility of handling external threats successfully is $\frac{G}{G+\Omega}$, his expected payoff is $\frac{G}{G+\Omega}[1-(G-s_t)^2]$. The ruler chooses G to maximize his expected payoff, subject to the constraint that $0 \leq G \leq 1$. For λ_1 and λ_2 denoting costate variables, the Lagrange for this maximization problem is

$$\frac{G}{G+\Omega}[1-(G-s_t)^2]+\lambda_1 G+\lambda_2(1-G).$$

The following conditions are necessary for the ruler's maximization:

$$\frac{\Omega}{(G+\Omega)^2}[1-(G-s_t)^2]-\frac{2G}{G+\Omega}(G-s_t)+\lambda_1-\lambda_2=0, \quad (1)$$

$$\lambda_1 G=0,\ \lambda_1 \geq 0,\ G \geq 0,$$

$$\lambda_2(1-G)=0,\ \lambda_2 \geq 0,\ G \leq 1.$$

There are three cases for equation (1). In the first case, in an interior equilibrium the level of G is neither zero nor one. With $\lambda_1=0$ and $\lambda_2=0$, equation (1) becomes

$$\frac{\Omega}{G+\Omega}[1-(G-s_t)^2]-2G(G-s_t)=0. \quad (2)$$

In the second case, if $\lambda_2>0$, then $G=1$. Thus, equation (1) becomes

$$\frac{\Omega}{G+\Omega}[1-(G-s_t)^2]-2G(G-s_t)>0. \quad (3)$$

In the third case, if $\lambda_1>0$, then $G=0$. Thus, equation (1) becomes

$$\frac{\Omega}{G+\Omega}[1-(G-s_t)^2]-2G(G-s_t)<0. \quad (4)$$

Second, individuals are matched randomly to establish projects in each period. When individuals of the same type meet, an individual has a clear expectation and understanding of his or her partner, and they do not need the intervention of governmental officials. Thus, their payoffs will not be affected by the percentage of officials chosen by merit. Specifically, when a C-type individual meets with another C-type one, each gets a payoff of y from the project they establish, a nonnegative constant. When two L-type individuals meet to establish a project, each gets a payoff of b, a nonnegative constant. When individuals of different types meet to establish a project, they will disagree and need to go to government officials for dispute settlements. The possibility that an individual gets a favorable result is directly proportional to the percentage of officials with similar views. Let m and n denote positive constants. When an L-type individual meets with a C-type one, if the L-type individual receives a favorable treatment from an official, the payoff from the project is m; otherwise, the payoff is zero. Since the percentage of officials chosen by merit is G, when an L-type individual meets with a C-type one, the L-type individual's expected payoff from the project is mG. When an L-type individual meets with a C-type one, if the C-type individual receives a favorable treatment from an official, the payoff from the project is n; otherwise, the payoff is zero. Since the percentage of officials chosen through inheritance is $1 - G$, when an L-type individual meets with a C-type one, the C-type person's expected payoff from the project is $n(1 - G)$.[16]

For an L-type individual, this person meets another L-type one s_t percent of the time and a C-type one $1 - s_t$ percent of the time. Thus, an L-type individual's expected payoff is $s_t b + (1 - s_t)mG$. For a C-type individual, this individual meets an L-type one s_t percent of the time and another C-type one $1 - s_t$ percent of the time. Thus, a C-type individual's expected payoff is $s_t n(1 - G) + (1 - s_t)y$.

Third, the evolution of the percentage of L-type individuals is as follows. Following Bisin and Verdier (2001), the type of an individual is affected by parent (direct socialization) and social

[16] In this model, we specify that an L-type individual's payoff increases with the percentage of officials chosen by merit when an L-type individual meets with a C-type one. This assumption is motivated by the observation that once Legalist institutions are adopted, behaviors consistent with this school would be encouraged and rewarded. This assumption is not essential. Alternatively, we may assume that the payoff of two L-type individuals meet increases with the percentage of officials chosen by merit while the payoffs when an L-type individual meets with a C-type one and when two C-type persons meet are not affected by the percentage of officials chosen by merit. Results under this alternative assumption will be similar because what is important in this model is that an increase in the adoption of Legalist institutions will increase the payoffs of individuals with similar beliefs relatively more.

