Institutions and Economic Growth

DISSERTATION

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By

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Abstract

Several studies link modern economic performance to institutions transplanted by European colonizers and here I extend this line of research to Asia and Africa. In case of Asia, Japan imposed its system of well-defined property rights in land on some of its Asian colonies, including Korea, Taiwan and Palau. In 1939 Japan began to survey and register private land in its island colonies, an effort that was completed in Palau but interrupted elsewhere by World War II. Within Micronesia robust economic development followed only in Palau where individual property rights were well defined. Second, I show that well-defined property rights in Korea and Taiwan secured land taxation and enabled farmers to obtain bank loans for capital improvements, principally irrigation systems. Considering all of Japan’s colonies, I use the presence or absence of a land survey as an instrument to identify the causal impact of new institutions. My estimates show that property-defining institutions were important for economic development, results that are confirmed when using a similar approach with British Colonies in Asia. Third, my analytical model predicts that high costs of creating an ownership updating system and a citizen identity system discourage a short-sighted government from implementing these crucial components, the absence of which gradually makes land registration obsolete.
Finally, I analyze the importance of legal safeguards against land expropriation in Africa. It is generally established that Britain was more effective in transferring their legal systems in Africa during the decolonization process than was France. While most African countries repealed British-inspired legal safeguards after independence, Botswana and Mauritius (2009 GDP per capita (PPP) $12,100 and $12,400, respectively) kept all such safeguards. By using differences in decolonization and post-colonial reforms as instrumental variables, this dissertation provides empirical evidence suggesting that securing private land ownership was an important factor of economic growth in Botswana and Mauritius.
Acknowledgments

First and foremost, I would like to express my gratitude to my advisor Professor Richard Steckel. I also would like to thank Professor Lung-fei Lee, Professor Trevon Logan and Professor Paul Evans for their comments and criticism. Last but not the least; I thank my dear wife, Jangeun Cho, for her constant support.
Vita

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Fields of Study

Major Field: Economics
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Chapter 1: Introduction

When and why developed nations became rich are central questions in economics and history. The process was undoubtedly complex, involving many factors such as government policies, investments in infrastructure, terms of trade, legacies of colonialism, natural resources, climate, and luck. Differential economic progress around the globe over the past half century has stimulated a search for fundamental conditions that trigger and sustain the process of development and modernization.

Many researchers now recognize the importance of institutions that protect property rights for economic development (La Porta et al. 1997, 1998; Acemoglu et al. 2001, 2002; Engerman and Sokoloff 1997, 2002; Banerjee and Iyer 2005; Nunn 2008). Economic agents are less willing to invest if others can seize the returns of their investments (Demsetz 1967, Alchian and Demsetz 1973). Research on the institutional roots of economic development often pays homage to the work of Douglass North and collaborators, who were trying to understand the onset and geographic spread of industrialization within Europe (North 1990, North and Weingast 1989). They linked England’s head start, for example, to the Glorious Revolution of 1688, which limited the confiscatory power of the Crown and strengthened rights in private property. In their view, the commitment to property rights lowered interest rates on public and private
investments that became the building blocks of industrialization. While the pathway is plausible, the historical data available to confirm the linkage to British industrialization is modest.

This dissertation contributes by clarifying the pathways between property-defining institutions and growth, and by incorporating work on a neglected continent, Asia. I divide property rights into two categories: institutions that ‘define’ property rights such as a land survey system and a land registration system and those that ‘protect’ property rights such as land expropriation laws or constitutional safeguards against property takings. I assess the economic legacy of institutional change imposed by Japan on its Asian colonies which were acquired through an opportunistic process of territorial expansion. I argue that decisions to colonize were exogenous to late twentieth century growth, a point substantiated by results from the quasi experiment in Micronesia. I return to the issue of exogeneity later in the dissertation. Prior to colonization these countries had complex systems of land tenure that impeded transactions, including multiple ownership, clan or lineage ownership, poorly defined boundaries, and lack of official titles. In an effort to generate tax revenue, Japanese colonial administrators abolished these complex systems in favor of single ownership, official titles, updated land registers and boundaries established by clear survey maps. A new system made plain who was responsible to pay taxes.

My inquiry is inspired by rates of economic growth that were vastly different across Asia, where Japan was the only Asian country to successfully begin industrialization in the late nineteenth century. Asian tigers (South Korea, Taiwan, Hong
Kong, and Singapore) successfully industrialized in the second half of twentieth century while other countries in the region are currently underway or have yet to begin. The ratio of per capita GDP between the most developed country and the least developed country in Asia is over 25:1. I ask to what extent might contrasting systems of property rights account for differential growth?

The case of Palau – an island country in Micronesia – provides a quasi-experimental setting, which shows that secure private property defining institutions provided a foundation for economic development. Japan controlled Micronesia from 1914 to 1945, and in Palau surveyed and registered private ownership from 1939 to 1941, classifying land into four categories: public, clan, lineage, and individual. In 1941 Japan began to survey other Micronesian countries, but the process was interrupted by World War II. After the war the U.S. controlled Micronesia, and in Palau, American judges upheld land titles originating from the Japanese land registers. The American judges consistently concluded that clans or lineages did not have any authority over private land. In other Micronesian countries, the American judges lacked legal proof of private ownership and following the tradition of common law, upheld customary ownership rights that allowed a village or clan leaders to confiscate or deny land-use rights if a resident neglected customary obligations to the village. As a result foreigners only invested in private lands that were protected in an absolute way, as in Palau. In 2007, Palau was three times richer than other Micronesian countries.

The Asian experience suggests that the Japanese land survey was initially motivated by public finance. Land has two special characteristics which make it attractive
for the tax base: it is "immovable" and "everlasting." Generally it is easier for the government to tax land as opposed to other assets that can be readily "hidden." Effective land taxation, however, requires registers and maps to identify parcels, as well as a system linking taxpayers to the registers (Cho 2003). In many countries, land taxes are evaded because the government cannot link registers, maps, and taxpayers. The Japanese land survey and registration system secured land taxation and thus promoted public finance.

The solution of a public finance problem eventually was important for private finance. The characteristics of land make it attractive to banks as collateral for loans. My analysis shows, however, that banks accept land as collateral only if secure title and well-defined boundaries were part of a central ownership verification system. The Japanese land registration system was designed to preempt ownership and boundary disputes and was well integrated to the ownership updating system and the citizen identity system.\(^1\) Thus, it promoted private capital markets. Because land was the most abundant and important asset in these agricultural economies, its collateralization provided a major boost for economic development. Especially, when farmers obtained access to credit, they invested in irrigation systems that increased agricultural productivity.

Next, the dissertation estimates the impact of institutions on economic growth by using 2 Stage Least Squares (2SLS) and an instrumental variable that is directly related to the property defining institutions. Japan acquired its colonies though wars from the

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\(^1\) Feder et al. (1986), SMERU Research Team (2002), Do and Iyer (2008) find that land titling has positive impacts on credit markets but some studies ignore the importance of secure title and central verification, and reach the opposite conclusion, as do Boucher, Barham, and Carter (2002), Field and Torero (2004), and Galiani and Schargrodsky (2006).
1890s to the early 1940s, including Taiwan and South Korea. Japan lost all of these colonies after World War II and its land survey was interrupted in some places by the war. I argue that whether Japan conducted and completed a formal land survey is an appropriate instrument for property defining institutions (i.e. land tenure system). My estimates show that property-defining institutions stimulated financial markets that contributed to economic development.² My results are confirmed when using a similar approach with British Colonies in Asia.

A review of the history of land reforms shows that establishing a good land tenure system was more difficult than one might expect. First, reforms had to contend with rough boundaries used in the past. Landowners tended to exaggerate the size of their land parcels in private land transactions, thus most plots carried a history of boundary disputes. Second, the core of secure land transactions and collateralization is a centralized ownership verification system, which required not only land registration, but also a citizen identity system and an ownership updating system. Most governments, however, did not fully understand the importance of these components. Finally, land reforms usually change the whole structure of a society, and thus governments potentially face huge costs from socioeconomic and political destabilization.

In order to understand the conditions under which governments undertake effective land reforms that can promote long-run growth, I construct a simple model. The analytical model based on the stylized facts of land reforms shows that a short-sighted government chooses an interior solution, surveying only a portion of land, and does not

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² I have research underway on Taiwan and Korea, which substantiates my argument based on micro-level data.
create a citizen identity system or an ownership updating system. In sharp contrast, a far-sighted government chooses a corner solution having all the major components of well-defined property rights. The model shows that the main difference between the short-sighted reform and the far-sighted reform is future tax revenue. The real tax revenue from the interior solution without the updating system decreases over time because state’s land registers gradually become obsolete. Conversely, the real tax revenue from the corner solution is stable because the updated land registers and the citizen identity system maintain current information for tax collection. The model also shows that stable tax revenue enables the government to reduce tax rates, to be less arbitrary, and to engage in long-range planning. Moreover, the creation of the updating system and the citizen identity system provides the institutional foundation for land collateralization.

Next, I expand the scope of the analysis to Africa, where most countries have poor records of economic growth. After World War II, the British imposed legal and constitutional safeguards against property expropriation during the decolonization process in Africa. However, this was a period when the notion of private property was eroding. A review of the history of constitutions and land expropriation law in Africa shows that after independence most former British colonies repealed the British-inspired legal and constitutional safeguards except Botswana (GDP per capita $12,100 in 2009) and Mauritius (GDP per capita $12,400 in 2009) (Read 1975; Ng’ong’ola 1992; Allen 2000).

A large strand of work evaluates the importance of property rights and the legacy of colonial rule on property rights institutions (La Porta et al. 1997, 1998; Acemoglu,
Johnson, and Robinson 2001, 2002; Engerman and Sokoloff 1997, 2002; Banerjee and Iyer 2005; Nunn 2008; Lee and Schutlz 2009; for summary, see La Porta, Lopez-De-Silanes, and Shleifer 2008). However, earlier empirical studies on economic growth in Africa have not given suitable weight to the significance of legal institutional differences caused by the post-colonial reforms. This dissertation shows that the effect of such legal differences on economic growth in Africa was critical.

The former colonies in Africa provide an excellent setting for investigating the relationship between legal property rights and economic development. Comparative studies on British and French decolonization in Africa indicates that the British decolonization was done gradually based on experiences in South Asia whereas the French decolonization was done more in haste after the costly independence wars in Indochina and Algeria, which had different consequences in imposing legal systems (Smith, 1978; Chafer, 2002, introduction). For example, imposing legal safeguards against arbitrary land expropriation was a basic framework of the British decolonization. In contrast, when Guinea voted for independence on September 28 1958, the country attained independence on October 2 1958 and all French personnel and equipment were withdrawn, including typewriters and telephones. As a result, the French were less effective in imposing their legal systems than were the British. The consequences are consistent with the existing works arguing that the former British colonies have better suited to economic growth than the former French colonies (Hayek 1960; Lipset 1993; La Porta et al. 1998, 1999; see also critiques Acemoglu, Johnson, and Robinson 2001; Acemoglu et al. 2007; Prezworski et al. 2000; Lee and Schultz 2009). However, the
history of decolonization suggests that the difference might originate from decolonization processes rather than the traditions of common law and civil law.

Furthermore, thirty former British colonies’ constitutions are based on the British inspired Nigerian constitution, which initially preserved private property rights. However, the degree of property rights soon began to differ across countries because many of them repealed their constitutions after their independence. For example, Botswana and Mauritius kept all constitutional safeguards while Malawi, Zambia, and Zimbabwe expunged them (Ng’ong’ola 1992; Allen 2000, chap. 3; Read 1975).

In sub-Saharan Africa, most countries have poor records of economic growth. Botswana and Mauritius are exceptions, and strong property rights institutions were possibly an important source of their success. However, how Botswana and Mauritius established secure institutions has not been fully explored. Acemoglu, Johnson, and Robinson (2003), give prime importance to Botswana’s good pre-colonial institutions that limited political leader’s arbitrary and confiscatory power. It is argued that these good pre-colonial institutions survived because the British colonial rule was minimally intrusive in Botswana; thus their political leaders consistently chose to take democratic paths and adopted effective economic policies. However, Acemoglu, Johnson, and Robinson (2003) allow that other factors could also have been significant and do not identify the key economic policy.

In this dissertation I focus on one key factor of economic development – the presence or absence of a secure land tenure system. “Since the arrival of the European farmer in the first years of the century land issues had never been far from the centre of
the political arena” (Wasserman 1973, 101). Small white settler communities were in control of disproportionate amounts of the best lands and the colonial agrarian policies were biased in favor of settler estate agriculture (Ng’ong’ola 1992). “[Africans] resented the white man’s wealth, his dominance, and the racial discrimination they encountered at his hands [For example,] the sixty year history of Kenya is replete with petitions, delegations, uprisings, and organizations reflecting a sizable body of African opinion in various degrees of opposition to settler control of the lost lands” (Wasserman 1973, 101).

Many African studies (see, for example, Machacha 1986; Dougan 2004; Adams, Kalabamu, and White 2003; White 1999) point to the Tribal Land Act of 1968 as the basis of stable politics and institutions in Botswana. This act marked a major change in the institutional framework that handled the country's land matters. It established land boards, vested tribal land in these boards, and defined their powers and duties. After the Tribal Land Act, any tribesman who wished to get land for any use applied to the land board. If the application was successful, the land board would demarcate the site and issue a certificate. Moreover, the new landowners, secure in their right of possession, made capital improvements to their land by fencing and establishing reliable water sources (Machacha 1986).

One can also observe that Mauritius – another country with strong legal and constitutional property rights – has a secure land tenure system. In Mauritius, the French colonial government introduced a secure land tenure system and the British, who replaced the French in 1810, maintained the system. Consequently no land is held under customary law in Mauritius to this day. In contrast, a major part of land is still under
customary law in other African countries, making the land tenure system insecure (Dale 1976; Meek 1949; Aden Willy and Mbaya 2001). For example, in Zambia 94% of land is under customary law and only 6% of land was surveyed in 1976.

This dissertation provides empirical evidence showing that securing private property was a key component of economic development. Instrumental variable regression results show that the magnitude of economic growth caused by institutional innovations is structurally different from the magnitude of economic growth caused by institutional catch ups.
Chapter 2: Property Rights and Financial Development

1. The Evolution of Property Rights in Japan and its Colonies

According to Wakita (1991), the Taiko land survey of the late sixteenth century established a secure land tenure system in Japan, whose main purpose was separation of the warrior and peasant classes (Asao 1991). Before unification by Toyotomi Hideyoshi in the 1590s, a samurai owned peasants in his fief. Thus, the samurai could turn the peasants into soldiers, which provoked many revolts. In order to prevent the frequent rebellions, Toyotomi Hideyoshi separated the two classes. Because the warrior class collected taxes in his fief, the separation required a new tax collection system. Therefore, the Taiko land survey identified the cultivator for every plot, which made clear who was responsible to pay the tax.

