A Tale of Two Frontiers---A Macro and Historical Comparison of Economic Take-off in China and the U.S.

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Abstract

This paper compares economic take-off in China (from 1949 to 1979) and the U.S. (from the late 1870s to 1917) from macro and historical perspectives by applying and extending the model of “frontier”. The study argues that the exploration and cultivation of the “frontier” was crucial in driving economic growth and social transition in both countries, although the connotation of the “frontier” varied over time and across national boundary. The study concludes that the state played important role in driving the “frontier” expansion. The study finds that similarities exist between the two economic developments although differences are still large. The study supports the thesis that economic developments of the two countries were shaped by domestic and international contexts. In sum, this study compares economic take-offs of two big economies by applying and extending the meaning of the “frontiers” model.

Key Words: Economic History, Economic Take-off, the “Frontier”, Institutional Arrangements, the State, China, the U.S.
Introduction

The rising of China after the 1990s has aroused many concerns. How can a big but backward economy achieve its economic take-off is an interesting topic for economic history studies. Using Comparative Historical Analysis Method (CHAM), we analyze economic transformations in the U.S. and China. The study argues that the exploration and cultivation of the “frontier” was crucial in driving economic growth and social transition in both countries, although the connotation of the “frontier” varied over time and across national boundary. The study concludes that the state played important role in driving the “frontier” expansion.

This paper also compares economic take-off in China (from 1949 to 1979) and the U.S. (from the late 1870s to 1917) from macro and historical perspectives by applying and extending the model of “frontier”. The study finds that similarities exist between the two economic developments although the differences are still large. The study supports the thesis that economic developments of the two countries were shaped by domestic and international contexts.

Method and Data Analysis

This paper employs Comparative Historical Analysis Method (CHAM) to analyze economic transformations in the U.S. and China. CHAM is fundamentally “concerned with explanation and the identification of causal configurations that produce major outcomes of interests” (Mahoney and Rueschemeyer, 2003: 11). CHAM also analyzes historical sequences and the unfolding of processes over time. CHAM practitioners also engage in systematic and contextualized comparisons of similar and contrasting cases. In
short, the research focuses of CHAM include, but not limit to, three aspects: a concern with casual analysis, the exploration of temporal processes, and the systematic and contextualized comparison limited to a small number of cases (Mahoney and Rueschemeyer, 2003: 11-15).

Employing CHAM in this study, we analyze the driving forces of economic take-offs of China and the U.S. in changing “frontiers” over decades-long periods. More important, we will also compare similarities and differences of the two take-offs.

We garner data from statistical reports, government documents, corporation documents, related researches, and other historical records. We use quantitative and qualitative methods to illustrate the shifts of “frontiers” in two large economies.

In this paper, the dependent variable (DV) will be economic development or economic take-off, which is interchangeably used and is mainly measured by the increase of GDP (GNP) per capita and the improvement of other social development indicators such as average education level of citizens, technological progress, and the constitution of the economy: agriculture, industry, and services. To retain the original connotation of “frontier”, we also use the expansion or contraction of cultivated geographic areas to indicate the “frontier” shifts. The main independent variables (IVs) include the change of political institutions such as Constitution, party-systems, and leaderships, the change of R&D levels, the variation of financial federalism, the change of external motivations such as FDI or new technology importation, the introduction of advanced managerial skills, and the implementation of particular economic policies.

Indeed, some dependent variables and independent variables may be interactive. For example, high R&D often generates high economic growth rate and vice versa.
Therefore, we use detailed qualitative discussion to differentiate the major directions between DVs and IVs. Namely, we put all variables in a changing historical process and thus evince the dynamic shifts of “frontiers” and the driving mechanisms of such shifts.

**The Periodization of the Two Economic Take-offs**

This study defines the American-take off from the 1870s to 1914, and the Chinese economic take-off from 1949 to 1979. The cutting line is based on some widely accepted classifications of the fundamental changes of political or economic institutions. In the U.S., the late 1870s was deemed as the ending period of the antebellum reconstruction and 1914 as the year when the U.S. was industrialized and was preparing to replace the Britain’s economic hegemony. The main trait of this period was the increasing power of the U.S. and “the burgeoning of industrial and financial corporations controlling nationwide industries and supplanting the small locally owned factories and businesses around which the national economy had been constructed” (DeSantis, 1973). In China, 1949 was the year when the Chinese Communist Party (CCP) established the socialist regime in China and 1979 as the year when the Chinese government initiated the Open Door policy and economic reform which were intended to transform the economic mode of production (Yang, 2001).

Despite the periodization, it is very difficult to draw a clear line to demarcate different stages of development. As an author depicted the shifts of mining frontiers of the West, that “it is more accurate to think of the mining West as constituting a series of frontiers, sometimes successive, sometimes widely separated geographically and chronologically, rather than a single entity” (Rodman, 2001:11), it is also in accurate to
depict economic take-offs of the two countries along a simple chronological path. Thus, if necessary the study may occasionally extend beyond the cut-off timelines to clarify the trajectory and profound influences of the two take-offs.

**Some Key Constructs**

To measure economic take-offs of the U.S. and China, we first need to define some key constructs that are important for this study.

**Frontier** Specifically, we define “frontier” as several boundaries in three dimensions. The first is geographical, meaning periphery areas surrounding the center. In the case of the U.S., the frontier and the West are not the same thing (Nugent, 1999:7-8). The shifts of the “frontier” mean resources move from the Northeast to the Midwest, the South, and then to the Pacific seaboard. In China the changes of frontier refer to the flows of resources and labor from the Coastal to the Inland and then to the West (Yang, 1991; 1997). Second, frontier may also refer to a variety of resources such as political institutions, ad hoc events, economic policies, natural resources, and social ideology, etc. More important, we also define the “frontier” as the mode of production that fundamentally drives economic development and social transition in China and the U.S. At the early stage of the economic growth, the “frontier” was deemed as an extensive mode of production, meaning investment of non-technological inputs that propelled economic growth. When national economic level reached a “choking point”, where the marginal rate of productivity resulted from the new “frontier” and the marginal cost of cultivating the “frontier” were equivalent, the economic growth mode has to be shifted.
from extensive to intensive, indicating the more efficient utilization of existing resources. The shift not only means the improvement of utilizing resources, it also implies the close of old “frontiers” and the opening of new “frontiers”. The inefficiency in responding to such shift negatively affected economic growth and hence arrested modernization of that country. The U.S. has successfully completed such transformation, whereas China is still undergoing the change.

