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日本統治時代下台灣，韓國及日本之財產犯罪比較研究

A Comparative Study of Property Crime in Taiwan, Korea and Japan during the Japanese-Colonial Era.

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謝辞

照りつける太陽の日差しに、濃紺の空、高雄の川縁で食べた芒果かき氷の味に一目惚れし大学院入学を決めたのはもう四年も前のことだ。そして新しい土地で新しいことを学ぼうと経済学の大学院進学を決め、台湾大学経済学部修士課程で勉強を始めたのは二年前になる。今、こうして無事論文を上梓することができたのはひとえに指導教授 Kelly Olds 先生のおかげである。ここに心からの感謝を伝えたい。また、論文の試験では古慧雯及び呉聰敏両教授に多くの教唆を頂いた。改めて深謝する。その他、我々学生に対し熱心な指導を行なってくださった台湾大学のすべての先生たちにも感謝を伝えたい。

大学院での授業は当初は耳馴れない専門用語が飛び交い、多くの戸惑いがあった。その多くは友人たちが解決してくれた。こうして無事修了を迎えられたのは、公私共にわたる彼らの協力があったからこそである。特に研究室を同じくした五名の素晴らしい友人、POLA、揚揚、小貝、翁柏揚、Maciej、そして研究室は違うがなぜか我々の研究室の一員のようにいつものように顔を出していた小白。彼らには（主に私生活で）非常に世話になった。今後も長く付き合っていくだろう彼らには、面と向かって改めて感謝を述べるのは少々照れくさいものだ。しかしこのような機会もあまりないので、ここだけに感謝の気持ちを残しておくとする。「ありがとう、お前らのおかげですげー楽しかった。」その他の級友たち、大学内外の先輩、後輩、友人たち、彼らのお陰で充実した学生生活を送ることができた。ここに感謝の気持ちを残したい。また海外の友人達からも時に多くの助力を得ることがあった。改めて感謝したい。

私の自主性を重んじ、寡黙にして深い愛を以って海の向こうの故郷から見守ってくれていた両親や家族にも感謝している。

最後に、台湾で起きたすべての事象の中で最もすばらしく、最も重要で、最

も美しかったものは邱彦榕、彼女との出会いである。たくさん一緒に笑って、泣いた。彼女がそばに居てくれる、それだけで元気が出た。これからもたくさん迷惑をかけると思うが、私も彼女を支えてあげたい。彼女に伝えたい言葉は多くはない。「愛してる、これからもよろしく。」

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Abstract

This thesis compares five property crimes, such as robbery, theft, fraud, extortion and embezzlement across Taiwan, Korea and Japan from 1905 to 1942. We found that there is a close relationship between social chaos and property crimes. Cross-section and FGLS analysis showed that robbery, theft and extortion were strongly correlated with population density. However, population density didn't correlate with fraud and embezzlement. Our results suggest correlation between socio-economic indicators and crime is different for each crime. The data organized in this thesis is available online.

Keyword: property crime, population density, Japanese colonial-era, robbery, theft, fraud, extortion, embezzlement

中文摘要

本論文比較研究 1905 年至 1939 年間，於日本統治時期下的台灣、朝鮮及日本之五種財產犯罪（包含強盜、竊盜、詐欺、恐嚇及侵占）。 其結果顯示，財產犯罪的發生率與社會混亂有密切關連性。 再者，根據橫斷面分析及 FGLS 推定法顯示，強盜、竊盜及恐嚇的發生率與人口密度密切相關，惟詐欺及侵占與人口密度無明顯相關性。從而，個別財產犯罪之犯罪發生率與社會經濟指標間，並無必然之相關性。本論文所使用之數據於線上公開下載使用。

關鍵字：財產犯罪、人口密度、日治時代、強盜、竊盜、詐欺、恐嚇、侵占

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1. Introduction

Crime is a basic part of the social environment. Although its definition changes over time, crime has always been a hot topic in newspapers and gossip. Sometimes a particularly serious criminal offense becomes a symbol of an era. This shows how closely crime is related to our social life.

Most modern penal code offenses are misdemeanors associated with money, such as theft and gambling. Therefore, crime, especially property crimes such as theft and fraud, are often thought to be related to economic indicators, such as unemployment and poverty. Many researchers from various fields have studied the relationship between crime and social or economic indicators in recent years.

Taiwan during the Japanese colonial era achieved rapid economic development due to investment from Japan and technological innovation, and faced many changes in the social structure, due to the population influx into the cities, industrial changes and improvements in the transportation network. As a result, crime in Taiwan also changed. How did these changes in social conditions affect property crime in Taiwan and how did Taiwan differ from Japanese-ruled Korea and Japan itself? This thesis confronts these questions.

Recently, 古慧雯 (2011) has summarized the early-20th century crime statistics, and 李維倫 (2007) has discussed the impact of the abolition of caning for theft. The *Japan White Paper on Crime* (1960) compiled a comprehensive and detailed analysis of criminal statistics for early 20th-century Japan. However, no study has been done comparing Taiwan, Japan and Korea.

The role of population density in generating or suppressing crime has long been discussed. The classic argument is that high density offers opportunities for property

crimes, given that it is a surrogate for the value of private property in an area, much of which offers attractive targets to thieves. On the other hand, densely populated areas offer natural surveillance that has the effect of inhibiting violent crimes in so far as witnesses are more abundant and events are more likely to be reported to police. In this thesis, we consider the relationship between property crimes and population density within Japanese-colonial-era Taiwan, Korea and Japan itself. Results show that some property crimes were moderately correlated with population density, but there were many differences among the three areas.

Generally, because of the differences in police and legal systems and the definition of the crime, the crime rate in different regions or countries are hard to compare. Before Japanese rule, the Qing Dynasty controlled Taiwan as part of China, and Korea was a country controlled by the native Yi Dynasty. Language, social system, ethnicity and culture were all different. However during the Japanese colonial period, criminal codes almost identical to that in Japan were applied in Taiwan and Korea; moreover, the judiciary and police system accorded closely with that in Japan. Therefore, we can fairly accurately compare crime rates during this period.

This thesis gives an overview and analyzes property crime in Japan and Japanese-colonial-era Taiwan, and Korea, and then shows the difference in the crime rate between urban and rural areas in Taiwan. We hypothesize that increased population density tends to increase the chance that people are tempted to take property; therefore, the property crime rate will increase. Wirth (1938) further argues that increased population density tends not only is there an increase in the value of property which may be stolen, but also intensifies competition for space and increases loneliness due to frequent contact with unfamiliar persons. This thesis largely verifies the relationship

between population density and property crime.

In addition, this thesis may be useful to those who wish to compare the phenomenon of property crime in each region/country before and after the Japanese colonial period. Because of limits in the data sources and the time needed to organize the data, it has been difficult to make full use of property crime data in this thesis. We hope that the data summarized in the appendix of this thesis will help future research.

This thesis is organized as follows. Chapter 2 reviews past studies concerning crime and its relationship to social indicators. We introduce the data sources in Chapter 3. Chapter 4 organizes and shows an outline of the data for each type property crime in each area. We analyze property crimes within urban and rural areas in Taiwan and discuss the results of our empirical cross-sectional model in Chapter 5, and we examine the correlation between population density and the property crime rate in Taiwan, Korea and Japan. Chapter 6 discusses these results and concludes.

2. Literature review

Mainstream theories of crime, of course, have been constructed within sociology and criminology. These theories are quite numerous. Typical examples in the field of sociology are the social disorganization theory of Shaw and McKay (1942), and the anomie theory of Merton[1] (1938).

From the standpoint of law, there are many ways to approach crime. For example, Lombroso proposed bone criminology based on the positivist school of criminology which assumes physical or genetic factors are causes of crime. The Classical school assumed environmental factors cause crime, and this theory has influenced modern criminal policy in most developed country. Legal scholars are still actively debating these problems.

Within an economic framework, it is assumed that criminals compare marginal benefits and marginal costs of crime and respond to incentives. Becker (1968) provided the first modern mathematical treatment of crime, and since his famous article, a large literature on the theory of deterrence has developed. Becker's rational choice theory became the basis of the economic model of crime. Concerning the study of the relationship between incentives and criminal behavior, Levitt (1997) shows the effect of police hiring on crime rates, and Donohue and Levitt (2001) considers the impact of legalized abortion on crime.

Benett (1991) shows income and the theft rate are positively correlated using data from 117 developed countries from 1947 to 1974. Chohen and Felson (2001) show an increase in the percentage of females employed and an increased divorce rate also

[1] Durkheim originally used anomie in his consideration of the problem of suicide.

affects crime using US panel data from 1947 to 1974. Masih and Masih (1996) report a relationship between the unemployment rate, divorce rate, individual income, urbanization level, police expenditure and violent crime using Australian data from 1963 to 1990. Messner (1989) reports that economic inequality causes an increase in violent crime.

Criminal research has also been done in Taiwan. Yang (1997) found the unemployment rate has a positive effect on the economic crime rate. 劉仲偉 (2005), using 1978-003 Taiwan data, also reports the unemployment rate is positively correlated with the crime rate. 姚雅清 (2008), using FGLS, shows the theft rate, and the rate for all crime, is affected by many economic indicators, such as population density, the divorce rate, the ruling party, the unemployment rate etc.

However concerning Taiwan in the Japanese colonial era, there is little research. 古慧雯 (2011) organized the statistical data and discussed the outline of crime at that time. 李維倫 (2007) tested how ending the practice of caning affected the theft rate. In Japan, little criminal research on this earlier time period has been done, but the police white paper (1960 and 1976) outlined the nature of crime before World War Two. There were some contemporary Japanese reports on crime in colonial-era Korea, e.g., Ireland (1926), but mainstream criminal research in South Korea concerning the colonial era focuses on Japanese abuse of the Korean people.

3. Data

3.1 Area and province

3.1.1 Taiwan

We separated Taiwan into five regions. These Taiwan regions are based on the five-prefecture-and-three-district (5 州 3 廳) system created in 1920. Taipei region includes modern Taipei City, New Taipei City and Yilan County. The Hsinchu region includes modern Taoyuan, Hsinchu and Miaoli counties. The Taichung region includes modern Taichung City, and Taichung, Changhua and Nantou counties, The South region includes all the counties and cities south of Changhua and also the Pescadores. The East region includes modern Taitung and Hualian counties. The Office of the Government-General was in Taipei, but previous to the 1890s, the traditional political center had been in the south.

Area data was taken from Chousa Ka, Taiwan Soutoku Kanbou.a [*Taiwan Governor Office Statistical book*] (1939)

3.1.2 Japan

The contemporary prefectural system had been established in the middle of the Meiji era. This thesis uses this system of 47 prefectures. The capital is Tokyo. Typical metropolitan prefectures are Osaka, Aichi, Hyogo, Hiroshima, and Fukuoka.

Area data is from Naikaku Toukei Kyoku (1941).

3.1.3 Korea

Korea includes the area which is now North and South Korea. Korea was called Chosen at this time, but we use the term Korea to avoid confusion. We are using the 13-do

classification system which was based on the Chosen 8-do (朝鮮八道) system established during the *Joseon* dynasty. The Office of the Government-General was in Gyonggi-do (now Seoul special city), notable big cities are Pyongyang in Pingannam-do and Sinuiju in Pinganbuk-do.

Area data is from Chousen Soutoku Fu (1942)

3.2 Population

3.2.1 Taiwan

There are two contemporary comprehensive sets of demographic data for Taiwan. One is from *Taiwan Government-General Statistical Book* and includes both "civilized" and "uncivilized" aborigine populations. The other is from Chousa Ka, Taiwan Soutoku Fu Kanbou [*Taiwan Criminal Statistics*] which reported only the "civilized" aborigine populations. However the *Taiwan Governor Office Statistical Book* (1919) over counted the uncivilized aborigine population before 1917[2]. Thus we use the population data reported in *Taiwan Criminal Statistics*. Data exists for the period from 1905 to 1938. Data in 1939 was estimated.

The appendix of the *Taiwan Criminal Statistics* which reports urban–rural population data includes the "uncivilized" aborigine populations from 1919 to 1939.