About 300 years later Japan further modernized the land tenure system. New tax laws promulgated in 1873 provided a uniform land tax, which was payable in money rather than rice and was assessed on the value of land, not the size of the harvest. Thereafter, peasants not only received title to the land, but gained the ability to buy and sell land, grow vegetables or fruit instead of rice as they saw fit, and even abandon their land if they wished (Duus 1976).
Between 1895 and World War II Japan occupied dozens of countries or territories in Asia. The map given in figure 1 presents a rough time line of territorial acquisitions\(^3\), beginning with Taiwan, acquired at the conclusion of the Sino-Japanese war in 1895. Japan invaded the Liaodong peninsula during the Russo-Japanese war of 1904-1905, and by terms of the Treaty of Portsmouth retained Liaodong peninsula and the southern portion of Sakhalin Island. In 1905 Japan declared Korea as a protectorate, and completed the process of colonization by annexation in 1910. Japan supported the Allies in World War I and was later rewarded with Germany’s colonies in the Pacific (Palau, the Northern Mariana Islands, the Marshall Islands, and the Federal States of Micronesia). Japan became increasingly militaristic in the 1930s and 1940s, invading Manchuria in 1931 and occupying the remaining territories in the south, from the Philippines to Indonesia and Indochina, during World War II.

\(^3\) Japan acquired Okinawa, the Kuril and other islands from 1886 - 1895.
Figure 1. Japanese colonies and a map of Micronesia
<table>
<thead>
<tr>
<th>Country</th>
<th>Japan (1873)</th>
<th>Korea (before 1918)</th>
<th>Taiwan (before 1905)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Single owner</td>
<td>Single owner</td>
<td>Multiple owner (sub-soil owner, top-soil owner)</td>
</tr>
<tr>
<td>Land register</td>
<td>Official registers (100% of land was registered)</td>
<td>Official registers for tax (50% of land was registered)</td>
<td>Official registers for tax (30% of land was registered)</td>
</tr>
<tr>
<td>Updating system</td>
<td>Yes; Registers were updated and connected to taxpayers</td>
<td>No; Registers were outdated and not informative to identify taxpayers</td>
<td>No; Registers were outdated and not informative to identify taxpayers</td>
</tr>
<tr>
<td>Title</td>
<td>Official titles; All titles were linked to a centralized system</td>
<td>Official and private title; Private titles were not linked to a centralized system</td>
<td>Official and private title; Private titles were not linked to a centralized system</td>
</tr>
<tr>
<td>Boundary (map)</td>
<td>Taiko survey (1590s); Cadastral survey (1873)</td>
<td>Boundary was described vaguely based on landmarks</td>
<td>Boundary was described vaguely based on landmarks</td>
</tr>
<tr>
<td>Tax system</td>
<td>Based on the value of land; Payable in money; Uniform tax rate</td>
<td>Based on the size of the harvest; Payable in rice; Tax rate varied locally</td>
<td>Based on the size of the harvest; Payable in rice</td>
</tr>
</tbody>
</table>

Source. – Duus (1976), Lin (2008), Rhee et. al. (2004)

Table 1. A comparison of land tenure systems

Table 1 summarizes important aspects of pre-colonial land rights in Taiwan and Korea. The first column repeats the salient features of the modern Japanese system: single owner; universal land registration that is updated as transactions occur; titles linked to a central registration system; and cadastral surveys (i.e. official boundary surveys). Other areas that became Japanese colonies might have had single owners (Korea) but much of the land was either unregistered or the registers were outdated, titles were not linked to a central system and surveys were based on landmarks. The systems in Taiwan
had similar problems and were even more complex than found in Korea with separate top-soil and sub-soil owners.

Japanese colonial governments completed land surveys in Taiwan (1898 - 1905) and Korea (1911 -1918) by which land ownership was identified and registered. After the survey, registered land increased by 215% in Taiwan (Ka 1995) and by 80% in Korea (Kwon 1989). The main purpose of these land surveys was to facilitate tax collection, which was needed to offset costs of colonial administration. Two years after the completion of the land survey, tax revenue increased more than three fold in Taiwan (Ka 1995) and two fold in Korea (Kwon 1989).

2. A Natural Experiment in Micronesia

One might suspect that I emphasize the completion of a land survey in Taiwan and South Korea because these countries later became rich. In identifying the long-run economic effects of property rights, one must consider the problem of reverse causality, i.e. secure property rights can be a result of economic development.

Reverse causality is not an issue in the case of Palau, a Pacific island that enjoys three times the GDP per capita ($7,600 in 2007) compared to other countries in Micronesia (the Marshall Islands, $2,900 and the Federated States of Micronesia, $2,300 in 2007). The case of Palau is illustrative because the Pacific islands have quite similar initial economic conditions (isolated geographic location and extremely limited land area) and a tradition of clan ownership.

Arguably Palau can be interpreted as an outcome of a natural experiment. Because of its favorable geographic location – for observing British activities in New
Guinea as well as American activities in Guam and the Philippines – relative to other Japanese interests in the region, Palau became the civil headquarters of Micronesia in 1922 (Mangefel and Caldwell 2005, 41). One might suspect that Palau was chosen for its economic potential. This was not the case. Japanese evaluation of Micronesia in 1916 failed to mention economic potential (Purcell 1967, 153). As a matter of fact, during the German era (1899 – 1914) the Marshall islands, which had abundant coconuts, was the economic center of Micronesia, and Truk (a state of the Federated States of Micronesia) had a large population based on favorable fishing conditions. Moreover, the Germans dug a canal and installed an undersea cable station in Yap (a state of the Federated States of Micronesia next to Palau), but neglected development in Palau (Etpison 2004).

In Micronesia, the Japanese colonial government first identified the boundaries between public lands and private lands from 1923 to 1937. Then, Japan identified owners and boundaries of private lands and made land registers in the Northern Mariana Islands from 1937 to 1939 and in Palau from 1939 to 1941 (Purcell 1967). However, in the Federated States of Micronesia and the Marshall islands, the Japanese land survey, begun in 1941, was curtailed and eventually stopped by the onset of World War II (Damas 1994, McGrath and Wilson 1971). Consequently, the Federated States of Micronesia and the Marshall islands still operate under the clan ownership system.

Legal cases in Micronesia clearly show the legacy of the Japanese land registration system. From 1945-1981 Micronesian countries became the Trust Territory of the United States and during this era courts consistently upheld land rights defined by the Japanese land survey in Palau. The American judges consistently concluded that
clans or lineages did not have any authority over private land (Orrukem v. Kikuch, Trust Territory Reports (T.T.R.) vol. 2, 533).

In sharp contrast, in the Federated States of Micronesia and the Marshall Islands, American judges were unable to find any basis or evidence of private land ownership and therefore customary land law applied. In Micronesia land tenure was based on clan, lineage or group ownership and most customary law allowed the chief to confiscate (customarily assigned) land if an individual violated village traditions. Consequently, the courts allowed (or sometimes enforced) the confiscation of land if a plaintiff provided clear evidence of violation of the customs by, for example, failing to attend important village activities (for example, Amon v. Tobek T.T.R. vol. 6, 36; Tamaggimed v. Bathin, T.T.R. vol. 2, 499; Phillip v. Carl, T.T.R. vol. 3, 330; Mita v. Piriska, T.T.R. vol. 3, 168). With the exception of Palau, this kind of legal tradition remains in Micronesia. In Yap, Civil Action No. 2008-043 states that “Generally, land titles in Yap … do not have the same meanings as land titles held elsewhere. … the titles are generally subject to various conditions or interests whether or not the conditions or interests are mentioned in the certificates of title” and the municipal judges can nullify land titles if the land owner violates the traditional customs (Yap state government, Section 7 of Yap State Law 2-38).

One might suspect that other factors such as education, health or infrastructure investments that were either unique or relatively more important to Palau led its

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4 See also Ngiruhelbad v. Merii, Imesei, and Tarkong, T.T.R. vol. 1, 367; the opinion of the Appellate Division in that action affirming the decision of the Trial Division, T.T.R. vol. 2, 631; the opinion in the case of Lusii Orrukem v. Kikuch and Issak; Palau District Civil Action No. 194.
economic growth. However, from 1945 to 1981, U. S. policy treated these countries as one political entity, the Trust Territory of the Pacific Islands.\(^5\) In fact, Japan and the United States built and repaired roads, harbors, and airfields not only in Palau but also in the Marshall Islands and the Federated States of Micronesia (Close up Foundation 2000, Boecker 1993). Moreover, there was a large expansion of American-style education\(^6\) and significant sanitation improvements in Palau, the Marshall Islands, and the Federated States of Micronesia after 1945. Economic growth, however, was robust only in Palau where Japan transferred its land tenure system completely.

<table>
<thead>
<tr>
<th>States with the Japanese land registers in Babeldaob island</th>
<th>Disposed</th>
<th>Pending</th>
<th>Disputed + Pending</th>
<th>Total</th>
<th>% of Disputed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ngchesar</td>
<td>17</td>
<td>50</td>
<td>16</td>
<td>29</td>
<td>33</td>
</tr>
<tr>
<td>Ngaremlengui</td>
<td>11</td>
<td>14</td>
<td>2</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Ngarchelong</td>
<td>46</td>
<td>154</td>
<td>7</td>
<td>5</td>
<td>53</td>
</tr>
<tr>
<td>Ngaraard</td>
<td>24</td>
<td>234</td>
<td>57</td>
<td>4</td>
<td>81</td>
</tr>
<tr>
<td>Melekeok</td>
<td>5</td>
<td>15</td>
<td>7</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>467</strong></td>
<td><strong>89</strong></td>
<td><strong>48</strong></td>
<td><strong>192</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>States without the Japanese land registers in Babeldaob island</th>
<th>Disposed</th>
<th>Pending</th>
<th>Disputed + Pending</th>
<th>Total</th>
<th>% of Disputed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airai</td>
<td>4</td>
<td>48</td>
<td>94</td>
<td>19</td>
<td>98</td>
</tr>
<tr>
<td>Aimeliik</td>
<td>24</td>
<td>10</td>
<td>7</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>Ngardmau</td>
<td>4</td>
<td>27</td>
<td>19</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>85</strong></td>
<td><strong>120</strong></td>
<td><strong>21</strong></td>
<td><strong>152</strong></td>
</tr>
</tbody>
</table>

Source. – Palau Land Court  
Note. – Two states that has fewer than five cases are excluded

Table 2. Disputed and undisputed cases in issuing land titles in Babeldaob 2000 – 10

One can also study the relationship between secure land tenure and development within Palau. Three of the 16 states in Palau – Aimeliik, Airai, and Ngardmau – lack the

---

\(^5\) Palau and the Marshall Islands voted for independence, declining to join the Federated States of Micronesia.

\(^6\) The U. S. navy estimated that about 90% of primary school age children were enrolled in schools and 95% of them were attending in 1950s (Mangefel and Caldwell 2005).
Japanese land registers because they were apparently misplaced in storage or lost in transit to Guam (Trust Territory of the Pacific Islands Office of Land Management, Note on Duplication 1967). Court records from 2000 to 2010 show that in Babledaob Island, where ten out of sixteen states are located, the three states lacking the Japanese land registers have more disputes (58.9%) in issuing land certificates than other states (27.2%) (table 2).

The relationship between the lack of a land register and low development is most clearly observed in the state of Ngardmau, which sank from one of the most to the least developed states in Palau after the land registers were lost. During the colonial era the state became relatively prosperous after the Japanese opened bauxite mines. In the 1960s, many Japanese companies wanted to reopen the mines, but the unclear boundary between public and private lands discouraged this (Petrosian-Husa, Miko, Smaserui 2002). Vague boundary and the slow process of land titling were the main obstacles to reopening the mines and invigorating economic development.  

3. Land Surveys Contribute to Public and Private Finance

Generally it is easier for the government to tax land because it cannot be readily "hidden" as other assets could be. However, effective land taxation requires registers and maps to identify parcels, as well as a system linking taxpayers to the registers (Cho 2003). In many countries, land taxes are evaded because the government cannot link the

---

7 One may suspect that destruction during World War II might be the cause of slow development in Ngardmau, which is one of the states on Babeldaob island. In 1947, the U. S. Geological survey evaluated Ngardmau’s potential for bauxite mining (Petrosian-Husa, Miko, and Smaserui 2002). They concluded that the principle asset remaining were the roads and railway grades, which could be restored and used to good advantage. The water mains, reservoirs, causeway, pier and also possibly the aerial tramway could be rehabilitated at moderate expense. In Palau, war destruction was heaviest in the adjacent islands of Peleliu and Angaur, which were the only areas of Palau the United States invaded.
three together. Governments appoint local authorities to make the links based on local information, giving them a percentage of the tax receipts as payment. This remedy is imperfect, however, because principal-agent problems often lead to corruption.

Traditionally Asian countries had land registers, but given the lack of surveys and ownership updates, the land registers were not very useful in collecting land taxes directly from the taxpayers. Sng (2009) argues that it was difficult for the central government to increase tax revenues assigned to local authorities because the poor usually shouldered a heavy tax burden. The Japanese land survey linked the registers, maps, and taxpayers. Moreover, the Japanese colonial government also introduced a citizen identity system in Korea and Taiwan as a way to control the population, but this facilitated tax collection by identifying particular individuals as taxpayers. The Japanese colonial governments faced large budget deficits during the land reform, but the new land tax system was cost effective and much more successful than expected. The total cost of land reform in Taiwan was 5.3 million yen, but the annual land tax revenue increased by 2 million yen.\(^8\) In Korea, the Japanese colonial government was able to decrease the land tax rate from 3% (planned) to 1.5% as a result of higher-than-expected revenues. Finally, it should be noted that stable tax revenue expands the state’s ability to undertake public projects by selling bonds (Furguson 2001). Government can issue bonds only if they have predictable tax revenue.

Interestingly, the solution of a public finance problem eventually was important for private finance. Because land is immovable and everlasting, banks are more willing

---

\(^8\) The land tax revenue increased from 0.92 million yen in 1903 to 2.98 million yen in 1905.
to accept it as collateral relative to other assets that can be stolen, hidden, or readily
destroyed. Tapping land as collateral, however, is more difficult than one might expect.
Legally, land ownership is an abstract concept and what the seller of land owns and offers
is “the right to sell” (tenants and squatters have the right to use but lack the right to sell).
However, “the right to sell” is justified only by the law (Simpson 1976). In most
cultures, traditionally land was considered to be held either directly or indirectly from the
King. Therefore to prove ownership the title had to be traced back to the original Crown
grant (or state grant). For example, in the U. S., title insurance links the deed through an
unbroken chain to the original state grant. Therefore, a centralized information exchange
system such as a record of deeds or registration of title is a very efficient way of proving
ownership. Moreover, land ownership has a very special problem, i.e. boundary
disputes. Therefore, banks are more willing to accept land as collateral if secure title and
well-defined boundaries are part of a central ownership verification system. A land
survey clarifies the boundary and makes abstract land ownership more concrete and
secure by reducing boundary disputes.

