Consumption Smoothing Behavior in Rural Philippines An Analysis Based on Daily Record Keeping Data

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Abstract

Farmers and agricultural laborers in developing countries face consumption fluctuations induced by seasonality in agricultural income. This thesis investigates the extent to which households in one village in the Philippines smooth their consumption, using the daily housekeeping data collected in 1975/76 and in 1980/82. In addition, this thesis applies the same approach to analyze the seasonality in cash inflow and outflow and the role of savings among them. The difference between cash inflow and outflow represents the change in net savings. As a whole, the evidence for the existence of consumption smoothing can be observed. This suggests that when income accrued did not determine the timing of expenditure. On the other hand, seasonality in cash outflow follows closely the fluctuation of cash inflow, as expected. In 1980/82, the relative role of savings in filling the gap between cash outflows and inflows became larger than in 1975/76. This could be due to the tightening of credit constraints as a result of crop failure in 1980/82.

1 Introduction

Farmers and agricultural laborers in developing countries face consumption fluctuations induced by seasonality in agricultural income. If the amount of income is sufficiently larger than that of expenditure, such income fluctuations in both income and expenditure may not pose a serious problem.Poor households, however, may be forced to reduce their consumption or investment if expenditure exceeds income for some months. Then, government interventions allowing them to smooth consumption flows might be desirable to ensure citizens' stable lives throughout a year. So it is important to understand the financial situation that housholds

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in developing countries face in order to explore potential policy options for supporting their lives.

This thesis follows the method proposed by Paxson (1993) to examine the extent of consumption smoothing among rural households in the Philippines in the late 1970s and the early 1980s based on daily records of income and consumption.

While Paxson (1993) used a single cross-section dataset on consumption and income, a few recent studies have relied upon detailed and frequent records of household activities over certain periods of time with basic principle of accounting imposed (e.g., Morduch 2009, Samphantharak and Townsend 2009). Samphanthrak and Townsend (2009) use the Townsend Thai Monthly Survey data starting in 1998 and covering 720 households living in different regions across Thailand. The well-defined and organized nature of the Townsend data enabled Samphantharak and Townsend (2009) to describe the financial situations of Thai households, many of whom were farmers, in great detail.

Remarkably, a similar data collection attempt, albeit with a smaller scale, was already made 20 years earlier by Yujiro Hayami, Masao Kikuchi and a team of researchers at the International Rice Research Institute (IRRI) in the Philippines. The research project was named the Anatomy of Peasant Economy project, in which participating households recorded daily accounts of income and consumption.

The main purpose of this thesis is to utilize this dataset and examine the consumption smoothing behavior of the rural households and the changees in such behavior between 1975/76 and 1980/82.

The uniqueness of this thesis comes from the nature of the data. The Anatomy data recorded income and consumption flows on a daily basis, which enable us to construct not only monthly aggregates, as analyzed in Paxson (1993) and Samphantharak and Townsend (2009), but also weekly flows of income and consumption. The total of 27 sample households were surveyed in the same village in two phases, in 1975/76 and in 1980/82. So the comparisons of the consumption smoothing patterns between the two phases can be linked with socio-economic changes observed in the village over the period. In the analysis, this thesis distinguishes the Income/Expenditure concept from the Cash Inflow/Outflow concept by following the accounting approach proposed by Samphantharak, K. & Townsend, R. (2009).

Section **??** provides some background information on agricultural and social history of the East Laguna village based on Hayami (1978), Kikuchi et al. (1980) and Hayami and Kikuchi (2000). In Section **??**, the theoretical framework originally proposed by Paxson (1993) and adopted in this thesis. The econometric specifications based on the theory are also presented in this section. Section **??** presents the characteristics of the data used in this thesis. In Section **??**, we discuss how the set of independent and dependent variables, Income/Expenditure and Cash Inflow/Outflow, are constructed following the approach proposed by Samphanthrak &

Townsend (2009). The results of some basic graphical analysis describing Income/Expenditure flow and Cash Inflow/Outflow are presented in Section **??**. In Section **??**, regression results are presented. Section **??** presents the conclusion drawn from the analyses and future researche agenda.

2 The Village Setting

Hayami and Kikuchi (2000) describe historical evolution of the village starting in the 1960s up to the 1990s. Hayami (1978) and Kikuchi et al. (1980) provide detailed information of the village. Based on these sources, this section offers some basic background information that allows us to understand the Anatomy survey data and the analysis using the data presented in this thesis.

2.1 Agricultural development

The East Laguna village, where the data used in this thesis was collected, is in Laguna Province, the Philippines.[*1] The village is located at the southeast of Metro Manila, the capital city of the Philippines, and faces the largest lake in the country, called Laguna de Bay. One should note that the International Rice Research Institute (IRRI) and the University of the Philippines at Los Baños (UPLB) have actively supported agricultural development of the region including this village since the late 1960s, thanks to the close proximity of the area to the city of Los Baños, where both IRRI and UPLB are located.

The distribution of semi-dwarf and high-yielding modern varieties (MV) of rice, including IR8, the first MV variety released by IRRI, started in 1966, setting-off the process later known as the Green Revolution. According to the record, one of the farmers in the village started planting IR8 in 1966/67 dry season. From this point onward, adoption of modern rice varieties in the village was accelerated by IRRI and by the national government. A survey conducted in the village in 1976 shows that almost all the farmers planted MVs, while only 40% of the farmers nationwide cultivated MVs in the same year.

The Philippines has two rice cultivating seasons in a year, Wet season and Dry season. Generally speaking, the wet season is the six month period between June and November, with

[*1] This village was first studied by a Japanese geographer, Hiromitsu Umehara. Starting with the Anatomy prokect in the mid-1970s, the village has subsequently been studied on a regular basis since by IRRI researchers and by others. Hayami and Kikuchi (2000) describes how socioeconomic conditions of this village evolved during the four decades. This thesis utilizes the historical description about the village found in this book. See Sawada et al. (2012) for the research conducted in the village.

monsoon rain, and the dry season corresponds to the period between December and May in the following year. Harvest months in each crop season are concentrated in a few month periods as shown in Table ??. This agricultural seasonality, with two peaks with harvest in a year, generates income fluctuations as typically observed in agricultural regions with seasonal sales of agricultural products for farmers and with seasonal agricultural casual works for landless laborers.

In the Philippines, the National Irrigation Administration (NIA) started the construction of the irrigation system in the East Laguna village in 1953 and completed it in 1958, enabling the farmers in the village to cultivate rice in Dry season, in addition to the conventional Wet season. Although the irrigation system started to deteriorate due to poor management and maintenance of the system since 1987, rice double-cropping was common among the farmers in the village during the 1970s and 80s, the period covered by this study.

Rice yields improved drastically after the 1960s due to the rapid adoption of MV crops combined with the functioning irrigation system. However, rice yields stagnated in the mid-1970s to the 1980s until the sudden decrease caused by the deterioration of the irrigation system.[*2] Consequently, rice productivity in normal years during the two study phases were roughly constant, although the village farmers experienced a major crop failure during the phase two (especially in 1980/81) as we can see in Table ??.

Between 1980 and 1982, the NIA undertook construction works with the irrigation system, that covers the region containing the East Laguna Village. Because of the extensive construction works, water supply to the village was delayed or completely stopped during the second phase of the study. Rice production seasons were delayed by one to two months in these years, making them abnormal years in terms of agricultural production. Table ?? also shows that the total rice outputs harvested in the second phase were lower than those in the first phase. In response, farmers were observed to have converted their rice farms into watermelon fields during the dry season in 1982.

2.2 Socioeconomic backgrounds

This subsection discusses the evolution of socioeconomic conditions in the village in the 1970s and 1980s in order to provide some contextual information for interpreting the graphical and the regression analyses in the following sections.

The population of the village has increased since the 1960s until today. Based on the 1976

[*2] Well-functionizing irrigation is necessary condition for MVs to produce high yields.

Table1 Monthly Rice Output

	*Phase*1	*Phase*2	
	1975/76	1980/81	1981/82
June	0	–	1720
July	0	0	362
August	0	0	66
September	396	0	0
October	3874	0	98
November	548	0	1551
December	0	2037	1656
January	0	1067	0
February	0	0	0
March	44	0	103
April	3271	0	1816
May	2138	166	0
Total Output	10271	3270	7372

The amount of rice harvest in June is assumed to be zero when calculating the total rice output in a year.

survey, 639 citizens were registered in the National census data while 707 were found in the 1980 census. This increase was not only due to natural increase but also due to migration into the village leading to the high population growth rate of, 10.6%, during the half decade. (Annual compound growth rate is 2.5%.) The total number of households also increased by twelve between 1976 and 1980. Landless households increased by eighteen, while, six farmer households dissolved or left the village during the five year periods. This led the expansion of the fraction of landless households in the village.

Both in 1974 and in 1980, the main income source of the village households was rice farming, based on cultivation of own farms and from work as farm laborers. In 1974, 65% of the economically active (13-65 years old) males answered their major occupations as rice-related works while 72% did so in 1980. At the same time, progress in diversity of income sources was observed in the village. Figure **??** shows average monthly income in PHP by income sources, year and farmer/non-farmer. In 1980/81 and 1981/82, the amount of income coming from non-

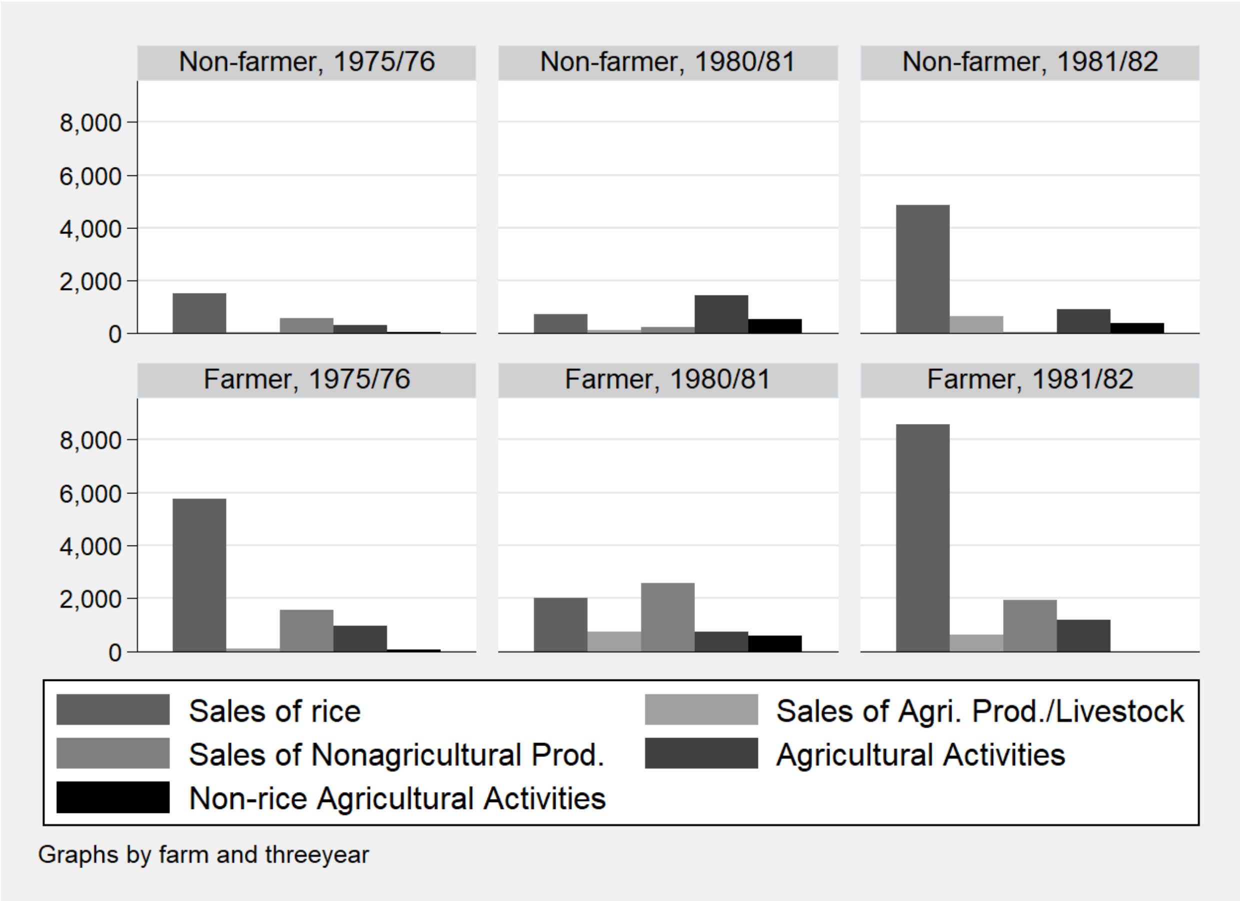

Figure1 Average monthly income in PHP, by sources

rice activities increased. Kikuchi et al. (1980) gives some examples of the expanding sources of income in 1980. First, sales from household-owned convenience stores, sari-sari stores, increased. This led the increase in the female working as shopkeepers. Second, opporunities for off-farm jobs, such as carpentry works, in urban area of the same district significantly increased in the survey period.

In the Philippines, international labor emigration, in search of better job opportunities, became one of the popular occupational options among rural residents starting in the late 1970s. Those labor migrants are popularly known as Overseas Filipino Workers (OFW). This movement was in response to the increase in the demand for labor in the Middle East starting in the early 1970s. Some villagers started working in Saudi Arabia in the late 1970s and brought back large amounts of income, followed by many others in the village, a trend that continues until today. As mentioned in Section **??**, No. 8 household had a family member living and working abroad during the second phase of the study and considered to be exceptional (back then) in Kikuchi (1983). However, this household is not exceptional considering the historical evolution

of OFWs in the village after the 1980s.
The educational level of villagers (7 years old and above) increased between 1974 and 1980. 6% of them had the level of schooling of college or above in 1974 while 8% did so in 1980. 10% of them had received secondary-level education in 1974 while 14% did so in 1980. Those who had never been to school compried 8% of the village population in 1974, while of 5% did so in 1980. It is likely that the rising level of education in the Philippines helped increasing number of its population to obtain opportunities to work abroad.

3 Theoretical background

3.1 A Model of Seasonal Consumption Patterns

First, a model of consumption decision under perfect smoothing is discussed. Then, the model is transformed into a new linear model that enables us to analyze imperfect consumption smoothing across seasons. All the models presented in this subsection **??** are based on Paxson (1993).