Economic Take-off According to Walt Whitman Rostow, economic take-off is “the interval when the old blocks and resistances to steady growth are finally overcome” (Rostow, 1960:7). In this study, economic take-off mainly refers to the process of industrialization. Moreover, we may use the term “economic take-off” and “economic development” interchangeably. Indicators of economic take-off may include the steady growth of population, the development of technology, per capita wealth, the literacy rate among adult, and the structure of industries.

Two Major Ways of Economic Take-offs: Intensive or Extensive Mode Generally, economic take-off may be classified into two types---intensive or extensive. Intensive mode means that the development is mainly generated by technological development. In production functions, this type of development may be expressed by an increasing productivity, or less cost for a given amount of product. Intensive mode may also be caused by learning effect or the introduction of advanced technology or managerial skills. Extensive mode means the take-off was fundamentally pushed by the investment of large amount of productive inputs such as capital, land, and labor. Although the investment of
resources will sooner or later meet the decreasing marginal revenue, this way of economic development has been adopted by countries lacking technologies. The economic expansion of the U.S. from the 1820s to the 1860s was mainly on an extensive development track. However, after the 1860s, technology development gradually transformed the extensive development into an intensive mode. In contrast, China till the 1990s was also on the extensive development track (Yang, 2001). Nevertheless, the Chinese government ever-increasingly realized that resources per capita could not sustain further economic development, and China began to change the mode of development by focusing on developing and importing advanced technologies in the late 1990s.

Another aspect of the two economic take-offs is that economic transformation may not be fulfilled at the same pace across the nation. For example, for a long time in the U.S., overall the West and the South have lagged behind the Northwest in productivity. In China, even the Coastal area has almost established the intensive way of development after the late 1990s, most of the Inland and the Western areas are still using extensive investment of resources as a major way to develop local economies (Yang, 2001). Thus, when the frontier of the extensive mode has been reached, the country must find ways to reach new frontiers, or the intensive mode of economic development.

Theoretical Models for Economic Take-off

Several theoretical models are employed to explain economic take-offs across countries. Although most of them can explain some aspects of economic changes, they are insufficient in detail the changing process of the two economic take-offs.
**Turner’s the end of American frontier**  In response to a report by the Superintendent of the Census in 1890 that declared the close of the American frontier, Frederick Jackson Turner argued that the American frontier was not indeed closed. According to Turner, the “frontier” was not merely the geographical expansion but it implied adaptation to new opportunities and the evolution of ideas and institutions. The “frontier” had several traits, indicating “that coarseness and strength combined with acuteness and inquisitiveness; that practical, inventive turn of mind, quick to find expedients; that masterful grasp of material things, lacking in the artistic, but powerful to effect great ends; that restless, nervous energy; that dominant individualism, working for good and for evil, and withal that buoyancy and exuberance which comes with freedom.” (Turner, 1893) The shift of the “frontier” also means the “bonds of customs are broken and unrestraint is triumphant.” (Turner, 1893) Turner’s interpretation of the “frontier” is powerful in explaining the multi-facets of the changing economy. The beauty of this model is that frontier is not limited to geographical boundary. Any change or breakthrough of previous conditions can be perceived as the extension of frontiers. What we still need is the detailed discussion of the driving force and agent of frontier shifts.

**Economic ring model**  This model is developed by the German economist and sociologist Von Thunen (Schwartz, 1994). The model assumes a center, which is the most developed economic role, for economic development, and with the increasing distance from the center, the surrounding areas were divided as rural areas. The assumption of this model is that the center has a radius with equal productivity in each ring. This model indicates that regional economies across nation cannot be equal. It also
means that trading with developed countries may help backward countries to develop due to comparative advantages of trading partners (Gilpin, 1988; Krugman, 1993 and 1995). The major problem of this model is that sometimes state interventions do change the distribution of rings and change regional inequalities.

*Ricardian or Kaldorian development* Ricardian model refers to the development based on the cultivation of raw materials while Kaldorian model means the development driven by technological transformation and the introduction of new elements into production (Schwartz, 1994: 63-65). The two models indeed are similar to the extensive and intensive development models respectively. The two models have several major problems. First, they do not show the possibility that the development model may not be the same for all regions in a nation. Some regions may base their economies on advanced technologies and effective managerial skills while others may develop their economy on selling raw materials. Second, they do not say that development mode may change when internal and external factors changed. That is, an extensive mode can be upgraded into an intensive mode. Economic take-offs in the U.S. and China showed that both economies endured an extensive development in the early take-off stage and then were updated into intensive development mode. The close of the American “frontier” thus can be more accurately understood as the downfall of the old mode of production instead of the ending of opportunities for American economic growth.

*Backward advantage* Backward countries could import advanced technologies but they need state support to reduce the risks or uncertainties of developing such technology
(Gerschenkron, 1962). Other authors also mentioned that backward areas may develop by absorbing investment, technology, and skills from developed areas (Kuznets, 1955; Hirschman, 1958; Williamson, 1965).

The problem of the model is, not all backward countries will import advanced technologies or skills due to two reasons. First, as long as the vested interests think they can retain their interests without new technology or advanced skills, they may lack the intent to change the status quo. Second, even if the backward countries want to adopt new technologies or advanced skills, they may still not improve their economic performances if other facilities such as well trained labor and well-built infrastructures are not provided in their countries. In other words, technologies have to effect in a well-prepared context.

All these models provide partial explanations for economic take-offs in the U.S. and China. However, a comprehensive framework is needed to explain the institutional mechanisms that drove of the shifts of economic frontiers of the two big countries.
Institutional Approaches to the Two Take-offs

Economic take-offs often need the effective combination of resources which include material resources, spiritual underpinnings, and institutional arrangement (Figure 1).

**Figure 1 The Mechanisms of the Three Elements for Economic Take-off**

- **Spiritual Underpinnings**: ideology, cultures, and religions
- **Material Resources**: capital, land, labor, transportation facilities, technologies, managerial skills, and raw materials.
- **Institutional Arrangements**: the state, the government, political parties, norms, and policies and rules, etc.
- **Economic Performances**: development or transformation.