Experiences in Asia suggest that the following are effective links of a chain: land
surveys, a citizen identity system, land titles, recording of deeds or registration of titles,
and acceptable collateral. First, banks are reluctant to accept land titles as collateral if the
document does not clearly specify the boundaries. In developing countries, many land
titles vaguely describe the boundaries, often based on landmarks, not a cadastral survey.
Thus, if the landmark is destroyed or moved, boundary disputes follow. Without clear
boundaries, the size and value of land is vague and consequently using land as collateral
becomes risky. For example, in Thailand 55 percent of land is held under a certificate of utilization, which is a quasi-formal land title having rough boundaries, but banks do not accept this as collateral. In Thailand, only 15 percent of land has a legal title based on a cadastral survey acceptable to banks (Angus-Leppan and Williamson 1985).

Second, governments must provide a centralized ownership verification system. Korea’s legal history provides a good example. Prior to 1918 there was no official registration system and Koreans could not register titles in land transactions. Before this step, the Japanese colonial government issued a verification letter for land transactions. The law, however, implicitly stated that the letter did not guarantee ownership to a third person (Cho 2003). Foreigners could buy land in Korea after 1905 and the colonial government tried to promote land transactions by verification letters, but ownership was not fully guaranteed. After the land survey, the registration-of-title system started and the law explicitly indicated that the government guaranteed ownership of such land. Consequently, banks began to accept land titles as collateral with more confidence.

Finally, it should be noted that a well established citizen identity system should be combined with a centralized ownership verification system. In many cultures, people have multiple names for different purposes. For example, in traditional Korea a man was given names at birth, as an adult, an official name for governments, a name for the family history, and a nickname. Thus, the Korean government had difficulty in identifying the owner of land from the name used on the traditional land register. Without a system that identifies a person with a single name, land cannot be used as secure collateral.

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9 The Japanese colonial government also introduced laws for house and land collateral in 1905.
At the time of Japanese conquest, Korea and Taiwan were heavily agricultural and land was the most abundant asset. By accepting land as collateral, banks solved a problem of private finance. In Korea, for example, Chosun bank – which played a major role in the 1910s – depended mainly on credit collateral and faced many loan default problems in the 1920s, and thereafter decreased its credit loans. In contrast, Siksan bank – which played a major role in the 1920s – required land as collateral and did not face such problems (figure 2) (Oh 1996). After the official land registration system was operational, access to credit became easier and interest rates declined. The total amount of collateralized loans from banks increased in Korea (table 3) after 1918 and the total number of collateralized parcels of land increased in Taiwan after 1905 (table 4) because land titles became reliable. After the Japanese land survey and registration in Korea, the private interest rate decreased to 30% and kept falling over the next 20 years (figure 3).\textsuperscript{10} A similar pattern is observed in Taiwan (figure 3). Figure 2 shows that the total amount of bank loans increased in Korea and figure 4 shows that value added in the financial sector increased dramatically after the land survey was completed.

\textsuperscript{10} Traditionally, the private interest rate was about 50% in Korea.
Source. – Oh (1993)

Figure 2. Total amount of loan and the portion of banks
Collateralized (land) regular loan

<table>
<thead>
<tr>
<th>Year</th>
<th>Siksan</th>
<th>Dongchuk</th>
<th>Geumjo</th>
<th>Choeun</th>
<th>Siksan</th>
<th>Botong</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>6,621</td>
<td>11,371</td>
<td>1,253</td>
<td>5,049</td>
<td>3,320</td>
<td>6,590</td>
<td>34,204</td>
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<tr>
<td>20</td>
<td>28,216</td>
<td>30,571</td>
<td>10,639</td>
<td>12,037</td>
<td>5,820</td>
<td>17,557</td>
<td>104,840</td>
</tr>
<tr>
<td>22</td>
<td>61,326</td>
<td>37,927</td>
<td>18,128</td>
<td>19,438</td>
<td>12,426</td>
<td>28,164</td>
<td>177,407</td>
</tr>
<tr>
<td>24</td>
<td>70,075</td>
<td>39,806</td>
<td>18,749</td>
<td>21,417</td>
<td>14,813</td>
<td>32,253</td>
<td>197,113</td>
</tr>
<tr>
<td>26</td>
<td>83,817</td>
<td>35,609</td>
<td>25,518</td>
<td>17,003</td>
<td>15,520</td>
<td>36,033</td>
<td>213,600</td>
</tr>
<tr>
<td>28</td>
<td>110,399</td>
<td>38,743</td>
<td>25,642</td>
<td>9,070</td>
<td>16,669</td>
<td>34,429</td>
<td>234,952</td>
</tr>
<tr>
<td>30</td>
<td>140,120</td>
<td>44,430</td>
<td>38,076</td>
<td>20,538</td>
<td>8,996</td>
<td>46,423</td>
<td>298,583</td>
</tr>
</tbody>
</table>

Source. – Hori, Gazuo (1982)
Note. – 1) Siksan, Dongchuk, Geumjo, Choeun, and Botong are the names of financial institutions. 2) The formal land survey was completed on November 1918.

Table 3. Amount of collateralized loan (collateral type: land) in Korea, 1918 – 1930

<table>
<thead>
<tr>
<th>Year</th>
<th>Parcels of land registered as collateral in Taiwan</th>
<th>Parcels of land registered as changing hands through sales in Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1905</td>
<td>4848</td>
<td>4499</td>
</tr>
<tr>
<td>1906</td>
<td>43731</td>
<td>51137</td>
</tr>
<tr>
<td>1907</td>
<td>38040</td>
<td>62043</td>
</tr>
<tr>
<td>1908</td>
<td>39798</td>
<td>64210</td>
</tr>
<tr>
<td>1909</td>
<td>46279</td>
<td>68466</td>
</tr>
<tr>
<td>1910</td>
<td>54474</td>
<td>74815</td>
</tr>
<tr>
<td>1911</td>
<td>53718</td>
<td>86286</td>
</tr>
<tr>
<td>1912</td>
<td>67335</td>
<td>151125</td>
</tr>
<tr>
<td>1913</td>
<td>83341</td>
<td>121328</td>
</tr>
<tr>
<td>1914</td>
<td>92130</td>
<td>93759</td>
</tr>
</tbody>
</table>

Source. – Statistics on Land Registration in Taiwan (臺灣土地登記集計表) (1915)
Note. – Registration began in July of 1905.

Table 4. Land transaction in Taiwan (collateralization / sales)
Source. – Source: Kim and Park (2004)
Note. – Public interest rate: Chosun, Siksan, Botong; Private interest rate: Daeguem, Youngam(chaip), Youngam(1), Youngam(2); Inflation was high in early 1920s due to aftermaths of World War I.

Figure 3. Public and private interest rates in Korea (above) and Taiwan (below)
Source. – Joo (2005)
Note. – Sub-total of valued added in finance services including special banks, commercial banks, oriental reclamation company, financial cooperative, moneylenders and pawnshops, stock exchange, trusts, other financial companies

Figure 4. Value-added by year in finance services in Korea

Various features of land tenure explain why land titling might have little impact on credit markets in some cases. Many African countries do not require a clear boundary map in land titling (Dale 1976) and fail to provide a centralized ownership verification
system. It is worth noting that limited impacts on credit markets are reported in land
titling for squatters in urban areas (Field and Torero 2004, Galiani and Schargrodsky
2006). Land titles issued to squatters are intrinsically less secure because ownership
disputes can occur between the original legal owners and squatters who obtained land
titles (or ownership can be restored to the original legal owners by political changes). In
fact, Galiani and Schargrodsky (2006) report disputes between the original legal owners
and the government in the processes of land titling and land expropriation from original
legal owners. Thus, it is plausible that banks are less willing to accept recently issued
land titles to the squatters in the short run. Additional barriers to credit markets originate
from a poor citizen identity system, and lack of an updating system and a reliable
centralized ownership verification system.

4. Pathways between Property Rights and Economic Growth

Historical evidence suggests that good property defining institutions stimulate
land transactions; capital investment; lower interest rates through the development of
financial markets; improve the inflow of outside capital; and facilitate the transfer of
technology.

On the first point, good property defining institutions facilitate land transactions
and mortgaging. A well established land registration system allows sub-division of land,
which helps to match parcel size with collateral needs. This might seem unimportant,
except under many customs and laws, all of the collateralized property can be forfeited to
the creditor, regardless of the difference between the value of the property and the
amount of the debt (Kim 2008). In addition, with effective land transactions, land values
tend to rise because the size of the market increases and resources are more likely to flow into their highest valued use (Alston, Libecap and Mueller 1999).

Second, the inflow of outside capital is very sensitive to property defining institutions as illustrated by the case of Hawaii. In Hawaii most land was owned by the government or a small number of landlords. Before 1967, most people leased property for 55 years rather than buying the land and houses (La Croix 1995). Consequently, mainland Americans were reluctant to invest in Hawaii because the land tenure system was unfamiliar and perhaps subject to arbitrary change. Similarly, Etpison (2004) explicitly describes that “land title disputes scared off legitimate investors, and make high-end hotel development a real challenge [in Micronesia].”

Finally, transfer of technology is also sensitive to property defining institutions. Observers have suggested, for example, that the collective land tenure system in Africa is an obstacle to adapting Western irrigation technology, which operates most efficiently on a large scale. Collective ownership of land complicates decision making by creating holdouts and assorted groups with diverse if not adversarial interests. Customary (tribal) law, therefore, impedes the adoption of this complex and expensive technology (Slabbers 1990).

The process of irrigation investment in Korea illustrates a clear pathway from a secure land tenure system to economic development. According to Rhee et al. (1992) irrigation investment was possible because the land survey clearly identified the boundaries and owner of the land. After the land survey, the board for the new irrigation system could use the land register to identify and gain permission from the relevant land
Moreover, the board could identify the land owners who needed compensation resulting from making new reservoirs and water distribution ditches. When the permission and compensation processes were finished, the relevant farmers could finance the cost for the new irrigation system by getting loans from banks. Banks founded by Japanese capital accepted land titles as collateral and the farmers received a low interest rate (However, the irrigation investments were such big projects that farmers often paid back their loans over twenty to thirty years).

After the completion of irrigation projects and subsequent adjustments, agricultural productivity in paddy land increased by 67 to 200 percent in Korea (Rhee et al. 1992). On average, there was a drought every eight years (figure 5) and extremely severe drought every twenty five years in Korea (Rhee and Cho 2005, Rhee 2009). Thus, it is clear why the farmers invested in the irrigation system when they first obtained access to credit. After 1918 one can observe that agricultural loans increased (figure 6) and the portion of land as collateral also grew (figure 7). The irrigation investments in Taiwan doubled the quantity of arable land from 1898 to 1940 (Ka 1995).

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11 In order to create a cooperative, the board was required to obtain permissions from a majority of land owners who owned at least two-thirds of the land area. Free riding was not a problem in setting up the cooperative because large landlords received the greatest benefit.

12 Agricultural productivity does not increase immediately partly because micro-organisms in the soil must adjust to more water.

13 Land reforms that led to irrigation investments and rising agricultural productivity are also reported in Botswana (Machacha 1986) and Kyrgyzstan (Akramov and Omuraliev 2009).
Source. – Rhee (2009)
Note. – 100% denotes the average rainfall from 1770 to 1990. Drought is defined as 50% of the average rainfall from April to June. Flood is defined as more than 200% of the average rainfall from July to September.

Figure 5. Rainfall 1770-1910 in Korea

Source. – Oh (1993)
Note. – In order to prepare World War II, Japan focused on industrial investments in the late 1930s in Korea.

Figure 6. Purpose of loans
Source. – Oh (1993)
Note. – Loans for industrial investments in the late 1930s were given without collateral because it was given for World War II preparation.

Figure 7. Decomposition of collateral in Korea

The case of Korea shows why the transfer of a western irrigation system is very difficult under conditions faced in many African countries. Even though an irrigation project may be financed by international organizations, the permission and compensation processes are stymied by the clan ownership system.

5. Empirical Estimation: Two Stage Least Squares

In this section, I estimate the long-term effects of good property defining institutions. I address reverse causality by using instrumental variables that measure the
degree of institutional transfer. I argue that whether Japan conducted and completed a formal land survey is a valid instrument because the Japanese occupation and the completion of the land surveys were determined opportunistically, and Japan abruptly lost all of its colonies after World War II.\textsuperscript{14} I maintain that the new property defining institutions (i.e. Japanese land tenure system) persisted. In fact, the current land tenure systems of Taiwan, South Korean, and Palau are based on Japanese land surveys. For example, in South Korea the original Japanese land registers are still in daily use (Gragert 1994). Consequently, the completion of a Japanese land survey affects current GDP per capita only through institutions of land rights.

In Asia, secure land tenure systems are found not only in Taiwan, Korea, and Palau, but also in Hong Kong and Singapore. In the latter cases the British colonial government transferred institutions of land rights. These historical facts enable us to extend the scope of institutional analysis and provide a consistent explanation for the origins of economic growth in Asia.

Hong Kong and Singapore began as British colonies, with British legal and administrative systems. Both are densely populated cities and land is a scarce resource.

\textsuperscript{14} Japan’s early interest in Taiwan, Korea, and Palau had little to do with industrial potential. Taiwan was acquired largely for reasons of honor and prestige from the Sino-Japanese War. In 1895 Taiwan was viewed “as unimportant to China and as quite abhorrently un-Chinese” (Hong and Murray 2005, 61). In fact, the Chinese general Li Hongzhang, who ceded Taiwan to Japan, informed the Emperor that the loss was trivial because it was a land of brigands, murderers, and pirates (Hong and Murray 2005). Korea was acquired largely because Japan felt that another power having a military presence on the peninsula would have been detrimental to Japanese national security. At that time Korea was described as “a dagger pointed at the heart of Japan.” Also, it is clear that Japan was not able to predict the division of Korea in 1945 and the consequent poor economic performance of North Korea. Japan occupied Micronesia including The Northern Mariana Islands and Palau because the British requested them to attack the German naval bases in Asia during World War I. Finally, Japan’s loss of all colonies after World War II makes the end of occupation an exogenous event in the colonies.
However, less well known is the fact that the state owns all the land in Hong Kong, and four-fifths of the land in Singapore (Phang 2000).

In Hong Kong and Singapore, the governments own and lease property. If the leasing contracts provided good property defining institutions for land, then I can apply the analysis of land tenure to these places. The following excerpt from Phang (2000) shows that British colonial leases, in fact were secure.

The British government, on taking over Hong Kong Island in 1841, recognized immediately the importance of controlling land. In 1843, it proclaimed that all land belongs to the Crown and that the government would not allow any private ownership of land. Leases were sold at public auctions or granted directly for the payment of an annual rent. Enforcement powers for land use decisions are found in the Building Ordinance and contractual powers in Crown leases.

In 1826, English statutes in force on November 26, 1826, and the principles of common law and equity were received as part of the law in Singapore. This meant that English doctrines of tenure and estates operated in Singapore. (Phang 2000)

In contrast, the British occupied India, Bangladesh, Pakistan, and Sri Lanka for an extended period, but their colonial government failed for some time to transfer the British land tenure system. A history of Sri Lanka's cadastral survey clearly shows that the British failed to transfer its land tenure system.