3.2.2 Japan

Japanese population data are based on Naikaku Toukei Kyoku in 1903, 1908, 1913 and 1918, and national census in 1920, 1925, 1930, 1935 and 1940. Intermediate year values

[2] Details in 古慧雯 (2011)

are extrapolated

3.2.3 Korea

李崙碩 (2011) doubts the statistic data in the Chousen Soutokufu during the early colonial period, but we nevertheless use this population data from 1910 to 1942.

3.3 Criminal statistics

In this research, we have, as far as possible, examined both (1) the number of crimes reported and (2) arrests for each crime. In Japan, police statistics reported only arrested persons in Japan before 1923. The Naikaku Toukei Kyoku (1941) reported only the number of crimes reported in 1905-1923, 1925 and 1926 (because of the Great Kanto Earthquake, there were no regional crime statistics reported in 1924).

The number of crimes reported is actually the number of cases that the police recorded. This is the closest data we have to the number of crimes actually committed. However, it is impossible to know how many crimes actually occurred. Some crimes are unreported or just unrecorded. This unreported number of crimes is not revealed by the statistics, and it may vary depending on location, time, type of crime, etc. The problem of unreported crimes is usually insignificant for serious crime, such as murder, injury and robbery, but for misdemeanors, such as theft, fraud, extortion and embezzlement, the problem should always be kept in mind.

The number of arrests is not always proportional to the actual number of crimes reported. The Japanese government officially recognized that the number of arrests can be larger than the number of crimes reported in the statistics. For example, if a criminal who has committed a crime in Tokyo, is arrested for the crime by police in Osaka,

escorted to Tokyo and then sent to a prosecutor's office, the crime is reported in Tokyo in the crime statistics, but the arrest is reported in both Tokyo and Osaka.

Some definitions of crime in the old Japanese Penal Code are different from the modern Penal Code. For example, before 1908, the definition of fraud in the old Penal Code included extortion. In addition, old crimes can be very different from modern ones. The majority of fraud cases in this period concern eating, drinking or residing in a place without paying the bill. There were few Ponzi schemes or security frauds.

3.3.1 Taiwan

The number of reported crimes and arrests come from *Taiwan Government-General Statistical Book* (1907-1941). Before 1908, the number of thefts include theft from forests (森林竊盜). Data for theft and fraud cover the period from 1905 to 1939, Extortion data exists for the period from 1910 to 1939 and embezzlement data for the period 1917 to 1939.

The number of convictions with significant penalty, broken down by whether they were committed in urban or rural areas, are given by *Taiwan Criminal Statistics*. The number of convictions is defined as the number of people found guilty and punished by at least a fine. These statistics differ greatly from those in the *Taiwan Governor Office Statistical book*.

3.3.2 Japan

The number of reports of robbery and theft from 1905 to 1923 are from Naikaku Toukei Kyoku (1905-1923). Theft cases include theft from forests. The number of reports and arrests for robbery, theft, fraud, extortion and embezzlement from 1924 to 1941 are

given in Naimu Shou Keiho Kyoku (1924-1942). The number of thefts includes pickpockets (掏摸).

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3.3.3 Korea

Basically all crime data is from Chosen Soutokufu. The period for all the data are from 1909 to 1942. Before 1910, the number of thefts includes theft from forests.

4. The characteristics of property crime

In this chapter, we discuss the incident and characteristics of property crime in Taiwan, Japan and Korea. We chose five crimes: robbery, theft, fraud, extortion and embezzlement as property crimes. Robbery includes preparation for robbery. Fraud includes quasi-fraud. Descriptive statistics for each property crime by area are shown in Table 1. First we discuss property crime in each area. Then we compare each property crime across the economies of Taiwan, Japan and Korea.

According to the Penal Code in Japan revised in 1908, of these five crimes, the punishment for robbery is the heaviest, that is, imprisonment with hard labor for a definite term of not less than five years. Fraud and extortion are punished by imprisonment with hard labor of not more than ten years. Theft is punished by imprisonment of not more than ten years or a fine of not more than ten yen, and embezzlement is punished by imprisonment of not more than five years. Generally most property crime consisted of theft. Next in importance came fraud and embezzlement.

In Taiwan, theft, fraud and embezzlement generally increased over the whole period. After theft, fraud was the most common form of property crime until 1937 when it was surpassed by embezzlement. These three types of crime made up the great bulk of property crime in Taiwan. The number of fraud and embezzlement arrests fell significantly after 1937.

In Japan, theft was also the most common form of property crime. The number of reports and arrests per capita for all property crimes show peak from 1933 to 1935 and then decreased. Korea had a notably high robbery rate. In 1910 and 1911 robbery was the second most common form of property crime in Korea. The theft rate in Korea increased throughout the whole period, but the fraud, embezzlement and extortion rates

peaked from 1929 to 1931, and then decreased.

4.1 Robbery

Robbery can cause severe social problems and punishment for this crime was heaviest. The penalty for robbery in the criminal code was imprisonment with hard labor for a definite term of not less than 5 years: but if committed along with other crimes, then the punishment could extend to life imprisonment or even death. The number of reports of robbery per 100,000 residents in recent years in each country is 2.80[3] for Taiwan[4] (2011), 3.15[5] for Japan[6] (2010) and 9.16[7] for South Korea[8] (2007). North Korea doesn't publish criminal statistics.

In considering the number of robbery cases in colonial Taiwan, we need to be aware of the bandit problem. A law against banditry[9] was enacted in 1898 in Taiwan. The first article in this law defines banditry as for "any purpose" and done "in a group."

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[3] Only robbery. Snatch [搶奪] cases are not included.

[4] Crime and population data in Taiwan is from 警政統計年報 (2012), and 內政部統計處年報 (2012).

[5] Total cases of robbery (including death and injury through robbery, rape in the course of a robbery, normal robbery and quasi-robbery)

[6] Crime and population data in Japan is from White paper on Crime (2011) and the National census (2010).

[7] Total cases of robbery (including death and injury through robbery, rape in the course of a robbery, normal robbery, quasi-robbery, quasi special robbery, robbery with hostage, robbery by Act on the Aggravated Punishment of Specific Crime [특정범죄 가중처벌 등에 관한 법률] etc.)

[8] Crime and population data in Korea is from 경찰통계연보 (2008) and the IMF World Economic Outlook Database (2008).

[9] On 7th November 1898, Kodama Gentaro (兒玉源太郎, the 4th Governor-General of Taiwan.) reported the "Bandit Punishment Law " to the throne.

According to the Penal Code of Japan enacted in 1908, “a person who takes the property of another through assault or intimidation commits the crime of robbery.” Surely we should add the cases of property crime by bandits to robbery cases, but we do not know the number of reported cases or arrests for property crime by bandits. In this thesis, crimes by bandit are not considered.

In Taiwan, both reported and arrest cases for robbery showed a peak in 1929 (See figure 1). The robbery rate was lower than in Japan or Korea. The arrest rate was 80-100%. Thus the large majority of robberies in Taiwan led to arrests. As far as robbery was concerned, Taiwan was a relatively safe area at this time.

The number of robbery reports or arrests per capita in the five regions of Taiwan generally rose and fell together. Reports and arrests per capita in the Taipei region are relatively high. Arrests per capita in the east from 1907 to 1918 were also high, especially in Hualian. These rose from 11.28 per 100,000 residents in 1907 to 49.61 in 1918 and then rapidly decreased. However, the number of robberies reported in in the eastern region was zero until 1910. There were no important differences between the east and other areas after 1918. There are several possible explanations for this. One is that the “bandit punishment law” was not much applied in the eastern region, but this is not likely since the cases reported did not later increase. Second, there is a possibility that criminals moved into the eastern region from other regions and were arrested there. This a question for further study.

In Japan, the reported crime rate for robbery was almost twice as high as in Taiwan, and it generally peaked from 1927 until 1935. Robbery arrests are only stated from 1924 to 1941. The trends for robbery reports and arrests are very similar. The arrest rate is more than 80 percent. By region, the average number of reports per 100,000 residents in the

metropolitan areas, Tokyo (6.12), Saitama (5.07), Chiba (4.03), Kanagawa (5.08) or Shizuoka (2.75), Aichi (2.99), Osaka (3.55), Hyogo (3.01), Yamaguchi (2.57) and Fukuoka (2.89), are also high. Robbery rates in prefectures with big cities are higher than in rural prefectures. The lowest rate is in Kagoshima (0.60). This is a difference of more than ten times compared to Tokyo. The arrest rate in the metropolitan area is relatively low. Moreover, the number of reported cases around Tokyo after 1923 increased rapidly, this was mainly caused by the confusion after the "Great Kanto Earthquake." A peak in some regions in 1918 seems to have been caused by the rice riots of 1918. Thus, robbery seems to be related to social confusion. The arrest rate in west Japan tended to be higher than in east Japan. It is possible that criminals who committed a robbery in east Japan moved to the western region and were arrested there. This seems similar to the high arrest rate in the eastern region of Taiwan.

From 1910 to 1941, the robbery report rate per 100,000 residents in Korea averaged 9.45, which was about seven times that in Taiwan. The report rate decreased rapidly after 1910, increased sharply to 18.09 in 1920 and then decreased again. The robbery report rate was finally reduced to the same level as in Japan. The arrest rate in 1910 was only 46% which was low. As the arrest rate increased, the number of reported cases decreased. Korea is distinctive in that the robbery rate rapidly increased after 1919. This is very different compared with Japan and Taiwan. A high robbery rate in the early period seems related to the social upheaval during the first phase of Japanese rule, like the bandit problem in Taiwan. The rapid increase after 1920 is clearly related to the March First movement which began in 1919.[10] On the route from Seoul to the Chinese

[10] The March 1st Movement (三一獨立運動) was one of the earliest public displays of Korean resistance.

border: Pinganbuk-do (23.08, average), Pingannam-do (17.29) and Hwanghe-do (15.10) had high robbery rates. Pinganbuk-do had two peaks in 1923 and 1928. It seems that there were some problems, such as famine and unrest. The high crime rate in Pinganbuk-do seems related to its bordering on northwestern China. A high robbery rate in non-urban regions is characteristic of Korea. In this it is very different from Taiwan and Japan.

4.2 Theft

Theft and gambling are the main form of penal crime both then and in recent times. There is a positive relationship between the amount of penal crime generally and the number of cases of theft. In this thesis, theft includes snatches. First-time offenders were often either probated, or not prosecuted at all. However the recidivism rate for theft was high. Criminals with a record must be imprisoned or fined. Reported thefts per 100,000 residents in recent years in each country is 295.33[11] in Taiwan (2011), 584.80[12] in Japan (2010) and 438.42[13] for South Korea (2007).

As depicted in figure 2, generally, the number of reports of theft per 100,000 residents was on an upward trend in Taiwan. In the late period, it was almost double what it had been in 1905. The arrest rate in 1905 was about 40 percent and had increased to 85

[11] Including snatches (4.35) and "heavy" theft [重大竊盜] (0.62) cases, but not including vehicle theft (including motorcycles and bicycles).

[12] Not including vehicle theft (including motorcycles and bicycles).

[13] Total cases of theft (Including normal theft, trespassing with theft at night, special theft, theft with illegal using car or ship etc., habitual theft, theft by Act on the Aggravated Punishment of Specific Crime). Not including vehicle theft (including motorcycles and bicycles)

percent in 1939. The number of thefts reported per capita in Taipei was highest, rising from more than 400 per 100,000 residents in the early period to more than 1000 at the end. The eastern area was also high. Hsinchu was lowest.

The number of reports of theft per capita in Japan was higher than either Taiwan or Korea. It was at its lowest in 1910, and increased to a peak in 1934 before decreasing. This record in 1934 was the highest that has ever been recorded in Japan. Data on the number of arrests per 100,000 residents after 1924 also showed a peak in 1934. The average arrest rate was 65-75 percent in this period. By region, the average number of reported thefts per 100,000 residents was high in Tokyo (1216.17), Osaka (1165.82) and Fukuoka (1080.68). Moreover the arrest rate in east Japan was low and it was high in west Japan.

