**The Effect of Change in Land Ownership on Agricultural Output: Evidence from Land Reform in Taiwan**

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This paper studies the effect of the land reform implemented in 1950s on the agricultural output in Taiwan. In developing countries, such as Taiwan in 1950s, agriculture tends to be an important industry for both GDP and employment. At that time, agriculture accounted for over thirty percent of GDP and over fifty percent of employment in Taiwan (Statistical Yearbook of the Republic of China, 1980; Tang, 1954). Hence, the policy related to agricultural industry was critical for the economy development in Taiwan.

Since 1947, the government in Taiwan had implemented a series of policies to reform the land ownership of farmland in Taiwan. Such land reform can be divided into three phases: reduction of farm rent to 37.5%, sale of public land, and land-to-the-tiller program. During the first phase, the government set a legal maximum percentage of farm rent, which was formally implemented in 1949. In 1951, the government stared to sell the public arable land while restricting the amount of area each household could buy. Finally, in 1953, the government forced landlords with more than 3 hectares of arable land to sell the excess area of land to the government so that the government can resell the land to those tenants without land or those with little area of land (Tang, 1954). This paper focuses on the effect of the third phase of the land reform, through which the government made the tenants own their own land. While the second phase of the land reform should have the same effect of transforming the tenants to owner-cultivators, the magnitude of the arable area affected was small (JCRR Annual Reports on Land Reform in the Republic of China, 1964). Before 1950, around 40% of agricultural population were tenants while the figure dropped to 21% in 1953 (Taiwan Agricultural Yearbook, 1956).

The land reform was closely related to the political condition in the late 1940s to 1950s in mainland China and Taiwan. After World War II, Japanese government retroceded Taiwan to Chinese government in 1945. In the meantime, the second phase of Chinese Civil War fought between the Nationalist government of the Republic of China (ROC) and Chinese Communist Party (CCP) continued until the Nationalist government retreated to Taiwan in 1949. As mentioned by Chu (2015), the land reform in Taiwan may also serve the purpose of reducing the number of tenants to prevent CCP mobilizing peasant revolt in Taiwan and the purpose of gaining the leading position of China’s modernization. In this historical context, the timing of the land reform may be treated as exogenous to the development of agricultural development in Taiwan.

While the land reform was implemented in all cities of Taiwan, since prefecture and city in Taiwan had different percentage of land cultivated by tenants (or different percentage tenants in agricultural population), the land reform should have different effect on the agricultural output in each prefecture and city. The paper uses two main methods to identify the effect of the land reform. The first is the difference in difference method. Due to the data constrain, I only collected the area cultivated by tenants in each prefecture and city in 1949 and 1956. By regressing the growth of agricultural output on the dummy of after land reform, prefecture and city fixed effect, and the interaction term of the previous two variables, the paper can find the total effect of prefecture and city difference during the period on the growth of agricultural output. However, such effect may also reflect factors other than land reform such as the difference in speed of reconstruction after war in each prefecture and city. Then, the paper regresses the coefficients of the interaction term for each prefecture and city on the change in area cultivated by tenants divided by total arable area in prefecture and city from 1949 to 1956 to see how much the difference in the area cultivated by tenants can explain the total effect of difference in prefecture and city during the period on the growth of agricultural output. The second method directly regresses the growth of agricultural output on the change in the population of tenants divided by the agricultural population (the change in the portion of tenant population in each prefecture and city) while controlling other factors, such as change in the irrigated and drained area and the growth in agricultural population. The coefficient of the change in the portion of tenant population represents the relation of the change in the portion of tenant population and the agricultural output. Since the main change in the portion of tenant population in each prefecture and city was caused by the land reform, the coefficient should be able to capture effect of land reform on agricultural output. Although the effect of change in the portion of tenant population may less precisely capture the effect of land reform than the area of land cultivated by tenants, the advantage of the second method is the completeness of the data in each year.

For the agricultural output (kilogram), agricultural population (number of people), and irrigated and drained area (hectare), the paper uses the data from Taiwan Agricultural Yearbook from the Department of Agriculture and Forestry. Taiwan Agricultural Yearbook collected these data in each prefecture and city since 1947. The agricultural output was the compilation of the estimation of each village. The agricultural output includes many different crops but can divided by five categories: rice, common crops (such as sweet potato and wheat), special crops (such as sugarcane and tea), vegetables, and horticulture (such as mango and grape). As mentioned by Cheung (1969), facing the change in the property right, tenants may also choose different crops to cultivate. Hence, when running the above regressions, I not only use the total agricultural output but also use the outputs of the five categories to see if there is a special pattern. The agricultural population was collected from household registrations of each prefecture and city and can be divided into three categories: owner-cultivator, part-owner, tenant. Owner-cultivators cultivate their own land; part-owners cultivate their own land and others’ land at the same time; tenants only cultivate others’ land. Hence, the effect of the land reform would be reflected on the portion of the tenants in agricultural population. Finally, the irrigated and drained area was collected by the commission on water conservancy in different regions. However, the region division was different from the prefecture and city division.

For the area cultivated by tenants in each prefecture and city (hectare), Taiwan Agricultural Yearbook provides the data of 1939 and 1949, which was measured by Japanese government and the Department of Agriculture and Forestry through directly measuring the area of land. Taiwan Land Bureau also calculated the area through the registered rental contracts after 1949 (Yearbook of the Republic of China, 1956). However, for the prefecture and city level data, I can only collect the data of year 1953 and 1956. Also, the results of the two methods were not matched. Eventually, I choose to use the data from Taiwan Agricultural Yearbook in 1949 and the data from Taiwan Land Bureau in 1956. The reason of choosing 1949 and 1956 rather than 1949 and 1953 or 1953 and 1956 is that the data in 1953 has already reflected the effect the third phase of land reform while the agricultural output might not reflect the effect so quickly. However, such choice means that the paper would suffer from a larger measurement error.

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