After the occupation of the country by the British, several attempts had been made for the establishment of a cadastre based on cadastral surveys. The proclamation by Governor North in the year 1800 for land owners to
appear before the 'Land raad' (a judicial official) to produce evidence of title and get their lands surveyed was the first attempt. This failed.

Systematic cadastral surveys commenced in three sub urban villages within the capital Colombo itself based on an Act passed in 1877 for the purpose. However, this activity was abandoned in 1891, after three years of operation, mainly due to the high costs involved. Subsequent attempts in the form of several studies, recommendations and draft acts prepared for the purpose did not borne fruit.

There is at present, what can be described as, a limited cadastre. About eighty percent of the country is covered by village plans prepared by the Surveyor General demarcating State (Crown) land. These plans are [...] prepared after 1910.

http://www.cadastraltemplate.org

As the above excerpt shows, the British colonial government attempted to implement a modern land tenure system in Sri Lanka, but it failed in 1800, and failed again in 1891 due to the high cost. Although the British occupied Sri Lanka for 153 years, the British colonial government could not transfer the crucial British institutions (i.e. the land tenure system based on cadastral surveys) for 114 years. Thus a huge difference existed between Sri Lanka and the two city-states, Hong Kong and Singapore.

Considering this difference, I suggest two more instruments. The first is whether a country is a city-state (CITY) that has a small land area to survey and register. The second instrument is the number of years of British occupation after the successful introduction of the British land tenure system (REVISED LENGTH OF BRITISH OCCUPATION), which is directly related to the transfer of a land registration system and
operational experience. For example, if I count the number of years of British occupation
in Sri Lanka after 1910 (when the village plans enabled a limited cadastre), REVISED LENGTH OF BRITISH OCCUPATION for Sri Lanka is 39 years. Since most of the
countries clearly recorded when the laws for the land tenure system were enacted,
REVISED LENGTH OF BRITISH OCCUPATION can be calculated with less concern
of subjectivity (See appendix B).

By using the completion of a Japanese land survey, whether a country is a city-
state, or revised length of British occupation as instruments, I can estimate the impact of
institutions on economic growth without concern for reverse causality and measurement
errors of institutional quality. Table 5 contains the basic information on 30 former
Japanese and British colonies in Asia. Thailand, a Southeast Asian country that did not
experience any colonial occupation, is also included in the regression. Data on the log
of GDP per capita (Purchasing Power Parity) are taken from the CIA World Fact Book
(2007), which covers all of the Pacific Islands. The World Bank and IMF's GDP per
capita (PPP) figures, however, are very similar to the CIA World Fact Book estimates.

\[15\] Since Japan colonized only parts of China and Russia, those countries are excluded (robustness checks are discussed later).
<table>
<thead>
<tr>
<th>Country</th>
<th>GDP per capita ($, PPP) in 2007</th>
<th>Rule of Law</th>
<th>Pacific Island</th>
<th>Japanese Land Survey</th>
<th>City-state Rule</th>
<th>Length of British Occupation</th>
<th>Revised Length of British Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1300</td>
<td>-0.84</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>172</td>
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<td>Brunei</td>
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<td>Federated States of Micronesia</td>
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<td>Nauru</td>
<td>5000</td>
<td>0.73</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>52</td>
<td>41</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2600</td>
<td>-0.81</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>105</td>
<td>44</td>
</tr>
<tr>
<td>Palau</td>
<td>7600</td>
<td>0.64</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>2000</td>
<td>-0.86</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>77</td>
<td>2</td>
</tr>
<tr>
<td>Philippines</td>
<td>3400</td>
<td>-0.45</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Singapore</td>
<td>49700</td>
<td>1.68</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>141</td>
<td>134</td>
</tr>
<tr>
<td>Solomon Island</td>
<td>1900</td>
<td>-1.05</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>80</td>
<td>10</td>
</tr>
<tr>
<td>South Korea</td>
<td>24800</td>
<td>0.73</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4100</td>
<td>0.02</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>153</td>
<td>39</td>
</tr>
<tr>
<td>Taiwan</td>
<td>30100</td>
<td>0.81</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Timor Leste</td>
<td>2500</td>
<td>-0.97</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tonga</td>
<td>5100</td>
<td>0.15</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>71</td>
<td>54</td>
</tr>
<tr>
<td>Tubalau</td>
<td>1600</td>
<td>1.28</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>88</td>
<td>44</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>3900</td>
<td>0.07</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>37.5</td>
<td>6</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2600</td>
<td>-0.53</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Thailand</td>
<td>8200</td>
<td>0.20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


Table 5. Former Japanese colonies and British colonies, descriptive statistics
I consider various measures of current institutional quality assembled under the auspices of the World Bank (Kaufmann, Kraay, and Mastruzzi 2007). The World Bank's governance indicators provide annual measures of six institutions, which I averaged over the years 1996-2007:

A. Voice and Accountability; B. Political Stability & Absence of Violence/Terrorism; C. Government Effectiveness; D. Regulatory Quality; E. Rule of Law; F. Control of Corruption.

Measure E, Rule of Law – measuring perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence – is used as the main measure of institutions. The other measures are used to check for robustness, which is confirmed.

In this dissertation, I replicated the methodology of Acemoglu, Johnson, and Robinson (2001) who emphasized property protecting institutions, because one of my main purposes is showing that property defining institutions are equally important in the long run. However, I use instruments that are directly related to the property defining institutions (i.e. LAND SURVEY, CITY, or REVISED LENGTH OF BRITISH OCCUPATION) to avoid pitfalls of weak instruments. Mortality rates and population density that are relevant to migration and transfer of institutions are not used as instruments because I believe land is a more fundamental and concrete determinant than
those two variables, given that most migrants were farmers. For example, Ferguson (2003) clearly describes that “the lure [of migration] was the offer of 160 acres of virgin real estate in Saskatchewan, free of charge.” The history of Japanese migration also indicates that the land was the most important motivating factor (Purcell 1967).

The first task is to estimate the relationship between institutions and GDP per capita, for which I use the following specification:

\[
\text{LGDP} = a_1 + a_2 \text{INSTITUTION} + a_3 \text{PACIFIC ISLAND} + e
\]  

(1)

where LGDP is the log GDP per capita (PPP in 2007) of the country, INSTITUTION is the governance indicator of the country (E. Rule of Law; high score denotes secure property rights in the standard normal distribution setting), and PACIFIC ISLAND equals one if the country is a Pacific island, zero otherwise.

The specification is motivated by work of Hall and Jones (1999) who maintain that institutions are the primary and fundamental determinant of economic growth. This conviction is based in part on the finding that human capital and physical capital explain a modest portion of cross-country differences in productivity. They observe, for example, that of the 35-fold difference in output per worker between the United States and Niger, only a factor of 1.5 is explained by physical capital and only a factor of 3.1 is explained by human capital. The remaining difference - a factor of 7.7 – is a productivity residual.

\[^{16}\text{REVISED LENGTH OF JAPANESE OCCUPATION is not used because its correlation with LAND SURVEY is 0.974} \]
Table 6. OLS and 2SLS regression in Asia

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land survey Pacific island City</td>
<td>Land survey Pacific island</td>
</tr>
<tr>
<td>INSTITUTION (E)</td>
<td>1.102** (S.E) (.149)</td>
<td>1.449** (S.E) (.228)</td>
</tr>
<tr>
<td>PACIFIC ISLAND</td>
<td>-.929** (S.E) (.250)</td>
<td>-1.064** (S.E) (.268)</td>
</tr>
<tr>
<td>Adj R-square</td>
<td>0.6534</td>
<td>-</td>
</tr>
</tbody>
</table>

Weak Instruments Tests

<table>
<thead>
<tr>
<th>Shea Partial R-square in the 1st stage</th>
<th>OLS</th>
<th>2SLS</th>
<th>2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.4642</td>
<td>0.4766</td>
<td>0.2199</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anderson canonical correlation LM statistic</th>
<th>OLS</th>
<th>2SLS</th>
<th>2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14.389</td>
<td>14.776</td>
<td>6.817</td>
</tr>
<tr>
<td>H0: Under-identified (p-value)</td>
<td>(0.0008)</td>
<td>(0.0006)</td>
<td>(0.0331)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cragg-Donald Wald F statistic</th>
<th>OLS</th>
<th>2SLS</th>
<th>2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11.695</td>
<td>12.294</td>
<td>3.806</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stock-Yogo weak ID test critical values:</th>
<th>OLS</th>
<th>2SLS</th>
<th>2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% maximal IV size</td>
<td>19.93</td>
<td>19.93</td>
<td>19.93</td>
</tr>
<tr>
<td>15% maximal IV size</td>
<td>11.59</td>
<td>11.59</td>
<td>11.59</td>
</tr>
<tr>
<td>20% maximal IV size</td>
<td>8.75</td>
<td>8.75</td>
<td>8.75</td>
</tr>
<tr>
<td>25% maximal IV size</td>
<td>7.25</td>
<td>7.25</td>
<td>7.25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sargan statistic</th>
<th>OLS</th>
<th>2SLS</th>
<th>2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.243</td>
<td>0.311</td>
<td>2.36</td>
</tr>
<tr>
<td>H0: Instruments are valid (p-value)</td>
<td>(0.6223)</td>
<td>(0.5770)</td>
<td>(0.1245)</td>
</tr>
</tbody>
</table>

Number of observations | 31 | 31 | 31

Note: * p < .05; ** p < .01

The Ordinary Least Squares (OLS) regressions are given in table 6. As can be seen, INSTITUTION and PACIFIC ISLAND are significant at the 1% level.

Next, I address the reverse causality and measurement error problems using the completion of a Japanese land survey, whether or not the entity is a city-state, and revised length of British occupation as instruments for estimating the degree of institutional
transfer. I also use the length of British occupation for a comparison. The equations for the first stage are as follows:

\[
\text{INSTITUTION} = b_1 + b_2 \text{ LAND SURVEY} + b_3 \text{ PACIFIC ISLAND} \\
+ b_4 \text{ CITY} + u \quad (2a)
\]

\[
\text{INSTITUTION} = c_1 + c_2 \text{ LAND SURVEY} + c_3 \text{ PACIFIC ISLAND} \\
+ c_4 \text{ REVISED LENGTH OF BRITISH OCCUPATION} + t \quad (2b)
\]

\[
\text{INSTITUTION} = d_1 + d_2 \text{ LAND SURVEY} + d_3 \text{ PACIFIC ISLAND} \\
+ d_4 \text{ LENGTH OF BRITISH OCCUPATION} + n \quad (2c)
\]

where \text{LAND SURVEY} equals one if the Japanese colonial government completed a land survey in the country, \text{CITY} equals one if a country is a city-state, \text{REVISED LENGTH OF BRITISH OCCUPATION} is the number of years of British occupation of the country after the successful introduction of the British land tenure system, and \text{LENGTH OF BRITISH OCCUPATION} is the number of years of British occupation. The first stage regression results are given in table 7.

Instrumental variables should satisfy two conditions: it must be correlated with the included endogenous variables, and orthogonal to the error process. Statistics commonly used to test the first condition is F-statistics and R-squared of the first stage regression with the included instruments partialled out (Bound et al. 1995) and Shea’s partial R-squared (Shea 1997). This dissertation also uses Anderson’s Canonical Correlation LM statistics and Stock and Yogo (2005) statistics. The second condition may be tested by Sargan statistics if the number of excluded instruments exceeds the number of endogenous variables.
Table 7. First stage regression in Asia

<table>
<thead>
<tr>
<th>Dependent variable: INSTITUTION (E)</th>
<th>(2a)</th>
<th>(2b)</th>
<th>(2c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND SURVEY</td>
<td>.978*</td>
<td>1.236**</td>
<td>1.126*</td>
</tr>
<tr>
<td></td>
<td>(.373)</td>
<td>(.380)</td>
<td>(.474)</td>
</tr>
<tr>
<td>PACIFIC ISLAND</td>
<td>.650**</td>
<td>0.384</td>
<td>0.450</td>
</tr>
<tr>
<td></td>
<td>(.236)</td>
<td>(.226)</td>
<td>(.278)</td>
</tr>
<tr>
<td>CITY</td>
<td>1.669**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(.385)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>REVISED LENGTH OF BRITISH OCCUPATION</td>
<td>- 0.012**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- (0.003)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>LENGTH OF BRITISH OCCUPATION</td>
<td>-</td>
<td>- 0.005*</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>- (0.002)</td>
<td>-</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.4835</td>
<td>0.5053</td>
<td>0.2626</td>
</tr>
<tr>
<td>Shea Partial R-square</td>
<td>0.4642</td>
<td>0.4776</td>
<td>0.2199</td>
</tr>
<tr>
<td>F statistics (partialled-out)</td>
<td>11.69**</td>
<td>12.29**</td>
<td>3.81*</td>
</tr>
<tr>
<td>Number of observations</td>
<td>31</td>
<td>31</td>
<td>31</td>
</tr>
</tbody>
</table>

Note. -- * p < .05; ** p < .01

First, Partialled-out F-statistics in the first stage test the joint significance of excluded instruments (LAND SURVEY and REVISED LENGTH OF BRITISH OCCUPATION). However, recent econometric studies emphasized R-squared of the first stage regression rather than the significance of coefficients and F-statistics. For example, Bound, Jaeger, and Baker (1995), Staiger and Stock (1997) have shown that (when R-squared is low) instruments can be weak even they are significant.\(^{17}\) Shea's partial R-squared tests whether the included instrument (PACIFIC ISLAND) is dominating the R-squared of the first stage. In other words, if the included instrument

\(^{17}\) "The use of instruments that explain little of the variation in the endogenous explanatory variables can lead large inconsistencies. The magnitude of bias of IV estimates approaches that of OLS estimates as the R2 between instruments and endogenous explanatory variable approaches 0." (Bound et al. 1995)
explains most of the R-squared in the first stage, then it means that the excluded instruments are weak. High Shea’s partial R-squared shows that the instruments are not weak.

Second, Anderson’s Canonical Correlation LM statistics test the rank of reduced form matrices. Analogous to ordinary correlation, canonical correlation squared is the percent of variance in the set of endogenous variable (RULE OF LAW) explained by the set of exogenous variables. In Anderson’s approach, $H_0$ (the rank of reduced form matrix is $K_1-1$) is equivalent to the null hypothesis that the smallest canonical correlation is zero (Baum, Schaffer, and Stillman 2007). Anderson's Canonical Correlation LM statistics show that the instruments do not have an under-identification problem.

Third, Stock and Yogo (2001) compiled critical values for Cragg-Donald Wald statistics$^{18}$ in the finite sample adjustments. The Stock–Yogo weak instruments tests specifies weak instruments in two ways: maximal relative bias and maximal size. Stock and Yogo (2001) showed that the Cragg-Donald Wald test rejects the null hypothesis too often. Thus, they compiled test statistics based on the rejection rate $r$ (10%, 15%, 20%, and 25%) that the researcher is willing to tolerate if the true rejection rate should be the standard 5% (Baum, Schaffer, and Stillman 2007). The Stock and Yogo statistics suggest that the main instruments (LAND SURVEY and REVISED LENGTH OF BRITISH OCCUPATION) do not have a large distortion problem.