The number of theft reports per 100,000 in Korea was low by comparison with Taiwan and Japan. This clearly contrasts with the high robbery rate. The theft rate peaked in 1918, bottomed in 1920, and then began increasing again. In 1942, it was double the rate in 1910. It seems to have been affected by the independence movement. The arrest rate was 46-87 percent and was highest in 1928. Throughout the whole period the number of reports and arrests per capita were highest in Gyonggi-do, except for the years 1932 and 1933 for which the rate in Jeollabuk-do was highest. After 1919, the arrest rate decreased in most regions, and then increased after 1923. We hypothesize that since the police force was faced with many more serious crimes and unrest to control during this period, the arrest rate for misdemeanors decreased.

4.3 Fraud

Fraud was the second most common property crime in all areas after theft. Before 1908

in the old criminal code, the definition of fraud included extortion. The number of reported fraud cases per 100,000 residents in each country in recent years is 101.67 in Taiwan (2011), 29.30 in Japan (2010) and 361.61 for South Korea (2007).

In Taiwan's statistics, extortion appears after 1919 (see figure 3). There is a question whether fraud data before 1919 includes extortion or not. Because the number of extortion cases was much smaller than fraud cases, we did not try to fix fraud data before 1919. Fraud in Taiwan increased until 1936, and then fell back in 1938, increasing again in 1939. Reports of fraud and fraud arrests were very similar to Korea until 1930. Reports of fraud per capita were greatest in Taipei except in 1919, 1920, 1921 and 1934, in which years the eastern region was highest. Arrests per capita showed the same pattern. This is different from robbery in which case only arrests were high from 1907 to 1910.

The number of reports and arrests per capita was highest in Japan, two to three times higher than in Taiwan. There was a big peak from 1929 to 1934. From the late 1920s to the early 1930s, the number of reports of fraud and embezzlement recorded their highest value[14] up to the present. There is a hypothesis that the "Showa crisis" that started after WW1 in 1920 and the Great Depression in 1929 promoted criminality (Houmu Shou 1960). Reports per capita in Tokyo were below the national average. The Chugoku, Kyushu region, such as Hiroshima, Okayama, Shimane, Yamaguchi, Fukuoka, was the area in which fraud was most common. Moreover the peak values in these regions were extremely high. For example, the peak in Tokyo was 316.02 per 100,000 residents in 1931, but the peaks were 5283.43 in Hiroshima in 1932, 4864.87 and in Okayama in

[14] Murders per 100,000 residents also recorded their highest value (4.02) in 1934.

1933, 2587.41 in Shimane in 1934, 1863.40 in Tokushima in 1935 and 4005.68 in Fukuoka in 1936[15] and 2633.28 in Oita in 1938. In other regions, such as Hokkaido, Iwate, Aichi and Mie, the crisis also had a strong effect.

In Korea, as in Taiwan, fraud reports per capita increased until 1931, and then decreased. The arrest rate was almost 100 percent. Reported frauds per capita in Gyonggi-do were highest until 1918, Frauds were highest in Pingannam-do, and Gwangwon-do in the later period. Chungcheongbuk-do, Chungcheongnam-do, Hwanghae-do, Hamgyongbuk-do had low rates of fraud throughout the whole period.

[15] There is no significant peak in 1937.

4.4 Extortion

Extortion differs from fraud in the level of fear induced and differs from robbery in the level of violence. Until the current Penal Code was enacted in 1908, fraud included extortion. The number of reports per 100,000 residents in each country in recent years is 0.26 in Taiwan (2011), 4.06 in Japan (2010) and 6.48[16] for South Korea (2007).

After 1919, statistics concerning extortion appeared in Taiwan. (See figure 4). Reports and arrests per capita were lower in Taiwan than Japan and Korea before 1930, but after 1931, Korea was the lowest. These increased throughout the whole period. The arrest rate was almost 100 percent. As usual, rates were highest in Taipei and the east. The peak in Taipei was 39.44 in 1935, and the peak in the east was 21.01 in 1931, but in other area, the rate was almost always under 5.

Except in 1924, reports per capita in Japan were the highest. A peak of 46.46 was reached in 1935, the same year as fraud cases peaked. The arrest rate was almost 100 percent. Aichi was the highest (34.65, on average). Okayama (30.66), Yamaguchi (25.31), Tokyo (21.26) and Fukuoka (20.05) also had high rates.

In Korea, the reports per capita rose slowly. Until 1930, the rate was higher than in Taiwan. After 1931, it was lower than both Taiwan and Japan. The arrest rate was almost 100 percent. Because the original frequency was low, there was little difference between regions. Data for Pinganbuk-do show two peaks in 1920 (15.02) and 1929 (15.54). After 1931, reports per 100,000 residents in Gwangwon-do and Jeollabuk-do were high.

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[16]Including normal extortion, habitual extortion, extortion by Act on the Aggravated Punishment of Specific Economy Crimes [특정경제범죄 가중처벌 등에 관한 법률].

4.5 Embezzlement

Embezzlement is the crime of stealing the funds or property of an employer, company or government, or misappropriating money or assets held in trust. We do not find statistics for embezzlement in modern Taiwan statistical handbooks. However, the number of embezzlement cases according to Naimu Shou Toukei Kyoku (1924) and the summation of embezzlement and embezzlement in the pursuit of social activities in Naimu Shou Keiho Kyoku (1924) are almost the same, and is as high as the fraud rate in present day Japan. Moreover the number of reports per capita is also similar to the number of fraud reports in Taiwan and Korea. The number of reported cases of embezzlement per 100,000 residents in each country in recent years is 1.36 in Japan (2010) and 25.83 for South Korea (2007).

The frequency of embezzlement and fraud, is similar but the amount of damage of embezzlement has always been greater than fraud. It seems that urbanization, industrialization and commercialization creates conditions conducive to embezzlement.

After 1910, there are statistics for embezzlement in Taiwan (See figure 5), the pattern shown in the embezzlement figure shows a pattern very similar to that of fraud. There is an increasing trend. The arrest rate was not less than 90 percent. Only in the eastern region, did the arrest rate exceed 100 percent. Some criminals seem to have moved to the east after committing embezzlement, and were arrested. The Taipei area showed the highest reported crime rate, especially after 1925. Its crime rate rapidly increased and peaked at 861.54 in 1937. Only in 1916, was the crime rate highest in the east. There was another peak in the number of arrests per 100,000 residents in the east, in 1922, but crime reports didn’t show such a peak. Many criminals who committed embezzlement in other regions may have came to the east and been arrested. This phenomenon

resembles the case of Japan in which the arrest rate in the east was lower than in the west. The crime rate in Pinganbuk-do, Pingannam-do and Hwanghae-do, Korea were high perhaps because criminals could easily escape to China or Manchuria.

As with other property crimes, there is a peak in 1934 in Japan. The value 402.46 in 1934 is the highest rate ever recorded. The arrest rate was almost 100 percent. The average frequency in Fukuoka was highest. Okayama, Hiroshima, Yamaguchi and Aomori are high too. Except Fukuoka, other metropolitan areas, such as Tokyo, Osaka and Aichi are low. From 1929 to the early 1930s, the crime rate increased in many regions

In Korea, the graph of embezzlement shows the same pattern as the fraud graph. Frequency of crime decreased in 1919, increased until 1931, and then decreased again. It may have been affected by the independence movement in 1919. The arrest rate was almost 100 percent. The number of reports per capita in Gyonggi-do was the highest until 1919, but after 1923 (except 1928) Pingannam-do showed the highest value. Gwangwon-do was also high. The movement of embezzlement cases from Gyonggi-do to Pingannam-do suggests the main center of property crime, and the center of industry and commerce, moved from Seoul to Pyongyang.

5. Effects of Urbanization on crime

5.1 Theft and Fraud in urban and rural Taiwan

In this section, we consider the changing rate of property crime in urban and rural areas of Taiwan. The definition of urban areas in the 1909-1928 period and the 1929-1938 period are different. First, we discuss the difference in crime in urban and rural areas from 1909 to 1928. Second, we consider about the difference in the crime rate in cities and other areas from 1929 to 1938. In this section, due to lack of data, we can only consider cases of theft and fraud in which perpetrators were found guilty and received significant punishment.

Data from 1909 to 1919 are from the urban crime table (市街群鄙別犯罪件数) in *Taiwan Criminal Statistics*(1911-1921) for each corresponding year. The data in this table is the number of cases in which a person is convicted and punished by a fine of more than 2 yen (until 1927), or more than 5 yen (until 1940), or detention of more than 10 days Thus, the numbers of crimes in this section are different from other sections. The breakdown of urban and rural population from 1909 to 1919 is based on data from Toukei Ka,Taiwan Soutoku Fu Kanbou (1911-1921).

We calculated the population of cities (市) and towns (街) as urban population. All other population is rural. Urban and rural populations from 1920 to 1928, and city and other area populations from 1929 to 1938 are from the data in an appendix to the *Taiwan Criminal Statistics* (1931-1941).

Statistical areas for the last two periods are different. From 1929 to 1938, there is separate data for Taipei city, Keelung city, Hsinchu city (beginning in 1930), Taichung city, Changhua city (beginning in 1933), Tainan city, Chiayi city, Kaohsiung city and Pingtung city (beginning in 1933).

First, we consider the overall change in the number of theft or fraud convictions over the whole period (see figure 6). The number of theft convictions per 100,000 residents peaked at 70.58 in 1913, and from 1918 to 1921, suddenly declined, afterward showing a slow decrease. This contrasts with the number of reports of thefts which tended to rise (see figure 2). There is no big change in fraud convictions. They ranged from 8 to 15 per 100,000 residents. Similar to theft convictions, fraud convictions also decreased somewhat after 1918. If damage from theft and fraud is minimal, many first offenders will be probated, and most convictions will be due to recidivism. Regardless of the increase number of reported cases, the number of significant convictions has declined. We guess that main cause of decrease in the recidivism rate is the high arrest rate for fraud and the increasing arrest rate for theft.

5.1.1 From 1909 to 1928

Figures 7 and 8 show the number of theft and fraud convictions per 100,000 in urban and rural areas within each region, and table 2 shows the descriptive statistics. The graphs show that both theft and fraud convictions in urban area are clearly higher than in rural area. The difference in the urban East region is most notable. There is a possibility that the ethnic mixture in Hualian city caused problems.

For theft cases, most urban and rural trends run parallel. In some areas, there are peaks around 1920. Fraud cases in rural area were very stable, but varied widely in urban areas.

5.1.2 From 1929 to 1938

Figures 9 and 10 show the number of theft and fraud convictions per 100,000 residents

in the various cities and rural areas in the 1929-1938 period and table 3 shows the descriptive statistics. From the graph, it is evident that convictions in rural areas show no great change. Moreover, the convictions in relatively non-urbanized cities, such as Hsinchu City, Changhua City and Pingtung City, are low. The peak for reports of theft was in 1937, but convictions show no peak in 1937. Therefore, the rise in reports of theft seems to be caused by increasing first time offenders. This suggests that suppression of recidivism by the judiciary was functioning effectively.

Convictions for theft in Taipei city (73.03, 10 years average), Keelung city (87.28) and Kaohsiung city (83.00) were high, other areas (18.76) were relatively low.

Chiayi city (21.54) recorded the highest number of fraud convictions, and Kaohsiung city (19.20) and Taichung city (16.63) were high, but Taipei city (6.02) was relatively low. Other areas (1.35) were also low. The convictions for fraud relative to population mainly occurred in urban area.

5.2 Results of cross-sectional analysis

Figure 11 shows the relationship between the number of reports for each crime per 100,000 residents and population density (defined as population per square kilometer). All variables are natural logarithms. Except for robbery, all property crime rates are clearly positively correlated with population density. The number of robbery arrests per 100,000 and population density is negatively correlated. However, this figure does not consider other regional characteristics.