3.1.1 Perfect Smoothing

Assume that income that a household earns is constant over a year, as are season-specific preferences and prices. Each household faces no credit market constraints and can borrow and lend their money at a constant seasonal interest rate. ($r \equiv R-1$) A year (t) is composed of multiple seasons (j). The length of each season is equal. For simplicity, assume that there are two seasons for a while. ($j = 0,\ 1$) This assumption is extended to multiple seasons later. Each household living forever chooses their consumption in each season so as to maximize their utility througrh their lives subject to their budget constraints. Their utility maximization problems can be denoted as the following equation:

$$
\begin{aligned}
& max \sum_{t=0}^{\infty} \rho^{2t} \left[U(C_{0it};\alpha_0) + \rho U(C_{1it};\alpha_1) \right] \\
& s.t. \sum_{t=0}^{\infty} R^{-2t} \left(P_0 C_{0it} + P_1 \frac{C_{1it}}{R} \right) = W_i + \sum_{t=0}^{\infty} R^{-2t} \left(Y_{0i} + \frac{Y_{1i}}{R} \right), \qquad (1)
\end{aligned}
$$

where C_{jit} represents consumption of an individual i in a season j in a year t, Y_{ji} is income earned by i in season j, α_j is a seasonal preference parameter which is constant over a year, P_j is a consumption commodity price in season j, W_i is a wealth that a houshold i owns and ρ is a constant discount factor multiplied by each season.
Assume that $\rho R = 1$, which is a widely-used assuption that a discount factor is equal to

the inverse of an interest rate in the same period. Assume also that utility function can be represented by a constant relative risk aversion (CRRA) form with a risk parameter, a. $(U'(C_{ji};\ \alpha_j) = \alpha_j(C_{ji})^{-a})$ The solution to the problem is the following two equations:

$$E^*_{0i} = P_0 C^*_{0i} = \frac{P_0\lambda R}{P_0\lambda R + P_1}\left[Y_{0i} + \frac{Y_{1i}}{R} + W_i\left(\frac{R^2-1}{R^2}\right)\right] \tag{2}$$

$$E^*_{1i} = P_1 C^*_{1i} = \frac{P_1 R}{P_0\lambda R + P_1}\left[Y_{0i} + \frac{Y_{1i}}{R} + W_i\left(\frac{R^2-1}{R^2}\right)\right] \tag{3}$$

$$where\ \lambda \equiv \left(\frac{\alpha_1 P_0}{\alpha_0 P_1}\right)^{-\frac{1}{\alpha}}$$

The terms in the brackets [ ] represents permanent income stream of a household i. What makes the difference between the amount of expenditure in two seasons are only $P_0\lambda$ and P_1. In other words, their ratio only comes from the seasonal changes in prices and preferences, under fixed risk parameter a. $\left(\frac{E^*_{1i}}{E^*_{0i}} = \frac{P_1}{P_0\lambda}\right)$
(**??**) and (**??**) can be simplified. Define Y_i to be the sum of expenditure in the two seasons. Then, expenditure in each season can be expressed as follows:

$$E^*_{ji} = \beta_j Y_i, \quad j = 0,\ 1, \tag{4}$$

$$where \qquad \beta_0 = \frac{P_0(\alpha_0 P_1)^{\frac{1}{\alpha}}}{P_0(\alpha_0 P_1)^{\frac{1}{\alpha}} + P_1(\alpha_1 P_0)^{\frac{1}{\alpha}}} \tag{5}$$

$$\beta_1 = \frac{P_1(\alpha_1 P_0)^{\frac{1}{\alpha}}}{P_0(\alpha_0 P_1)^{\frac{1}{\alpha}} + P_1(\alpha_1 P_0)^{\frac{1}{\alpha}}} \tag{6}$$

Again, β_j reflects the relative utility weight given to consumption and relative prices in each season. $\left(\sum_{j=0}^{1}\beta_j = 1\right)$ Under this setting, seasonal consumption patterns are never affected by the timing of income revenue, which is just the definition of consumption smoothing.

3.1.2 Imperfect Smoothing

Denote that Y_{ji} is a weighted average of income in season j and desired expenditure given perfect smoothing:

$$E_{ji} = E^*_{ji}(1-\pi) + Y_{ji}\pi, \quad j = 0,\ 1, \tag{7}$$

$$where\ \ 0 \le \pi \le 1$$

$$\Leftrightarrow \qquad E_{ji} = Y_i\left[\beta_j(1-\pi) + A_{ji}\pi\right], \quad j = 0,\ 1, \tag{8}$$

where A_{ji} is the fraction of annual income earned by individual i in season j, which means $\sum_{j=0}^{J} A_{ji} = 1$. As π increases, E_{ji} is affected more strongly by the income at the same season. Larger π reduces the weight on desired expenditure amount under perfect smoothing hypothesis, E_{ji}^*, in the expenditure function. In other words, π represents how strongly income fluctuation affects the expenditure in the same season. If $\pi = 1$, seasonal expenditure is just determined by seasonal income variation. If $\pi = 0$, household i achieves perfect consumption smoothing. $\pi > 0$ means that imperfect smoothing is observed in the household finance.

3.1.3 Expanding season and Taylor expansion

The model above can be modified so that empirical analysis on multiple seasons ($j \geq 3$) can be applied. Redefine Y_i to be equal to total annual income divided by the number of seasons. (In this thesis, a year is separated into twelve seasons for monthly analysis, and also separated into 52 seasons for weekly analysis, after.) Here, assume that the number of seasons is J. Then, Y_i represents the average monthly income level of an individual i. Redefine A_{ji} and β_j to be multiplied by the number of seasons. Then, both A_{ji} and β_j now average to one across seasons for any individuals.

$$\sum_{j=1}^{J} A_{ji} = J$$
$$\sum_{j=1}^{J} \beta_j = J$$

Taking the logarithm of (**??**) and then taking a first-order Taylor expansion around $\beta_j = 1$ and $A_{ji} = 1$ yield the following log expenditure equation:

$$ln(E_{ji}) = ln(Y_i) + (1 - \pi)\beta_j + \pi A_{ji} - 1 \tag{9}$$

As in the equation before, π in Equation **??** expresses the extent of the consumption smoothness. Perfect smoothing ($\pi = 0$) implies that seasonal expenditure is determined only by annual income, preferences, and prices. Imperfect smoothing ($\pi > 0$) implies that the timing of income flow (A_{ji}) is also a determinant of seasonal expenditure.

3.2 Empirical Implementation

Now, we can apply simple ordinary least squares (OLS) approach using the data of $ln(E_{ji})$, $ln(Y_i)$ and A_{ji}, because it is just a linear equation regression model. Estimating the size of

the parameter π in equation (**??**) is the main purpose of this thesis in order to know the extent of consumption smoothness. Then, null hypothesis which has to be tested is $\pi = 0$, representing the situation where perfect smoothing is achieved. In other words, under null, seasonal income, A_{ji} has no effect on expenditure in the same seasons at all.
However, there will be a bias on the estimates of π only with the simple OLS equation. All the transactions were recorded in the same accounts, and E_{ji}, Y_i and A_{ji} are constructed using them. (See Section **??** in detail.) Therefore, measurement error in the amount of each transaction in the same dirrection in one period cause positive correlation between independent variables and dependent variables.
Consider an Instrument Variable (IV) that determines the timing of seasonal income flow and is uncorrelated with a measurement error in seasonal income. Let Z_i denote an IV (or a vector of IVs) that satisfies the essential conditions. Then, the IV regression using Z_i can be represented by the following two linear equations (**??**) and (**??**), or 2SLS regressions using (**??**):

(Reduced-form Income Share Equation) $Parameter:\ \alpha_{\mathbf{j'}},\ \alpha^{\mathbf{Z}}_{\mathbf{j'}}$

$$A_{ji} = cons._1 + \sum_{j'=1}^{J} \alpha_{\mathbf{j'}} D_{j'} + \sum_{j'=1}^{J} \alpha^{\mathbf{Z}}_{\mathbf{j'}} Z_i D_{j'} + \varepsilon_{ji} \tag{10}$$

(Reduced-form Expenditure Equation) $Parameter:\ \beta, \beta_{\mathbf{j'}},\ \beta^{\mathbf{Z}}_{\mathbf{j'}}$

$$ln(E_{ji}) = cons._2 + \beta\ ln(Y_i) + \sum_{j'=1}^{J} \beta_{\mathbf{j'}} D_{j'} + \sum_{j'=1}^{J} \beta^{\mathbf{Z}}_{\mathbf{j'}} Z_i D_{j'} + \epsilon_{ij}, \tag{11}$$

(Estimates of Structural Expenditure Equation) $Parameter:\ \pi$

$$\begin{aligned} &ln(E_{ji}) = cons._3 + \beta\ ln(Y_i) + \pi A_{ji} + u_{ji} \\ &Using\ an\ IV\ for\ A_{ji}:\ Z_i \times\ D_j, \end{aligned} \tag{12}$$

where $D_{j'} = \mathbb{1}(j' = j)$, which represents the term including $D_{j'}$ appears for each different seasons j. Then, in equations (**??**) and (**??**), the parameters, $\alpha_{j'}$, $\alpha^Z_{j'}$, $\beta_{j'}$ and $\beta^Z_{j'}$, are estimated for each seasons, $j = 1, \cdots, J$, respectively. This thesis applies the following four types of F-tests to these parameters in order to check the seasonal effects both for expenditure and for income.

[Four F-tests to check the existence of seasonal effects]

Test 1 No seasonal effects for $Z = 0$.

$H_0: \beta_{1,Z=0} = 0 \ \& \ \beta_{2,Z=0} = 0 \ \& \ \cdots \ \& \ \beta_{12,Z=0} = 0$

Test 2 No seasonal effects for $Z = 1$.

$H_0: \beta_{1,Z=1} = 0 \ \& \ \beta_{2,Z=1} = 0 \ \& \ \cdots \ \& \ \beta_{12,Z=1} = 0$

Test 3 No difference in seasonal effects for $Z = 1$ and $Z = 0$.

$H_0: (\beta_{1,Z=0} = \beta_{1,Z=1}) \ \& \ (\beta_{2,Z=0} = \beta_{2,Z=1}) \ \& \ \cdots \ \& \ (\beta_{12,Z=0} = \beta_{12,Z=1})$

Test 4 The difference in seasonal effects for $Z = 0$ and $Z = 1$ is constant across months.

$H_0: \beta_{1,Z=1} - \beta_{1,Z=0} = \beta_{2,Z=1} - \beta_{2,Z=0} = \cdots = \beta_{12,Z=1} - \beta_{12,Z=0}$

IV regression using the equation (**??**) leads the estimates of π, which is the most cruicial parameter determining the degree of consumption smoothness.
Besides the IV regression shown in (**??**), this thesis also checks the following OLS regressions:

$$ln(E_{ji}) = cons._4 + \beta \ ln(Y_i) + \pi A_{ji} + \delta \ Z_i + u_{ji} \tag{13}$$

$$ln(E_{ji}) = cons._5 + \beta \ ln(Y_i) + \pi A_{ji} + \sum_{j'=1}^{12} \xi_{j'} Z_i D_{j'} + u_{ji} \tag{14}$$

3.3 Choice of Z

Z_i must consist of a household characteristic that determines the timing of income receipts, A_{ji}, and is uncorrelated with measurement error in seasonal expenditure and preferences, u_{ji}. Paxson (1993) introduces the following four dummy instrument variables, (1) Urban/Rural, (2) Non-farm/Farm, (3) Double cropping/Single cropping, and (4) South/Non-south. This thesis uses whether a household i is a land-owner or a landless as an IV, since the data used in this thesis were collected in the same village and most of the farmers in the village adopted double cropping rice farming. Income from agricultural products accrues when the products are harvested while income from agricultural odd jobs are usually counted when the workers do the work. This supports the necessary condition for Z_i to be an IV that Z_i determines the timing of the income statements.

4 Data

The data in this study is based on daily records of household accounts collected in one village (called, the East Laguna village, in this thesis) in Laguna Province, in the Philippines, as part of the project, called Anatomy of Peasant Economy, led by two researchers belonging to IRRI, Yujiro Hayami and Masao Kikuchi. The main purpose of the project was to describe the economic transactions of the farmers in a developing country based on double-entry accounts so that the data become comparable with the United Nations system of national accounts.[*3]

The Anatomy project collected detailed household data in two phases, in 1975/76 and 1980/82.[*4] Phase I started from 1/Apr/1975 to 31/May/1976, followed by Phase II starting from 9/May/1980 to 30/June/1982. This report extracts the data taken from 1/June/1975 to 31/May/1976 in Phase I, and from 1/June/1980 to 31/May/1982 in Phase II, so that successive data covering the three years period can be obtained. During the 1st phase, twelve households recorded their daily financial flow, while fifteen households did so in Phase II. Eight households were surveyed in both phases. (See Table **??**) Hayami (1978) mentions that one of the farmers collected in Phase I, No. 10, was omitted from the analysis due to the low quality of its data. Kikuchi et al. (1983) also mentions that one of the landless households, No. 8, cannot be classified as a typical landless household, because its main income source came from the remittance from an OFW working abroad. Kikuchi et al. (1983) is based on the analysis without these two households, but also shows the results with them on the Appendix **??**. Overall findings do not change much by including or excluding those households. Applying this treatment, Phase I is composed of ten households, and Phase II of fourteen households. Seven households are included in the both phases.

The ratio of land owners to landless households is 2:1 in both phases. Categorizing the surveyed houseohlds into three types, Large Farmer (LF), Small Farmer (SF) and Landless Farmer (LF), according the size of their landholdings (the threshold between LF and SF is 2ha), the types are also balanced in both phases. According to Kikuchi et al (1980), "the farmer is defined as one who cultivates rice fields either as an owner or as a tenant, and the landless worker as one with no rice farm to operate, either his own or rented."

While the Anatomy dataset originally consisted seven different accounts, which are linked each other.[*5] This study utilizes the Income-expenditure account, the only existing raw data

[*3] The Townsend Thai Monthly Survey led by Robert Townsend from 1998 was similarly designed to make it possible to analyze the collected data in terms of the standard corporate financial accounts. Samphantharak & Townsend (2006) is a monograph that utilizes the data.