environment (indirect socialization). For $i, j = L, C$, the probability that a parent of type i will have an offspring of type j is q^{ij}. Between an L-type individual and her offspring, direct socialization takes place with probability d^L, where the superscript L means "Legalism". For indirect socialization which happens with probability $1 - d^L$, the offspring will meet an L-type individual with probability s_t. The possibility that an L-type individual having an L-type offspring is the sum of the possibilities of direct socialization and indirect socialization: $q^{LL} = d^L + (1 - d^L)s_t$. The possibility that an L-type individual having a C-type offspring is through indirect socialization only: $q^{LC} = (1 - d^L)(1 - s_t)$. The probability for a C-type parent to have the same type child directly is d^C, where the superscript C means "Confucian". Overall, the transition probabilities between types are as follows:

$$q^{CC} = d^C + (1 - d^C)(1 - s_t), \tag{5a}$$

$$q^{CL} = (1 - d^C)s_t, \tag{5b}$$

$$q^{LC} = (1 - d^L)(1 - s_t), \tag{5c}$$

$$q^{LL} = d^L + (1 - d^L)s_t. \tag{5d}$$

Plugging the value of q^{CL} from (5b) and the value of q^{LL} from (5d) into $s_{t+1} = s_t q^{LL} + (1 - s_t)q^{CL}$ yields

$$s_{t+1} - s_t = s_t(1 - s_t)(d^L - d^C). \tag{6}$$

We now study a continuous-time version of the model. From (6), the following equation determines the dynamics of the percentage of L-type individuals if time is continuous rather than discrete:

$$\dot{s_t} = s_t(1 - s_t)(d^L - d^C). \tag{7}$$

Following Francois and Zabojnik (2005), we specify that $d^L - d^C$ is an increasing function of the difference of payoffs to different types of individuals. This function is Φ and $\Phi' > 0$. We also specify that $\Phi(0) = 0$. Since the expected payoff difference between an L-type individual and a C-type one is $s_t b + (1 - s_t)mG - s_t n(1 - G) - (1 - s_t)y$, equation (7) yields

$$\dot{s_t} = s_t(1 - s_t)\Phi[s_t b + (1 - s_t)mG - s_t n(1 - G) - (1 - s_t)y]. \tag{8}$$

For the dynamics of the percentage of L-type individuals, we have

$$\dot{s_t} = \begin{cases} > 0 \; if \; s_t b + (1 - s_t)mG - s_t n(1 - G) - (1 - s_t)y > 0 \; and \; s_t < 1; \\ < 0 \; if \; s_t b + (1 - s_t)mG - s_t n(1 - G) - (1 - s_t)y < 0 \; and \; s_t > 0; \\ = 0 \;\; otherwise. \end{cases}$$

In a steady state, the percentage of individuals does not change over time. We remove subscripts for variables in a steady state.

Definition: A steady state is stable if there exists a $\bar{\varepsilon}$ such that for all $\varepsilon \in [0, \bar{\varepsilon}]$, $\dot{s}(G^*(s^* - \varepsilon), s^* - \varepsilon) > 0$ and $\dot{s}(G^*(s^* + \varepsilon), s^* + \varepsilon) < 0$.

The following proposition shows that a corner steady state in which all individuals are L-type always exists.

Proposition 1: The steady state $s = 1$ and $G = 1$ is stable if

$$b > 0. \tag{9}$$

Proof: When $s = 1$ and $G = 1$, (1) becomes $\frac{\Omega}{1+\Omega} \geq 0$. This inequality is always satisfied. Thus, there is no tendency for G to decrease. When (9) is satisfied, there is no tendency for s to decrease. ■

The intuition behind Proposition 1 is as follows. When all individuals are L-type and all officials are chosen by merit, the payoff of an individual of L-type is b, a positive number. If a child switches to a C-type, the payoff of a C-type paired with an L-type is zero. Since (9) is satisfied, it is more profitable to stay as an L-type rather than to become a C-type. Since it is not profitable for anyone to switch to C-type, the equilibrium that all individuals are L-type is always stable.

The following proposition establishes a condition for a corner steady state in which all individuals are C-type to be stable.

Proposition 2: The steady state $s = 0$ and $G = G^*$ defined by equation (11) below is stable if

$$G^* < \frac{y}{m}. \tag{10}$$

This equilibrium is less likely to be stable when external threats increase.

Proof: From (8), for the steady state to be stable, we need (10) to be satisfied.