Finally, Sargan's statistic is a special case of Hansen's J statistics under the assumption of conditional homoskedasticity. It tests whether the moment equations in

$^{18}$ Cragg-Donald Wald Statistics are closely related to the rank of reduced form matrices.
2SLS regression are correct (i.e. instruments and the error process are orthogonal). A rejection of the null hypothesis implies that the instruments are not orthogonal to the error process.

As can be seen in table 6, the effect of institutions is greater in the 2SLS regression if LAND SURVEY and REVISED LENGTH OF BRITISH OCCUPATION are used as instruments (regression results are similar when LAND SURVEY and CITY are used). The coefficient on institutions from the OLS estimates is 1.102 (significant at 1% level) and from the IV estimate is 1.421 (significant at 1% level). A Hausman test confirms that there is a systematic difference (at 5% level) between OLS and IV estimates. This empirical result is consistent with the findings of Acemoglu, Johnson, and Robinson (2001) who focus on property protecting institutions and shows that property defining institutions were important in Asia.

My empirical results also indicate that the methodology suggested by Hall and Jones (1999) and Acemoglu, Johnson, and Robinson (2001) should be adopted with caution. For example, using LENGTH OF BRITISH OCCUPATION, which is possibly related to property rights institutions may lead to a different conclusion. Here, I suggest that focusing on property defining institutions is a better strategy in finding reliable instruments.

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19 The regression result is roughly similar when I control for the length of American, French, German, Portuguese, Spanish occupation in Asia. However, those colonizers were not effective in transferring their land tenure systems (the coefficients are insignificant and very close to 0 in the first stage), thus I did not control for other colonizes in the main regression. Also, Stock, Wright, and Yogo (2002) report that a combination of strong and weak instruments can be weak.
Chapter 3: Conditions of Successful Land Reforms

1. Stylized Facts of Land Reforms

Why do many developing countries fail to implement a secure land tenure system that solves public and private finance problems and leads to economic development? According to Simpson (1976)

“[Land registration] is a device which may [be] essential to sound land administration but it is merely part of the machinery of government. It is not some sort of magical [device] which will automatically produce good land use and development; nor is it a system of land holding; it is not even a kind of land reform, though it may be a valuable administrative aid to land reform. In short, land registration is only a means to an end. It is not an end itself. Much time, money, and effort can be wasted if that elementary truth be forgotten (Simpson 1976, 3).”

Unfortunately, a review of the history of land reforms suggests that many governments either did not learn or forgot this elementary truth, and thus waste much time, money, and effort.

The review identifies some stylized facts that underlie land reforms. First, the variable cost function is convex, but most promoters of reform do not recognize this structure at the outset. Instead they may anticipate a concave function because the administrative effort of registering a parcel of land decreases with volume. The realized
function, however, is convex because the most costly aspect is surveying the boundaries, which increases convexly. In the example of figure 8, one can observe that the number of boundaries to be identified increases by $n^2 - 2n$ where $n$ is the total number of parcels arranged in a grid fashion. For example, if there are 4 parcels of land, then the surveyor needs to identify 4 boundaries between 4 parcels. However, for 9 parcels it is 12 boundaries and for 16 parcels it is 24 boundaries. In short, if the number of parcels increases by one, then the number of boundaries to be identified increases by one or more.

![Diagram](image)

**Total number of boundaries between parcels = 4** (the number segments of solid lines)

![Diagram](image)

**Total number of boundaries between parcels = 12**

![Diagram](image)

**Total number of boundaries between parcels = 24**

Note.— If the number of parcels increases by 1, then the number of boundaries to be identified increases by 1 or more.

Figure 8. The number of boundaries to be identified

Second, creating and implementing an updating system and a citizen identity system are very difficult and costly. Governments understand the importance of an ownership updating system but typically underestimate or do not want to bear the cost.
The simplest (and cheapest) system periodically resurveyed ownership by visiting the plot, as was done in China and Korea every five years. However, the resurveyed register gradually lost its information value as transactions made it obsolete. Moreover, given a principle-agent problem, government officials frequently copied and resubmitted the old land registers rather than expending effort to resurvey ownership.

A record of deeds—sometimes called an abstract of title that shows the history of transactions-- is a better system but also has limitations. Over time it may become obsolete unless ownership is systematically verified after transactions occur. A central registration of titles is the most effective system, but it was not implemented until the mid nineteenth century. A record of deeds and registration of title require centralized recording, a systematic coordination system, and legal regulations that update the validity of ownership. Moreover, transferring old records to a new system was not a simple task. In many cases the importance of a citizen identity system was not recognized until land reform was well underway. Consequently, the unexpected high costs discouraged complete implementation of systems that were critical for centralized ownership verification.

Third, the land reform usually changed the whole structure of a society, imposing political costs. Most land reforms in developing countries created individual ownership from communally owned land, which heavily affected not only current but future

---

20 A deed does not in itself prove title; it is merely a record of an isolated transaction. A deed does not confirm that the parties were legally entitled to carry out the transaction and by itself does not prove the transaction valid. It follows therefore that investigation of its validity and legal effect will still be necessary before any further transactions can be safely conducted on the strength of it (Simpson 1976, 15).

21 A register of title is an authoritative record kept in a public office. The register is at all times the final authority and the State accepts responsibility for the validity of transactions, which are affected by making an entry in the register and only by this means (Simpson 1976, 15-16).
economic activities. This confronted traditions of multiple or clan ownership. With the exception of the new registered owners, other traditional owners of land lost use rights forever. Eliminating clan ownership meant that the chief – the political leader – would lose his control in managing the clan’s land. The experience in Yap in 1970s shows how the political leaders fought the change and nullified the effect of land reform (Marksbury 1979). In addition, landowners who were unsatisfied with the boundaries were against the land reform. The review suggests that these political costs existed for colonizers but were much higher or difficult to overcome if undertaken by traditional governments. Colonizers that succeeded in imposing land reform, such as Japan, compensated the chiefs and other traditional land owners who lost land-use rights.

Finally, the review shows that whether a government is short-sighted or far-sighted is critical for the success of a land reform. A short-sighted government can be defined as one that is interested in short-term tax revenue. In contrast, a far-sighted government promotes long-run economic growth. For example, the conflict between Pierre Poivre and the French mercantilists shows the different viewpoints between the short-sighted and far-sighted government. From 1767 to 1772, Pierre Poivre served as governor in Mauritius. He accurately estimated population and the island’s natural resources and instituted a land tribunal to survey and adjudicate concessions (Vaughan 2005, 69). “Poivre brought the island to self-sufficiency, in opposition to the prevailing

---

22 In fact, the duality of ownership in land even existed in the sixteenth century England, as a way to avoid feudal dues.
23 Many colonizers tried to implement land registration systems. For example, the first land register of England – the Doomsday Book – was made by the William who conquered England in 1066.
24 Similarly, when the Hawaiian government introduced the land registration, the government compensated chiefs.
mercantilist doctrine that colonies should be exploited for the benefit of the mother
country. By the time he left Mauritius in 1772, Poivre and his supporters were finding
themselves outmaneuvered by mercantilist governors and ministers who were more
interested in short-term profits than long-term prosperity” (Maverick 1941).

When short-sighted governments realized it was very costly in the near term to
survey, register and update all land ownership, they restricted the process to prosperous
areas. For example, the Germans surveyed and registered only coconut and pineapple
plantations in Micronesia and the British did the same only for white settler’s farm land
in sub-Saharan Africa. Limited and isolated surveys required less investment in
boundary identification. Moreover, these limited surveys usually did not heavily
depended on creating an updating system, because transactions occurred infrequently or
were prohibited by the colonizers.

2. Comparison of Land Reforms

Comparing the traditional land tenure system of Taiwan during the Qing period
and colonial land tenure system of Taiwan during the Japanese colonial period helps to
identify the relationship between secure land tenure and economic development.
According to Lin (2008), although the Qing government supported economic
development, its system had little success in attracting outside capital and modern
technology due to insecure and complex property rights. In southern China and Taiwan,
custom recognized top-soil and sub-soil rights. The former were permanent tenancy
contracts that the community recognized as a kind of property (the tenant leased the land
for three or four generations). Both top-soil and sub-soil rights could be leased. The dual
owner system provided security for tenants, but made land transactions and tax collection very difficult (Macauley 2009). Only the native Taiwanese could control every aspect of complex property rights: multiple owners and potentially numerous rental contracts (Ka 1995).

From June of 1886 to December of 1889 (10 years before the Japanese occupation), a Chinese general Liu Ming-chuang reformed the land tenure system of Taiwan, an effort that cost 426,635 ounces of silver. Notably the general did not create an updating system to register land sales, new land reclamation or other changes from that point onward. Consequently, this new system gradually lost its effectiveness, as had happened with earlier reforms. Their priority was to determine which landowner should be taxed under the new system (Lin 2008).

In contrast, the Japanese colonial government introduced the modern, single owner, land tenure system based on accurate cadastral surveys. Its total expenditures in surveying land and making registers were about 4,230,905 ounces of silver (ten times of the expenses of Liu’s reform; the original expenditure was 5,357,188 yen; the annual budget of the traditional Taiwanese government was about 1 million yen). More importantly, coupled with a series of land registry regulations, household registry rules, and other administrative measures, the government could now record all changes in land distribution and household composition (Lin 2008). In order to introduce a single ownership system, the Japanese colonial government bought all sub-soil rights and gave legal title to top-soil owners, at a of about 2 million yen (Ka 1995).
After the land reform, land yields and agricultural productivity increased by 81% from 1901 through 1938 (Lin 2008) and Taiwanese landlords who benefited from the land-tax reform continued to save and to invest in commercial enterprises such as sugar and rice processing (Ka 1995). Moreover, a large amount of Japanese capital flowed to Taiwan (Myers and Peattie 1984).

The comparison of Japanese and American land reforms in Micronesia also helps to identify the conditions crucial to success. Japan occupied Micronesia from 1919 to 1945 and the U. S. succeeded from 1945 to 1981. After occupation, Japan implemented a citizen identity system that included finger prints, a land reform, and a tax reform, as they had done earlier in Taiwan and Korea. When Japan officially occupied Micronesia in 1919, they conducted a complete census on October 1, 1920. In fact, Japan was so adamant about accuracy, it was made a general rule to carry out the census twice and double-check the results. Japan also introduced a system to register titles and update the register following transactions. When the Japanese colonial government introduced land registration in Micronesia, they compensated or planned to compensate chiefs. Consequently, Japan’s land reform in Micronesia was more successful than the one undertaken by Germany (occupied 1899 – 1914), which surveyed only prosperous areas such as coconut and pineapple plantations, and prohibited land transactions.

In contrast, after occupying Micronesia, the U. S. faced difficulties in implementing an effective citizen identity system and a land tenure system. The Trust Territory government clearly acknowledged the critical roles of ‘land surveying’ and ‘registration and updating’ for secure land tenure. For example, Trust Territory Policy
Letter, P-1, clearly states “the long range plan includes cadastral survey of all land, registration of titles, and recording of all land transfers” (Wright 1947, 55). At the planning stage, however, the government did not recognize the importance of citizen identity system. After the initiation of land registration, the American promoters realized that “Micronesians as a whole do not appreciate the need for signatures and correct spelling of names” (Trust Territory of the Pacific Islands 1971, 23). The first land registration project in Micronesia was abandoned by 1951 (McGrath 1971). In the 1970s, the Trust Territory government reinstated a land reform, but its speed was painfully slow (McCutcheon 1981).

3. A Model of Land Reform

I construct a simple model based on the stylized facts. The goal is to understand the conditions under which governments undertake effective land reforms that can promote long-run growth.

3.1. Cost and Revenue Functions of Land Reform

The cost function of a land reform is defined as follows:

\[
\text{Cost} = a + cL^2 + UP + ID + PC(1 - PD)
\]

where \(a\) denotes a fixed cost of implementing land reform \((a > 0)\), \(L\) denotes total amount of registered land by the land reform \((L > 0)\), \(UP\) denotes the cost of creating an updating system \((UP > a)\), \(ID\) denotes the cost of creating a citizen identity system \((ID > a)\), \(PC\) denotes a political cost, and \(PD\) denotes the degree of political dominance \((PC > a; 0 \leq PD \leq 1)\).
For simplicity, I assume a linear tax revenue function (the analysis is consistent with a concave revenue function). The revenue function of the land reform is defined as follows:

$$\text{Revenue} = tLP$$

where $t$ denotes tax rate ($t > 0$), $P$ denotes the average price of registered land, which is normalized $P = 1$.

$T_{old}$ denotes tax revenue under the current taxation system, and $R_{min}$ denotes minimum tax revenue that the government desires to collect. $r$ denotes the portion of valid information of the land register in the following year. With the updating and identity systems $r = 1$ (all information in the land register is valid and is linked to the taxpayers). Without two systems, $r < 1$ (the land register becomes obsolete over time). $\beta$ is the discount factor of the short-sighted government, $\delta$ is the discount factor of the far-sighted government, and $\pi$ is one plus the rate of inflation. I assume that the average price of registered land increases by the rate of inflation. For a simple calculation, I assume that the discount factor of the far-sighted government is $\delta = \frac{1}{\pi}$ for both of the tax revenue and the deficit. Moreover, I assume that $\beta_d = \delta$ for the deficit, but $\beta_r = \mu \delta$ for the tax revenue where $\mu < 1$. $L_{max}$ denotes the total area of land in the country, $L^*$ denotes the optimal level of land registration, and $N(L^*)$ denotes the number of years required to complete the land reform, which is an increasing function of $L^*$. I assume that the government collects $T_{old}$ before the completion of the land reform and collects $tL^*$ after the completion of the land reform.

3.2. Interior Solution of Short-sighted Government
Historically, land was the main source of wealth, thus the main source of revenue. When the tax revenue under the current taxation system ($T_{old}$) becomes smaller than the minimum tax revenue that government desires to collect ($R_{min}$), a government considers a land reform to increase its income.

The marginal revenue of land reform is $t$ and the marginal cost of land reform is $2cL$. Assuming the existence of an interior solution, the short-sighted government chooses $L^* = \frac{t}{2c}$ (figure 9).