[*4] Hayami et al. (1978) is based on the data collected in the 1st phase (1975-76) to describe the peasant economy in this village. However, the analysis using the data collected in Phase II has not been published until now, although Kikuchi et al. completed working papers based on the second phase of the survey. (Kikuchi et al. (1980), Kikuchi et al. (1981), Kikuchi et al. (1983) and Kikuchi et al. (n.d.).) See references section in detail.

[*5] The set of collected accounts is composed of (1a) current agricultural production account, (1b) current nonrice agricultural production account, (2) current non-agricultural production account, (3) income-expensiture account, (4) fixed capital production account, (5) capital financial account and (6) transac-

found at IRRI. Unfortunately, other accounts appear to have been lost. For this reason, this thesis also uses some descriptive tables found in Hayami (1978) and Kikuchi et al. (1983), which contain some data aggregated at the village level or aggregated by the landholding statuses.

The income-expenditure account records daily flows of the value of each income/expenditure transactions (with commodities or type of income sources identified with a set of coding lists). For example, consumption expenditure on shrimp with 2 PHP[*6] is recorded with the sets of the commodity code, "61.2", and its value in PHP, "2", in adjacent cells. As for income, source codes, such as the name of the commodities being sold and the name of the income earning activities, are recorded with its value.

This thesis uses the aggregated data on a monthly as well as a weekly basis. Table **??** and Table **??** show the number of months and weeks analyzed. Note that No. 30 household, which is identical with the No. 8 in Phase II, did not record the household keeping between Jun./1980 and Dec./1981. No. 24 (= No. 3) household did not record after Oct/1981, also.

Additional information about household characteristics is taken from regular surveys held in the village in 1974, 76, 80 and 83, and from the table in Kikuchi et al. (n.d.).

5 Accounting techniques to describe household finance

This section describes the way the raw data from the daily records of income-expenditure account were converted into "true income." The need for such modification mainly applies for the sales and self-consumption of agricultural products. We primarily follow Samphantharak & Townsend (2010), but some additional assumptions are also needed due to the nature of our data.

5.1 In-kind transactions

In-kind transactions are common in the Philippines, and in developing countries in general. For example, most of agricultural casual work laborers in the 1970s and 1980s received some units of rice/paddy as in-kind wage, and those transactions are not recorded in the cash inflow/outflow accounts. On the other hand, income/expenditure accounts count them as the transactions in cash.

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tion account.

[*6] PHP (Philippine Piso) is the currency used in the Philippines. In 1975, 1 USD ≒ 7.3 PHP

5.2 Sales of agricultural products/Self-consumption of home-produced agricultural products

All the respondents in this survey were engaged in agricultutral activities. One distinctive feature of agricultural activity is that it extends over the periods of several months. This means that farm households hold inventory storage that persists for more than one period. At the timing of harvest without immediate sale of agricultural products, there are two approaches to account for the transaction. One can consider that the transaction does not affect the income statement nor the statement of cash flows until the outpus are sold to others. Alternatively, one can treat the transaction as if the household sold their outputs as they harvested them and then, repurchased them from the market, adding them to its finished-goods inventory at the same time. By adoptng the latter approach, we can separate the capital gain from inventory storage, and from the net income from agricultural production.

This thesis follows the latter approach to calculate monthly income.[*7] On the other hand, we define the variable without such conversion as Cash Outflow/Inflow of the household.

Self-consumption is the consumption of the products that a household produced by itself. The transaction is not only treated as consumption but also as income increase, because the value of the products is generated by their own activities.

These two examples illustrate the necessity to modify the raw income-expenditure account data in order to obtain income flow. The value of rice planted and harvested by farm households needs to be entered at the time of harvest. Similarly, the value of rice paid as wage should be entered at the time when the household engages in the casual work, which is the main source of the income for landless households. In the absence of data on rice production, it is necessary to sum up the value of rice/paddy sold and total value of self-consumed rice by the households through the year, and to allocate the total value of rice production as income in each months according to the ratio of the rice production in respective month to total production for the year ($outputshare_j$) or alternatively, the ratio of rice received as wage by the household in a respective month to total paid rice for the year ($workshare_j$).

Due to the lack of relevant data, this thesis assumes that the ratios of monthly rice production to its annual total are common across all the households. The total amount of monthly rice production in the village in the two phases can be obtained from Hayami (1978) and Kikuchi et al. (1983). Then, $outputshare_j$ for each month, which is assumed to be common among all households, can be calculated. Note that the rice production in June, 1980, is assumed to

[*7] It appears that Hayami (1978) also adopted this approach to calculate disposable income, while not stated explicitly, based on a comparison of Figure 4.1 (pp. 52) with a similar figure in Hayami (1978) and Figure **??** in this thesis.

be zero, because the value is missing.[*8] The fraction of the amount of rice given as income in season j within a year, $workshare_{ji}$, is substituted into the fraction of the value of rice given as wage.
$\frac{Total\_produced\_rice}{Total\_rice}$ and $\frac{Total\_rice\_as\_wage}{Total\_rice}$ cannot be calculated by available data. So this thesis assumes them to be dummy variables, one of which is equal to one for a household while the other is equal to zero. The different combinations of the dummy functions lead to the following three income statements:

Income_1 All the landless households distribute their income coming from rice according to $workshare_{ji}$ and all the landowners allocate income from rice to $outputshare_j$.

Income_2 All the sample households distribute their income coming from rice according to $workshare_{ji}$.

Income_3 All the sample households distribute their income coming from rice according to $outputshare_j$

In cases of Income_1 and Income_2, all the households none of the members engage in agricultural casual works allocate income coming from rice to $outputshare_j$.
In these three types of the income statements, Income_1 seems to be the most applicable to the reality in terms of the distinction of the characteristics of farmers and nonfarmers. In Section **??**, let the income statement denote the set of Income_1 and expenditure. Some main regression results using Income_2 and Income_3 are shown in the Appendix **??**.
The same principles also apply to non-rice agricultural products, such as vegetables and fish, and livestock production. This thesis does not assign the income coming from them to each month, however, due to the absence of the information on the timing of production. Insead, income corresponding to self-consumption and income from sales are included in the months, in which such transactions occurred. Since their production can be done throughout a year, unlike rice production, errors induced by this application would be not so large.

5.3 Grant

In the Philippines, grants between households are found throughout a year, both in kind and in cash. Grant includes gifts, transfers, and remittances to the households. Although donated capital is not entered into an income account in the corporate financial accounting, National

[*8] June is usually not in harvesting season. Then, errors caused by this assumption would be small or zero.

Income and Product Accounts (NIPA) treat them as a part of income. Samphantharak & Townsend (2010) does not include grant in the income statement because grants are not related to productivity of the household, which is their focus with the application of the corporative accounting to the households. The main purpose of this thesis, however, is to investigate financial transactions of the households by covering all the transactions. Therefore, this thesis includes all the grants into the income statement. The accruing timing of the grant is the same both in Cash Inflow/Outflow and in Income/Expenditure.

5.4 Lending and borrowing

In developing countries, informal lending and borrowing, in addition to formal loans provided by banks, are common. In the income-expenditure account, the amount recorded as repayment of loans cannot distinguish the principal from interet payments. Nor is it possible to link between a particular lending or borrowing incidence and te corresponding repayments. This thesis does not distinguish the differences between them.

$[Cash\ Inflow/Outflow]$

$$\begin{aligned}
Inflow_j &= (revenue_j - revenue_k_j) + (grantto_j - grantto_k_j) + borrow_cash_j + lend_rec_cash_j \\
Outflow_j &= (rice_j - rice_h_j) + (food_j - food_h_j) + nonfood_j + invest_j + (grantfrom_j - grantfrom_k_j) \\
&\quad + lend_cash_j + debt_pay_cash_j,
\end{aligned}$$

$$\begin{aligned}
where\ revenue_j &: Total\ revenue\ received\ in\ season\ j \\
revenue_k_j &: Total\ revenue\ in\ kind\ received\ in\ season\ j \\
grantto_j &: Total\ grant\ given\ to\ the\ household\ in\ season\ j \\
grantto_k_j &: Total\ grant\ in\ kind\ given\ to\ the\ household\ in\ season\ j \\
borrow_cash_j &: Total\ cash\ borrowed\ from\ others\ in\ season\ j \\
lend_rec_cash_j &: Total\ cash\ repayment\ from\ others\ in\ season\ j \\
rice_j &: Total\ rice\ consumption\ in\ season\ j \\
rice_h_j &: Total\ home\text{-}produced\ rice\ consumption\ in\ season\ j \\
food_j &: Total\ food\ consumption\ in\ season\ j \\
food_h_j &: Total\ home\text{-}produced\ food\ consumption\ in\ season\ j \\
nonfood_j &: Total\ non\text{-}food\ consumption\ in\ season\ j \\
invest_j &: Total\ investment\ in\ season\ j \\
grantfrom_j &: Total\ grant\ given\ from\ the\ household\ in\ season\ j \\
grantfrom_k_j &: Total\ grant\ in\ kind\ given\ from\ the\ household\ in\ season\ j \\
lend_cash_j &: Total\ cash\ lent\ to\ othes\ in\ season\ j \\
debt_pay_cash_j &: Total\ debt\ replayment\ in\ cash\ in\ season\ j
\end{aligned}$$

$[Income/Expenditure]$

$$
\begin{aligned}
Income_j = {} & (revenue_j - revenue\_sr_j - revenue\_k_j) + grantto_j - invest\_r_j \times outputshare_j \\
& +[\sum_{j=1}^{J}(rice\_h_j + revenue\_sr_j)] \times \frac{Total\_produced\_rice}{Total\_rice} \times outputshare_j \\
& +[\sum_{j=1}^{J}(rice\_h_j + revenue\_sr_j)] \times \frac{Total\_rice\_as\_wage}{Total\_rice} \times workshare_j \\
Expenditure_j = {} & rice_j + food_j + nonfood_j + grantfrom_j
\end{aligned}
$$

$$
\begin{aligned}
where\ revenue\_sr_j &: Total\ sales\ of\ rice\ in\ season\ j \\
invest\_r_j &: Total\ investment\ on\ rice\ production\ in\ season\ j \\
\\
Total\_rice &: Total\ produced\ rice + Total\ rice\ given\ to\ the\ HH\ as\ wage \\
& (Total\_rice = Total\_produced\_rice + Total\_rice\_as\_wage) \\
Total\_produced\_rice &: Total\ produced\ rice\ by\ the\ household \\
Total\_rice\_as\_wage &: Total\ rice\ given\ to\ the\ HH\ as\ wage \\
\\
outputshare_j &: Total\ rice\ produced\ in\ season\ j/Total\ produced\ rice \\
workshare_j &: Total\ rice\ given\ to\ the\ HH\ as\ wage\ in\ season\ j \\
& /Total\ rice\ given\ to\ the\ HH\ as\ wage\ in\ a\ year
\end{aligned}
$$