For $s = 0$, equation (2) simplifies to

$$\Omega - 2G^3 - 3\Omega G^2 = 0. \quad (11)$$

For equation (11), an application of implicit function theorems shows that G is an increasing function of Ω. That is, when external threats increase, (10) is less likely to be valid. ■

The interpretation of (10) is as follows. Equation (11) defines $G^* = G^*(\Omega)$ and $\frac{dG^*}{d\Omega} > 0$. Inequality (10) indicates that if external threats is lower than a critical level determined by y/m, a steady state with everyone is of the Confucian type is stable. That is, a Confucian steady state is possible only if external threats are low. Proposition 2 is consistent with the observation of the Spring and Autumn and the Warring States periods that an increase in external threats increases the incentive for a ruler to reform. The intuition behind Proposition 2 is as follows: When all individuals are C-type, an individual's payoff is y. If a child switches to L-type, this individual will get an expected payoff of mG. If (10) is valid, it does not pay for a child to switch and the equilibrium that all individuals are C-type is stable.

A point (s^*, G^*) is an interior steady state if $\dot{s}(s^*, G^*) = 0$ and (2) is valid. In an interior steady state in which (2) holds with equality, an application of implicit function theorem shows that the result that a higher level of external threats will increase the ruler's incentive to adopt Legalist institutions is also valid in this case.

The following proposition shows that the percentage of officials chosen by merit is lower than the percentage of individuals of Legalist type will not arise in equilibrium.

Proposition 3: In an interior steady state, the percentage of Legalist institutions is higher than the percentage of L-type individuals: $G > s$.

Proof: In an interior solution, $\frac{\Omega}{G+\Omega}[1 - (G - s)^2] > 0$. From (2), we have $G - s > 0$. ■

The intuition behind Proposition 3 is as follows. The marginal benefit of increasing the percentage of officials chosen by merit is $\frac{\Omega}{(G+\Omega)^2}[1 - (G - s)^2]$ and the marginal cost is $\frac{2G}{G+\Omega}(G - s)$. When the percentage of officials chosen by merit is equal to the percentage of L-type individuals, the marginal benefit is strictly positive while the marginal cost is zero. Thus, it pays to have the percentage of officials chosen by merit higher than the percentage of L-type individuals.

We now study the existence, uniqueness, and stability of interior steady states. Equation (2) has two roots:

$$G - s = -\sqrt{1 + \frac{G^2(G+\Omega)^2}{\Omega^2}} \pm \frac{G(1+\Omega)}{\Omega}.$$

For the two roots, the root $G - s = -\sqrt{1 + \frac{G^2(G+\Omega)^2}{\Omega^2}} - \frac{G(1+\Omega)}{\Omega}$ is discarded because it violates $G > s$. The other root is kept. This root yields the following relationship between G and s:

$$\Psi_1 \equiv s + \sqrt{1 + \frac{G^2(G+\Omega)^2}{\Omega^2}} - G - \frac{G(1+\Omega)}{\Omega} = 0. \tag{12}$$

In equation (12), G increases with s.

In a steady state, the percentage of L-type individuals is constant. When the percentage of L-type individuals is neither zero nor one, from (8), the expected payoffs of the two types of individuals should be equal in a steady state:

$$\Psi_2 \equiv sb + (1-s)mG - sn(1-G) - (1-s)y = 0. \tag{13}$$

In an interior steady state, equations (12) and (13) form a system of two equations defining two endogenous variables G and s as functions of exogenous parameters. From (13), we have

$$G = \frac{sn+(1-s)y-sb}{sn+(1-s)m}. \tag{14}$$

Partial differentiation of this expression yields $\frac{\partial G}{\partial s} = \frac{mn-bm-ny}{[sn+(1-s)m]^2}$. Depending on whether $mn - bm - ny$ is negative or positive, there are two cases.

First, if $mn - bm - ny < 0$, equation (13) shows a negative relationship between G and s, and the two curves Ψ_1 and Ψ_2 may intersect at most once. If $\frac{y-m}{b+y-m} > 1 + \frac{1+\Omega}{\Omega} - \sqrt{1 + \frac{(1+\Omega)^2}{\Omega^2}}$, Ψ_2 is always above Ψ_1 and the two curves will not intersect, and no interior steady state exists. The case that the two curves intersect once is shown in Figure 1. When $mn - bm - ny < 0$, the interior steady state is unstable. Thus, the equilibrium shown in Figure 1 is unstable. In Figures 1 and 2, the dashed curve is Ψ_1 and the dotted curve is Ψ_2. Dynamics of the percentage of Legalist type persons over time is indicated via arrows. The economy always moves along the Ψ_1 curve, as indicated by the movement of the symbol ⊳. The steady-states are indicated by circles. The filled circles are stable, and the hollow ones are unstable.