Figure 9. Costs and benefits of land reforms
After determining the optimal level of land registration, the government considers three factors: the cost, the budget deficit during the reform, and the increased revenue after completion. First, the cost of land reform for the short-sighted government – only interested in a short term profit – is

\[ a + c(L^*)^2 + PC(1 - PD) \]

\[ = \frac{1}{N(L^*)} [a + c(L^*)^2 + PC(1 - PD)] + \beta_d \pi \frac{1}{N(L^*)} [a + c(L^*)^2 + PC(1 - PD)] + \ldots \]

\[ + \beta_d^{N(L^*)-1} \pi^{N(L^*)-1} \frac{1}{N(L^*)} [a + c(L^*)^2 + PC(1 - PD)] \]

because it is unwilling to spend much money for creating the updating system and the citizen identity system and the discount factor of the deficit (\( \beta_d \)) is \( \delta = \frac{1}{\pi} \). Second, the deficit of the short-sighted government during \( N(L^*) \) years of land reform is

\[ N(L^*)R_{min} - T_{old} \frac{1 - r^{N(L^*)}}{1 - r} \]

\[ = [R_{min} - T_{old}] + \beta_d \pi [R_{min} - T_{old}r] + \ldots + \beta_d^{N(L^*)-1} \pi^{N(L^*)-1} [R_{min} - T_{old}r^{N(L^*)-1}] \]

Finally, the present value of increased tax revenue after the completion of land reform is,

\[ \beta_r^{N(L^*)} \frac{tL^* - T_{old}r^{N(L^*)}r^{N(L^*)}}{1 - \mu r} \]

\[ = \beta_r^{N(L^*)} [tL^* - T_{old}r^{N(L^*)}r^{N(L^*)}] + \beta_r^{N(L^*)+1} [tL^*r\pi - T_{old}r^{N(L^*)+1}r^{N(L^*)+1}] + \ldots \]

because the discount factor of tax revenue (\( \beta_r \)) is \( \mu \delta \).

The short-sighted government completes the land reform if
In other words, the expected profit of the land reform should be positive and the annual deficit of the government during the land reform should be lower than the deficit tolerance level of the government. Otherwise, the government stops the land reform.

The first condition explains why the colonial governments or conquerors are more likely to implement land reforms than traditional governments. The degree of political dominance \((PD)\) of colonizers is more likely to be larger than that of traditional governments because military power accompanied colonization. Moreover, the tax revenue from the old system \((T_{old})\) for a colonizer can be, in effect, zero. Thus, the first condition is more likely to be satisfied. In addition, the colonial government cannot but endure the deficit after the colonization.

Two conditions of the land reform also explain why the short-sighted government is less likely to create the updating and identity systems. Creating two systems increases the costs of land reform significantly, increasing the annual deficit. Moreover, the government is very likely to face higher political costs due to the loss of political support after the initiation of the land reform. Thus, even if the government realized the

\[
\beta_t^{N(L')} t L^* - T_{old} \pi^{N(L')}^r r^{N(L')} - \frac{1}{1 - \mu r} - [a + c(L^*)^2 + PC(1 - PD)] - [N(L^*)R_{min}]
\]

and

\[
\left|\pi^{N(L')-1} r^{N(L')-1} T_{old} - \pi^{N(L')-1} R_{min} - \frac{1}{N(L^*)} [a + c(L^*)^2 + PC(1 - PD)]\right| < \text{Deficit tolerance of the short sighted government.}
\]

In other words, the expected profit of the land reform should be positive and the annual deficit of the government during the land reform should be lower than the deficit tolerance level of the government. Otherwise, the government stops the land reform.
importance of those two systems after the initiation of the land reform, it is unable to impose those two systems.

3.3. The Corner Solution of the Far-sighted Government

A far-sighted government is interested in long-term growth, and thus creates both the updating system and the citizen identity system, if it realizes the importance of those systems.

The cost of land reform of the far-sighted government is

\[ a + cL^2 + UP + ID + PC(1 - PD) \]

However, the revenue structure from the land reform depends upon the package adopted. The updating and identity systems continuously validates the land register and taxpayers \((r = 1)\). Sng (2009) argues that increasing tax revenue for traditional governments is very difficult due to a principle-agent problem. Under a corrupt tax collection system operated by local authorities, the poor shouldered heavy burdens and a riot could ensue if the government imposed higher tax rates. With the updating and identity systems, the government can collect revenue directly from taxpayers. Therefore, the tax system becomes relatively fairer and the government is effectively able to grow tax revenue by the rate of inflation.

The present value of revenue of the land reform is

\[ \delta^{N(L)}[tL + tL\delta\pi + \ldots] = \delta^{N(L)}[tL + tL\delta\frac{1}{\delta} + \ldots] = \infty \]

In other words, after the completion of the land reform, the government’s real tax revenue does not decrease over time. In this case, the conditions of performing the land reform are
The first condition is always satisfied even though $t$ is very large. Thus, the government registers all land ($L = L_{max}$) to maximize the real tax revenue (figure 9). In addition, the review of land reforms indicates that the updating system works more efficiently when all land is registered. The government, however, endures a larger deficit for a longer period of time in the interim.

3.4. Tax Rate and Discount Factor

In the previous section, the tax rate is assumed to be exogenous. Experience in Asia, however, suggests that after the completion of the land reform, the far-sighted government is able to lower its tax rates because the registered land in the corner solution is larger than that of the interior solution ($L_{max} > L^*$). In this section, I assume that the probability of a riot is an increasing function of the tax rate and the discount factor of the government is a function of the probability of a riot. In other words, a high tax rate decreases the discount factor of the government. For example, I may suppose that

$$\delta^{N(L)}\left[ (tL + tL + \cdots) - \frac{T_{old}t^{N(L)}r^{N(L)}}{1 - \mu r} \right] - [a + cL^2 + UP + ID + PC(1 - PD)]$$

$$- [N(L)R_{min} - T_{old} \frac{1 - r^{N(L)}}{1 - r}] > 0$$

and

$$\left| \frac{\pi^{N(L)-1}r^{N(L)-1}T_{old} - \pi^{N(L)-1}R_{min}}{N(L)} \frac{\pi^{N(L)-1}}{[a + cL^2 + UP + ID + PC(1 - PD)]} \right|$$

is the deficit tolerance of the far-sighted government.

The first condition is always satisfied even though $cL^2 + UP + ID$ is very large. Thus, the government registers all land ($L = L_{max}$) to maximize the real tax revenue (figure 9). In addition, the review of land reforms indicates that the updating system works more efficiently when all land is registered. The government, however, endures a larger deficit for a longer period of time in the interim.
where $t_{\text{no-riot}}$ denotes the tax rate that government will not face any riot. For the far-sighted government, if $t_{\text{far}} < t_{\text{no-riot}}$, then, the discount factor of the far-sighted government becomes $\delta = \frac{1}{\pi}$. In contrast, the tax revenue of the short-sighted government keeps decreasing over time as the land register becomes obsolete. When the tax revenue becomes less than its minimum spending level ($R_{\text{min}}$), the short-sighted government needs to increase its tax rate, suggesting that the government faces a higher probability of potential resistance and becomes more short-sighted over time (or the government becomes more arbitrary in taxation to increase its tax revenue).
Chapter 4: Constitutions, Private Property, and Economic Growth in Africa

1. Legal and Philosophical Origins of Private Property

Many studies on private property (see, for example, Schlatter 1951; Scott 1977; Grunebaum 1987) agree that the foundations of modern private ownership notion originate from John Locke’s *Treatises Of Civil Government* published in 1690 as a defense of the Glorious Revolution. The new and original part of his work was a theory of private property. He was the first to demonstrate that private property is ‘natural’ and a man has a natural right to property created by his labor.

According to Schlatter (1951, 156), “before 1690 no one understood that a man had a natural right to property created by his labor; after 1690 the idea came to be an axiom of social science. The date might be taken to mark the year when the middle classes [or capitalists] rose to power: the year in which their experience, dressed up in philosophical language by John Locke, was presented to the world as the eternal truth of things.”

After the Glorious Revolution, the powers of the Crown were now wielded by an omnipotent Parliament of landowners.

“The absence of feudal privileges and the comparative freedom of the English owner to use and dispose of his property were taken to mean that England had returned to the system of nature. Feudal property, the theorists implied, is natural property encumbered with restrictions and
dues created by the law for the benefit of privileged classes: if the legal encumbrances are removed, as they had been in England, natural property remains. So long as no one objected that capitalist property was not natural, the [Lockean] theory was useful” (Schlatter 1951, 163).

Some scholars, for example Schlatter (1951, chap. 7), thought the Lockean theory was abused by the capitalists because they believed farmers should own the land that they plow, but from legal and economic viewpoints the Lockean theory did secure private property.

A comparison of mining and mineral laws across countries indicates the strength of English property rights. At Common Law, minerals other than silver and gold were the property of the owner (The Crown still had the right to gold and silver for coinage). William Blackstone (1765) wrote "...therefore if a man grants all his lands, he grants thereby all his mines of metal and other fossils, his woods, his waters, and his houses, as well as his fields and meadows.” Of course, English land owners did not have these rights in the sixteenth century. It is the result of estate laws enacted by the Parliament (Bogart and Richardson 2010). Under the German system, gold, silver and other precious metals were controlled by the state. The law in European Catholic countries was more restrictive reflecting different historical and social influences. "Under French law, mines proper constituted a part of the domain of the state, and could only be worked by virtue of a governmental concession. But quarries it seems, could be privately owned and no state permit was required to operate them" (MacSporran 1971). In Spain, another Catholic country, “all mines on either public or private lands were regarded as belonging to the Crown" (MacSporran 1971).
The review of the history of British private property suggests that the British established relatively secure property rights through the Reformation, Statute of Uses and Statute of Enrollments\textsuperscript{25}, the Glorious Revolution, and the contribution of John Locke. However, a further review of the history of private property suggests that comparing the traditions of the common law and the civil law is not a simple problem.

There are counter examples that suggest the civil law traditions could be as good as the common law traditions (Rajan and Zingales 2003). For example, the colonial history of Mauritius shows that the civil law land tenure system was so good that the British maintained the civil law systems when the British took over Mauritius in 1810. Moreover, it should be noted that the Lockean theory was more welcome to foreigners (that is the Americans and the French) than to the British. In America, the slogan, ‘no taxation without representation,’ was justified by the Lockean theory of property. “Because a man’s property, acquired by labour, was his by the law of nature, it could not be taken away unless he or his representatives consented” (Schlatter 1951). “The protection of property was, in effect, seen as a central tenet in the United States legal system, even to the extent of the United States Constitution” (Banning 2002, 14).

Similarly, the natural rights of property were adopted as an axiom of French political thought (Schlatter 1951, chap. 8). After the French Revolution, which adopted the natural rights of property and declared the right to property is inviolable and holy, “property in the civil law elaborated, particularly during the nineteenth century, and

\textsuperscript{25} During the Reformation, kings succeeded in taking control of the monastic lands and handed them over to new owners. The confiscation of Church property led to two important legal developments for a modern land tenure system – elimination of duality of ownership (Statute of Use) and initiation of public land registration (Statute of Enrollment).
protected the rights of property in a rather absolute way. [Moreover], the right to property was included in the course of the nineteenth century in the civil codes of most continental European states as the most absolute control someone can have over a thing” (Banning 2002, 14).

However, “unlike the civil law concept, the common law concept of property was, in formal legal definitions, never seen in absolute terms. While the continental civil codes saw ownership as a right to enjoy a thing in the most absolute manner, common law does not recognize absolute title to private persons. The absolute title or eminent domain was in the name of king” (Banning 2002, 14) partly because the land ownership in the common law developed through the eliminating the feudal dues.

“[In the common law] the ownership of land is therefore defined essentially in relative terms. Acknowledging this academically correct position, it may be concluded from the state practices in many common law systems that the course of the eighteenth and nineteenth centuries, the protection of property gradually developed into a system whereby the person who held the best title enjoyed an almost absolute degree of protection that was comparable with the continental system in terms of protection” (Banning 2002, 14).

In sum, it is not clear that whether the common law tradition was better than the civil law tradition in terms of property protection.

It is, however, clear that many of Locke’s ideas, such as those relating to property rights and the duty of government to protect these rights, were later embodied in many constitutions and the notion of private property has fluctuated. During the time of John Locke, and the American and French Revolutions, private property enjoyed very secure protection (Banning 2002, chap. 1). However, the heyday of private property did not last forever; the common property theory began to challenge the private property theory. In
fact, the common property theory also left an important legacy in constitutions – the confiscation of private property for public benefits. Most constitutions, even in the Declaration of the French Revolution which regarded property rights as inviolable and holy, allowed the confiscation of private properties for public benefits under certain circumstances.26

In Britain, although the social priority between property rights and public interest varied over time27, in general, common law tradition supported property rights over the public interests. For example, William Blackstone (1765, 135) states that

“If a new road, for instance, were to be made through the grounds of a private person, it might perhaps be extensively beneficial to the public; but the law permits no man, or set of men, to do this without consent of the owner of the land. In vain it may be urged, that the good of the individual ought to yield to that of community; for it would be dangerous to allow any private man, or even a public tribunal, to be the judge of this common good, and to decide whether it be expedient or no. Besides, the public good is in nothing more essentially interested, than in the protection of every individual’s private rights, as modeled by the municipal law.” (William Blackstone 1765, 135 from Allen 2000)

The support of private property was also maintained in the United States and France during industrialization. The framers of the United States Constitution feared that state and federal governments would use their new power to redistribute property without a view to the broader public interest (Allen 2000, 203). During the French

26 “Les Propriétés étant un droit inviolable et sacré, nul ne peut en être privé, si ce n’est lorsque la nécessité publique, légalement constatée, l’exige évidemment, et sous la condition d’une juste et préalable indemnité.” Informal translation: “The right to property is inviolable and holy; no one can be deprived thereof, except on the basis of public necessity, established in accordance with the law, if evidently needed and under the condition of fair compensation paid in advance” (Banning 2002, 4).

27 “The compulsory relinquishing of property occurred relatively infrequently in Blackstone’s time. The frequency increased with industrialization, especially during the railway booms of the nineteenth century” (Allen 2000, 15).
industrialization, private property enjoyed nearly absolute protection\textsuperscript{28} (Banning 2002, 14).

Communism shook the foundations of law because private property was seen as a source of exploitation. “While some see property protection as the only sound basis for individual liberty, others see the unlimited control of the State over individual property as the only guarantee of independence for the small man” (Banning 2002, 4). Such ideas were prevalent in other periods such as after World War II when African countries attained their independence and in many places property rights were eroded or abolished (Banning 2002, chap. 1; Grey 1980).

2. Transfer of Legal Property Rights Institutions in Africa

A comparison of decolonization process between the British colonies and the French colonies in Africa suggests that the British were more effective in imposing their legal systems than were the French. After World War II, the British accepted decolonization as a irresistible trend and began to establish self-government in its colonies. In contrast, the French wanted to keep their colonies and denied self-government as long as possible. For example, “the ultimate decision of Britain to grant India independence in 1947 did constitute a momentous precedent for British policy toward the rest of the colonies” (Smith 1978). In contrast, France conferred French citizenship on all the people in its colonies in 1947 to implement its policy of assimilation (Khapoya 1998, chap. 6).