In this section, we examine the relationship between population density and crime using cross-sectional data. The data used is an average for a five-year period in each region. Dependent variables are averages of the number of reports of property crimes per 100,000 residents. The number of arrests was very similar to the number of reports so this variable is not used. Independent variables are the average population density and dummy variables for Japan and Korea. Reports of embezzlement in 1909 in Taiwan, reports of fraud, extortion and embezzlement and all arrests data in 1924 in Japan, and all data after 1940 are omitted. The estimated models are specified as follows:

$$ln(Crime) = \beta_0 + \beta_1\, ln(Population\ density_i) + \beta_2[JAPAN_i] + \beta_3[KOREA_i] + \varepsilon_i$$

ln(Crime) denotes the natural logarithm of the number of reports of crime per 100,000 residents for each property crime in region i. *ln(Population density)* is a natural logarithm of population density in each region. JAPAN is a dummy variable, if a region i belongs to Japan main land then 1. KOREA is a dummy variable, if a region i belongs to Korea area then 1. Table 4 shows the results for the 1910-1914, 1920-1924 and 1935-1939 periods for robbery and theft, and for the 1925-1929, 1930-1934 and

1935-1939 periods for fraud, extortion and embezzlement.

5.2.1 Robbery

Column (1) in each time period shows only the dummy variables which distinguish the Japanese and Korean economy from Taiwan, Column (2) shows the effect of population density. From 1910 to 1939, population density generally had a positive effect on the robbery rate. The coefficients for population density ranged from 0.25 to 0.38; the highest value was in the early 1915 to 1919 period. The coefficients for the Korea dummy variable were high and were strongly significant for all periods. The coefficient for the 1910-1914 period was the highest. It decreased in the 1915-1919 period, and increased in the 1920-1924 period. This is the same result earlier shown in figure 1. Moreover, comparing columns (1) and (2), the coefficients for population density didn't affect the coefficients of the Korea dummy. Thus the high robbery rate in Korea wasn't due to high population density. Only in the 1935-1939 period, was the coefficient of the Japan dummy positive and significant. Comparing columns (1) and (2), population density can explain about 22 percent of the higher robbery rate in Japan

5.2.2 Theft

The coefficients for population density were 0.17-0.37 and these were significant. The value of the coefficients were increasing over time showing the effect of population density was increasing over time. The coefficients of the Japan dummy variable were significantly positive in the 1905-1910 and 1930-1939 periods. In 1930-1934, the coefficient of the Japan dummy in column (2) was 0.7229 and in column (1) it was 0.4886. Population density could thus explain 32 percent of the difference in the theft

rate between Japan and Taiwan. The coefficients of the Korea dummy were negative and significant in the 1910-1914 and 1915-1919 periods, and the value of the coefficient was increasing. After the 1920-1924 period, the Korea dummy had no significance. Furthermore population density didn't affect the Korea dummy.

5.2.3 Fraud

Over the whole period, population density was not correlated with the fraud rate. The Japan dummy had a significantly positive coefficient in the 1925-1929, 1930-1934 and 1935-1939 periods. In addition, population density had no effect on the Japan and Korea dummy. This suggests other factors caused the high fraud rate in Japan.

5.2.4 Extortion

The value of coefficients for the Korea dummy decreased but were not significant. The Korea dummy was not affected by population density. The values of coefficients of the Japan dummy were increasing after the 1930-1934 period. In the 1935-1939 period, 16 percent of the higher extortion rate in Japan, compared to Taiwan, could be explained by population density.

5.2.5 Embezzlement

There was no correlation between population density and the embezzlement rate. The coefficients of the Japan dummy were all significantly positive. As with the case of fraud, population density didn't affect the coefficients of the Japan and Korea dummy.

6. Discussion and conclusion

This thesis compares property crime, such as robbery, theft, fraud, extortion and embezzlement across Taiwan, Korea and Japan from 1905 to 1942. We found that the earthquake, the Showa crisis and the Great Depression seem to have had a big impact on property crime in Japan. Moreover, the number of robberies per capita increased rapidly following the independence movement in Korea. These points suggest there is a close relationship between social chaos and property crimes.

Theft was the major property crime and one of the most common crimes overall. It was strongly correlated with population density. Thus we can assume that there was a correlation between crime and population density at that time. However, we found that population density didn't correlate with fraud and embezzlement. Our results suggest correlation between socio-economic indicators and crime is different for each crime.

We found relationships between population density and robbery, theft and extortion by cross-sectional analysis. For example, in the 1935-1939 period, we found that an increase of one percent in population density causes the number of reports of robbery, theft and extortion per capita to increase 0.29, 0.37 and 0.34 percent respectively. Fraud and embezzlement had no correlation with population density. The high fraud and embezzlement rate in Japan is most likely based on other socioeconomic factors.

Finally, there are some interesting questions concerning the crime variables. Each of the three economies was governed by the same Penal Code, but the nature of crime was different within each area. However special laws applied only in colonized areas in the early period, such as caning and bandit law, did create some differences in the legal environment.

The low robbery rate and high frequency of other property crimes in Japan may be due to substitution between types of property crime. The high robbery rate in Korea during the early colonial period and early 1920s is very conspicuous, and it had a generally downward trend over the whole period. This may indicate the Penal Code was very effective in Korea. But without knowing the crime rates previous to the colonial era in each area, we cannot be sure how the Penal Code affected crime.

In addition, with the exception of the Great Kanto Earthquake, the effect of natural disasters has been ignored. During this period, there were some massive earthquakes in Taiwan, such as the Chiayi-Meishan earthquake (1906), and the Hsinchu-Taichung earthquake (1935). These disasters may have had an effect on crime.

In conclusion, robbery, theft and extortion were all affected by population density. We found that natural disasters, the Depression and other social disruptions also affect property crime. We hope further research using the data organized in this thesis can advance our understanding of crime.

All data in this thesis is being made available in following site: http://homepage.ntu.edu.tw/~olds/

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8. Appendix: results of an FGLS estimation

This appendix analyzes the relationship between property crime and economic variables by using panel data for each region from 1905 to1939

8.1 Data

We adopt two new dependent variables.

8.1.1 Farm density

Farm density is the number of farms per square kilometer. If there are many farms in an area, the area is less urbanized. The expected sign of this variable is negative. Data is based on the *Taiwan Government-General Statistical Book* (1923-1941), Nourin Shou (1924-1941) and Chousen Soutoku Fu (1909-1942)

8.1.2 Road length

Road length denotes the length of road measured in kilometers per square kilometer. When first occupied by Japan, there were few so-called “roads” in Taiwan and Korea. The Japanese Empire built many roads. Advanced road networks allow for personal mobility and the development of industry. The expected sign for road length is positive. Data is based on the *Taiwan Government-General Statistical book* (1909-1941), Nourin Shou from 1926 to 1941 and Chousen Soutoku Fu (1923-1942)

8.2 Model

In this chapter, we test the effect of urbanization as proxied by population, farm and road density on property crime. In addition, we use Japan and Korea dummy variables

to allow for comparison with Taiwan. The expected sign of population density is positive. A decrease in the number of farms per square kilometer means development of other industries. It leads to a separation of residence and place of work and it weakens ties with relatives and neighbors. Its expected sign is negative. The length of road per square kilometer facilitates the movement of persons and things and expands the range of the police operations. Its expected sign is positive. Japan and Korea dummy variables include the effects of unknown factors in Japan and Korea that differentiate these economies from Taiwan. The model is defined as follows:

$$Y_{i,t} = \rho Y_{i,t-1} + \beta_0 + \beta_1 ln\left(Population\ density_{i,t}\right) + \beta_2\, ln\left(Farm\ density_{i,t}\right) + \beta_3\, ln\left(Road\ length_{i,t}\right) + \beta_4 JAPAN_i + \beta_5 KOREA_i + \sum_{t=1905}^{1942} \beta_{6,t} \cdot Year\ dummy_i + \varepsilon_{i,t}$$

Y denotes the number of reports of crime per 100,000 residents for each property crime in region *i* in year *t*. Because the crime series have strong positive autocorrelation, this model includes lag of *Y*. *Population density* is the population density in each region and year. *Farm density* and *Road length* denote the number of farms in unit area and the length of road in unit area in each region and year. JAPAN is a dummy variable, if a region *i* belongs to Japan then JAPAN = 1. KOREA is a dummy variable, if a region *i* belongs to Korea area then KOREA = 1.

Except for the Japan and Korea dummy variables, all variables are natural logarithms. Table 5 shows descriptive statistics for each variable. Sometimes crime reports are zero, and the statistical period is not always the same in each economy for every variable.

Thus the panel data is unbalanced, but no special measures were taken to deal with this problem. Moreover, the number of crime reports or arrests per 100,000 residents showed autocorrelation, so the model includes a lagged dependent variable. We adopt FGLS estimation to deal with the autocorrelation and any possible heteroskedasticity problems. The next section discusses the results.

8.2.1 Robbery

Table 6 shows the results. The only independent variables shown in column (1) are the Japan and Korea dummy variables. Column (2) adds the natural logarithm of population density, and column (3) adds the natural logarithm of farm density and road length. Column (4) adds year fixed effects. The coefficient of population density in column (2) is 0.2678 and is strongly significant. When population density increases 1 percent, the robbery rate grows almost 0.27 percent. Basically, the sign of the coefficient for farm density and road length is the same as we expected, and the results resemble the cross-sectional results. The results for cases of arrests were almost the same as crime reports results.

8.2.2 Theft

In columns (2) to (4), the coefficients of population density all were positive and significant. If population density increases 1 percent, then the theft rate also increases 0.27 to 0.50 percent. Theft seems to be the crime most sensitive to urbanization. In columns (3) and (4), farm density has a negative coefficient and is also quite significance, but road density shows no significance. Perhaps thieves do not move far, regardless of convenience of transportation. The anonymity of urbanization and the low

arrest rate for theft supports this story. The Japan and Korea dummy have significantly positive coefficients in column (3) and (4).

8.2.3 Fraud

All indicators of urbanization had no significance. We already saw this in the cross-sectional results. The interesting point is intellectual crime, such as fraud and embezzlement are not affected much by urbanization. We should test the relationship between intellectual crime and other economic indicators, such as the education level, the number of schools and the circulation of newspapers.

8.2.4 Extortion

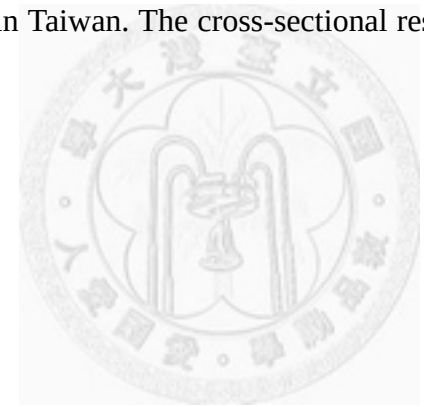
The results for extortion are very similar to robbery. The coefficients for population density in column (2) to (4) were all significant. In column (4) farm density and road length were all significant with the expected signs. In column (4), when population density increases 1 percent, the extortion rate increases 0.16 percent. If farms per square kilometer increase 1 percent, then extortion decreases 0.14 percent. If length of roads per square kilometer increases 1 percent, extortion increase 0.20 percent. Generally, we can say that violent crime in rural areas seems lower than in urban areas.

8.2.5 Embezzlement

Results for embezzlement are similar to those of fraud. As in the case of fraud, the Japan dummy has a positive coefficient and does not appear affected by urbanization. Fraud and embezzlement are common in Japan. Further research is needed to understand this problem.

8.3 Conclusion

When population density increases 1 percent, robbery, theft and extortion each increase 0.28, 0.46 and 0.16 percent respectively. When farms per square kilometer increase 1 percent, robbery, theft and extortion each decrease 0.26, 0.23 and 0.14 percent, embezzlement and fraud are unaffected. If the length of the road per square kilometer increases 1 percent, then robbery, fraud and extortion each increase 0.30 and 0.20 percent, while theft, fraud and embezzlement were not affected by road length. The robbery rate in Korea was higher than in Taiwan, and the fraud and embezzlement rate in Japan were higher than in Taiwan. The cross-sectional results and FGLS results were very similar.