[Insert Figure 1 here]

Second, if $mn - bm - ny > 0$, G increases with s. In this case, both Ψ_1 and Ψ_2 have positive slopes, they may not intersect, intersect once, or intersect multiple times. The case that the two curves intersect twice is shown in Figure 2. In Figure 2, for Ψ_2, when $G = 1$, $s = 1$ from equation (13) because $m > y$ is necessary for $mn - bm - ny > 0$.

[Insert Figure 2 here]

Since the sign of $mn - bm - ny$ is crucial in affecting the characteristics of the steady state, it is valuable to interpret the economics behind it. How to interpret $mn - bm - ny < 0$? Partial differentiation of equation (13) yields

$$\frac{\partial G}{\partial s} = -\frac{\frac{\partial \Phi_2}{\partial s}}{\frac{\partial \Phi_2}{\partial G}} = \frac{-[b+y-mG-n(1-G)]}{sn+(1-s)m}. \tag{15}$$

From (15), since $sn + (1 - s)m > 0$, $\frac{\partial G}{\partial s} < 0$ if and only if

$$b + y > mG + n(1 - G). \tag{16}$$

Inequality (16) can be interpreted as follows. Remember that b is the payoff to a Legalist when two Legalists meet and y is the payoff to a Confucian if two Confucian type persons meet. Also, when a Confucian meets with a Legalist, a Confucian gets n with probability $1 - G$ and a Legalist gets m with probability G. When inequality (16) is satisfied, it says that the total payoffs when the same type of persons meet is higher than the total expected payoffs when different types of persons meet. It is understandable that when inequality (16) is valid, it is more likely that individuals will be the same type in a steady state because total surplus is higher when individuals are of the same type than that when individuals belong to mixed types. That is, stable corner solution will be more likely when inequality (16) holds. In (16), G is endogenously determined. Plugging the value of G from (14) into (16) yields $mn - bm - ny < 0$.

From Propositions 1 and 2, if $G^* < y/m$, two stable corner steady states exist. Also, stable interior steady states may exist. The existence of multiple stable steady states can be used to explain why the state of Qin was the eventual unifier of China while other states did not engage in reforms as comprehensively as Qin did. With a culture different from those of other states, Qin adopted Legalist institutions comprehensively. The adoption of Legalist institutions again

increased the percentage of L-type individuals in Qin, and Qin ended up in a steady state with a high percentage of L-type individuals. While adopting Legalist institutions could increase military power, rulers in other states with a high percentage of C-type individuals did not adopt them for fear of internal rebellions, and those states ended up in another steady state. With a higher percentage of Legalist institutions, Qin's military capacity was higher than other states' and the state of Qin eventually conquered other states and unified China.

4. Other examples of interdependence between culture and institutions affecting long-run performance

In this section, we provide two additional examples to illustrate the interdependence of culture and institutions on long-run performance.

First, China was divided in the period of Southern and Northern dynasties. Even though regime changes were frequent in this period and various exogenous shocks affected performance, the interdependence between culture and institutions is still useful to illustrate different performance between the north and the south. In the north, land was occupied by various nomadic groups that established political regimes. Thus, the north was a mixture of Han (汉) and nomadic groups. For the influence of culture on institutions, since clans were not so powerful culturally and politically, Northern Wei developed the equal-field system under which lands were distributed to peasants. For the influence of institutions on culture, with the equal-field system the power of clans was contained, therefore Han (汉) nobles in the north needed performance to survive and they developed a practical culture with skills in military and government (Tang, 1992). In the south, to avoid wars, large numbers of Han (汉) Chinese had emigrated from the north. While borders between the north and the south shifted frequently over the years, roughly speaking the south was not occupied by nomadic groups. For the influence of culture on institutions, with the strong cultural and military power of clans in the south, emperors needed the support of clans to rule. Clans occupied mountains and rivers and it would be impractical for rulers in the south to adopt the equal-field system. For the influence of institutions on culture, even though rulers in the south such as Liu Yu (刘裕) tried to promote officials from insignificant family backgrounds, overall politics in the south was still controlled by powerful clans. With family backgrounds playing an essential role in selecting officials, the south developed a culture called Neo-Daoism (玄学). Under

this, Han (汉) nobles engaged in "empty chat" (清谈) of classics and philosophy.[17] This kind of behavior can be understood in terms of signaling. The classics were difficult to understand and normally familial instruction over generations was needed for proficiency. Difficult to mimic, individuals from powerful clans used empty chat to demonstrate their cultural superiority. A cost of engaging in empty chat is that nobles in the south lacked military and political skills. This kind of signaling is like male peacocks carrying beautiful and long tails: it is useful to show a peacock is strong but carrying a long tail makes this peacock more likely to be predated by other animals. In the south, powerful clans hid population from the government and government tax revenues were reduced. In the north, the equal-field system helped the collection of taxes for the government. Eventually, the north under Sui succeeded in unifying China.