\textsuperscript{28} In France, this degree of protection was eroded, but not completely in the 20th century (Banning 2002, chap. 1).
Faced with the emergence of the United States and the Soviet Union, Britain sought to maintain its global influence by gradual withdrawal with appropriate compromise and ‘friendly’ elites in the former colonies (Chafer 2002, introduction). “In a sense, one may mark the first phase of British Decolonization as stretching from the Durham report of 1839 relative to Canada to the Statute of Westminster [South Africa] of 1931. By this series of measures, Britain created the Dominion system and institutionalized a procedure for gradually loosening control over her possessions” (Smith 1978).

<table>
<thead>
<tr>
<th>Territory</th>
<th>YES %</th>
<th>NO %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cote d’Ivoire</td>
<td>99.98</td>
<td>0.02</td>
</tr>
<tr>
<td>Benin (Dahomey)</td>
<td>97.84</td>
<td>2.16</td>
</tr>
<tr>
<td>Guinea</td>
<td>4.78</td>
<td>95.22</td>
</tr>
<tr>
<td>Burkina Faso (Haute-Volta)</td>
<td>99.18</td>
<td>0.82</td>
</tr>
<tr>
<td>Mauritania</td>
<td>94.04</td>
<td>5.96</td>
</tr>
<tr>
<td>Niger</td>
<td>78.43</td>
<td>21.57</td>
</tr>
<tr>
<td>Senegal</td>
<td>97.54</td>
<td>2.46</td>
</tr>
<tr>
<td>Sudan (Soudan)</td>
<td>97.53</td>
<td>2.47</td>
</tr>
</tbody>
</table>

Source. – Chafer 2002, 179.
Note. – “NO” meant outright independence from France. “YES” meant accepting the Constitution of Fifth Republic that gave French predominance in French West Africa

Table 8. Voting results for the Constitution of the Fifth Republic

In contrast, French policy-makers were prevented by the legacy of the past, in terms of both ideas and procedures from adopting gradual withdrawal. Instead of gradual withdrawal, France persuaded its African colonial leaders that close ties to France would be more beneficial to the colonies. In fact, the persuasion was quite successful to the
colonial leaders. In 1958, only Guniea voted for outright independence among eight territories in French West Africa (table 8) (Chafer 2002, chap. 6).

However, when Guinea voted for outright independence, “the French government reacted peevishly and punitively by severing ties with Guinea, withdrawing all French personnel, and taking with them all their equipment including typewriters and telephones. The harsh treatment meted out to Guinea was an eloquent testimony to French paternalism” (Khapoya 1988, 182). By 1960, the colonies in French West Africa requested independence and French colonial policy shifted toward independence for all African colonies.

<table>
<thead>
<tr>
<th>British Colonies</th>
<th>French Colonies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Date</td>
</tr>
<tr>
<td>Ghana</td>
<td>March 6, 1957</td>
</tr>
<tr>
<td>Cameroon</td>
<td>January 1, 1960</td>
</tr>
<tr>
<td>Nigeria</td>
<td>October 1, 1960</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>April 27, 1961</td>
</tr>
<tr>
<td>Uganda</td>
<td>October 9, 1962</td>
</tr>
<tr>
<td>Kenya</td>
<td>December 12, 1963</td>
</tr>
<tr>
<td>Malawi</td>
<td>July 6, 1964</td>
</tr>
<tr>
<td>Zambia</td>
<td>October 24, 1964</td>
</tr>
<tr>
<td>Tanzania</td>
<td>December 9, 1964</td>
</tr>
<tr>
<td>Gambia</td>
<td>February 18, 1965</td>
</tr>
<tr>
<td>Botswana</td>
<td>September 30, 1966</td>
</tr>
<tr>
<td>Lesotho</td>
<td>October 4, 1966</td>
</tr>
<tr>
<td>Mauritius</td>
<td>March 12, 1968</td>
</tr>
<tr>
<td>Swaziland</td>
<td>September 6, 1968</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>April 18, 1980</td>
</tr>
<tr>
<td></td>
<td>(Proclaimed Nov. 1965)</td>
</tr>
</tbody>
</table>

Table 9. Dates of independence in Sub-Saharan Africa
In sum, the British decolonization process in Africa was planned more carefully and done gradually based on the decolonization experience in South Asia, while the French decolonization was done suddenly after the costly interminable wars in Indochina and Algeria, and the experience of Guinea (Smith 1978; Chafer 2002, chap. 6; Khapoya 1988, chap. 6). In fact, most of the British decolonization process in sub-Saharan Africa started in March 1957 (Ghana) and completed in September 1968 (Swaziland) (table 9). The British spent, on average, about three to seven years for decolonization. On the other hand, most of the French decolonization in sub-Saharan Africa started in October 1958 (Guinea) and completed in November 1960 (Mauritania) (table 9). The French spent less than two years for decolonization: arguably, in the extreme case, Guinea attained independence in five days. Consequently, the British were able to firmly impose legal and constitutional safeguards in the former British colonies one by one. In sharp contrast, the former French colonies in Africa were required to make their constitutions by themselves in haste to attain independence.

In the British decolonization, “independence was granted on the basis of the continuation of the system, and not on its destruction” (Mohiddin from Wasserman 1973, 101). Moreover, the British also argued that the protection of property would contribute to economic and political stability. The relationship between property rights and inflow of overseas capital was recognized in framing African constitutions. For example, the Report of the Kenya Constitutional Conference states the importance of property rights:

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29 The length of the British decolonization depends on how to define the starting point. For example, Kenya attained independence in December 12 1963. The first direct elections for Africans to the Legislative Council took place in 1957, but the first official discussion started in the First Lancaster House Conference in February 1960.
“Only by this means will it be possible to maintain confidence, and to encourage development and investment, including the attraction of overseas capital, not only in the immediate future but also in the long term” (from Allen 2000, 59). Consequently, the discussion on economic development was biased to securing property rights.

The property clause in the Kenya Constitution of 1963 reveals most of the standard terms evolved for the protection of such rights and interests. It stipulated that no property of any description should be compulsorily taken except upon the satisfaction of certain conditions. Among these conditions, first the taking must have been necessary to promote the public benefit. Second, the action must provide for the prompt payment of full compensation. Third, the expropriatee was entitled to repatriation of compensation to any country of his choice (Ng'ong'ola 1992).

However, this was the era in which the private property were eroded or abolished. “Newly independent states wished to establish the power of eminent domain in their territories, emphasize their sovereignty over natural resources, and remove the ownership of property which had been acquired during colonial times in a way whose legitimacy was questionable” (Banning 2002, 155). Thus, after independence most of the former British colonies in Africa supported the public interests (that is land redistribution) over property rights and repealed the constitutions initially implemented by the British. For example, “the Malawi government was decidedly against a full Bill of Rights because it was apparently not so effective in ensuring protection of minority groups” (Ng’ong’ola 1992). The governments of Nigeria and Uganda repealed their constitutions for the
similar reasons. Socialism and centralism, which imply a much greater involvement of the state in economic and social affairs, did affect on African colonial leaders. Furthermore, the constitutions were granted by the British and many Africans thought the British-inspired constitutions did not reflect the realities of each territory.

Most African countries repealed the constitutional safeguards after independence, especially, the clauses guaranteeing the repatriation of compensation to any other country. They were in fact hurriedly deleted from the constitutions of most other countries in the region due to the exchange rate issue after independence, including the constitution of Kenya, which was also otherwise less inclined to interfere with the inherited constitutional safeguards. In extreme cases, Malawi, Zambia and Zimbabwe completely expunged the constitutional safeguards against property expropriation for the public interests (Ng’ong’ola 1992). Only Botswana and Mauritius kept the constitutional safeguards against property expropriation, especially the repatriation clause.

The enactment of new compulsory acquisition legislation was a disaster for property rights. For example,

Section 3 of the Zambian Act stipulates that "the President may, whenever he is of the opinion that it is desirable or expedient in the interests of the Republic so to do, compulsorily acquire property of any description". Section 3 of the Malawi Act uses the same language except that the acquiring authority is the minister [who for a long time has been the Life President of the Republic] responsible for land matters.

In Malawi the minister has the responsibility of assessing "fair compensation", and his award "shall be final and shall not be subject to any appeal, or to any review by any court". In Zambia, too, the first assessment must be conducted by the minister. He may seek advice and assistance from a Compensation Advisory Board constituted in terms of
Part VI of the Act, but he is not bound to follow any such advice or recommendation. (Ng’ong’ola 1992)

The Zimbabwean provision refers to the ‘compulsory acquisition of property without compensation.’ (Allen 2000, 63)

One can easily see room for corruption under these circumstances, even if the original purpose of this repeal was to redistribute idle white settlers’ land to landless peasants (Allott 1967).

These historical facts suggest that keeping and maintaining the institutions that secure property rights might be one of the causes of the economic growth of Botswana and Mauritius. As can be seen in table 10, there is a clear difference between the countries that kept and the countries that expunged the constitutional safeguards.

A similar situation is observed in the commonwealth countries in the Caribbean and the Pacific. Among the Caribbean islands countries, St. Kitts and Nevis, and St. Lucia have clauses in their constitutions about repatriation. In contrast, the Jamaican Constitution states that if the property owner has indirectly benefited from the public project, then the owner has no claim to direct compensation. Among the Pacific islands countries, Fiji has a constitutional clause about repatriation (Allen 2000, chap. 3).
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Note. – Education is % of primary-education attainment in 1980

Table 10. Descriptive statistics in Africa

72
3. **Statistical Analysis: constitutions as an instrumental variable**

It was unlikely that Botswana (a landlocked country with a lot of desert) and Mauritius (a small island country), had favorable initial economic conditions. Acemoglu et al. (2003) indicate that the initial conditions of Botswana were worse than other African countries (for example, 12 kilometers of paved road; 22 Botswana had graduated from university). Toussaint (1977) describes that poor economic growth of Mauritius was expected after its independence due to its unfavorable environment such as fast population growth and isolation.

It is true that Botswana is rich in diamonds, but in many developing countries natural resources are more likely to be a curse rather than a blessing (Sachs and Warner 1995). Especially, diamonds that are mined within a war zone and sold to finance insurgent activities, civil insurrection, or an invading army’s campaign are called as ‘blood diamond.’ Since the 1950s rebel groups in Angola, Democratic Republic of Congo, Liberia, and Sierra Leone seized diamond mines, traded their rough diamonds for weapons and cash. Then, the question is why Botswana did not experience the curse of blood diamond. A possible answer is Botswana’s good institutions. In other words, the questions comes back to how Botswana established good institutions.

In Africa, exogenous institutional changes are observed in colonies because colonizers enforced new institutions. Moreover, a key contributing factor in the timing of independence, the rise of nationalist movement, was mainly determined by exogenous political factors. One may suspect that Botswana and Mauritius anticipated good
economic growth, and thus kept the constitutional safeguards. However, the converse suggests that the argument is unlikely to be true: it implies that other African countries repealed constitutions because they expected bad economic growth. In case of the colonial government, the converse argument could be true. However, given that the African nationalist government performed the reform, it was unlikely that the native government set up extractive institutions expecting bad economic growth. Moreover, during the decolonization process, the debate about economic growth was biased to maintain British inspired property institutions (Wasserman, 1973). Thus, if the government expected bad economic growth, then the government was less likely to reform the current system.

Thus, one is able to test whether the “economic takeoffs” in some African countries were the results of (keeping) institutional innovations or not by comparing OLS and 2SLS estimates. A structurally different and larger 2SLS estimate indicates that “economic takeoffs” are more likely to be the result of (keeping) institutional innovations.

Historical facts show that the degree of transfer of legal institutions differed between the French and the British colonies. Moreover, in the British colonies, the degree of property rights protection is directly linked to the extent to which post-colonial governments preserved or repealed features of the constitutions inherited from the British. Consequently, two instrumental variables are suggested: one, colonial origins – that is France or Britain; two, the presence or absence of clauses in the constitutions of

30 Usually, newly independent government is more likely to expect a rosy future.
Thirty former British colonies’ constitutions are based on the Nigerian example\textsuperscript{31}; thus one can directly compare the strength of private property in the colonies. For empirical investigation, the former commonwealth countries are divided into three groups: 1) the countries with strong constitutional property rights (the countries that have repatriation clauses or strong constitutional safeguards\textsuperscript{32}); 2) the countries with weak constitutional property rights (the countries that do not pay reasonable compensation for compulsory purchases); 3) the countries in between (the countries that do not have repatriation clauses but pay reasonable compensation). The former French colonies serve as a comparison group. The relationship between the constitution and institution measure (the rule of law) is estimated by the following equation:

\[
RULE \ OF \ LAW = d_0 + d_1 \text{MID} + d_2 \text{WEAK} + d_3 \text{FRENCH} + d_4 \text{PACIFIC} + d_5 \text{AFRICA} \quad (3)
\]

where RULE OF LAW is measure of institutional quality (from Kaufmann, Kraay, and Mastruzzi 2007) – measuring perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (the units is measured follow a normal distribution with a mean of zero and a standard

\textsuperscript{31} Twelve African countries, nine Caribbean islands countries, six Pacific islands countries, two Latin American countries, one Mediterranean island country.

\textsuperscript{32} South Africa is classified as a country with strong property rights because the main purpose of including a right to property in the constitution was ensuring land restitution would affect white farmers as little as possible (Allen 2000, 74). In other words, South Africa gave supported property rights over public interests. Namibia was a colony of South Africa until 1990. The regression results are robust without South Africa and Namibia.
deviation of one); MID equals one if the former British colony repealed the repatriation clause but did not expunge all constitutional safeguards (group 2), zero otherwise; WEAK equals one if the country expunged constitutional property rights (group 3), zero otherwise; FRENCH equals one if the country is a former French colony; PACIFIC equals one if the country is a pacific island, zero otherwise; AFRICA equals one if the country is an African country, zero otherwise.

\[
\begin{array}{lcc}
\text{MID} & (3) & (3') \\
-.471^\dagger & - .829^* & \\
(.257) & (.332) & \\
\text{WEAK} & -.993^{**} & -1.227^{**} \\
(.364) & (.372) & \\
\text{FRENCH} & -.824^{**} & -1.257^{**} \\
(.289) & (.385) & \\
\text{AFRICA} & -.897^{**} & -1.294^{**} \\
(.234) & (.423) & \\
\text{PACIFIC} & -.330 & -1.176^{**} \\
(.290) & (.378) & \\
\text{EDUCATION} & - & -.034 \\
& & (.030) \\
\text{R}^2 & .5505 & .6417 \\
\text{Shea Partial R}^2 & .2166 & .3887 \\
\text{F statistics (partialed-out)} & 3.50^* & 4.87^{**} \\
\text{N} & 44 & 30 \\
\end{array}
\]

Note. – The dependent variable is RULE OF LAW.
\( ^\dagger p < .10, ^* p < .05, ^{**} p < .01 \)

Table 11. First stage regression in Africa

The first stage regression result (table 11 column (3)) shows that 1) the British colonies that have repatriation clauses have much stronger property rights institutions than the French colonies; 2) the British colonies have stronger property rights institutions than the French colonies if they did not expunge the constitutional safeguards; 3) the
British colonies that expunged constitutional safeguards have weaker property rights than the French colonies. Moreover, high Shea partial R-squared in the first stage suggests that the instruments are valid.