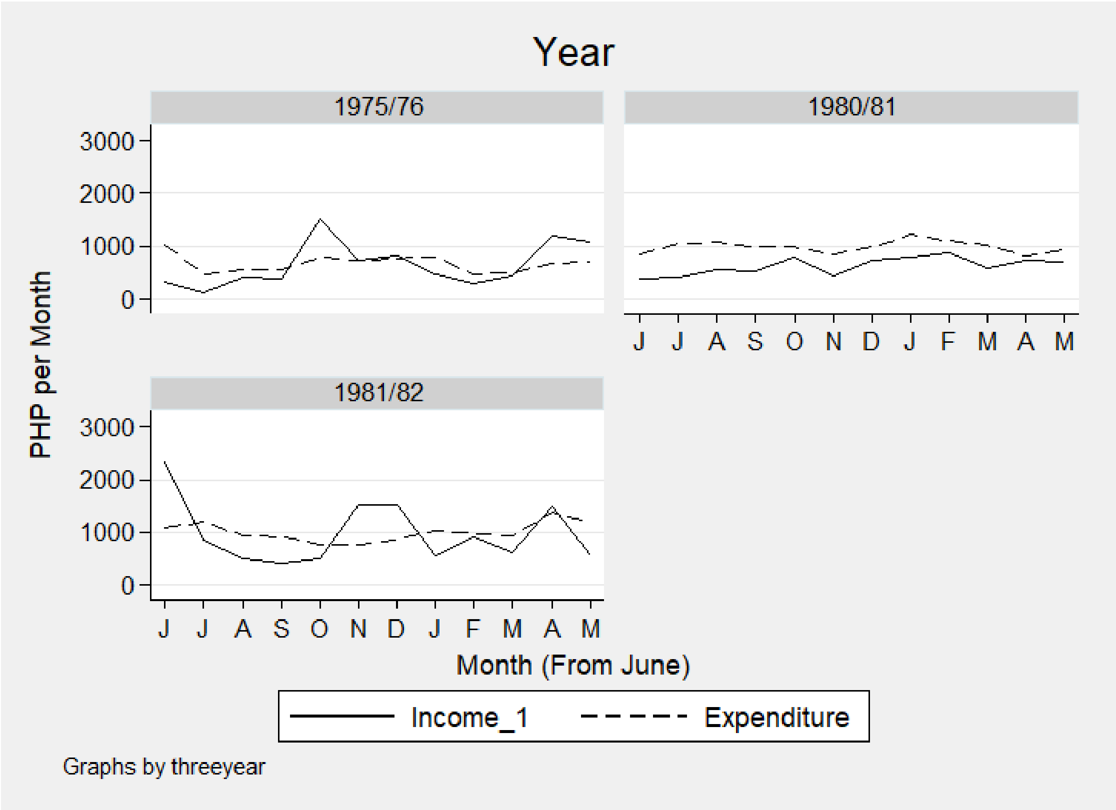

Figure2 Income_1/Expenditure flow by year

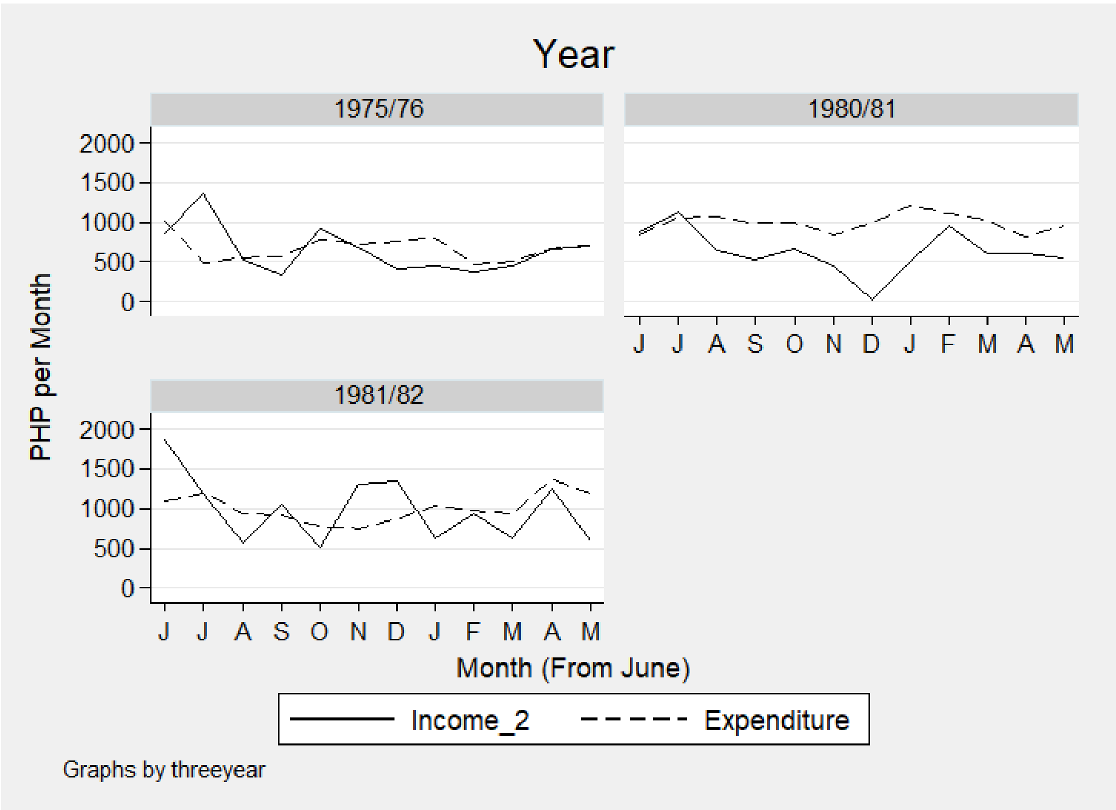

Figure3 Income_2/Expenditure flow by year

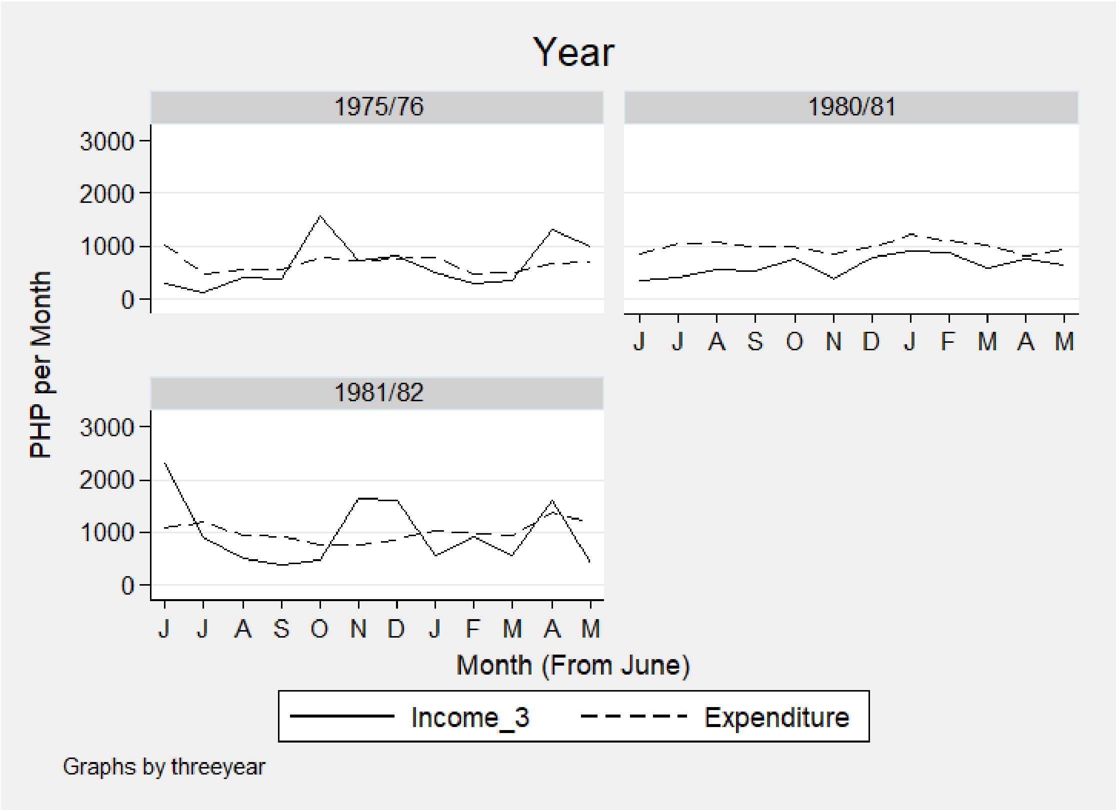

Figure4 Income_3/Expenditure flow by year

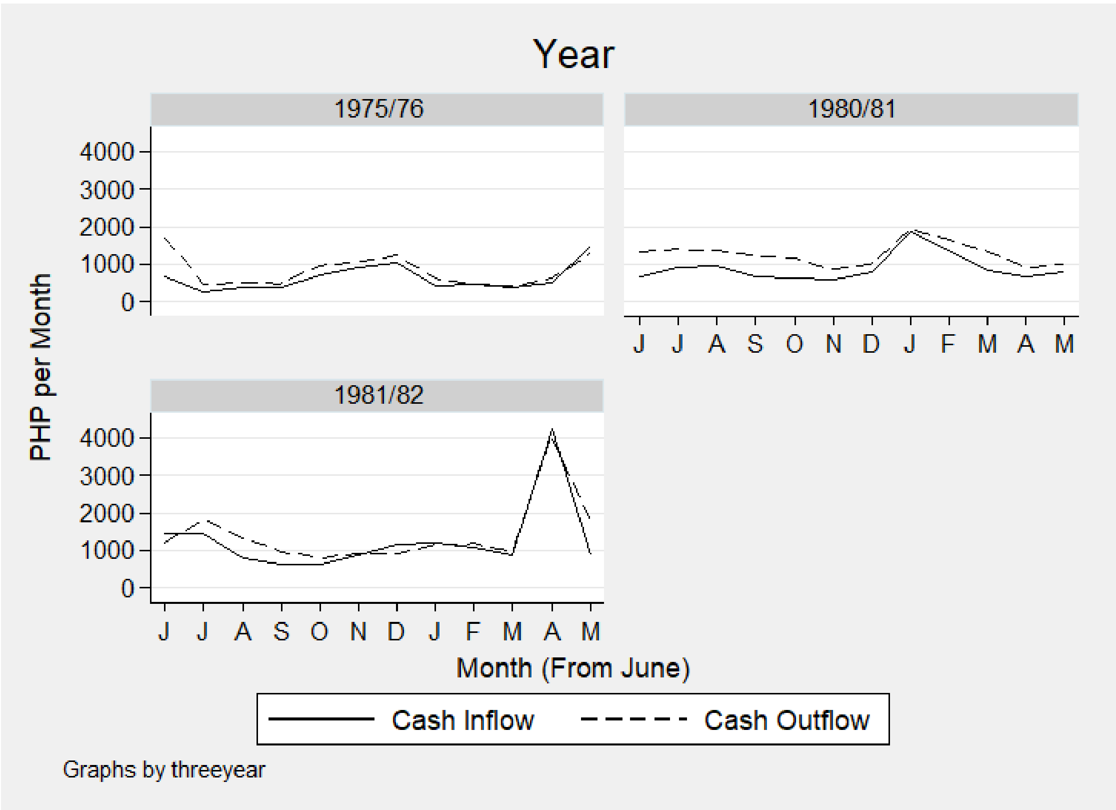

Figure5 Cash Inflow/Outflow by year

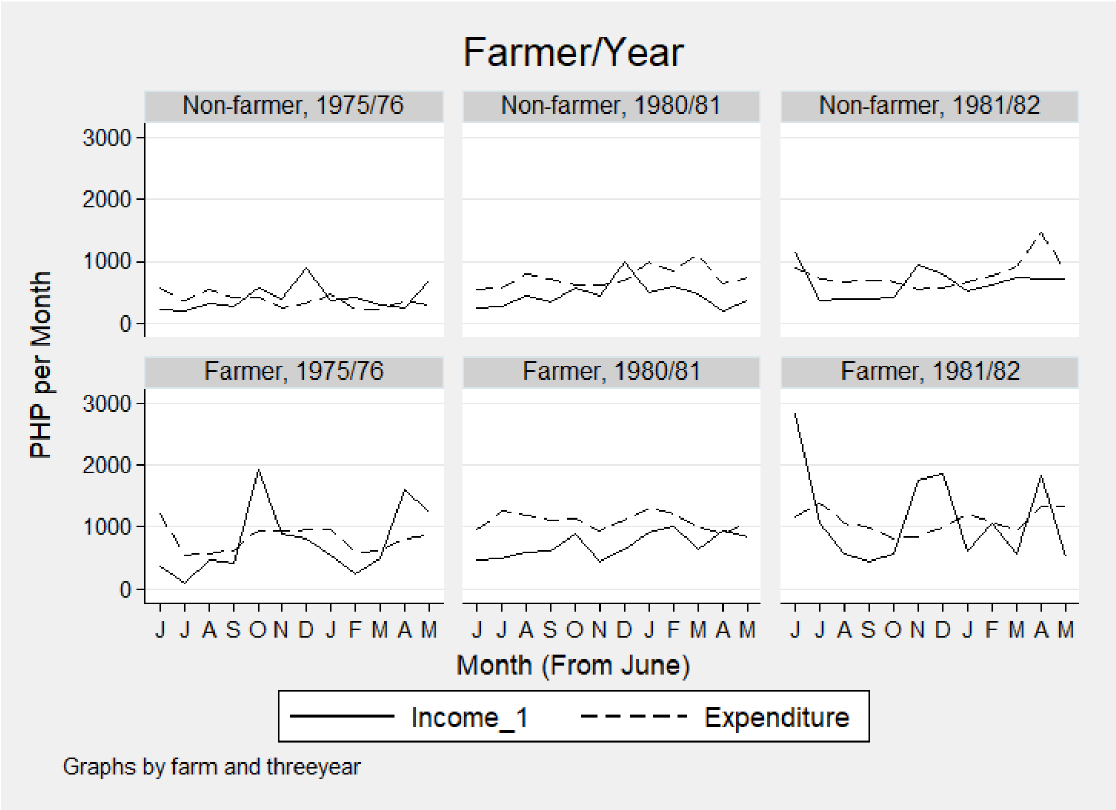

Figure6 Income_1/Expenditure flow by year and farm/non-farm

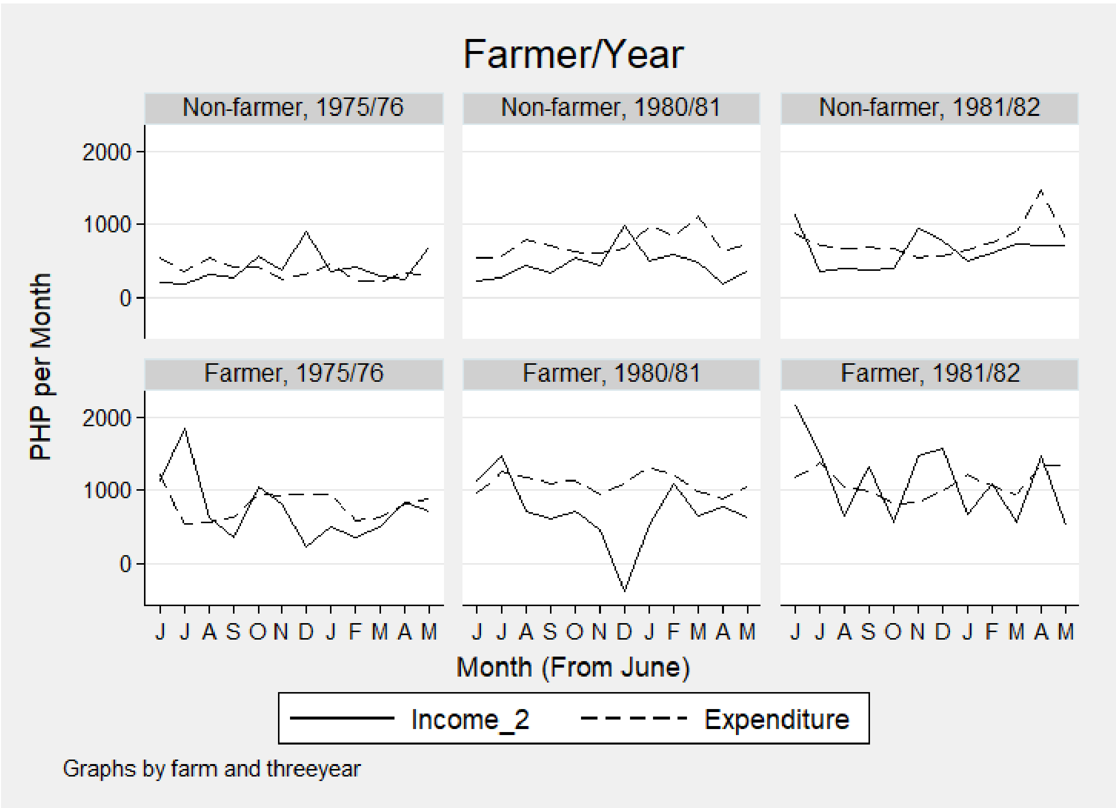

Figure7 Income_2/Expenditure flow by year and farm/non-farm

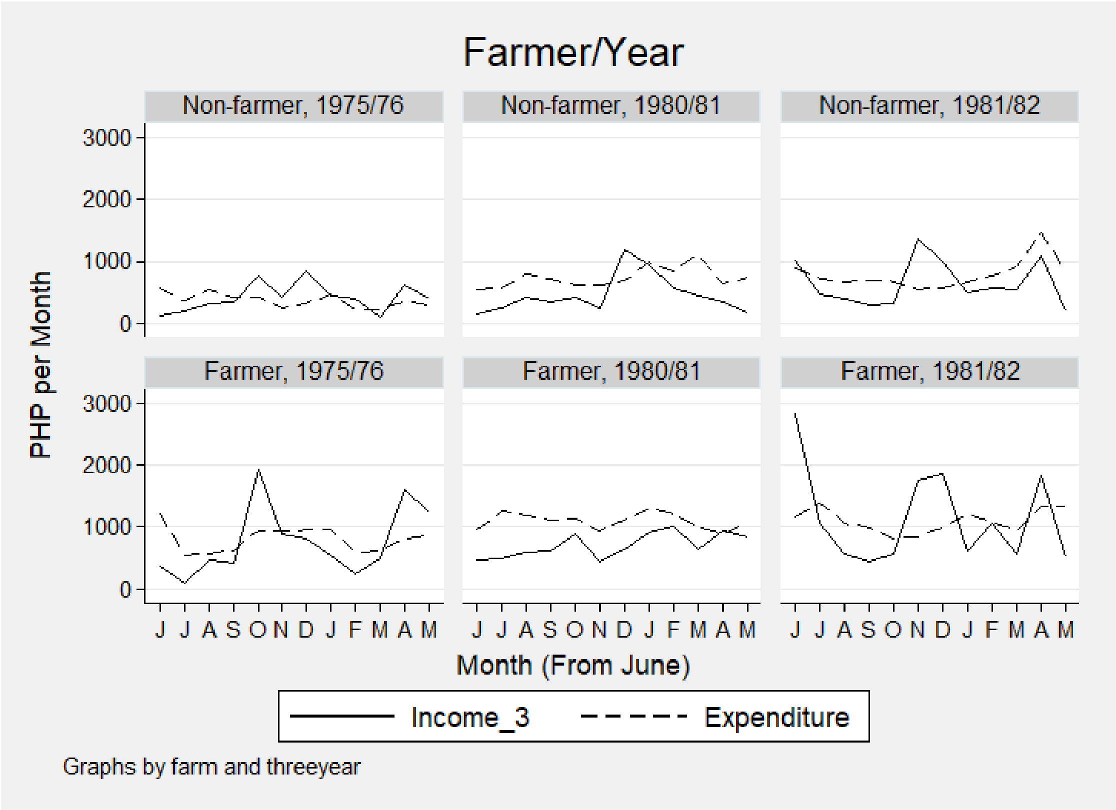

Figure8 Income_3/Expenditure flow by year and farm/non-farm

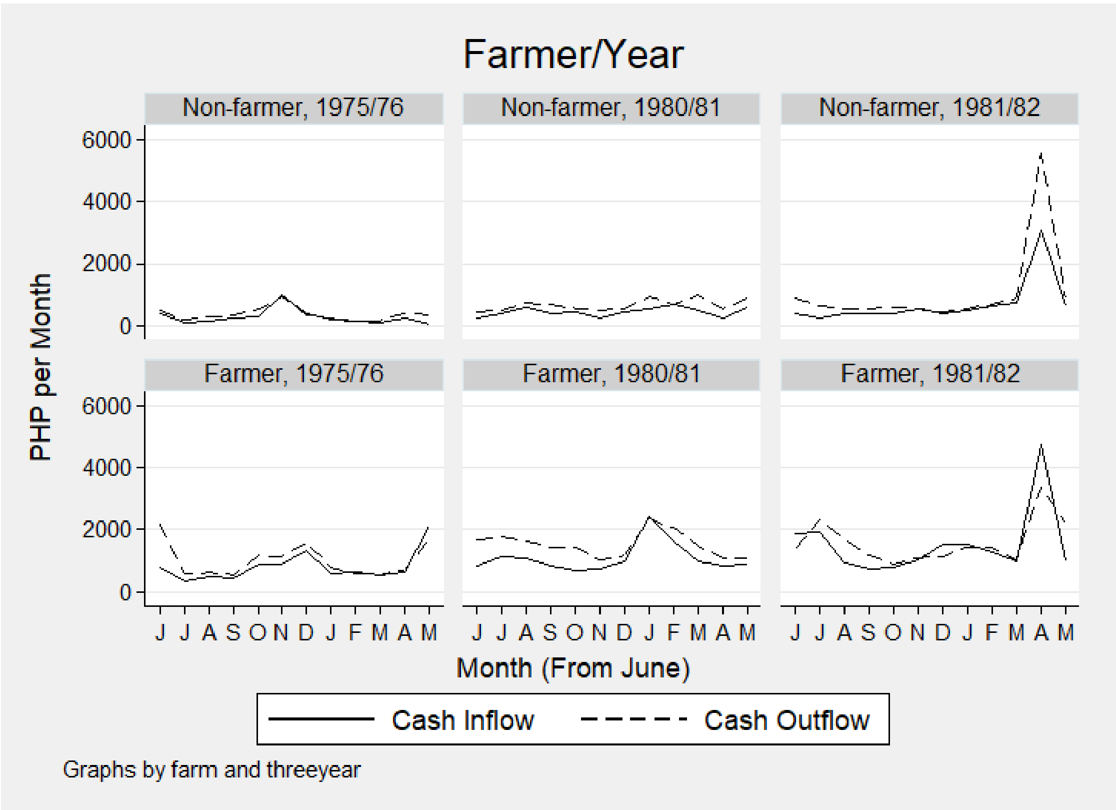

Figure9 Cash Inflow/Outflow by year and farm/non-farm

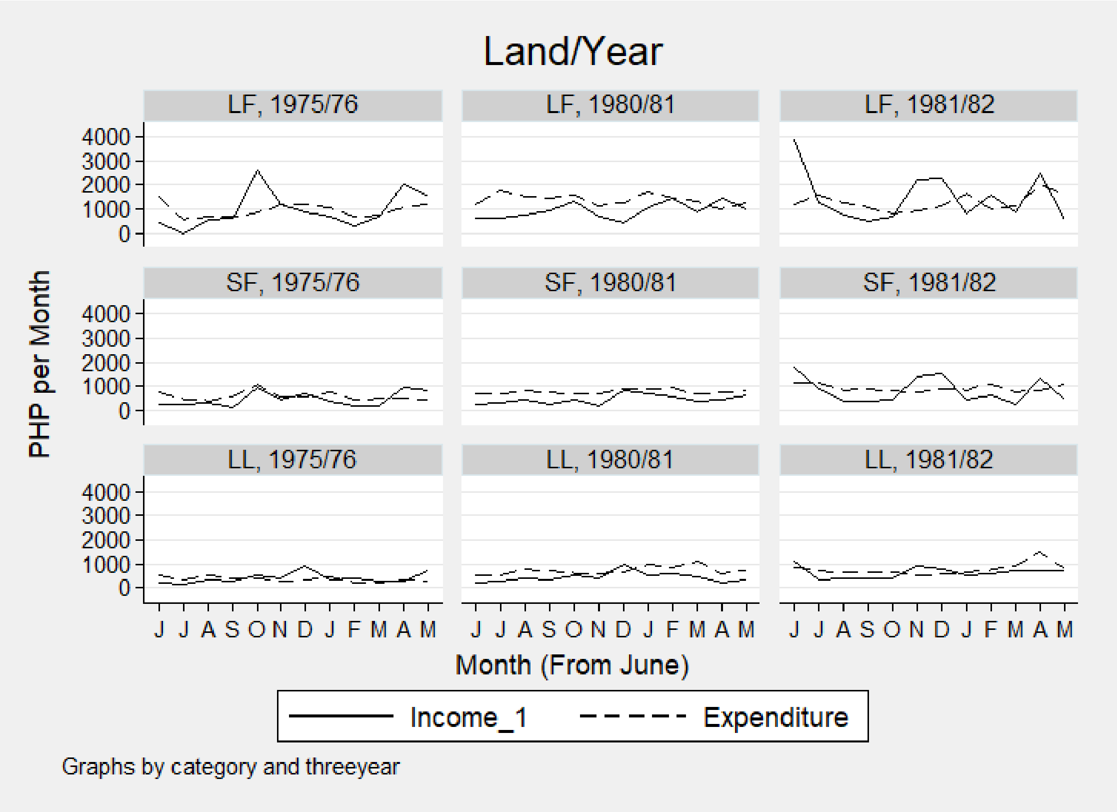

Figure10 Income_1/Expenditure flow by year and land holding

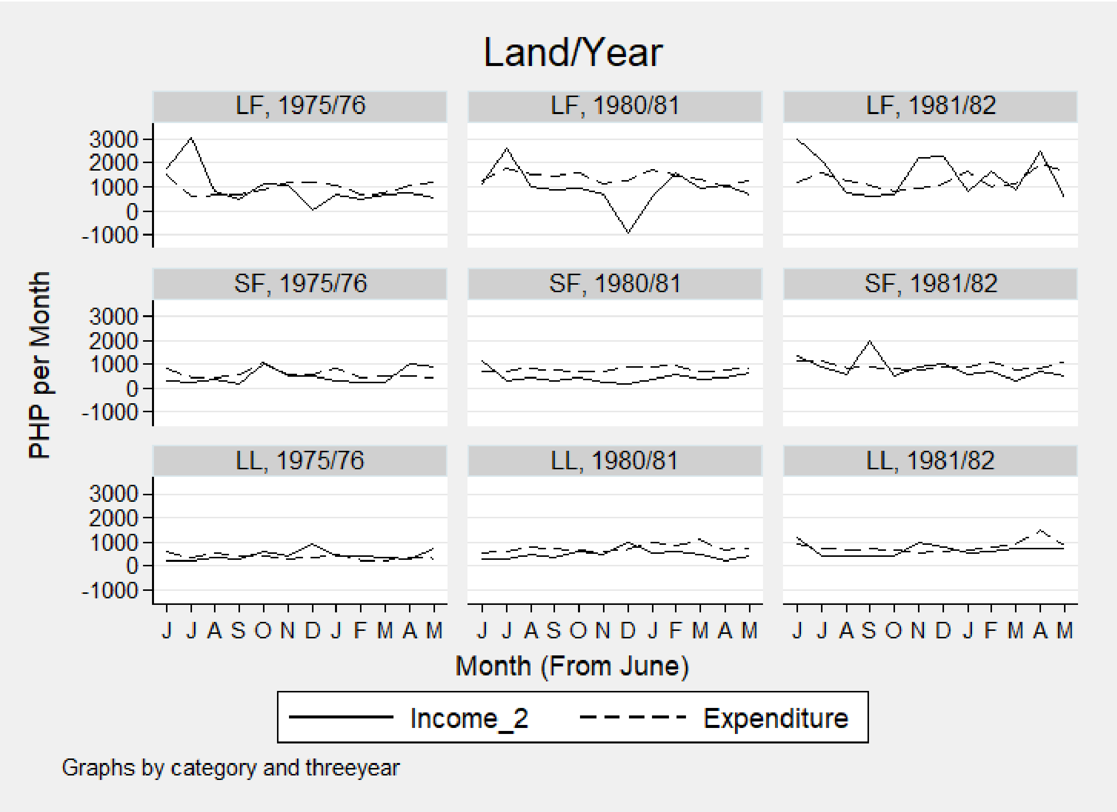

Figure11 Income_2/Expenditure flow by year and land holding

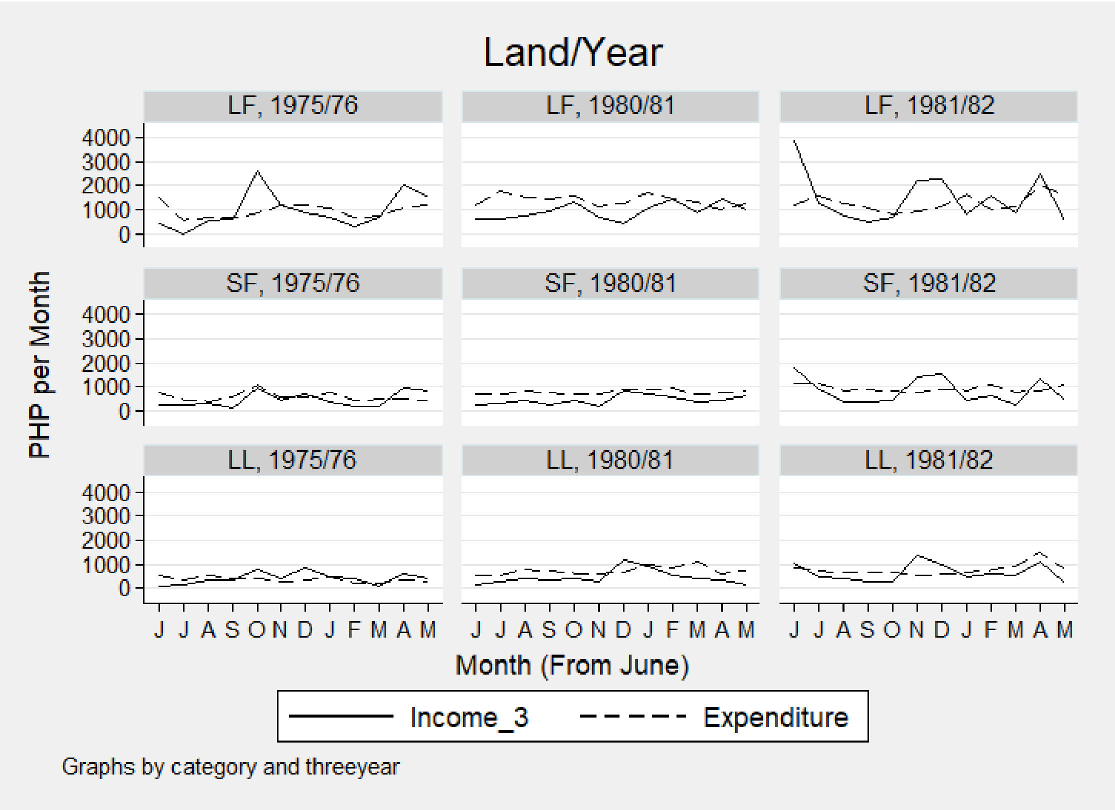

Figure12 Income_3/Expenditure flow by year and land holding

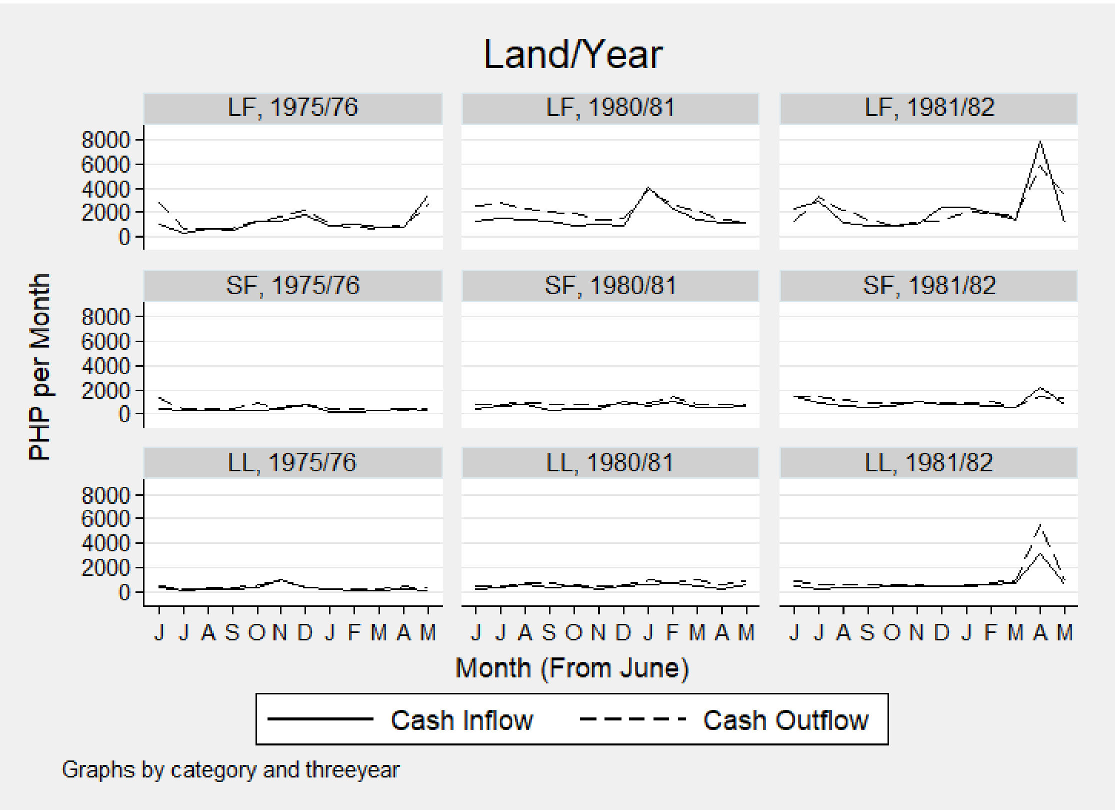

Figure13 Cash Inflow/Outflow flow by year and land holding

Table2 Data Composition

	(Phase1) HH ID	Land Own	(Phase2) HH ID	Previous ID	Land Own
	1	*LF*	21	(= 1)	*LF*
	2	*SF*	22		*SF*
	3	*LF*	23	(= 2)	*SF*
	4	*SF*	24	(= 3)	*LF*
	5	*SF*	25		*SF*
	6	*LL*	26		*LF*
	7	*LF*	27	(= 4)	*SF*
	[8]	*LL*	28	(= 6)	*LL*
	9	*LL*	29	(= 7)	*LF*
	[10]	*SF*	[30]	(= 8)	*LL*
	11	*LF*	31		*LL*
	12	*LL*	32		*LL*
			33	(= 9)	*LL*
			34		*LF*
			35		*SF*
N	12	–	15		–
Large Farmer	–	4	–		5
Small Farmer	–	4	–		5
Land Less	–	4	–		5

6 Graphic Evidence

Each of Figure **??**, **??** and **??** shows annual Income/Expenditure stream of the sample households (without No.8 & 10 hoseholds), in which income is defined differently. In all the years, income flow seasonaly fluctuates and converges on some months. On the contrary, slopes of expenditure changes look gentle, comparing to that of income. In 1975/76 and 81/82, income exceeded expenditure in some months, which is supposed to compensate for the defecit

Table3 Freq. of Month

	*Phase*1	*Phase*2		*Phase*1&2
	1975/76	1980/81	1981/82	
Jun.	12	14	15	42
Jul.	12	14	15	42
Aug.	12	14	15	42
Sep.	12	14	15	42
Oct.	12	14	14	42
Nov.	12	14	14	42
Dec.	12	14	14	42
Jan.	12	15	14	42
Feb.	12	15	14	42
Mar.	12	15	14	42
Apr.	12	15	14	42
May	12	15	14	42
N	144	173	172	489

caused at the rest of the year. However, in 1980/81, expenditure surpasses income throughout a year due to income loss caused by crop failure mentioned in the last section. It looks like expenditure is somehow independent from the movement of the each type of income. Then, it can be said that consumptoin smoothing is realized in terms of Income/Expenditure account. Figure **??** shows Cash Inflow/Outflow stream. It looks that cash inflow and outflow comove throughout the years. It indicates that consumption smoothing is incompletely realized from the perspectives of cash flow account. By design, the difference between cash inflows and outflows represents the change in net savings.

Cash outflow stood out in April/1982, with a drastic increase in cash inflow originated from sales of watermelon. As for non-farmers, cash outflow went over the budget in the month, but it was within the budget without the repayment for the past debt.

Figure **??** to Figure **??** shows annual income and consumption stream, separated by farmers and non-farmers. Both types of villagers are facing similar seasonal variance in income, while farmers are experiencing larger fluctuation. Such tendency can also be observed in Figure **??** to Figure **??**. As their holding farms become large, their income fluctuation also look large.