Second, Iran provides another example of the interdependence between culture and institutions.[18] This interdependence in Iran during the second half of the 20th century can be shown as follows. Historically, religious groups in Iran developed their own financial resources and legitimacy independent from secular governments (Daniel, 2000, chap. 4). While land reform helped economic growth in countries such as South Korea, it was difficult to implement in Iran. For the influence of culture on institutions, land reform under King Pahlavi was opposed by religious leaders because of "the incompatibility of such legislation with Islamic principle" (Milani, 1994, p. 45). This reduced the legitimacy of institutional changes. Institutional reforms adopted by King Pahlavi in Iran contributed to rebellions of religious leaders. While King Pahlavi's policy mistakes and the human rights orientation of the Carter Administration in the United States were important in explaining the downfall of King Pahlavi in 1979; religious groups provided the organizational networks and financial resources in the rebellion against the Shah. For the influence of institutions on culture after the revolution, "a body of new Islamic laws became the foundation of the new legal system" (Milani, 1994, p. 200), and institutions adopted in Iran reinforced Islamic culture. Hundreds of political opponents were either killed or exiled (Daniel, 2000, chap. 8). Living standards for average citizens in Iran in the 1980s were worse than those in the 1970s.

5. Conclusion

[17] This originated from the evaluation of officials in the Han dynasty.
[18] Kuran (2004) provides an illustration of how economic development in the Middle East is affected by institutions established long time ago.

Many scholars believe that institutions are important in determining an economy's long-run performance. Then, why don't developing countries adopt institutions in developed countries to become rich? Culture affects power distribution in a country and the ability of the government to adopt institutions successfully. While institutional reforms could make a country rich, institutions may not be adopted because they could also increase political turmoil.

In this paper, we have used the interdependence of culture and institutions to explain long-run performance. In this model, culture affects a ruler's choice of institutions, while culture itself evolves endogenously over time. The model is illustrated using cases from Chinese history. For example, the conflicts between the state of Qin and other states were both military and cultural. Qin did not strictly practice the patriarchal clan system advocated by Confucianism, thus the power of elites in Qin was smaller than that in other states. With a culture different from other states, Qin adopted Legalist institutions and government officials were selected by merit; and Qin ended up in a steady state with a large percentage of individuals oriented toward material incentives. Institutions introduced through the Reforms of Shang Yang further changed Qin's culture. Even though adopting Legalist institutions could increase military power, rulers in other states did not adopt them comprehensively for fear of internal rebellions. Other states ended up in another steady state with a large percentage of individuals valuing loyalty and family values. Interdependence between culture and institutions in Iran is also discussed.

There are some interesting generalizations and extensions of the model. First, the model may be extended to a more general production structure for different types of individuals. Second, while this paper focuses on the interaction between culture and institutions to explain Qin's unification of China, there are other interesting mechanisms. A referee suggests the following mechanism based on difference in population density. States differ in their population densities with the state of Qin had a lower population density than other states. Aristocrats or county magistrates choose how much tax revenue to forward to the center and that their future incomes are decided by their future decisions. A lower population density made it more difficult for Qin aristocrats to oppose the rule of the central government. This made it easier for Qin rulers to adopt Legalist institutions.

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Figure 1: Existence of a steady state, $mn - mb - ny < 0$

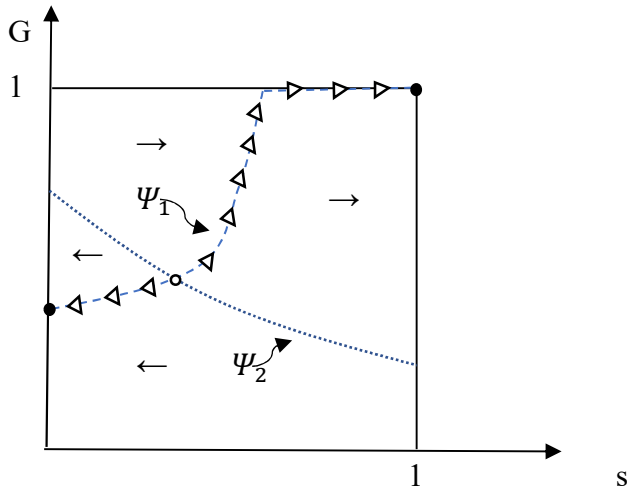

Figure 2: Existence of a steady state, $mn - mb - ny > 0$