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<tr>
<td>(0.023)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>AFRICA</td>
<td>-1.205*</td>
</tr>
<tr>
<td>(.275)</td>
<td>(.370)</td>
</tr>
<tr>
<td>PACIFIC</td>
<td>-1.201*</td>
</tr>
<tr>
<td>(.314)</td>
<td>(.376)</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.7520</td>
</tr>
</tbody>
</table>

Weak Instruments Tests

Shea Partial R² in the 1st stage 2.166 .3887
Anderson canonical
Correlation LM statistic 9.53 11.661
H0: Under-identified (p-value) 0.023 0.0086
Cragg-Donald Wald F statistic 3.502 4.875
Stock-Yogo weak ID test critical values:
5% maximal IV relative bias 13.91 13.91
10% maximal IV relative bias 11.59 11.59
20% maximal IV relative bias 9.08 9.08
30% maximal IV relative bias 6.46 6.46
10% maximal IV size 22.3 22.3
15% maximal IV size 12.83 12.83
20% maximal IV size 9.54 9.54
25% maximal IV size 7.8 7.8
Sargan statistic .261 .047
H0: Instruments are valid (p-value) .8779 .9769
N 44 30 44 30

Note.—The dependent variable is log GDP per capita in 2009
† p < .10, * p < .05, ** p < .01

Table 12. OLS and 2SLS regression in Africa
The effect of institutions (that is the rule of law including property rights) on GDP per capita (PPP) is estimated by the following equation:

\[
\text{Log GDP per capita} = c_0 + c_1 \text{RULE OF LAW} + c_2 \text{AFRICA} + c_3 \text{PACIFIC} + e \quad (4)
\]

The 2SLS regression result shows than the effect of institutions on economic growth becomes larger in 2SLS regression (table 12 column (4) in OLS and 2SLS). The coefficient on institutions is 1.932 (significant at 1% level) in 2SLS and 0.896 in OLS (significant at 1% level). The Hausman test shows that there is a systematic difference between 2SLS and OLS estimates (significant at 1% level). This systematic difference suggests that the magnitude of economic growth created by exogenous institutional change is structurally different from that of economic growth caused by the endogenous institutional catch ups. The regression result is robust after controlling for primary-education attainment in 1980 (Barro and Lee 1993).  

4. Land tenure: An Important Source of Economic Development

Botswana is known as an African growth miracle and quite possibly good institutions were an important source of their success. However, how Botswana established good institutions has not been fully explored. Many African studies (see, for example, Machacha, 1986; Dougan, 2004; Adams, Kalabamu, and White, 2003; White, 1999) agree that ‘the Tribal Land Act of 1968’ of Botswana as the basis of stable politics and institutions in Botswana.  

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33 This dissertation uses the primary-education attainment in 1980, because the data of primary-educational attainment in 1965, 70, 75 is missing for many countries.

34 At the time of independence, cattle raising was more important than land in Botswana. However, pressures of rapid urbanization, the expansion of agricultural activity and widening mineral exploitation led to land rights very important in Botswana (Dougan, 2004).
In the 1890s, the colonial administration declared the land of Botswana as Crown land, excluding freehold land and tribal land claimed by the five principal Tswana tribes. At independence, in 1966, Botswana inherited three types of tenure: tribal land (49 per cent); State land (Crown lands, 47 per cent); freehold land (white settlement, 4 per cent) (White, 1999).

Prior to independence, concerns about land tenure were growing in tribal areas where chiefs controlled the land. Insecure land tenure resulting from arbitrary land allocation by chiefs discouraged capital investments in the tribal areas (Machacha, 1986). In 1969 the Botswana Democratic Party stated that their intention to build institutions that secure property rights in land would ensure greater agricultural productivity (Masire, 1969).

In 1968, the Botswana Government passed the Tribal Land Act. With this legislation, land boards were established in 1970 and the authority of the chiefs was transferred to the land boards. The Tribal Land Act defined the power and duties of land boards and spelled out the procedures for allocating land. A tribesman applied to the land board for land allocation and, if the application was successful, the land board demarcated the site and issued a certificate to the holder of the plot (Machacha, 1986).

The Tribal land act did improve the security of land tenure and encouraged investments. After allocation with a certificate, people made capital improvements to their land by fencing and establishing reliable water sources (Machacha, 1986). Since

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35 The Tribal Land Act also ensured the security of commercial grazing plots (Dougan 2004). The Tribal Grazing Land Policy adopted by government in 1975 allows large cattle owners to fence off land that formerly fell under the commons (Cullis and Watson 2003, 7).
independence, most tribal land and half of State land has been converted into private holdings with a certificate (but the private land with a certificate is classified as tribal land). In 1998, only 25 per cent of Botswana's land was under State control (Adams, Kalabamu, and White, 2003).36

Another interesting case is Mauritius, an African island next to Madagascar. In most African countries, a major part of the land is still under customary law (Alden Wily and Mbaya, 2001). However, in Mauritius, no land is under customary law to this day. A review of the history of Mauritius shows that this private ownership is the result of concessions during the period of French occupation (Meek, 1949, chap. 14).

The Dutch occupied Mauritius from 1638 to 1710. However, the Dutch failed to settle in Mauritius mainly because the farmers could not produce sufficient food products (Mauritius was called the island of rats). In 1721, the French East India Company occupied Mauritius and parcels of land (roughly sixteen hundred yards long by four hundred yards wide) were offered to any Frenchman who promised to clear it of trees and rocks and bushes. The French farmers were fairly successful and produced sufficient food for stable settlement (Barnwell and Toussaint, 1949, chap. 6). From 1767 to 1772, Pierre Poivre served as governor and left a significant legacy in Mauritius. He accurately estimated population and the island’s natural resources and instituted a land tribunal to survey and adjudicate on concessions (Vaughan 2005, 69). “Poivre brought the island to self-sufficiency, in opposition to the prevailing mercantilist doctrine that colonies should

---

36 However, Botswana’s land boards system had some problems due to a weak record keeping system. Usually, the land boards solved disputes on land by allocating unused land (Machacha 1986). Some African studies point out that The Tribal Land Act worked in Botswana because Botswana had abundant land and small population. In fact, land allocation was free, except for commercial use in Botswana.
be exploited for the benefit of the mother country. However, by the time he left Mauritius in 1772, Poivre and his supporters were finding themselves outmaneuvered by mercantilist governors and ministers who were more interested in short-term profits than long-term prosperity” (Maverick, 1941). Although Poivre stepped down, the following administrators kept his land reform, consequently, by 1788 210,844 arpents (a measure of land slightly larger than an English acre) were granted and 72,845 were under cultivation (Toussaint, 1977, 38). In 1810, the British replaced the French, but maintained the French Judicial system including the land tenure. Historical records show that mortgages were in operation in 1815 (Storey, 1997, 25-8). In 1940, 83% of the total area (460,800 acres) is under the control of private ownership37 (Meek, 1949). In 2002, the agricultural productivity of Mauritius was four times higher that of sub-Saharan African countries (FAO, 2003).

37 The remainder is under the control of state.
Chapter 5: Conclusion

The historical record provides an excellent laboratory for study of institutions and economic growth, but existing work tends to exclude Asia and focuses on property protecting institutions.

Japan began to establish a secure land tenure system in the late sixteenth century and completed the process in 1873. Its colonial governments transferred the Japanese land tenure system to Taiwan and Korea – two growth miracles – and Palau – a leading economy in the Pacific. Abundant and reliable data in Asia from the early twentieth century allow us to identify the mechanism linking property defining institutions to economic growth. Instrumental variable estimates suggest that secure property rights stimulated economic growth.

Historical analysis shows that a thorough land tenure system solves a public finance problem by linking land registers, maps, and taxpayers. Moreover, the solution to a public finance problem spills over to private finance. A proper land survey defines boundaries and registration of titles enables banks to readily verify ownership. Because land is the most abundant asset in agricultural economies, its collateralization can provide a major boost for financial markets that nurture economic development. In Asia, a secure land tenure system combined with financial market developments encouraged
investment, promoted new technology such as irrigation systems, and consequently increased agricultural productivity.

The identified pathways in Asia suggest that property defining institutions were a major stimulus to economic development. Although property defining institutions and property protecting institutions are closely related, I think the reverse causality problem is less severe in property defining institutions. The motivation of land reform was solving a budget deficit and raising tax revenue. In order to solve the budget problem, the government surveyed available assets such as land and population. The survey and updating system made the economy of country more manageable by the government. Historical and political viewpoints on the emergence of modern nation-states also emphasize increasing the taxation capacity of governments (Tilly 1990, Furgerson 2001, and Besley and Persson 2009). Moreover, it is worth to note that some legal historians observe that “secure property rights in land established a precedent for the establishment of secure property rights in general” (Hughes and Cain 2007, 14).

My review of the history of land reforms suggests that success requires a clear understanding of the importance of clear boundary lines, the citizen identity system, and the ownership updating system. The analytical model shows that a far-sighted land reform is more costly than the short-sighted version but solves the long-term problem of public finance. The review suggests that the skills to establish and maintain a secure land system are a form of institutional capital.

The relative strength of the notion of private property roughly matches the relative success of industrialization. Moreover, historical analysis indicates that the differing
development paths in Africa depended on the differing decolonization processes and post-colonial reforms.

The differences in decolonization processes and constitutional property rights in the former African colonies provide an excellent laboratory for the study of property rights institutions and economic growth. In Africa, the British were more effective in transferring their legal and constitutional systems than were the French. The British did set up non-extractive institutions, although the white settler communities in the colonies were small. However, most former British colonies in Africa repealed the legal and constitutional safeguards in order to facilitate economic redistribution for public benefits. A comparative study across African countries indicates that keeping the legal and constitutional safeguards was critical for economic growth and explains the divergence across African countries. Moreover, the revised constitutions of some African countries provide clear examples of extractive institutions which many previous studies defined vaguely.

Historical facts suggest that the civil law countries in Africa inherited poor institutions because France was less willing to transfer its system during the decolonization process. The conflict between Poivre and the French mercantilist governors suggests that the tendency toward poor institutional transfer might originate from the doctrines of French mercantilists that pursued short-term profits from the African colonies. In contrast, the British decolonization process was focused on transferring its legal systems especially for property protection. This difference in decolonization processes seemed to affect the quality of current legal systems more than
the traditions of common and civil law systems. Mauritius is a good example showing that the civil law system was quite effective if it was properly transferred.


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Appendix A. Japanese and British Occupation

<table>
<thead>
<tr>
<th>Country</th>
<th>Japanese Occupation</th>
<th>British Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>1941.12.22-1945.6.10</td>
<td>1888 - 1984</td>
</tr>
<tr>
<td></td>
<td>1945.3.9-1945.8.15;</td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>troop 1940.9.22-1945.8.15</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>1932-1945 (Manchuria)</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>1941.12.25-1945.8.15</td>
<td>1841-1997</td>
</tr>
<tr>
<td>India</td>
<td>1945 (Andaman and Nicobar Islands)</td>
<td>1757-1947</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1942.3.8-1945.8.17</td>
<td>1811-1816</td>
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<tr>
<td>Kiribati</td>
<td>1941.12.9-1943.11.23</td>
<td>1892-1979</td>
</tr>
<tr>
<td></td>
<td>1945.3.9-1945.8.15;</td>
<td></td>
</tr>
<tr>
<td>Laos</td>
<td>troop 1940.9.22-1945.8.15</td>
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<tr>
<td>Macau</td>
<td>1943.8-1945.8.14</td>
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<td>Malaysia</td>
<td>1942.1.31-1945.9.11</td>
<td>1826-1957</td>
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<td>Marshall Islands</td>
<td>1914.10.3-1944.2</td>
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<tr>
<td>Federated States of Micronesia</td>
<td>1914.10.7-1944.2</td>
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<td>Myanmar</td>
<td>1942.8.1-1945.5.3</td>
<td>1886-1948</td>
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<td>Nauru</td>
<td>1942.8.26-1045.9.13</td>
<td>1914-1920</td>
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<td>Palau</td>
<td>1914.10.8-1944.10.11</td>
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<td>Papua New Guinea</td>
<td>1942.1.21-1944.8</td>
<td>1914-1921</td>
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<tr>
<td>Philippines</td>
<td>1942.1.2-1945.10.14</td>
<td>1762-1763</td>
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<tr>
<td>Russia</td>
<td>1918-1927 (Sakhalin)</td>
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<tr>
<td>Singapore</td>
<td>1942.2.15-1945.9.11</td>
<td>1819-1963</td>
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<td>South Korea</td>
<td>1910.8.29-1945.8.15</td>
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<td>Taiwan</td>
<td>1895.5.8-1945.10.25</td>
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<td>Timor Leste</td>
<td>1942.2.20-1945.9.11</td>
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<td>Tubalau</td>
<td>1941.12.9-1943.11.23 (not occupied)</td>
<td>1892-1979</td>
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<td>1945.3.9-1945.8.15;</td>
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<tr>
<td>Vietnam</td>
<td>troop 1940.9.22-1945.8.15</td>
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Note.— Kiribati and Tubalau were the same country (Gilbert and Ellice Islands) in the 1940s. Japan did not occupied Ellice Islands (Tubalau)
Appendix B: Introduction of the British Land Tenure System
<table>
<thead>
<tr>
<th>Country</th>
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<th>Year</th>
<th>Law, Survey, or Committee</th>
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<td>1888 – 1984</td>
<td>1909</td>
<td>The Land Code</td>
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<td>; autonomy 1959</td>
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<td>Cook Islands</td>
<td>1888-1900</td>
<td>1891</td>
<td>To settle disputes about Land (Aitutaki) - IC.</td>
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<td>Crocombe (1964), Land Tenure in the Cook Islands</td>
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<td>Fiji</td>
<td>1874-1970</td>
<td>1876</td>
<td>The Real Property Ordinance (Torrens Systems)</td>
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<td>Hong Kong</td>
<td>1841-1997</td>
<td>1844</td>
<td>The Land Registration Ordinance</td>
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<td>1757-1947</td>
<td>1904</td>
<td>The recommendation of the 1904 Committee of Govt.</td>
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<td>Mishra, Cadastral surveys in India: A critique; <a href="http://www.gisdevelopment.net/application/lis/policy/lisp0001.htm">http://www.gisdevelopment.net/application/lis/policy/lisp0001.htm</a></td>
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<td>Kiribati</td>
<td>1892-1979; 1877</td>
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<td>The first Lands Commission</td>
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<td>British jurisdiction</td>
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<td>From Tuvalu; Kiribati and Tuvalu were the same country until 1975</td>
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<td>Nauru</td>
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<td>1928</td>
<td>Given legislative backing in 1956</td>
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<td>Britain jurisdiction</td>
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<td>Australasia</td>
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<td>Curley and Boydell (2004), The Regulation, Registration and Representation of Surveyors in the Pacific Islands Countries</td>
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<td>1974</td>
<td>A Land Trust Board</td>
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