			Obs	Mean	Std.Dev.	Min	Max
Robbery	Reports	Taiwan	35	1.34	0.56	0.45	2.76
		Japan	37	2.44	0.67	1.44	3.80
		Korea	33	9.45	6.16	1.49	24.31
	Arrests	Taiwan	35	1.34	0.57	0.38	2.55
		Japan	18	2.54	0.68	1.42	3.43
		Korea	33	7.19	3.93	1.32	15.51
Theft	Reports	Taiwan	35	316.04	70.12	188.11	499.45
		Japan	37	596.72	238.86	310.38	1061.58
		Korea	33	250.75	78.34	71.60	379.96
	Arrests	Taiwan	35	196.76	93.12	75.89	443.52
		Japan	18	578.99	159.52	271.05	836.53
		Korea	33	179.69	72.81	33.29	290.15
Fraud	Reports	Taiwan	35	94.20	67.65	13.26	261.53
		Japan	18	311.16	125.66	152.70	577.23
		Korea	33	79.32	35.34	10.18	130.17
	Arrests	Taiwan	35	88.15	68.50	12.34	313.47
		Japan	18	377.03	154.05	187.63	682.01
		Korea	33	81.12	36.80	9.14	134.37
Extortion	Reports	Taiwan	21	4.59	2.15	1.48	9.78
		Japan	18	13.96	9.91	4.56	46.46
		Korea	33	4.18	1.25	1.73	5.78
	Arrests	Taiwan	21	4.35	2.11	1.48	9.59
		Japan	18	15.51	11.18	4.87	52.31
		Korea	33	4.15	1.25	1.64	5.90
Embezzlement	Reports	Taiwan	30	72.42	51.01	24.82	211.24
		Japan	18	221.73	97.70	77.10	402.46
		Korea	33	45.54	17.68	5.01	74.94
	Arrests	Taiwan	30	67.62	51.79	22.51	222.52
		Japan	18	248.17	108.16	87.80	434.97
		Korea	33	46.52	18.17	4.28	74.31

Table 1. Descriptive statistics for property crimes per 100,000 residents

			Obs	Mean	Std.Dev.	Min	Max
Theft	Taipei	Urban	20	128.34	29.92	57.38	172.08
		Rural	20	54.28	28.79	16.66	98.25
	Hsinchu	Urban	20	60.91	17.07	27.10	116.92
		Rural	20	23.77	9.11	9.89	42.63
	Taichung	Urban	20	67.19	21.50	37.27	97.78
		Rural	20	28.24	13.34	11.37	47.50
	South	Urban	20	103.89	22.72	71.99	144.72
		Rural	20	33.24	13.49	15.95	53.15
	East	Urban	20	122.54	61.30	31.90	289.86
		Rural	20	29.42	13.19	10.45	58.64
	All	Urban	20	100.05	21.47	56.73	124.43
		Rural	20	33.70	14.03	16.50	53.00
		Average	20	50.54	14.51	28.10	70.58
Fraud	Taipei	Urban	20	30.64	11.67	13.12	51.79
		Rural	20	6.92	2.42	4.09	12.09
	Hsinchu	Urban	20	20.64	9.25	11.79	51.31
		Rural	20	5.72	2.82	1.94	13.05
	Taichung	Urban	20	28.72	12.91	12.14	59.84
		Rural	20	6.80	2.58	3.47	13.22
	South	Urban	20	25.96	7.99	15.75	44.78
		Rural	20	5.98	1.77	2.66	9.88
	East	Urban	20	41.73	35.06	0.00	143.57
		Rural	20	5.61	4.40	0.00	15.37
	All	Urban	20	27.46	8.80	16.63	43.61
		Rural	20	6.25	1.60	3.58	8.79
		Average	20	11.56	3.01	8.16	16.86

Table 2. Descriptive statistics for theft and fraud convictions per 100,000 residents, from 1909 to 1928 in urban and rural areas Taiwan

		Obs	Mean	Std.Dev.	Min	Max
Theft	Taipei city	10	73.03	19.33	48.23	113.10
	Keelung city	10	87.28	19.49	62.65	117.91
	Hsinchu city	9	50.91	13.57	29.08	68.38
	Taichung city	10	69.25	9.17	56.07	82.84
	Changhua city	6	35.74	11.82	22.12	50.83
	Tainan city	10	66.32	12.45	49.88	93.73
	Chiayi city	9	72.33	26.44	9.08	97.95
	Kaohsiung city	10	83.00	29.98	36.66	146.91
	Pingtung city	6	46.11	18.20	17.82	68.62
	Other	10	18.76	3.23	15.55	25.64
Fraud	Taipei city	10	6.02	31.79	20.80	43.45
	Keelung city	10	7.08	21.16	9.68	29.75
	Hsinchu city	9	14.01	26.89	13.08	53.93
	Taichung city	10	16.63	32.06	9.23	55.54
	Changhua city	6	11.61	19.03	4.02	33.15
	Tainan city	10	10.51	36.03	20.79	53.65
	Chiayi city	9	21.54	46.05	28.42	98.39
	Kaohsiung city	10	19.20	44.24	16.12	83.35
	Pingtung city	6	9.09	18.18	9.59	35.65
	Other	10	1.35	10.63	9.69	14.21

Table 3. Descriptive statistics for theft and fraud convictions per 100,000 residents, from 1929 to 1938 in cities and other areas.

Robbery	1910-1914				1920-1924				1935-1939			
	(1)		(2)		(1)		(2)		(1)		(2)	
ln(population			0.3090	**			0.2521	*			0.2873	***
density)			(0.1097)				(0.0943)				(0.0780)	
JAPAN	0.0824		-0.2108		-0.1979		-0.4031		0.7067	***	0.5502	*
	(0.3145)		(0.3159)		(0.2691)		(0.2679)		(0.2420)		(0.2247)	
KOREA	2.4399	***	2.4386	***	2.0795	***	2.0716	***	1.2158	***	1.2574	***
	(0.3519)		(0.3337)		(0.3010)		(0.2871)		(0.2707)		(0.2471)	
Intercept	0.3816		-0.9268		0.3336		-0.7740		-0.1775		-1.5603	***
	(0.2990)		(0.5441)		(0.2558)		(0.4808)		(0.2300)		(0.4302)	
R Squared	0.6775		0.7146		0.7240		0.7530		0.2585		0.3934	
Adj. R Squared	0.6671		0.7006		0.7151		0.7408		0.2346		0.3635	
n	65		65		65		65		65		65	

Theft	1910-1914				1920-1924				1935-1939			
	(1)		(2)		(1)		(2)		(1)		(2)	
ln(population			0.1910	**			0.3206	***			0.3690	***
density)			(0.0676)				(0.0759)				(0.0793)	
JAPAN	0.1831		0.0019		0.0866		-0.1743		0.7389	**	0.5379	*
	(0.1940)		(0.1948)		(0.2331)		(0.2157)		(0.2588)		(0.2283)	
KOREA	-0.8062	***	-0.8070	***	-0.3740		-0.3842		0.0637		0.1171	
	(0.2170)		(0.2058)		(0.2607)		(0.2312)		(0.2896)		(0.2510)	
Intercept	5.4832	***	4.6747	***	5.5255	***	4.1171	***	5.6300	***	3.8537	***
	(0.1844)		(0.3356)		(0.2216)		(0.3872)		(0.2461)		(0.4370)	
R Squared	0.4860		0.5454		0.1244		0.3224		0.2502		0.4468	
Adj. R Squared	0.4694		0.5230		0.0961		0.2891		0.2260		0.4196	
n	65		65		65		65		65		65	

Fraud	1925-1929				1930-1934				1935-1939			
	(1)		(2)		(1)		(2)		(1)		(2)	
ln(population			-0.0377				-0.0627				-0.0690	
density)			(0.0855)				(0.1028)				(0.0864)	
JAPAN	0.6254	**	0.6534	**	0.7203	*	0.7609	*	0.6490	**	0.6866	**
	(0.2337)		(0.2437)		(0.2846)		(0.2937)		(0.2436)		(0.2488)	
KOREA	0.1021		0.1018		-0.3147		-0.3198		-0.4963		-0.5063	
	(0.2615)		(0.2632)		(0.3184)		(0.3201)		(0.2725)		(0.2736)	
Intercept	4.5974	***	4.7678	***	5.0432	***	5.3356	***	5.0497	***	5.3820	***
	(0.2222)		(0.4463)		(0.2706)		(0.5516)		(0.2316)		(0.4763)	
R Squared	0.2071		0.2096		0.3467		0.3507		0.4589		0.4645	
Adj. R Squared	0.1815		0.1708		0.3256		0.3187		0.4415		0.4382	
n	65		65		65		65		65		65	

Extortion	1925-1929				1930-1934				1935-1939			
	(1)		(2)		(1)		(2)		(1)		(2)	
ln(population			0.0986				0.1228				0.3411	***
density)			(0.0951)				(0.1068)				(0.1041)	
JAPAN	0.4052		0.3319		0.9514	***	0.8717	**	1.1398	***	0.9540	***
	(0.2618)		(0.2710)		(0.2979)		(0.3051)		(0.3168)		(0.2999)	
KOREA	0.3942		0.3949		-0.0460		-0.0361		-0.2787		-0.2293	
	(0.2928)		(0.2927)		(0.3332)		(0.3325)		(0.3544)		(0.3298)	
Intercept	1.2656	***	0.8200		1.5874	***	1.0144		1.4444	***	-0.1974	
	(0.2489)		(0.4963)		(0.2832)		(0.5729)		(0.3011)		(0.5741)	
R Squared	0.0376		0.0543		0.3368		0.3509		0.4573		0.5385	
Adj. R Squared	0.0066		0.0078		0.3154		0.3190		0.4398		0.5158	
n	65		65		65		65		65		65	

Table 4: results of the cross-sectional analysis

Embezzlement	1925-1929				1930-1934				1935-1939			
	(1)		(2)		(1)		(2)		(1)		(2)	
ln(population			-0.0229				-0.0152				0.0135	
density)			(0.1017)				(0.1159)				(0.1058)	
JAPAN	0.6879	*	0.7050	*	1.0970	***	1.1069	***	0.8797	***	0.8724	**
	(0.2777)		(0.2898)		(0.3199)		(0.3312)		(0.2967)		(0.3046)	
KOREA	0.0783		0.0781		-0.2575		-0.2587		-0.5713	*	-0.5693	
	(0.3106)		(0.3130)		(0.3579)		(0.3609)		(0.3320)		(0.3350)	
Intercept	4.0357	***	4.1392	***	4.3793	***	4.4505	***	4.5002	***	4.4352	***
	(0.2640)		(0.5308)		(0.3042)		(0.6219)		(0.2821)		(0.5832)	
R Squared	0.1943		0.1950		0.4303		0.4304		0.4815		0.4817	
Adj. R Squared	0.1683		0.1554		0.4119		0.4024		0.4648		0.4562	
n	65		65		65		65		65		65	

Table 4: (continue)

Note: the symbols *, **, *** denote statistical significance at the 5%, 1% and 0.5% levels.