*Material resources* include capital, land, labor, transportation facilities, technologies, managerial skills, and raw materials. In the U.S., the vast land of the West provided a huge opportunity for economic expansion. Oil, lumbers, gold, and other materials in the Western area supported essential materials to economic take-off. The abundant water resources in the new frontiers also provided navigational and irrigational convenience to economic development. The U.S. government started the land grant program to develop high educations and transportations in the relatively backward regions. China also had a large “frontier” area in the West and Inland that endowed with necessary resources for economic development (Table 1). The Chinese government also allocated land for free to major programs that were deemed important to economic development or national security (Yang, 2001; Dong, 2003).
Table 1  Regional Distribution of China’s Major Mineral Resources (%)

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Coastal area</th>
<th>Inland Area</th>
<th>Western Area</th>
<th>Inland and the Western Areas in Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium</td>
<td>12.5</td>
<td>7.1</td>
<td>80.4</td>
<td>87.5</td>
</tr>
<tr>
<td>Iron</td>
<td>47</td>
<td>27.9</td>
<td>25.1</td>
<td>53</td>
</tr>
<tr>
<td>Manganese</td>
<td>8.8</td>
<td>21.9</td>
<td>69.3</td>
<td>91.2</td>
</tr>
<tr>
<td>Gold</td>
<td>27.6</td>
<td>47.5</td>
<td>24.9</td>
<td>72.4</td>
</tr>
<tr>
<td>Silver</td>
<td>24.1</td>
<td>45.3</td>
<td>30.6</td>
<td>75.9</td>
</tr>
<tr>
<td>Nicker</td>
<td>0.8</td>
<td>9.8</td>
<td>89.4</td>
<td>99.2</td>
</tr>
<tr>
<td>Lead</td>
<td>25.6</td>
<td>31.1</td>
<td>43.3</td>
<td>74.4</td>
</tr>
<tr>
<td>Zinc</td>
<td>21.3</td>
<td>31.6</td>
<td>47.1</td>
<td>78.7</td>
</tr>
<tr>
<td>Copper</td>
<td>10.5</td>
<td>37.2</td>
<td>52.3</td>
<td>89.5</td>
</tr>
<tr>
<td>Bauxite</td>
<td>4.4</td>
<td>58.8</td>
<td>36.8</td>
<td>95.6</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>8.5</td>
<td>38.1</td>
<td>53.4</td>
<td>91.5</td>
</tr>
</tbody>
</table>

Data Sources: Chen, 1996; Joseph, and Zhang, 1999.

Table 2  Classification of Trade Areas with Respect to Intermediating Roles and Capital Flow

<table>
<thead>
<tr>
<th>Capital-exporting Regions</th>
<th>Capital-importing Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant Intermediating Roles</td>
<td>No Significant Intermediating Roles</td>
</tr>
<tr>
<td>New York</td>
<td>Philadelphia</td>
</tr>
<tr>
<td>Boston</td>
<td>Hartford</td>
</tr>
<tr>
<td>Cleveland</td>
<td>Albany</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Syracuse</td>
</tr>
<tr>
<td>Chicago</td>
<td>Buffalo</td>
</tr>
<tr>
<td></td>
<td>Baltimore</td>
</tr>
<tr>
<td></td>
<td>St Louis</td>
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<tr>
<td></td>
<td>Scranton</td>
</tr>
<tr>
<td></td>
<td>Pittsburg</td>
</tr>
<tr>
<td></td>
<td>Milwaukee</td>
</tr>
<tr>
<td></td>
<td>Columbus</td>
</tr>
<tr>
<td></td>
<td>Indianapolis</td>
</tr>
<tr>
<td></td>
<td>Detroit</td>
</tr>
</tbody>
</table>


As for capital, before the late nineteenth century the U.S. had some built financial centers in Boston, Chicago, and New York, which attracted international and
Northeastern capital and then relocated it to the West and the South (Table 2). In the West and South, some major cities such as Saint Louis, San Francisco, Los Angeles, and Denver also worked as regional centers to intermediate cross-regional capital flows (Bensel, 2000). In main agricultural areas, large cities like Chicago also functioned as a transaction center for agricultural business.

In China, the CCP set the central bank—the People’s bank and several professional banks such as the Agricultural Bank, the Industrial and Business Bank, and the Construction Bank to allocate funds to designed programs (Yabuki and Stephen. 1999).

The development of transportation facilities in the U.S. during the take-off stage mainly focused on railway and canal building. Although there are disputes over the real influences of railroads American on economic growth (Fogel 1965; Fishlow, 1965), there is an agreement that railroads, at least partly, facilitated the thriving of related industries such as steel, timbering, and engine building. It has also been studied that railroads reduced the cost of selling agricultural goods and hence increased the real income of farmers (Davis and North, 1971). Moreover, as Alfred Chandler pointed out, railroads also innovated managerial skills in American firms (Chandler, 1965 and 1977).

In China, railroad building was set to facilitate economic growth and increase Chinese national power. The CCP organized the Railroad Ministry in the 1950s in charge of railway building and some military divisions were also assigned to this task. The construction focus was on the West. After the 1990s, the CCP also allocated funds to renovate related skills for railroads. In addition, after 1949, the Chinese government also dredged rivers and built several canals to reduce transportation cost of agricultural and manufactured goods.
Spiritual underpinnings include ideology, cultures, and religions that may affect the social members’ motivation to engage in some activities and the identification of certain behaviors. In the U.S., pure religious advocacy, especially the Protestant and other Christian values had motivated millions of new migrants to pursue the material interests. The spirit of entrepreneurship also motivated risk-takers to invest in the new land and the exploration and development of the unknown world. After the late 1850s, when railroads and marine technologies were widely used, the frontier is extended for Americans to chase the new opportunities brought by the “brave new world”.