Table4 Freq. of Week

	$Phase1$	$Phase2$		$Phase1\&2$
	1975/76	1980/81	1981/82	
Week 1	12	14	15	41
⋮	⋮	⋮	⋮	⋮
Week 17	12	14	15	41
Week 18	12	14	14	40
⋮	⋮	⋮	⋮	⋮
Week 31	12	14	14	40
Week 32	12	15	14	41
⋮	⋮	⋮	⋮	41
Week 52	12	15	14	41
N	624	749	745	2118

The phenomenon may reflect the fact that larger farmers are more subject to the agricultural seasonality.
In Appendix **??**, figures showing cash flow on a weekly basis are reported.

7 Regression Results

All the results in this section are calculted with two types of the samples. One is the sample excluding two exceptional households (No.8 and No.10), called "All" in this section. The other is the sample covering the seven households included in both phases, called "Panel" in this thesis. The results calculated with all the sample households including No.8and No.10 are shown in Appendix **??**. Note that the income statement in this section is Income_1 introduced in Section **??**. The results calculated with Income_2 and Income_3 are shown in Appendix **??**. In each table, the coefficients of A_{ji} are the smoothing parameters, π, which represent the extent to which seasonal income affects seasonal expenditure.
Table **??** to Table **??** show the OLS estimates and the IV estimates. Both in OLS and IV, π for cash accounts (let it denote π_{cash}) are significantly positive. This indicates that cash outflow follows cash inflow, as wxpected, but also that non-negligible portions of consumption

Table5 OLS&IV Regression (Month/w/o No.8 & 10/Robust)

	Income			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	5.002***	4.987***	6.100***	3.085***	3.234***	3.534***
	(0.318)	(0.324)	(0.449)	(0.454)	(0.462)	(0.701)
Aji	0.037***	0.039***	0.016	0.351***	0.345***	0.382***
	(0.013)	(0.013)	(0.042)	(0.039)	(0.037)	(0.091)
lnYi	0.082	0.082	0.082	0.407***	0.414***	0.407***
	(0.067)	(0.067)	(0.067)	(0.097)	(0.094)	(0.095)
Z	○	–	–	○	–	–
month×Z	–	○	*IV*	–	○	*IV*
N	448	448	448	448	448	448
R^2	0.669	0.719	0.667	0.738	0.775	0.737

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table6 OLS&IV Regression (Month/Panel/Robust)

	Income			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	4.964***	4.949***	5.995***	2.957***	3.020***	3.733***
	(0.485)	(0.482)	(0.611)	(0.683)	(0.743)	(0.943)
Aji	0.023	0.036	0.001	0.329***	0.354***	0.286***
	(0.019)	(0.026)	(0.025)	(0.082)	(0.053)	(0.082)
lnYi	0.099	0.092	0.100	0.392***	0.401***	0.392***
	(0.093)	(0.090)	(0.091)	(0.134)	(0.139)	(0.128)
Z	○	–	–	○	–	–
month×Z	–	○	*IV*	–	○	*IV*
N	244	244	244	244	244	244
R^2	0.698	0.765	0.696	0.732	0.791	0.730

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table7 IV Regression (Month/w/o No.8 & 10/Robust)

	Income			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	Ph.1	*Ph*.2	*Ph*.1&2	*Ph*.1	*Ph*.2	*Ph*.1&2
_cons	1.131	6.522***	6.100***	−0.236	3.944***	3.534***
	(0.717)	(0.615)	(0.449)	(0.722)	(0.788)	(0.701)
Aji	0.047	0.102*	0.016	0.472***	0.445***	0.382***
	(0.040)	(0.057)	(0.042)	(0.093)	(0.092)	(0.091)
lnYi	0.783***	0.091	0.082	0.918***	0.396***	0.407***
	(0.107)	(0.084)	(0.067)	(0.113)	(0.097)	(0.095)
N	120	328	448	120	328	448
R^2	0.653	0.607	0.667	0.754	0.683	0.737

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table8 IV Regression (Month/Panel/Robust)

	Income			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	Ph.1	*Ph*.2	*Ph*.1&2	*Ph*.1	*Ph*.2	*Ph*.1&2
_cons	2.198***	6.243***	5.995***	1.600***	4.431***	3.733***
	(0.301)	(0.991)	(0.611)	(0.307)	(0.997)	(0.943)
Aji	0.060	−0.011	0.001	0.459***	0.268***	0.286***
	(0.045)	(0.027)	(0.025)	(0.076)	(0.097)	(0.082)
lnYi	0.632***	0.141	0.100	0.663***	0.354***	0.392***
	(0.051)	(0.134)	(0.091)	(0.054)	(0.121)	(0.128)