Area			Obs.	Mean	Std.Dev.	Min	Max		Obs.	Mean	Std.Dev.	Min	Max
Japan	Robbery	reports	1734	1.967	1.650	0.096	13.918	Korea	429	9.672	11.094	0.688	84.422
		arrests	841	1.950	1.547	0.131	10.701		429	7.311	7.926	0.567	55.205
	Theft	reports	1739	468.105	345.290	94.488	2256.248		429	237.583	158.971	14.192	955.121
		arrests	846	483.146	297.968	67.760	2012.726		429	174.133	130.863	12.911	681.984
	Fraud	reports	846	305.706	423.172	24.819	5283.429		429	77.175	44.713	1.492	214.785
		arrests	846	369.937	537.091	24.104	5980.476		429	78.428	47.778	1.492	250.353
	Extortion	reports	846	11.822	17.178	0.171	263.764		429	4.174	2.132	0.104	15.544
		arrests	846	12.537	18.223	0.171	264.225		429	4.137	2.115	0.104	15.054
	Embezzlement	reports	846	222.111	242.893	23.487	1617.456		429	45.022	25.187	0.559	147.082
		arrests	846	242.050	270.622	23.263	2530.591		429	45.756	26.611	0.559	150.445
	Population density		1739	274.557	393.245	13.939	3429.211		429	103.696	50.626	20.565	251.451
	Farm density		1398	22.680	13.694	1.806	76.829		429	16.750	5.967	4.998	33.248
	Road density		846	3.539	2.305	0.423	12.974		286	0.158	0.056	0.078	0.322
Taiwan	Robbery	reports	163	1.628	1.500	0.133	12.189	Total	2326	3.364	5.818	0.096	84.422
		arrests	166	2.799	6.100	0.133	49.610		1436	3.650	5.495	0.131	55.205
	Theft	reports	175	336.376	359.507	82.073	3762.469		2343	416.058	333.195	14.192	3762.469
		arrests	175	205.187	219.340	21.095	1462.731		1450	358.174	290.835	12.911	2012.726
	Fraud	reports	175	100.588	119.660	2.032	847.063		1450	213.337	344.594	1.492	5283.429
		arrests	175	95.593	120.041	1.880	1104.272		1450	250.580	436.601	1.492	5980.476
	Extortion	reports	105	5.154	6.315	0.403	39.449		1380	8.937	14.088	0.104	263.764
		arrests	105	4.952	6.118	0.403	39.067		1380	9.349	14.962	0.104	264.225
	Embezzlement	reports	150	75.555	112.119	8.649	861.545		1425	153.371	208.559	0.559	1617.456
		arrests	150	73.415	114.744	8.473	919.620		1425	165.204	231.825	0.559	2530.591
	Population density		175	117.108	62.004	4.368	250.855		2343	231.513	347.649	4.368	3429.211
	Farm density		90	10.774	5.285	1.320	18.515		1917	20.794	12.528	1.320	76.829
	Road density		155	0.409	0.214	0.036	0.793		1287	2.411	2.439	0.036	12.974

Table 5. Descriptive statistics for the panel data

Note: Property crimes are per 100,000 residents.

ln(Robbery reports)								ln(Theft reports)							
	(1)		(2)		(3)		(4)	(1)		(2)		(3)		(4)	
ln(Population			0.2678	***	0.2754	***	0.2849	***		0.2767	***	0.4997	***	0.4619	***
density)			(0.0367)		(0.0457)		(0.0303)			(0.0366)		(0.0355)		(0.0301)	
ln(Farm)					-0.2206	***	-0.2596	***				-0.2243	***	-0.2319	***
					(0.0575)		(0.0387)					(0.0475)		(0.0401)	
ln(Road)					0.2204	***	0.3003	***				0.0107		0.0364	
					(0.0712)		(0.0520)					(0.0486)		(0.0420)	
Japan	0.2788		0.1473		-0.1156		-0.1501	0.3798	***	0.1131		0.2236		0.0811	
	(0.1135)		(0.1118)		(0.1927)		(0.1495)	(0.1301)		(0.1263)		(0.1463)		(0.1434)	
Korea	1.5044	***	1.5588	***	1.5796	***	1.6860	***	-0.4349	***	-0.4948	***	-0.1005		-0.0883	
	(0.1283)		(0.1257)		(0.1783)		(0.1320)	(0.1507)		(0.1410)		(0.1370)		(0.1383)	
Intercept	0.2078		-1.0617	***	-0.3928		0.7789	***	5.6137	***	4.4375	***	3.8502	***	3.6832	***
	(0.1084)		(0.2046)		(0.3493)		(0.2689)	(0.1263)		(0.1953)		(0.2493)		(0.2368)	
Year dummy	No		No		No		Yes	No		No		No		Yes	
Chi Squared	277.51		328.00		228.59		919.04	90.51		157.21		446.59		955.43	
Rho	0.6339		0.6145		0.6090		0.5134	0.8831		0.8725		0.8284		0.8348	
n	2168		2168		1160		1160	2185		2185		1163		1163	

ln(Fraud reports)								ln(Extortion reports)							
	(1)		(2)		(3)		(4)	(1)		(2)		(3)		(4)	
ln(Population			0.0407		0.0181		-0.0028			0.2049	***	0.1281	*	0.1592	***
density)			(0.0359)		(0.0413)		(0.0288)			(0.0504)		(0.0640)		(0.0473)	
ln(Farm)					-0.0136		-0.0577					-0.1040		-0.1434	***
					(0.0582)		(0.0432)					(0.0895)		(0.0666)	
ln(Road)					-0.0805		-0.0234					0.1509		0.1961	***
					(0.0572)		(0.0453)					(0.0812)		(0.0683)	
Japan	1.1920	***	1.1540	***	0.7894	***	0.7455	***	0.9431	***	0.7980	***	0.6367	***	0.5855	***
	(0.1137)		(0.1179)		(0.1440)		(0.1187)	(0.1394)		(0.1443)		(0.2131)		(0.1829)	
Korea	0.0030		0.0022		-0.2257		-0.0537		0.1845		0.1606		0.5355	**	0.6240	***
	(0.1229)		(0.1232)		(0.1277)		(0.1021)	(0.1383)		(0.1415)		(0.1936)		(0.1698)	
Intercept	4.0152	***	3.8296	***	4.4372	***	4.1669	***	1.0002	***	0.0637		0.7703	***	0.9767	***
	(0.1063)		(0.1977)		(0.2564)		(0.2083)	(0.1291)		(0.2755)		(0.3745)		(0.3337)	
Year dummy	No		No		No		Yes	No		No		No		Yes	
Chi Squared	317.23		316.26		201.44		661.70	126.34		144.52		90.81		405.99	
Rho	0.7157		0.7170		0.7268		0.6711	0.5994		0.6751		0.6390		0.6371	
n	1352		1352		1163		1163	1282		1282		1163		1163	

Table 6: Results of FGLS estimation

ln(Embezzlement reports)								
	(1)		(2)		(3)		(4)	
ln(Population			0.1000		-0.0113		-0.0480	
density)			(0.0490)		(0.0557)		(0.0417)	
ln(Farm)					-0.0083		-0.0483	
					(0.0776)		(0.0631)	
ln(Road)					-0.0582		0.0004	
					(0.0691)		(0.0602)	
Japan	1.0836	***	1.0015	***	0.9219	***	0.8971	***
	(0.1190)		(0.1260)		(0.1980)		(0.1673)	
Korea	-0.2519		-0.2477		-0.2209		-0.0170	
	(0.1325)		(0.1343)		(0.1722)		(0.1463)	
Intercept	3.6546	***	3.1975	***	3.9585	***	3.7773	***
	(0.1093)		(0.2574)		(0.3266)		(0.2892)	
Year dummy	No		No		No		Yes	
Chi2	265.22		262.37		181.75		484.62	
Rho	0.7550		0.7961		0.7670		0.7637	
n	1327		1327		1163		1163	

Table 6: (Continue)

Note: the symbols *, **, *** denote statistical significance at the 5%, 1% and 0.5% levels.

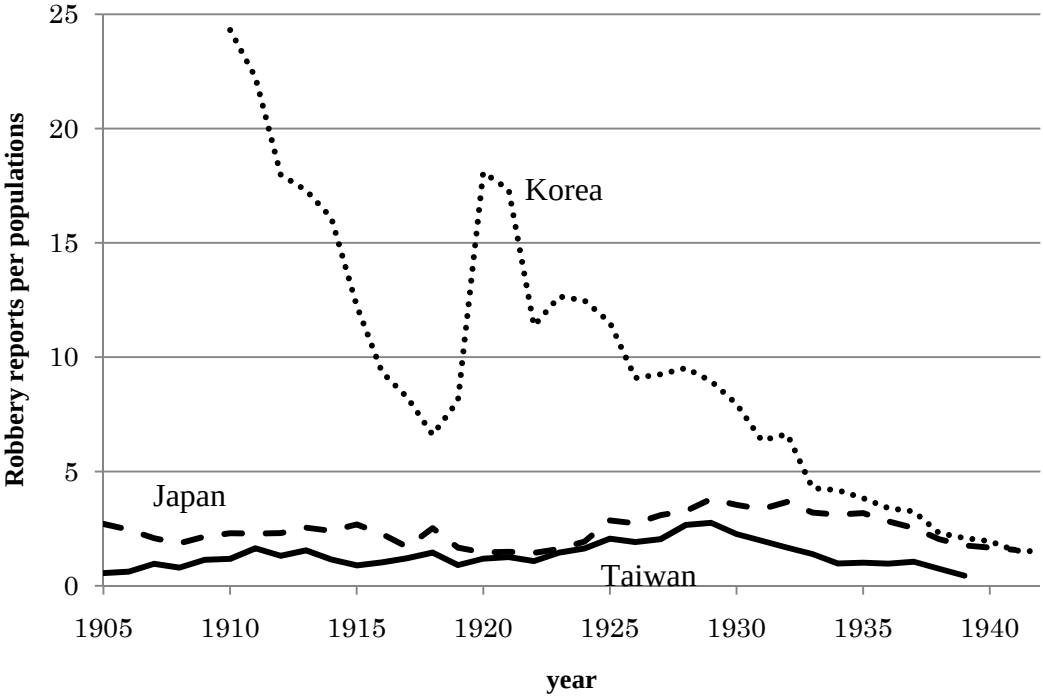


Figure 1. Reports of robbery per 100,000 residents.

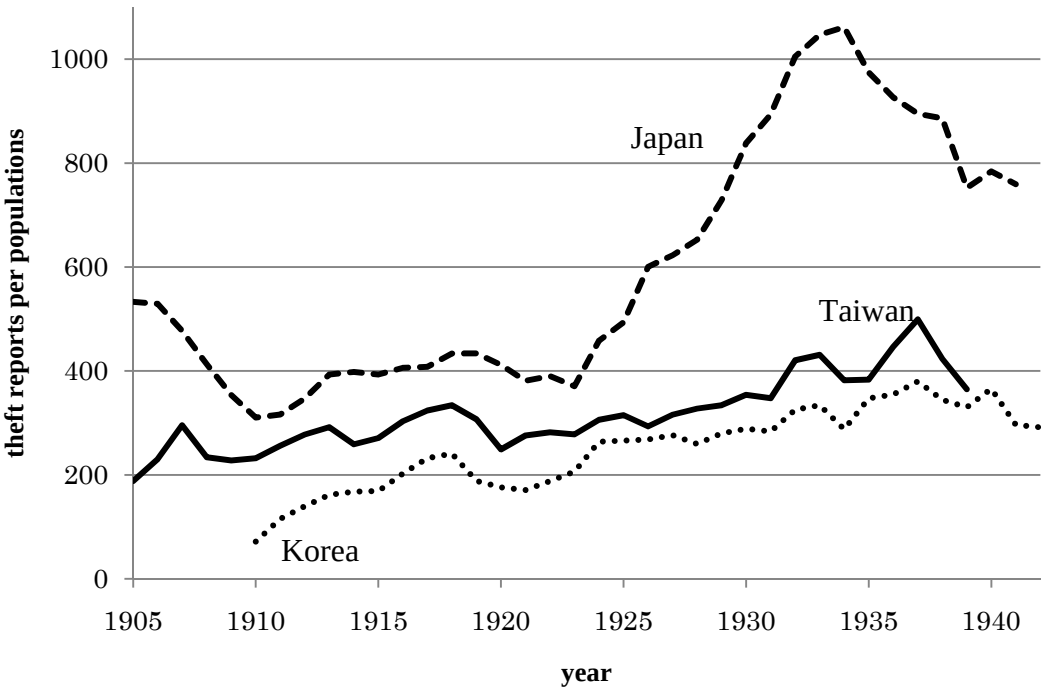


Figure 2. Reports of theft per 100,000 residents.