In China, the spiritual underpinnings are somewhat different. The collective governance has its tradition originated in the managing of flood more than two thousand years ago (Qian, 1997). After 1949, the CCP and the Chinese government proposed that individual interests should conform to collective interests embodying in government policies and orders (Yang and Chen, 2006). The communist party also propagated that China was still an underdeveloped country and to ensure China’s dignity in international arena, China must developed its economy as fast as it could. The CCP or the Chinese government was the only agent that could lead China into modernization. Labeling itself as different with any previous Chinese government, the post-1949 Chinese government also asked its citizens to live a stoic life. Pursuing personal enjoyment was deemed as moral decadence. Western culture was also suppressed in China. At least before 1979, the time when China began to launch the open door policy and economic reform, the CCP and the Chinese government perceived Chinese economic development as a revival of the Eastern culture.
Of the three elements, *institutional arrangements* are crucial because they mediate and moderate the effect of the other two elements (Figure 1). According to Douglass North, instructional arrangement or institutions mean a set of rules, formal or informal, of the game in a society that shape human activity (Davis and North 1971; North, 1990). In the process of economic development, institutional arrangements define the scope and legality of social activities and channel resources to achieve certain economic goals.

One of the major institutional arrangements is the state, which is a set of administrative, policy and military organizations headed, and more or less well-coordinated by, an executive authority” (Skocpol, 1979:29). The state essentially includes the government, political parties, social norms, and policies and rules (Rueschemere, et al., 1985). This study interchangeably uses the word “state” and “government”.

The state helped the two countries endure economic transform. The state can significantly affect economy especially when there is the problem of market failure (Weimer and Vining, 1999:74-115). The state plays irreplaceable role in trying to reduce transaction cost and uncertainties ensued with economic transformations (Caporaso, and Levine. 1992: 181-196). William Baumol also pointed out that the rise of the government or the state as a solution to internalize externalities in a society (Baumol, 1952).

According to John Stigler, the state may regulate economy in at least four ways (Stigler 1971: 116-119): a direct subsidy of money, the control of entry by new rivals, using the power to affect substitutes and complements, and price-fixing. In other words, the state may directly and/or indirectly shape economic development. First, the state may regulate the scope of economic activities and transaction cost by defining do’s and don’ts (Eisner, 2000). Second, the state may shape the economic transformation via direct
involvements (North, 1990). For example, the state may build state-owned enterprises (SOEs) to directly engage in the market. The state, especially in collective economies, may deeply influence the financing by setting interest rates or loaning procedures and affect the staffing of private firms by setting specific labor laws. The state may define the boundary of property rights and hence affect cost and benefit of economic activities. Moreover, the state may also provide infrastructures to drive economic development. The state may also propose particular values that indirectly affect economic take-off, for example, the spirit of entrepreneurship in the U.S. in the late 19th century and the “collective interests” advocacy in China before the late 1970s. Davis Lance and Douglas North also mentioned that the American government proposed the development of railways and canals in two ways: the state helped to define the property rights of land for railway construction; the government or the state helped to stabilize prices related with railway expansion (Davis and North, 1971). The first way reduced bargaining cost between railway companies and land owners, while the second way reduced risks caused by price variation and helped to attract enough investors for railway construction.

The expansion of the “frontier” may illicit “feedbacks” on institutional arrangements as Figure 1 showed. The “feedback” mechanisms are responsible for the emergence and maintenance of various institutional and policy trajectories over time (Mahoney and Rueschemeyer, 2003: 208). With the development of economy or the transformation of development mode, institutional arrangement may also change to meet the new demand induced during the economic shifts. This means the enactment of new laws, regulations, or rules. For example, during the Progressive period, the U.S. government had to partly meet the demands from the masses to limit the power of big companies. Thus, the
Sherman Anti-Trust Law was enacted in 1890 and the Clayton Act in 1914. With the ever increasing expansion of the “frontier” of cross-continent businesses, the U.S. state also passed the ICA (The Interstate Commerce Act) in 1887 and built the FTC (Federal Trade Commission) in 1914 (Eisner, 2000: 49-62). The U.S. government also designed a series of immigration laws in the late 19th century and at the beginning of the 20th century to appease discontents from labors. The changing institutions may also be facilitated by the mass media. For example, the exposure of the unsanitary meat packing conditions in Chicago meat industry by Upton Sinclair’s The Jungle in 1906 pressured the U.S. government to issue the Pure Food and Drug Act of 1906 and the Meat Inspection Act of 1907 (Robertson and Judd, 1989:51).

In China, many new ministries were built to meet the new demands arising from economic take-off. For instance, the oil department was set in the mid-1950s to regulate the development of Chinese oil industry. To industrialize China, the Chinese state also set at least seven Industrial Ministries from the 1950s to the late 1970s, which regulated the production of many goods ranging from plastic shoes to atomic bombs (Yang, 2001). After 1979, the Chinese government also designed Foreign Investment Committee in charge of attracting foreign direct investment (FDI). In addition, the Chinese National Securities Council was also built in the late 1990s to manage domestic and international capital mobility. A series of laws were also passed to facilitate economic growth (Yabuki and Harner, 1999). Of all these institutional changes, the most important change was that the Chinese state deeply involved in the management of economy (Baum, 1994).
Three Key Factors for the Take-off of the U.S.

Economic take-off of the US from the 1870s to the early twentieth century was largely grounded in three factors: the international gold standard, protected tariffs, and an integrated national market (Bensel, 2000). These three factors incorporate material resources, spiritual support, and institutional arrangement. The gold standard helped the U.S. build a stable exchange rate and protected the variation of domestic prices (Gilpin, 1988; Gourevicth, 1986; Bensel, 2000). Protected tariffs helped domestic manufacturers exclude the competition from European firms. The integrated market on the one hand established a large market for domestic producers; on the other hand it induced new demands when integrating separated local markets. As Albert Fishlow maintained, the development of the canal system and the expansion of cross-continental railroads also induced the development of marine engines, timber, and steel industries (Fishlow, 1965).

It is true that not all interests would support the three arrangements. For example, bankers in New York would like to retain a stable exchange rate and they strongly advocated the Gold standard (Bensel, 2000). Farmers, however, especially in Southern states strongly opposed the protected tariffs because they did not want to see that in retaliation European countries would obstruct the exportation of Southern agricultural goods to these countries, and also important, farmers had to buy consumer goods in a highly protected market (DeSantis, 1971:59). Midwestern silver miners would also like to see the currency to be fixed on silver values and thus resisted the Gold standard. In addition, local interests would also keep monopolistic power in local markets, fearing that an integrated market would bring external competition. However, the Republican party
successfully tried to build a coalition to smooth out discontents by winning support for the Gold standard and protected tariffs.