N	84	160	244	84	160	244
R^2	0.618	0.672	0.696	0.732	0.715	0.730

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

smoothing come from adjustments in net savings. Estimates of π_{Income} are not significant, although they are significantly positive in OLS estimates using the samples without No.8 & 10.

Table **??** and Table **??** show the IV estimates calculated separately by the phases. Both in the two phases, π_{Cash} are significantly positive. All the tables indicate π_{Cash} in Phase II is smaller than that in Phase I. The differences are larger in the panel data than those in all the samples. It appears that the relative role of savings in filling the gap between cash inflows and outflows became larger in Phase II.

In order to distinguish the difference of π between the phases and between farmer/nonfarmer,

Table9 OLS Regression [*Income*] (Month/w/o No.8 & 10/Robust)

	Ph.1		*Ph*.2		*Ph*.1&2	
	(1)	(2)	(1)	(2)	(1)	(2)
_cons	15.5000*	15.711**	5.501***	5.385***	5.002***	4.987***
	(8.020)	(6.180)	(0.414)	(0.406)	(0.318)	(0.324)
Aji	0.044	0.038	0.035**	0.030**	0.037***	0.039***
	(0.030)	(0.034)	(0.015)	(0.013)	(0.013)	(0.013)
lnYi	−1.722	−1.722	0.091	0.095	0.082	0.085
	(1.398)	(1.077)	(0.080)	(0.074)	(0.067)	(0.067)
Z	○	–	○	–	○	–
month×Z	–	○	–	○	–	○
N	120	120	328	328	448	448
R^2	0.653	0.787	0.638	0.721	0.669	0.719

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table10 OLS Regression [*Cash*] (Month/w/o No.8 & 10/Robust)

	Ph.1		*Ph*.2		*Ph*.1&2	
	(1)	(2)	(1)	(2)	(1)	(2)
_cons	−0.174*	−8.722**	3.571***	3.539***	3.085***	3.234***
	(4.985)	(4.143)	(0.489)	(0.474)	(0.454)	(0.462)
Aji	0.413***	0.383***	0.324***	0.285***	0.351***	0.345***
	(0.038)	(0.046)	(0.051)	(0.048)	(0.039)	(0.037)
lnYi	2.560***	2.562***	0.396***	0.404***	0.407***	0.414***
	(0.909)	(0.754)	(0.094)	(0.087)	(0.097)	(0.094)
Z	○	–	○	–	○	–
month×Z	–	○	–	○	–	○
N	120	120	328	328	328	448
R^2	0.758	0.835	0.702	0.760	0.738	0.775

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

interaction terms are introduced in the regression equations from Table ?? to Table ??. The first four tables compare π in both phases. The difference can be evaluated by seeing the value of the coefficients on $A_{ji} \times \mathbb{1}(Phase = 2)$. The dummy variable, $\mathbb{1}(Phase = 2)$, takes value one if the observation is included in Phase II data. The value of π in the first phase is equal to the coefficients on A_{ji}, and π in the second phase is equal to the sum of the coefficients on A_{ji} and the coefficients on $A_{ji} \times \mathbb{1}(Phase = 2)$. Based on accrued income, there

Table11 OLS Regression [$Income$] (Month/Panel/Robust)

	$Ph.1$		$Ph.2$		$Ph.1\&2$	
	(1)	(2)	(1)	(2)	(1)	(2)
_cons	5.129***	5.359***	5.332***	4.972***	4.964***	4.949***
	(1.314)	(1.115)	(0.806)	(0.751)	(0.485)	(0.482)
Aji	0.053	0.034	0.005	0.016	0.023	0.036
	(0.038)	(0.049)	(0.018)	(0.020)	(0.019)	(0.026)
lnYi	0.043	0.043	0.141	0.163	0.099	0.092
	(0.265)	(0.228)	(0.138)	(0.127)	(0.093)	(0.090)
Z	○	−	○	−	○	−
month×Z	−	○	−	○	−	○
N	84	84	160	160	244	244
R^2	0.618	0.745	0.673	0.808	0.698	0.765

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table12 OLS Regression [$Cash$] (Month/Panel/Robust)

	$Ph.1$		$Ph.2$		$Ph.1\&2$	
	(1)	(2)	(1)	(2)	(1)	(2)
_cons	5.258**	5.652**	3.615***	3.450***	2.957***	3.020***
	(2.386)	(2.436)	(0.712)	(0.688)	(0.683)	(0.743)
Aji	0.439***	0.423***	0.273***	0.278***	0.329***	0.354***
	(0.050)	(0.060)	(0.076)	(0.070)	(0.054)	(0.053)
lnYi	−0.087	−0.088	0.354***	0.355***	0.392***	0.401***
	(0.496)	(0.498)	(0.126)	(0.120)	(0.134)	(0.139)
Z	○	−	○	−	○	−
month×Z	−	○	−	○	−	○
N	84	84	160	160	244	244
R^2	0.733	0.815	0.715	0.818	0.732	0.791