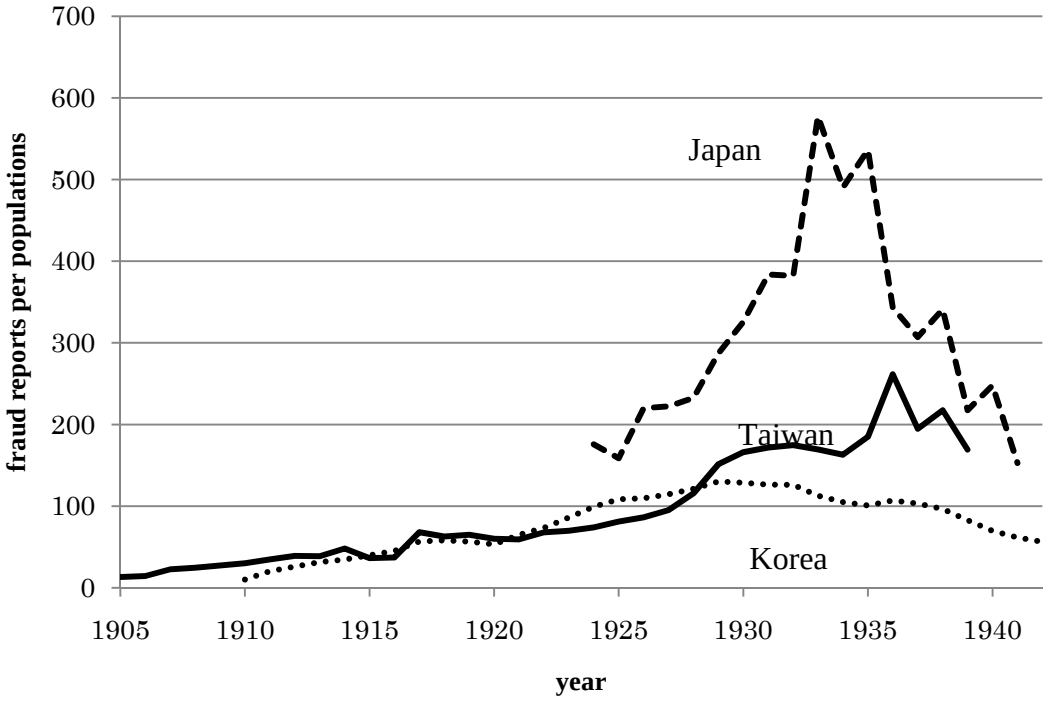


Figure 3: Reports of fraud per 100,000 residents.

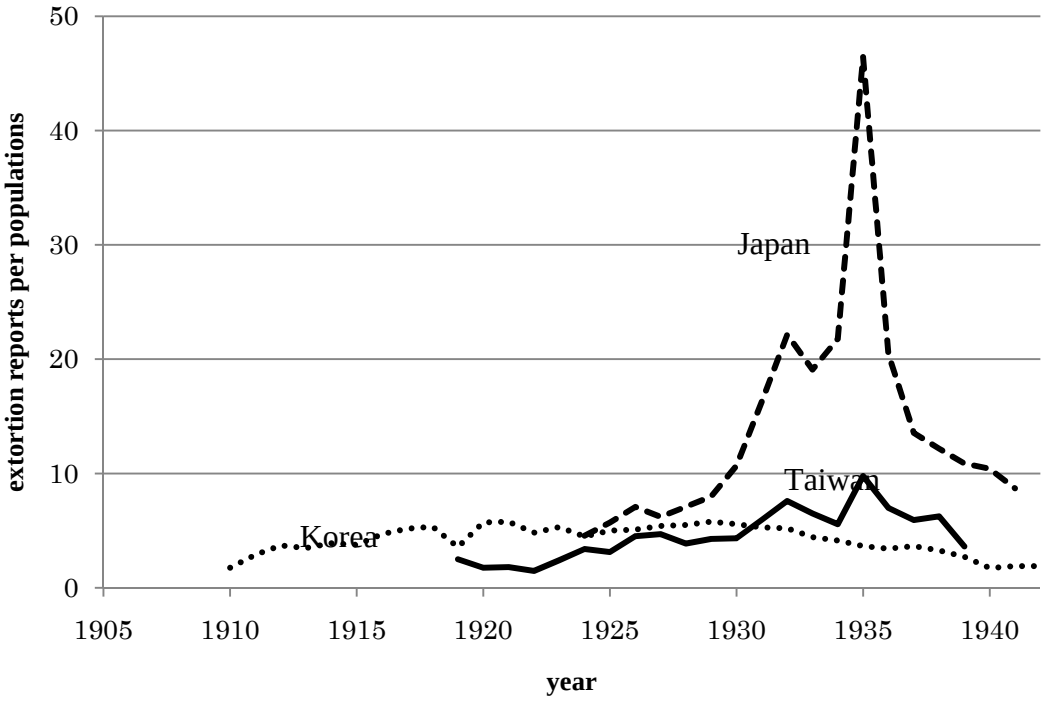


Figure 4. Reports of extortion per 100,000 residents.

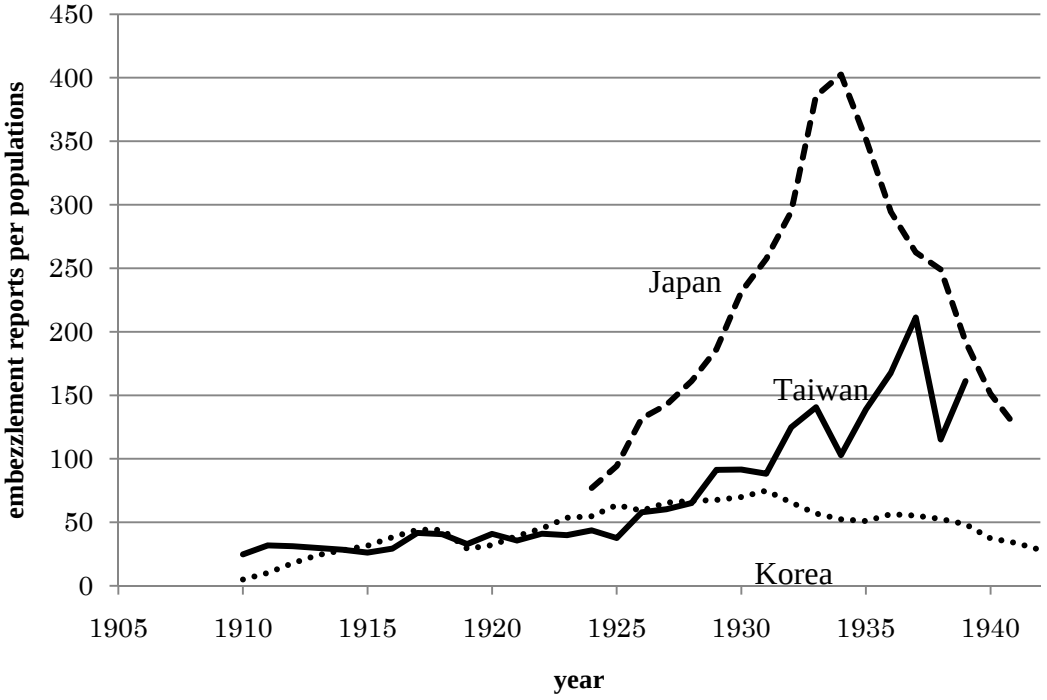


Figure 5: Reports of embezzlement per 100,000 residents.

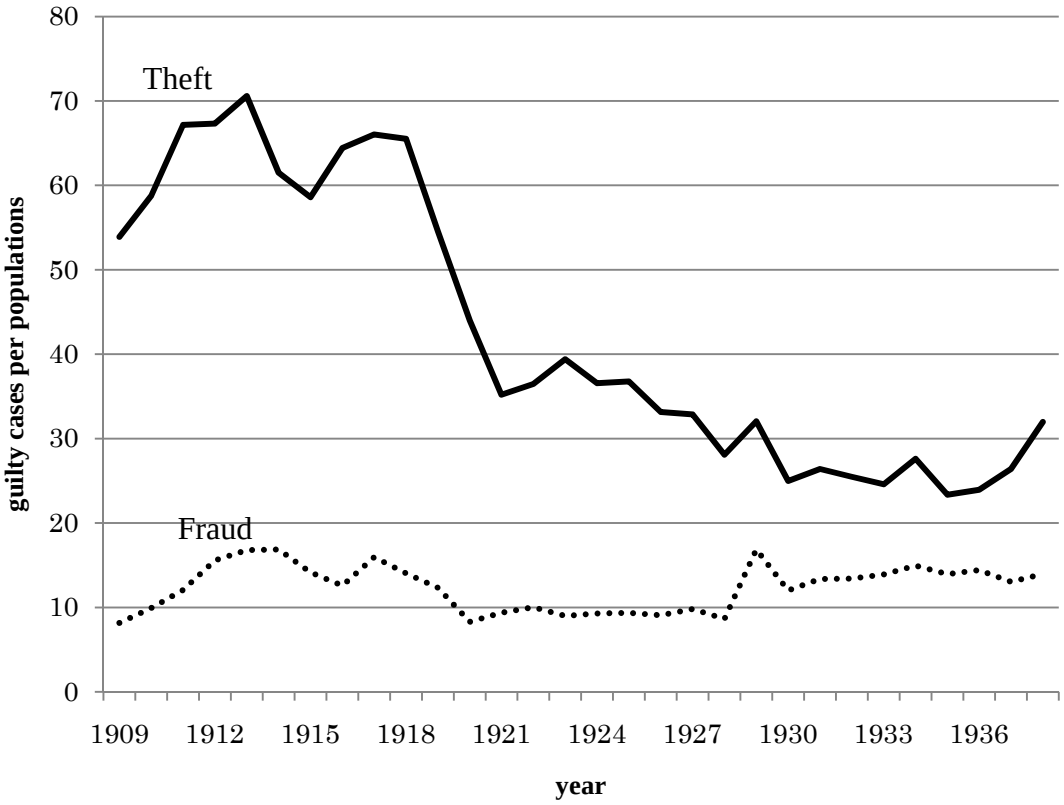


Figure 6: Taiwan theft and fraud convictions per 100,000 residents.

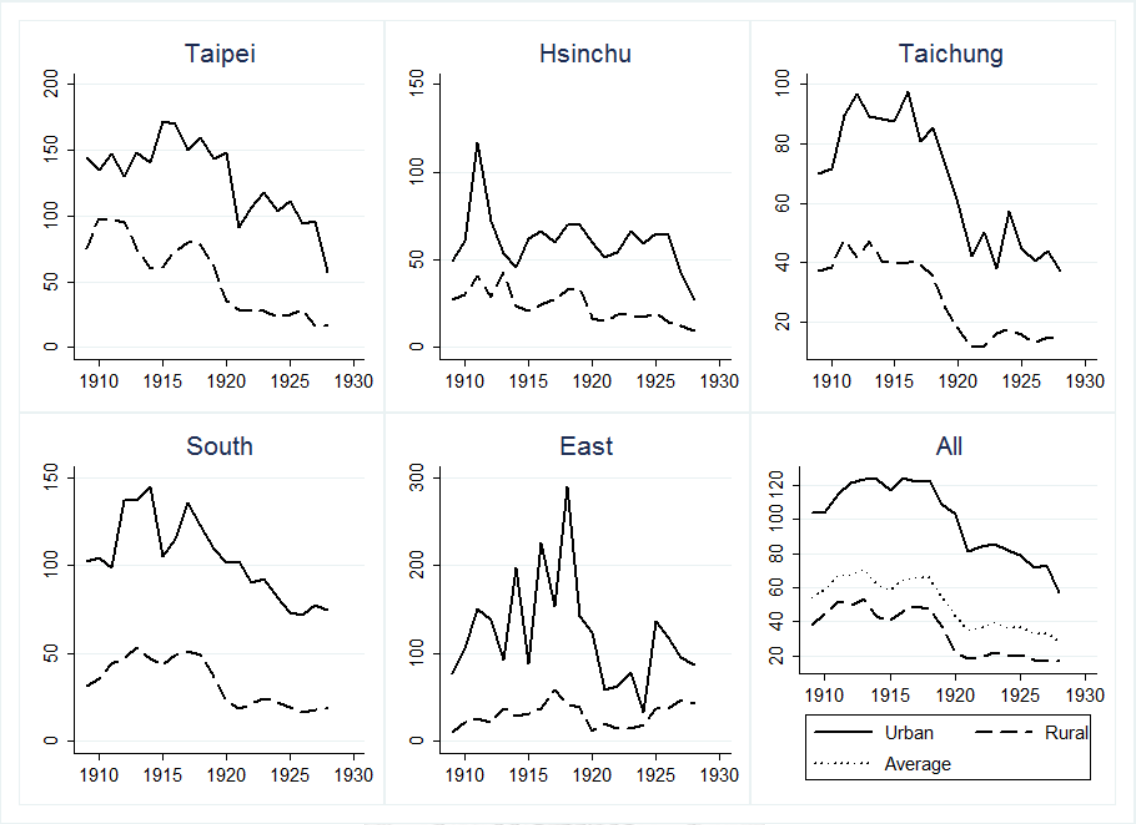


Figure 7. Theft convictions per 100,000 residents in each region of Taiwan.