**Westward Ho: The Expansion to the New Area**

Generally, the trajectory of American economic expansion was from the Northeast to the West and South. The frontier first extended across the Mississippi river, then to the wide plains, and finally moved to California. The communication with Asian and Pacific countries furthered the frontier to the sea in the late 1890s.

Indeed, the expansion is not just a “Westward” movement, because it also involved the urbanization of the new areas. Moreover, the expansion is not just an economic development. Sometimes the process was featured by wars, political negotiations among various interests, and the immigration of capital, technology, and labors to the new areas.

The Northeastern and international capital were transferred to the West via regional intermediary financial centers. The investment focused on mining, ranching, and farming as many Eastern and international investors believed, might be falsely, that these fields could generate stable return (Cashman, 1993). The South, however, did not attract sufficient funds from the outside because of the high operation cost of financial services resulting from the small size of Southern farms, the low illiteracy rate of potential borrowers, the impoverished condition of most rural producers, and their specialization in cotton (Woodman, 1990: 349-352). These factors retarded the development of intermediate financial agencies or banking systems in the South which in turn obstructed the industrial and commercial expansion of this region (Bensel, 2000: 91-92).
The process also marked the shift of property rights on land, which stimulated immigration of labors including farmers, ranchers, and miners to the new areas. The Westward Movement was first initiated by merchants who explored the West to get fur, tobaccos, gold, and other commodities for Northeastern or European customers. The increasing cost in the Northeast pushed some settlers to flush to the low-cost West to make a living. The land grant policies allowed the development of cross-continental railways and highways. A series of acts such as the Homestead Act of 1862, the Timer Culture Act of 1873, the Desert Land Act of 1877, the Timer and Stone Act of 1878, the Dawes of 1887, and the Carey Act of 1894 also allowed millions of settlers to pay a few dollars to move to the West and own land that native Indians had claimed as their properties (Cashman, 1993:290-302, 311; DeSantis, 1971:23). As for the South, although the slavery system was dissolved, only more small-size plantations replaced large plantations. These partitioned plantations were often inefficient in managing agricultural production because of the economy of scale, underdeveloped agricultural technology, and the protected tariffs which mainly favored manufactures. To find their prosperity, African-Americans, often remained unskilled, also migrated to the West from the South after the Civil war. According to a study, more than 40,000 sharecroppers left Southern states for the “freedom lands” in Kansas (Cashman, 1993:237). The immigration of settlers to these frontiers not only created new land owners, the labor flow also prepared sufficient labor force for the ongoing industrialization in these areas.

The development of technology in the new “frontiers” was essentially fueled by manufacturing firms, mining companies, ranchers, and individual settlers. To defend property rights, new technology such as the barbed wire was introduced into the West.
The railway introduced new managerial skills to the new land. The federal government also sponsored the dissemination of engineering and technology to the West (Cashman, 1993:311-312).

The State Matters: The Industrialization of China

The main agent of the Chinese take-off was the state. Unlike the American industrialization, the Chinese industrialization was tightly governed by the Leviathan: the communist party-controlled state. In China, before the late 1990s, the party and the state were strongly integrated into each other. Although China had a government with many professional departments, the CCP controlled everything. The CCP determined the constitution and the staffing of the government, monitored the designing of policies, and controlled the media as well as other resources to regulate economic growth (Yabuki and Harner, 1999).

The process of Chinese industrialization after 1949 was also a process of Chinese national integration. Up to 1949, regional inequality among the Coastal, the Inland, and the Western regions was large. Partly based on the socialist ideology that inequality obstructed the freedom of human beings, which was claimed as one of the major targets of socialist parties, and partly due to the consideration of national security, the Chinese government and CCP tried to reduce such regional inequality by investing the majority of resources into the Inland and the Western region. Since there were insufficient resources to develop the three regions simultaneously and the Coastal area was deemed to be easily attacked in future wars, the Chinese government decided to relocate Coastal resources to the other two regions (Chen, 1996).
The development of the Chinese West was based on the assumption that a strong Chinese West and Inland would provide China with a powerful strategic basis for possible war with the world major power: the U.S. or the Soviet Union. In addition, the development of the Chinese West was also perceived as an effective way to calm down the grudges of Chinese ethnic minorities who mainly resided in the West, say, the Tibetans in Xizang and Muslims in Xingjiang (Chen, 2005).

The Chinese Westward Movement was shaped by direct government involvement. The Chinese state depicted the blueprint to develop interior regions and ordered the flow of any needed resources to the Inland and the West.

The expansion of the Chinese economy in its first stage was assisted by abundant land and labor. Since about 65% to 70% of the Chinese well-trained labor resided in the Coastal area before the early 1950s, the Chinese government relocated millions of well-trained labor to the West and some Inland areas through administrative orders. Assuming that “the more people, the easier to get things done” (Ren Duo Hao Ban Shi), the government also encouraged families to have more kids. Despite the famines from 1959 to 1961, which claimed by some scholars to have starved millions of the Chinese, the Chinese population doubled from 450 million to about 900 million from 1949 to 1979. The Chinese government also developed ten-year-education plan after the early 1950s. Intermediate schools were also built across China to train skilled workers. These provided abundant labor for China’s economic growth, especially in the Chinese West that previously lacked sufficient labor. The abundant land in the West and the Inland also encouraged China develop large state-owned farms and plantations, which provided sufficient raw materials for manufacturing industrial goods. In addition, the government
often allocated land to newly built industries with no cost. In short, the low cost of land and productive labor fueled Chinese economic take-off and also helped the development of the backward West and Inland from 1949 to 1979.

The central bank also tilted investment toward the two areas (Table 3). Some of these funds were industrial investment, and some were earmarked for transportation improvement. The Agricultural Bank and the Rural Credit Union were built in China after 1949 to offer small amount loans to peasants. In addition, to develop the West and Inland, the Chinese state created the “allocating price” (Diao Bo Jia) to transfer manufactured goods with low prices from the Coastal region to the Inland and West, which partially increased the real income per capita of the two regions. Nevertheless, the Chinese government often used the “allocating price” to suppress the real price of agricultural goods to subsidize the industrialization (Yang, 2001).