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

is weak evidence (Table **??**, Column (2)) that the extent of consumption smoothing was weaker in Phase II despite the increased diverity in income sources, although the difference is not statistically significant in Table **??**. This could be due to the large decline in rice production in Phase II that likely tightened credit constraints. Table **??** shows that, conversely, the coefficients on $A_{ji} \times \mathbb{1}(Phase = 2)$ are significantly negative, which means π was smaller in Phase II than that in Phase I. This is consistent with the results shown in Table **??** and in

Table13 Regression with an interaction $A_{ji} \times Phase_{ji}$ [$Income$] (Month/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	All		*w/o No.*10 & 8		*Panel*	
_cons	4.460***	5.471***	4.840***	4.953***	4.904***	5.960***
	(0.363)	(0.492)	(0.278)	(0.325)	(0.398)	(0.652)
Aji	0.039	0.060*	0.044	0.067*	0.053	0.079
	(0.030)	(0.034)	(0.031)	(0.036)	(0.040)	(0.050)
lnYi	0.204***	0.159**	0.115**	0.085	0.105	0.092
	(0.059)	(0.064)	(0.058)	(0.067)	(0.076)	(0.090)
$\mathbb{1}$(Ph. = 2)	0.485***	0.509***	0.560***	0.581***	0.606***	0.631***
	(0.072)	(0.068)	(0.069)	(0.069)	(0.081)	(0.088)
$Aji \times \mathbb{1}(Ph. = 2)$	0.014	−0.010	−0.009	−0.035	−0.048	−0.068
	(0.039)	(0.040)	(0.035)	(0.038)	(0.045)	(0.053)
Z	○	–	○	–	○	–
month×Z	–	○	–	○	–	○
N	489	489	448	448	244	244
R^2	0.668	0.717	0.668	0.720	0.700	0.768

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table14 Regression with an interaction $A_{ji} \times Phase_{ji}$ [$Cash$] (Month/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	All		*w/o No.*10 & 8		*Panel*	
_cons	2.572***	3.111***	3.166***	3.278***	2.887***	3.034***
	(0.420)	(0.677)	(0.386)	(0.442)	(0.739)	(0.798)
Aji	0.415***	0.434***	0.414***	0.444***	0.439***	0.466***
	(0.039)	(0.038)	(0.040)	(0.038)	(0.053)	(0.056)
lnYi	0.416***	0.450***	0.374***	0.414***	0.303***	0.400***
	(0.071)	(0.084)	(0.083)	(0.092)	(0.105)	(0.130)
$\mathbb{1}$(Ph. = 2)	0.485***	0.515***	0.507***	0.552***	0.635***	0.635***
	(0.098)	(0.098)	(0.105)	(0.109)	(0.134)	(0.142)
$Aji \times \mathbb{1}(Ph. = 2)$	−0.099*	−0.138**	−0.090	−0.166*	−0.190**	−0.256***
	(0.060)	(0.060)	(0.065)	(0.066)	(0.092)	(0.096)
Z	○	–	○	–	○	–
month×Z	–	○	–	○	–	○
N	489	489	448	448	244	244
R^2	0.743	0.775	0.739	0.779	0.739	0.798

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table15 Regression with an interaction $A_{ji} \times Farm_i$ [$Income$] (Month/w/o No. 8 & 10/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$		$Ph.2$		$Ph.1\&2$	
_cons	3.552***	3.730***	5.533***	6.053***	5.018***	5.008***
	(0.325)	(0.275)	(0.452)	(0.448)	(0.324)	(0.328)
Aji	−0.010	0.025	0.061	0.048	0.020	0.025
	(0.026)	(0.024)	(0.053)	(0.042)	(0.029)	(0.026)
lnYi	0.373***	0.373***	0.091	0.095	0.082	0.085
	(0.063)	(0.051)	(0.080)	(0.075)	(0.067)	(0.067)
$\mathbb{1}$(Farm = 1)	0.471***	0.061	1.059***	1.071***	1.058***	0.415
	(0.137)	(0.177)	(0.178)	(0.242)	(0.163)	(0.305)
$Aji \times \mathbb{1}(Farm = 1)$	0.085*	0.046	−0.029	−0.020	0.019	0.017
	(0.051)	(0.106)	(0.055)	(0.044)	(0.033)	(0.030)
month×Z	–	○	–	○	–	○
N	120	120	328	328	448	448
R^2	0.660	0.788	0.638	0.721	0.669	0.719

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table16 Regression with an interaction $A_{ji} \times Farm_i$ [$Cash$] (Month/w/o No. 8 & 10/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$		$Ph.2$		$Ph.1\&2$	
_cons	2.551***	2.982***	3.421***	3.869***	3.032***	3.188***
	(0.371)	(0.415)	(0.494)	(0.636)	(0.437)	(0.450)
Aji	0.350***	0.362***	0.447***	0.394***	0.405***	0.388***
	(0.040)	(0.067)	(0.040)	(0.055)	(0.038)	(0.032)
lnYi	0.489***	0.489***	0.396***	0.406***	0.414***	0.447***
	(0.075)	(0.072)	(0.091)	(0.086)	(0.095)	(0.093)
$\mathbb{1}$(Farm = 1)	0.282*	−0.303	0.689**	0.649*	0.559*	0.024
	(0.138)	(0.252)	(0.295)	(0.356)	(0.295)	(0.523)
$Aji \times \mathbb{1}(Farm = 1)$	0.116*	0.038	−0.166**	−0.145*	−0.078	−0.063
	(0.068)	(0.092)	(0.069)	(0.079)	(0.062)	(0.059)
month×Z	–	○	–	○	–	○
N	120	120	328	328	448	448
R^2	0.761	0.835	0.709	0.764	0.739	0.775

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table17 Regression with an interaction $A_{ji} \times Farm_i$ [$Income$] (Month/Panel/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$		$Ph.2$		$Ph.1\&2$	
_cons	2.408***	3.190**	5.326***	5.261***	4.974***	5.023***
	(0.365)	(1.585)	(0.863)	(0.825)	(0.489)	(0.486)
Aji	0.010	0.014	0.014	−0.020	0.012	−0.000
	(0.030)	(0.034)	(0.052)	(0.058)	(0.030)	(0.034)
lnYi	0.600***	0.489	0.141	0.163	0.099	0.092
	(0.063)	(0.310)	(0.138)	(0.128)	(0.093)	(0.090)
$\mathbb{1}$(Farm = 1)	–	–	0.902***	0.844***	0.998***	1.199***
			(0.190)	(0.208)	(0.158)	(0.255)
$Aji \times \mathbb{1}(Farm = 1)$	0.069	0.084	−0.011	0.043	0.014	0.049
	(0.063)	(0.166)	(0.055)	(0.062)	(0.037)	(0.047)
month×Z	–	○	–	○	–	○
N	84	84	160	160	244	244
R^2	0.623	0.746	0.673	0.808	0.698	0.766

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table18 Regression with an interaction $A_{ji} \times Farm_i$ [$Cash$] (Month/Panel/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$		$Ph.2$		$Ph.1\&2$	
_cons	1.964***	4.421***	4.506***	2.963***	2.854***	2.923***
	(0.387)	(1.116)	(0.938)	(0.675)	(0.625)	(0.709)
Aji	0.362***	0.282***	0.486***	0.539***	0.433***	0.430***
	(0.043)	(0.057)	(0.029)	(0.042)	(0.036)	(0.054)
lnYi	0.608***	0.211	0.354***	0.354***	0.392***	0.400***
	(0.070)	(0.196)	(0.114)	(0.112)	(0.127)	(0.135)
$\mathbb{1}$(Farm = 1)	–	–	–	–	0.884***	0.358
					(0.325)	(0.746)
$Aji \times \mathbb{1}(Farm = 1)$	0.127	0.218**	−0.292***	−0.340***	−0.152*	−0.110
	(0.079)	(0.102)	(0.082)	(0.079)	(0.079)	(0.087)
month×Z	–	○	–	○	–	○
N	84	84	160	160	244	244
R^2	0.737	0.823	0.742	0.836	0.739	0.793

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table19   IV Regression (Month/wo No.8&10/Generation/Robust)

	Income			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	*Ph.*1	*Ph.*2	*Ph.*1&2	*Ph.*1	*Ph.*2	*Ph.*1&2
_cons	2.276***	1.261***	5.077***	2.509***	1.374***	4.445***
	(0.342)	(0.409)	(0.604)	(0.322)	(0.475)	(0.635)
Aji	0.047	0.071	0.015	0.117	0.205***	0.160***
	(0.040)	(0.051)	(0.039)	(0.073)	(0.058)	(0.054)
lnYi	0.763***	0.095	0.108	0.621***	0.145*	0.154**
	(0.091)	(0.080)	(0.073)	(0.070)	(0.074)	(0.071)
N	120	304	424	120	304	424
R^2	0.653	0.629	0.686	0.686	0.635	0.709

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table20   IV Regression (Month/Panel/Generation/Robust)

	Income			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	*Ph.*1	*Ph.*2	*Ph.*1&2	*Ph.*1	*Ph.*2	*Ph.*1&2
_cons	2.763***	4.586***	4.726***	4.769***	3.482***	4.805***
	(0.493)	(0.706)	(0.789)	(0.974)	(0.422)	(0.764)
Aji	0.060	−0.011	−0.000	0.081	0.082**	0.066*
	(0.045)	(0.027)	(0.025)	(0.073)	(0.038)	(0.036)
lnYi	0.181	0.141	0.167	0.862	0.103	0.120
	(0.339)	(0.134)	(0.108)	(0.088)	(0.106)	(0.088)
N	84	160	244	84	160	244
R^2	0.618	0.672	0.723	0.643	0.705	0.747

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table **??**. This implies that a larger proportion of the gap between cash inflows and outflows was filled with net savings in Phase II. This could be due to the tightening of credit constraints as a result of crop failure.

Table **??** to Table **??** include an interaction term, $A_{ji} \times \mathbb{1}(Farm = 1)$. Its coefficient represents the difference of the size of π between farmers and non-farmers. π for farmers can be calculated by the sum of the coefficients of π and the coefficients of $A_{ji} \times \mathbb{1}(Farm = 1)$. Focusing on Table **??** and Table **??**, the coefficients of the interaction term are positive in Phase I and negative in Phase II, although two of them are insignificant. This implies that farming on their own land played a different role in determining financial flow in the mid-1970s and in

Table21 IV Regression (Week/Cash/Robust)

	w/o No.8 & 10			7 Com.		
	(1)	(2)	(3)	(1)	(2)	(3)
	Ph.1	*Ph*.2	*Ph*.1&2	*Ph*.1	*Ph*.2	*Ph*.1&2
_cons	−0.194	3.170***	2.564***	1.452***	3.331***	2.386***
	(0.430)	(0.466)	(0.496)	(0.234)	(0.604)	(0.520)
Aji	0.250***	0.243***	0.205***	0.229***	0.160***	0.167***
	(0.056)	(0.033)	(0.031)	(0.055)	(0.032)	(0.028)
lnYi	0.899***	0.363***	0.409***	0.613***	0.346***	0.448***
	(0.091)	(0.070)	(0.069)	(0.057)	(0.091)	(0.091)
N	529	1435	1964	370	700	1070
R^2	0.508	0.483	0.532	0.472	0.503	0.530

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table22 Regression with an interaction $A_{ji} \times Phase_{ji}$ $[Cash]$ (Week/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	All		w/o No.10 & 8		*Panel*	
_cons	1.902***	2.043***	2.417***	1.954***	2.955***	1.801*
	(0.234)	(0.475)	(0.196)	(0.457)	(0.369)	(0.956)
Aji	0.160***	0.153***	0.159***	0.158***	0.162***	0.157***
	(0.021)	(0.022)	(0.021)	(0.023)	(0.026)	(0.029)
lnYi	0.400***	0.430***	0.363***	0.422***	0.301***	0.454***
	(0.054)	(0.061)	(0.061)	(0.067)	(0.077)	(0.094)
$\mathbb{1}$(Ph. = 2)	0.370***	0.365***	0.411***	0.394***	0.490***	0.448***
	(0.064)	(0.066)	(0.069)	(0.071)	(0.082)	(0.093)
$Aji \times \mathbb{1}(Ph. = 2)$	0.032	0.037	0.034	0.031	−0.000	0.005
	(0.031)	(0.033)	(0.032)	(0.035)	(0.043)	(0.054)
Z	○	–	○	–	○	–
month×Z	–	○	–	○	–	○
N	2144	2144	1964	1964	1070	1070
R^2	0.522	0.585	0.535	0.602	0.528	0.638

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

the early-1980s.

Low yields in the early 1980s, again, may have caused this difference between farmers and non-farmers. In response to the crop failure, larger proportions of the gap between cash inflows and outflows were filled with savings among farmers than among non-farmers. Another possible explanation is that non-farmers had to cut their consumption because of their little confidence and small amount of savings. In contrast, the marginally significant positive coefficient on the interaction term in the first phase is puzzling. This appears to imply that there was lesser extent of consumption smoothing (Table **??**) among farmers than non-farmers, and that smaller proportion of the gap between cash inflows and outflows was filled by savings among farmers than among non-farmers.

Household compositions are additionally controlled in the regressors in Table **??** and in Table **??**. The regressions in these tables include the number of the household members, separately by their sex and age. Those who were under 20 years old are classified into "child," 20 to 49 are "adult," and over 50 years old are defined to be "elder." Therefore, six terms (2 sexes $\times$ 3 generation) are added in the regressions. π_{Income} are not significant and π_{Cash} in Phase II and the Phase I&II are significantly positive as in the results without the additional terms. However, π_{Cash} in Phase I is insignificant in these tables.

In Table **??** and Table **??**, one period, j, is redefined to be a week. Then, π in these tables represent the weekly smoothing parameters. The income statements defined in this thesis are derived using estimated monthly rice output. Since similar estimation for weekly production is difficult, only the results in the cash statement are calculated using the weekly aggregated data. All the coefficients on A_{ji} are significantly positive in these tables.

By comparing the results with Table **??** and **??**, weekly π_{Cash} are much smaller than the corresponding monthly π_{Cash}. Against the expectation, the monthly effect of seasonality in cash inflow on outflow is much larger than the weekly effect. It is supposed that the amount of consumption is largely deviated from the fraction of income in a few weeks. The effect of the deviation in the weeks is much smaller than that in a month, considering the number of the samples of the periods.