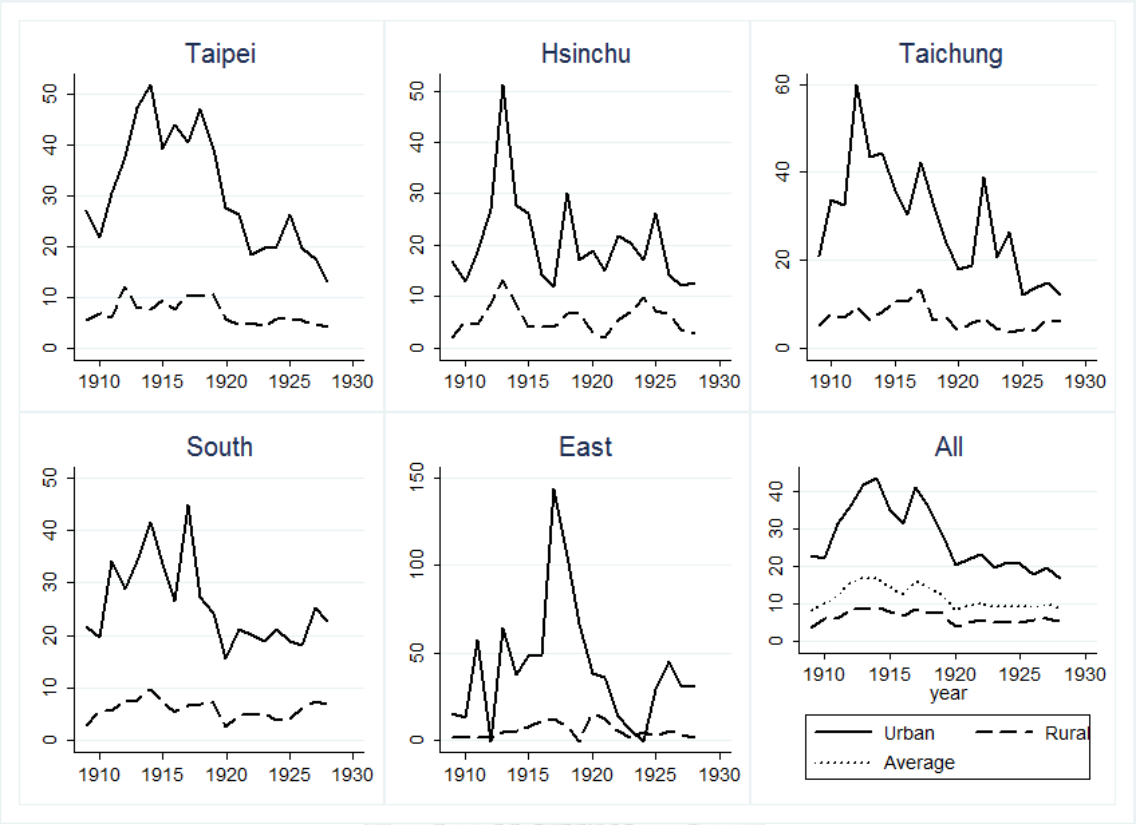


Figure 8. Fraud convictions per 100,000 residents in each region of Taiwan.

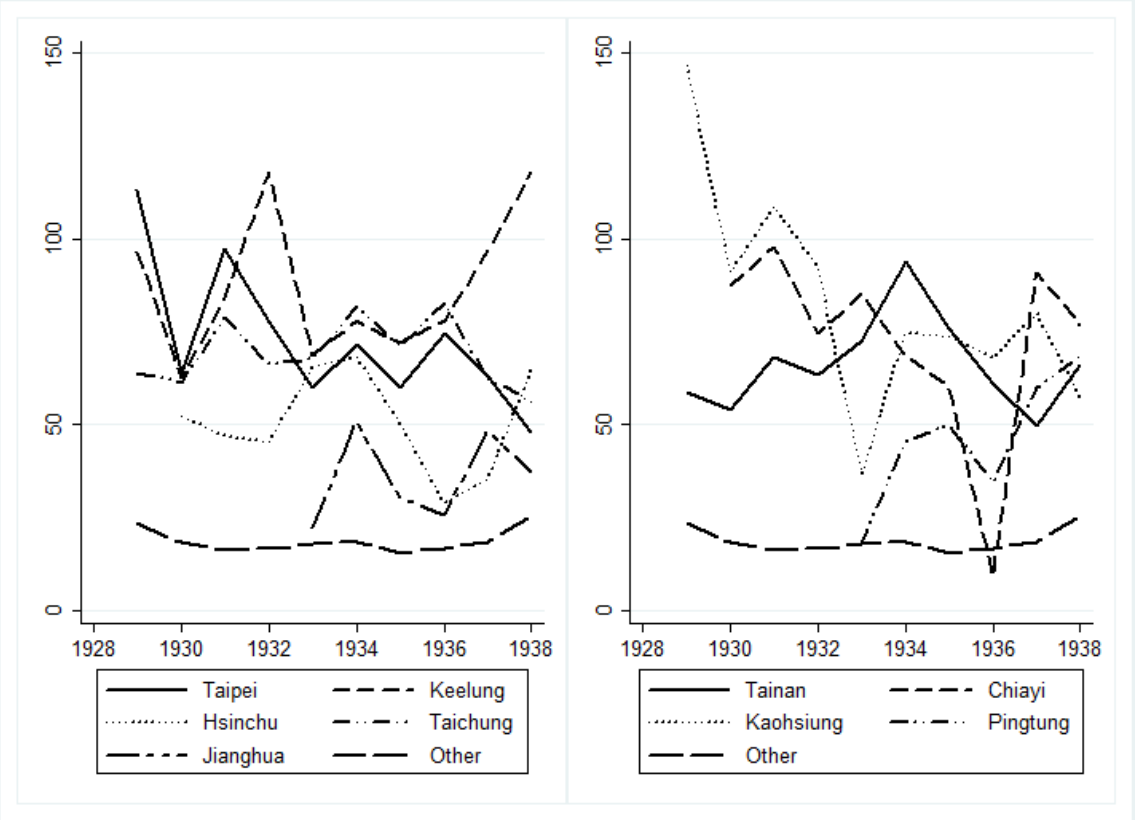


Figure 8. Theft convictions per 100,000 residents in cities and elsewhere in Taiwan.

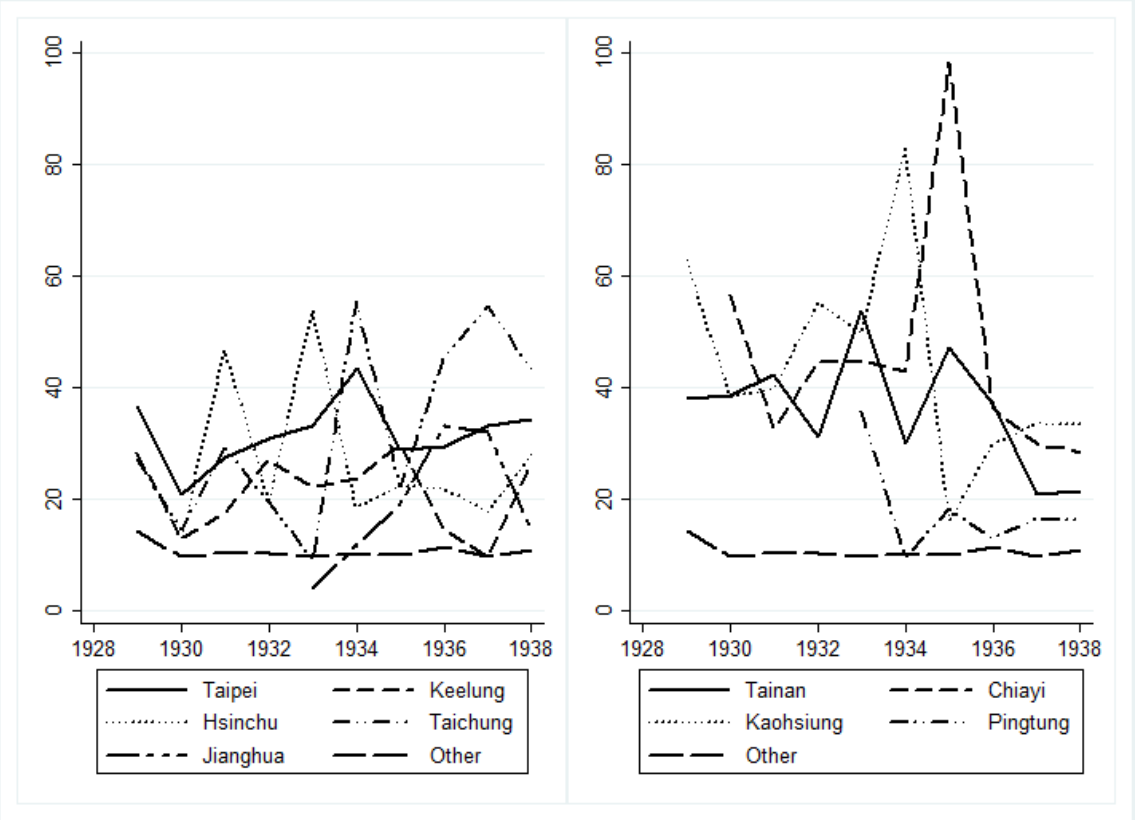


Figure 9. Fraud convictions per 100,000 residents in cities and elsewhere in Taiwan.

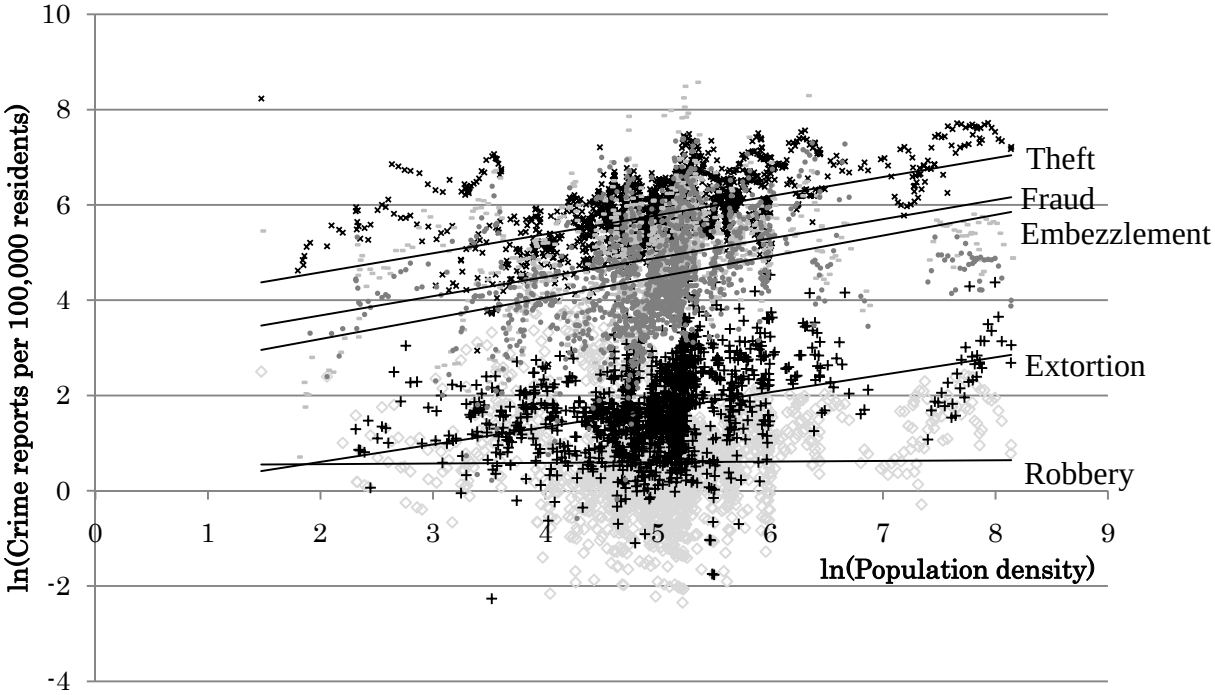


Figure 10: Comparison of reports per 100,000 residents for each type crime in all regions over the whole period.