Table 3  Regional Shares of Chinese Government Investment, 1953--1975 (Percent)

<table>
<thead>
<tr>
<th>Year</th>
<th>1953-56</th>
<th>1958</th>
<th>1969</th>
<th>1975</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal</td>
<td>45.9</td>
<td>39.2</td>
<td>36.2</td>
<td>39.5</td>
</tr>
<tr>
<td>Inland and West</td>
<td>54.1</td>
<td>60.8</td>
<td>63.8</td>
<td>60.5</td>
</tr>
</tbody>
</table>


To secure productive labor force for the industrialization of the Inland and West, the Chinese state invested intensively in projects closely related with civilian development such as schools and medical centers in the early 1950s (Table 4)
Table 4  Investment in Civilian Key-point Development Projects in the First FYP (1953-57) (million yuan)

<table>
<thead>
<tr>
<th></th>
<th>Number of projects</th>
<th>Amount (Million Yuan)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>98</td>
<td>14261</td>
<td>100.0</td>
</tr>
<tr>
<td>Coastal</td>
<td>26</td>
<td>4449</td>
<td>31.2</td>
</tr>
<tr>
<td>Inland</td>
<td>56</td>
<td>7902</td>
<td>55.4</td>
</tr>
<tr>
<td>Western</td>
<td>16</td>
<td>1911</td>
<td>13.4</td>
</tr>
</tbody>
</table>


Millions of “educated youth” (Zhiqin) were also assigned from the Coastal area to the two regions after the late 1950s. The government encouraged technological innovation by rewarding innovators money or offering them political promotion. Moreover, the central government also ordered to relocate some Coastal colleges and universities to the two regions. All these policies decreased illiteracy rate of the two regions and they helped the two backward regions absorb advanced technologies and skills in a very short period. The policies improved technological level stimulated industrialization of China’s hinterland.

A Comparison----Major Similarities between the Two Take-offs

As for similarities between the two take-offs, several things need to be examined. First, before the take-offs, both countries had a large unbalanced economic geography caused by natural, historical, or social-economic reasons. In the U.S., the Northeastern area was the most developed and then the economic momentum began to shift to the West, the South, and any other geographic frontiers. In China before the late 1990s, the national economy was divided into three economic areas: the Coastal, the Inland, and the West (Yang, 1997). The Coastal area had been the most developed area since the 18th
century. The Inland lagged far behind the Coastal area and the West was the least developed region. The economy gap between the Coastal area and the Inland and the West increased from 1840 to 1949. The Coastal area concentrated about 70% of modern Chinese industry and about two thirds of capital. In addition, almost all well-trained labors were employed in Coastal industries (Dong, 1999).

Table 5  The Five Year Plans and Their Impact on Chinese Regional Inequality:1953-1980

<table>
<thead>
<tr>
<th>The Five Year Plans</th>
<th>Dates</th>
<th>Main Projects Related with Regional Development</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>The First Five Year Plan</td>
<td>1953-1957</td>
<td>The 156 Project</td>
<td>The 156 Project pushed the rapid industrialization of the two areas and reduced Chinese regional inequality.</td>
</tr>
<tr>
<td>The Second Five Year Plan</td>
<td>1958-1962</td>
<td>The Great Leap Forward (GLF)</td>
<td>Between 1963 and 1965 the FYP was suspended due to the disaster caused by the GLF.</td>
</tr>
<tr>
<td>The Third Five Year Plan</td>
<td>1966-1970</td>
<td>The Cultural Revolution; The Third Front Program (TFP)</td>
<td>Local regions won more power in dealing with local economy. The TFP greatly developed the economy of the West and Inland area. Chinese regional inequality reduced.</td>
</tr>
<tr>
<td>The Fourth Five Year Plan</td>
<td>1971-1975</td>
<td>TFP</td>
<td>The TFP greatly developed the West and Inland. Chinese regional inequality was reduced.</td>
</tr>
<tr>
<td>The Fifth Five Year Plan</td>
<td>1976-1980</td>
<td>Radicalism ended and economic reform began in 1979; Special Economic Zones (SEZs) was built to develop the Coastal area</td>
<td>The Coastal area’s economy began to take-off.</td>
</tr>
</tbody>
</table>

Data Source: Chinese National Statistics Bureau (CNSB).

Second, both governments intervened in the economic development. In the U.S., especially the Republican Party successfully built widely-supported development policies.
The U.S. government also tries to use land grant, low interest loan, product subsidies, and education development plans to advocate economic take-off in the West and the South (Robertson and Judd, 1989; Bensel, 2000). In China, the CCP and the government designed the five year plans to institutionalize economic development across the nation (Dong, 2003; 2005 a and b. Table 5).

Third, both take-offs were intended to transform from the extensive development pattern to the intensive development mode, and the two take-offs significantly increased the national power of each country. In the U.S., overall economy achieved great success during the take-off (Table 6).

Table 6  Some Major Indicators of American Economic Growth, 1860-1900

<table>
<thead>
<tr>
<th>Indicators</th>
<th>1860</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railroad Mileage</td>
<td>30,000</td>
<td>193,000</td>
</tr>
<tr>
<td>Capital Invested in Manufacturing</td>
<td>$1 billion</td>
<td>$10 billion</td>
</tr>
<tr>
<td>Industrial Workers</td>
<td>1.3 million</td>
<td>5.3 million</td>
</tr>
<tr>
<td>Annual Industrial Product</td>
<td>Less than $2 billion</td>
<td>More than $13 billion</td>
</tr>
</tbody>
</table>


American economic growth and industrialization were also reflected by population change, urbanization, and employment structure in the three economic fields: agriculture, industry, and services (Table 7).

Table 7  Population and Employment Change in the United States, 1870-1910

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (Millions)</th>
<th>Population (% Urban)</th>
<th>Employment in Agriculture</th>
<th>Employment in Industry</th>
<th>Employment in Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>39.8</td>
<td>25.7</td>
<td>50.8</td>
<td>30</td>
<td>19.2</td>
</tr>
<tr>
<td>1880</td>
<td>50.1</td>
<td>28.2</td>
<td>50.6</td>
<td>30.1</td>
<td>19.3</td>
</tr>
<tr>
<td>1890</td>
<td>62.9</td>
<td>35.1</td>
<td>43.1</td>
<td>34.8</td>
<td>22.1</td>
</tr>
<tr>
<td>1900</td>
<td>76</td>
<td>39.6</td>
<td>38.1</td>
<td>37.8</td>
<td>24.1</td>
</tr>
<tr>
<td>1910</td>
<td>92</td>
<td>45.6</td>
<td>32.1</td>
<td>40.9</td>
<td>27</td>
</tr>
</tbody>
</table>

The take-off helped China build a modern industrial system and laid a solid foundation for the country’s rapid economic growth after 1979 (White, 1998; Yang, 2001; Dong, 2003; Gao, 2004).

Fourth, the damages to ecological context resulted from the take-off was also severe in both countries. In the U.S., gold miners used mercury to get gold from the pulverized minerals, which polluted a lot waters. Bison in the West were almost wiped out at the end of the 19th century (Cashman, 1993: 285, 311). In China, the over-cultivation of the West also destroyed local ecosystems (Chen, 1996). In Xingjiang, for example, the extraction of underground water has severely alkalized millions acre of land.

Moreover, the process of expanding the frontiers also caused or intensified conflicts among various interests. In the U.S., the conflicts among the states and confrontations between Indians and the newly-arrived residents occurred frequently. In China, the conflicts between regional governments and the central authority also happened many times that even during Mao’s leadership, which has been widely considered as highly centralized, the Chinese central government had to change the unitary taxation system several times into bicameral system which made provincial governments much more power in designing provincial economies (Wong, 1991 and 2003).

Finally, regional economic inequality still existed in both countries. That means sometimes the “frontiers” shaped by natural or historical constraints cannot be easily broken through by government policies or private motivations.
Major Differences between the Two Take-offs.

Some major differences exist between the American and the Chinese economic take-offs. The following analyzes such differences.

Philosophies that guided the take-offs. The philosophy that guided Chinese economic take-off is affected by two conventional sources. First, Confucianism argued that all the people in the world should enjoy the same level of life. This doctrine implies that all the people should be on the same poverty level. The Chinese state hence believed that the take-off was designed to help all the Chinese rich (Confucius, 1996; Qian, 2007). Second, the Chinese historically believed that the nature and human beings coexist in a same world and human-nature harmony instead of economic efficiency should be a goal for the state to design economic policies (Dong, 1995).

Despite the influences of conventional ideologies, economic nationalism dominated economic policy making in China from 1949 to 1979. Although economic nationalism has different labels such as mercantilism, statism, and protectionism, it basically refers to the safeguarding or the enhancement of national interests. Economic nationalism implies that all economic activities “should be subordinate to the goal of state building and the interests of the state.” (Gilpin, 1988: 31) In China, at least before the late 1970s, economic nationalism guided Chinese industrialization (Liu, 2008).

Three reasons explain why industrialization became of the first goal for Chinese economic take-off. First, as economic nationalists believe, industrialization has spillover effects throughout the economy and drives economic growth. Second, industrialization is perceived to increase a country’s self-sufficiency and autonomy. Third, industry is an
inalienable element of modern military power (Gilpin, 1988:33). Heavy industries including machinery and chemical firms were built (Dong, 2003). To avoid possible attacks from the sea, most of these firms were built in the West and Inland areas (Xu, 2005). The Chinese state designed the Five Year Plan since 1953, which institutionalized the industrialization of China by securing needed amount of capital, technology, and labor to newly built industries. After 1963, the Chinese central government started the “Three Front” project, which allocated about 65% of new industrial investment to the West and Inland (Chen, 2006). To guarantee stable supply of raw materials to heavy industries, the CCP established Energy Department and the General Bureau of Geology. The collective purchasing of agricultural goods (Tong Gou Tong Xiao) also secured low cost materials for industries at the expense of Chinese peasants (Yang, 2001). The Chinese economic nationalism has been widely criticized for its economic inefficiency but it industrialized the backward West and Inland area and partly narrowed that long existed regional inequality between the Coastal and the other two areas.

The Chinese expansion of the frontier also changed local social structures. To supply well-trained labor, all levels of schools in the frontier areas were built. Local financial centers, although often worked as an intermediate agent for allocation funds from the central bank, funded the development of local projects. Medical institutions were widely set in most rural areas. Furthermore, cross-region highways and railroads were established, which reduced transportation cost of agricultural and manufactured (Dong, 2003).

The industrialization also broke some old values and beliefs. For example, peasants often believed that road or railway might irate the spirit of ancestors and thus would bring
disasters to the village. The conveniences brought by the new transportation facilities, however, finally changed such perceptions. In this regard, the Chinese Westward movement had generated Joseph Schumpeter’s “creative destruction” effect.

The U.S. take-off was deeply influenced by the Protestant ethics, which was partly embodied by exploring the unknown world with diligence and abstinence. As a study pointed out, outposts “stimulated the spirit of individualism and inventiveness, putting a special premium on democracy and versatility,” and American society “owed to the frontier its special characteristics of earthiness and practicality.” (Cashman, 1993:283) The U.S. take-off was also based on the assumption that scientific methods and skills will led to growth. Thus, the natural environment is waiting for cultivation, and technologies will help people breakthrough natural boundaries or other “frontiers” sooner or later.

The major (or perceived) international context was different When American economy was going to take-off in the late 1830s, major European countries were balanced by each other and none had intention or sufficient power to deeply interfere with American affairs. The U.S. still could borrow capital from Europe and sell some of its products, whether cotton from the South or manufactured goods from the Northeast and the Great Lake littorals, to European customers (Bensel, 2000).

In China, the Cold War partially explained China’s exclusivity from the Western market. The CCP’s assumption of power in 1949 and the subsequent Korean War (1950-1953) not only intensified the conflict between the socialist group and Western countries, it also helped to form a perception among the top Chinese leaders that China had to industrialize itself, especially the backward Inland and West, to secure national security.
The economic starting point was different When Americans tried to develop the far West and South, the Northeast had already well developed. In China, before 1949 the Coastal area was the most developed one and the West lagged far behind economically. The Inland area had built some small industries before 1949, but most of them were light industries and only produced intermediary products for Coastal factories. The post-1949 Chinese state originated from the Chinese West and Inland and then it controlled the entire China. Mainly equipped with resources for industrialization from the Coastal area, the Chinese state began to industrialize the West and Inland after the early 1950s. Thus, the political trajectory of Chinese take-off is from the two backward regions to the Coastal area and then went back to the two regions.

Paths were different In the U.S. take-off, the process was partially private and partially state. Miners, ranchers, and farmers immigrated to the new frontiers with policy supports such as the Homestead policy, the land grant project, and the government sponsorship in railway and other transformational facilities. However, because of the democratic institution, different interests would form political parties, unions, lobbying groups in striving for preferential policies. The federal and state government must develop policy designs with wide political alignment. During the industrialization of the U.S., the Republican party played an important role in building coalitions to support development policies. Thus, there was no streamlined product policy for the entire take-off, meaning each development policy had to be the result of the consideration of various interests (Gourevitch, 1988; Bensel, 2000).
In China, the state dominated almost every aspect of Chinese political economy and the state had the authoritative power to concentrate resources to many SOEs (Bo, 1998). The Chinese government and CCP still needed to reduce objections from party veterans and regional interests to streamline a national development plan. The Chinese state first convened regional leaders, including minority leaders, to Beijing in the early 1950s and stipulated that the development policy of the Inland and the West should be fully implemented. The state maintained that even if some regional interests might be undermined for the Westward movement, these interests should obey the central rules.

The forms of economic organization differ  The two take-offs also differed in the forms and roles played by business firms. During the American economic take-off, vertical and horizontal merge were frequent, which facilitated the development of large firms or cross-firm cooperation in forms of pool, trust, and long-term contract (Bensel, 2000:314-321). The large firms, including railway corporations provided a new form of management in economy to achieve the scale and/or scope of economy (Fishlow, 1965; Davis and North, 1971; Chandler, 1967; Bensel, 2000).

Unlike those American giant enterprises developed from competitions, Chinese SOEs often worked inefficiently in planning and implementing economic strategies. As budget constraints in SOEs often were not strictly abided (Kornai, 1986; Szelenyi, 1981; Szelenyi and Szelenyi, 1994), economic inefficiency was widespread. In addition, from 1949 to 1979, large SOEs also acted as para-military units with millions of labors trained as civilian soldiers. In some remote areas, SOEs also acted as local governments by offering local residents education, security, and medical services (Yang, 2001).
Differences in regional inequality  Finally, the two take-offs had different economic and social results although both achieved great economic growth. The U.S. successfully changed its mode of production from extensive to intensive after the 1870s (Bensel, 2000: 5), but China till the late 1990s had still a long way to go to transform its mode of production from extensive to intensive.

More important, the two take-offs exerted different influences on regional inequality. American regional inequality seemed to exist for a long time and the take-off occasionally widened such inequality (Table 8).

<table>
<thead>
<tr>
<th>Section</th>
<th>1840</th>
<th>1880</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast/Midwest</td>
<td>106</td>
<td>118</td>
<td>117</td>
</tr>
<tr>
<td>Plains and West</td>
<td>n/a</td>
<td>126</td>
<td>130</td>
</tr>
<tr>
<td>South</td>
<td>89</td>
<td>62</td>
<td>63</td>
</tr>
<tr>
<td>Nation</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>


Specifically, the Northeast retained the dominant status and the West developed quickly. The South, as we have analyzed, remained underdeveloped and some times became victims of policies such as the Gold standard and the protective tariffs (Gourevitch, 1986: 107-111). The estimated value of property in the U.S. in 1880 was $47.64 billion, of which the South had only $5.72 billion (Cashman, 1993: 233-234). The South was also lagged behind in many other fields in terms of residents’ literacy rate, capital stock, technology level, and firm size (Cashman, 1993; Bensel, 2000). In fact, moving to the “frontier” undermined interests of native Indians. All the land acts to some extent satisfied settlers’ desire for free land at the cost of native Indians (Cashman, 1993: 293-302).
In China, reducing Chinese inequality was attained while developing the national economy from 1949 to 1979 (Wei, 2000). The Chinese government and the CCP saw regional inequality as a potential threat to its governance. First, since the Chinese socialism stressed equality across all social strata and geographical regions, the Chinese state perceived the inequality undermined its political ideology (Mao, 1956). Second, regional inequality could illicit the feelings of relative deprivation (Gurr, 1970) among the Chinese, which obstructed the integration of a modern China. Third, to industrialize backward areas would enhance China’s overall military power and improve China’s national security. Finally, regional inequality could obstruct further economic development because poor areas would not have sufficient purchasing power to buy manufactured goods from the developed region. Thus, the Chinese state assumed the reduction of regional inequality as both a political and an economic goal.

From the early 1950s to the mid-1980s, heavy industries and concomitant factories and facilities were rapidly developed in the Chinese West and Inland (Yang, 2001). Although many of these factories were mainly built for military uses, they improved the two regions’ economic situations from two aspects. First, these industries had spill-over effect on related economic fields such as education, medical services, raw materials production, and transportation. Second, these factories helped the two backward regions to build a comprehensive modern industrial system that would have been very difficult to be achieved by private investment. Third, these industries employed local residents in the two regions and trained millions productive labors.
One direct result of the industrialization of the Inland and West was the regional inequality, measured by the GDP per capita, between the Coastal area and the other two regions had been significantly reduced from 1949 to 1979 (Table 9).

**Table 9  The Changing Ratio of GDP per capita across Chinese Regions**

<table>
<thead>
<tr>
<th>Region</th>
<th>1949</th>
<th>1965</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Inland</td>
<td>0.64</td>
<td>0.818</td>
<td>0.672</td>
</tr>
<tr>
<td>West</td>
<td>0.42</td>
<td>0.71</td>
<td>0.549</td>
</tr>
</tbody>
</table>


**Conclusions**

This study explores economic take-offs in the U.S. and China by extending Turner’s frontier model. The study argues that the “frontier” is not merely defined in geographic dimension. Indeed, new technology, institutions, and the mode of production can also be incorporated into the category of “frontier”. The study finds that the state in both countries, although to different extent, played important roles in shaping the road and pattern of each country’s economic take-off. The study also compares economic take-offs of the two biggest economies in the world and details the differences and similarities.

In sum, the “frontier” will never be closed as long as human beings are going to pursue new economic or institutional improvements with incessant vigor and inventiveness.
References