In Table **??**, all the coefficients of an interaction term, $A_{ji} \times \mathbb{1}(Phase = 2)$, are insignificant, which are significant in Table **??**. The difference of π_{Cash} between the phases cannot be observed in the weekly financial transactions.

8 Conclusion

This thesis investigates to the extent to which households in one village in the Philippines smooth their consumption, using the daily housekeeping data collected in 1975/76 and in 1980/82. As a whole, the evidence for the existence of consumption smoothing can be observed in Income/Expenditure flow. This is consistent with the results in Paxson (1993), in which consumption smoothing behavior was observed in rural Thailand. This suggests that when income accrued did not determine the the timing of expenditure. On the other hand, significant positive values of the estimates of π_{Cash} indicate that seasonality in cash outflow follows closely the fluctuation of cash inflow.

The fluctuations in cash inflows and outflows were more closely aligned in the mid-1970s than in the early-1980s. This could be due to the relatively large loss of income due to rice crop failure, which, in turn, resulted from the lack of irrigation. This crop failure possibly caused the tightening of credit constraints and the larger role played by net savings for filling the gap between cash inflows and outflows.

Farmers had larger π_{Cash} than non-farmers in Phase I. Conversely, π_{Cash} for farmers were smaller than that for non-farmers in Phase II. This also can be explained by the change in the agricultural condition in the village.

This thesis does not directly indicate what determines the smoothness of consumption and what generated the differences in it between the two phases and farmer/non-farmer. Clarifying the sources of these differences with statistical analysis is a task left for the future.

Cash inflow consists of some transactions unrelated to production works, such as grant, lending and borrowing. Cash outflow consists of investment on agricultural production, which is considered to cost independent of the individual efforts. By removing them from the cash flow statement, respectively, and applying the same analysis, the effects of each component to consumption flow are identified. This further investigation is also a task for the near future.

Note that there are some limitation in the data used in this thesis. First, the number of sample households is small in applying statistic analysis. Second, how well the chosen nineteen sample households represented the village of those days is unknown, although sample households were chosen so that they represented the situation of the whole village, according to Hayami (1973) and Kikuchi et al. (1980).

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10 Appendix

10.1 Weekly Cash Inflow/Outflow

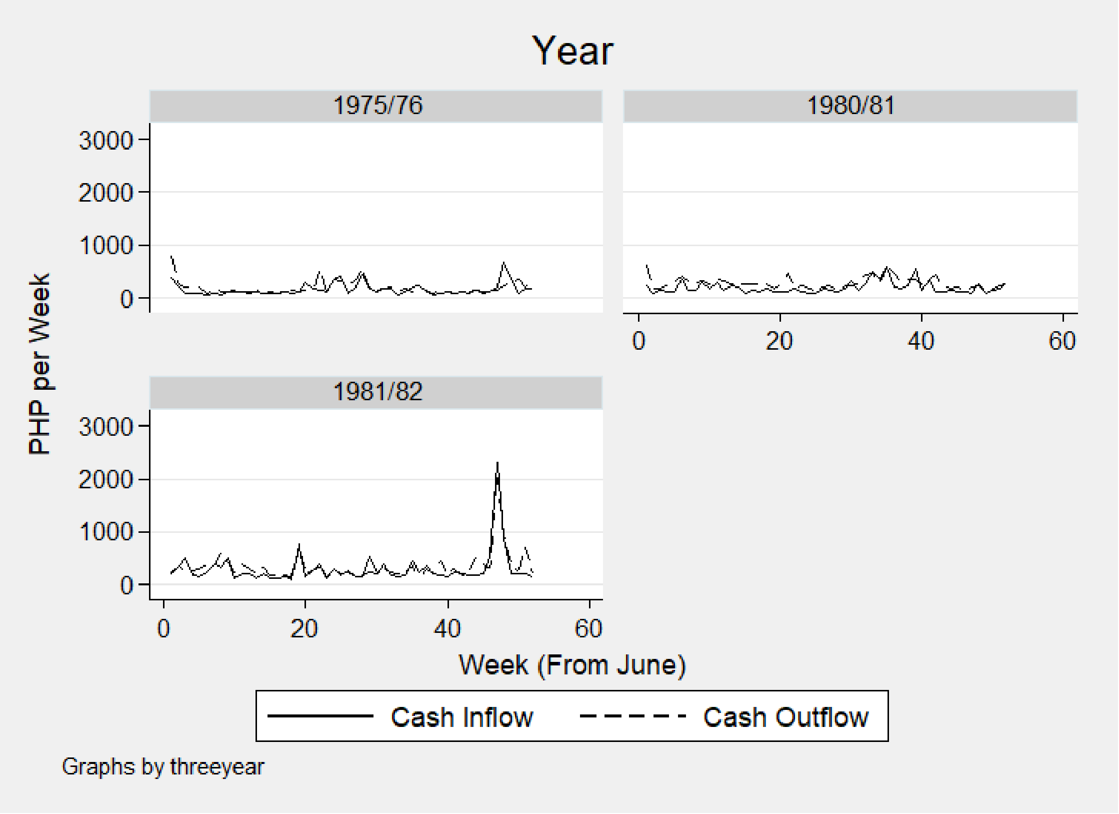

Figure14 Weekly Cash Inflow/Outflow by year

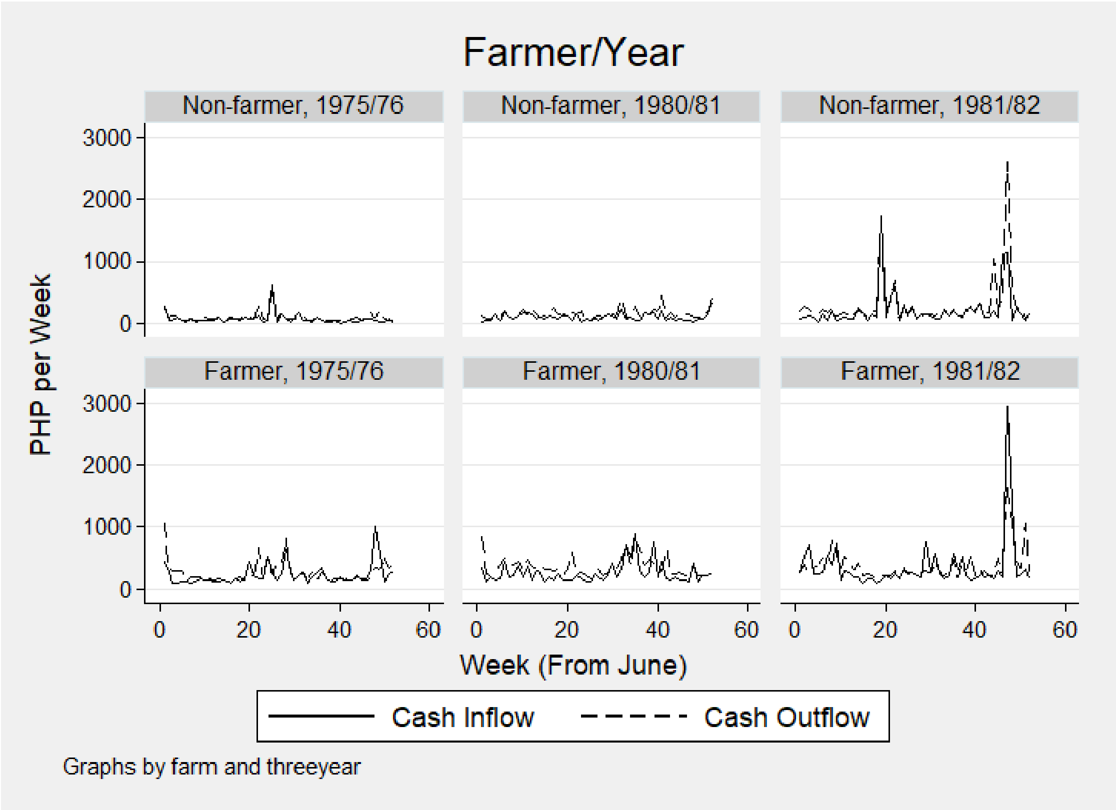

Figure15 Weekly Cash Inflow/Outflow by year and farm/non-farm

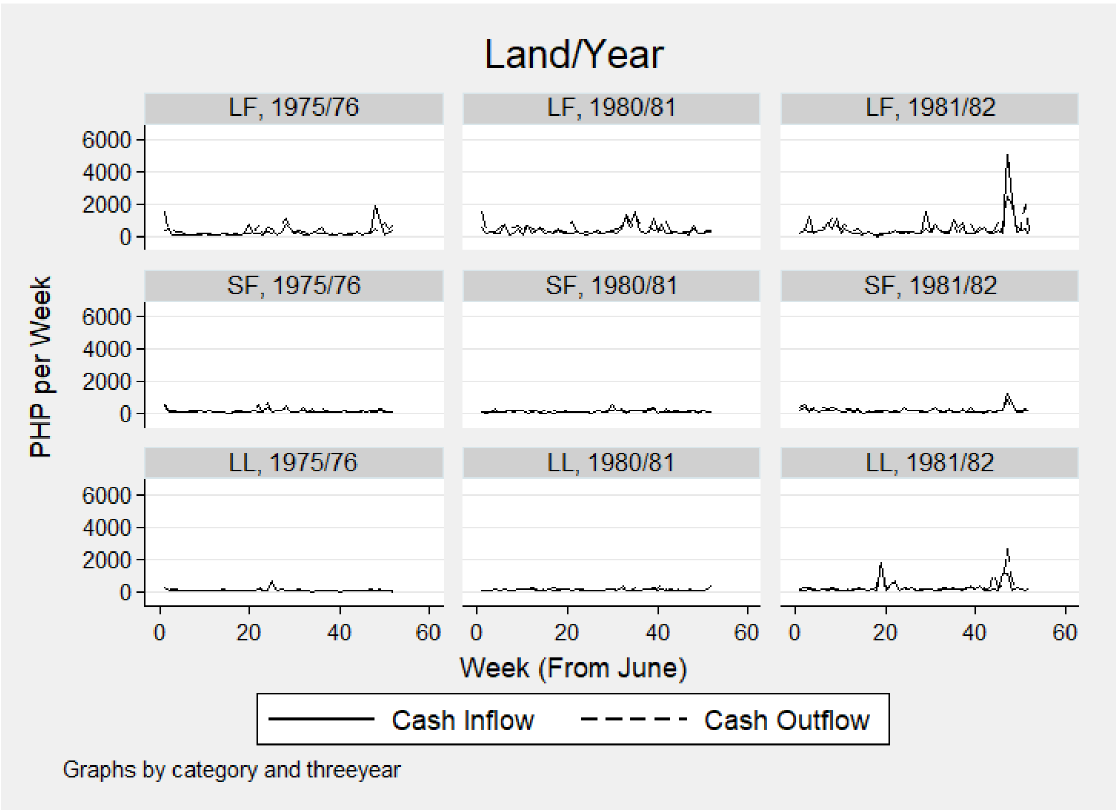

Figure16 Weekly Cash Inflow/Outflow by year and land holding

10.2 Monthly Coefficients

From Table ?? to Table ??, the results of the four different F-tests for the coefficients of the interaction terms between the farmer dummy and the month dummies, $Z_i \times D_j$, in the two reduced form IV equations, in (??) and (??), are shown. The samples of the first four tables are all the households without No.8 and No.10, and the last four were calculated with panel households. The tested monthly coefficients estimated with Cash Inflow/Outflow are shown as examples from Table ?? to Table ??.

Table23 Non-farm/Farm Reduced-form Estimator F-test (Month/Income/w/o No.8 & 10/Robust)

	Phase 1		Phase 2		Phase 1&2	
Dep. Var.	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$
Test 1	6.73	4.88	1.13	2.31	1.31	2.35
	[0.0000]	[0.0000]	[0.3402]	[0.0100]	[0.2152]	[0.0082]
Test 2	2.85	3.39	0.57	1.99	0.70	1.64
	[0.0031]	[0.0006]	[0.8502]	[0.0290]	[0.7357]	[0.0845]
Test 3	2.47	3.56	0.53	1.95	0.61	1.95
	[0.0097]	[0.0004]	[0.8800]	[0.0330]	[0.8217]	[0.0319]
Test 4	2.36	3.79	0.59	2.14	0.66	2.09
	[0.0161]	[0.0003]	[0.8253]	[0.0214]	[0.7649]	[0.0246]
N	120	120	328	328	448	448

P-values in parentheses

Table24 Non-farm/Farm Reduced-form Estimator F-test (Month/Cash/w/o No.8 & 10/Robust)

	Phase 1		Phase 2		Phase 1&2	
Dep. Var.	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$
Test 1	5.65	11.08	2.02	2.05	0.97	0.90
	[0.0000]	[0.0000]	[0.0268]	[0.0241]	[0.4748]	[0.5413]
Test 2	1.51	1.64	1.02	1.74	0.99	1.21
	[0.1430]	[0.1010]	[0.4268]	[0.0649]	[0.4537]	[0.2775]
Test 3	2.59	2.44	1.16	1.79	0.67	1.03
	[0.0066]	[0.0106]	[0.3173]	[0.0548]	[0.7692]	[0.4149]
Test 4	2.82	2.68	0.81	1.97	0.73	1.14
	[0.0044]	[0.0066]	[0.6233]	[0.0363]	[0.6949]	[0.3334]
N	120	120	328	328	448	448

P-values in parentheses

Table25 Non-farm/Farm Reduced-form Estimator F-test (Month/Income/Panel/Robust)

	Phase 1		Phase 2		Phase 1&2	
Dep. Var.	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$
Test 1	8.26	46.69	1.77	1.59	2.24	1.52
	[0.0000]	[0.0000]	[0.0659]	[0.1088]	[0.0136]	[0.1268]
Test 2	4.64	4.83	1.41	1.33	1.29	1.18
	[0.0001]	[0.0000]	[0.1771]	[0.2174]	[0.2331]	[0.3015]
Test 3	3.77	13.07	0.94	0.93	0.99	1.29
	[0.0005]	[0.0000]	[0.5042]	[0.5094]	[0.4521]	[0.2313]
Test 4	3.66	14.37	0.99	1.02	1.02	1.42
	[0.0009]	[0.0000]	[0.4568]	[0.4270]	[0.4248]	[0.1750]
N	84	84	160	160	244	244

P-values in parentheses

Table26 Non-farm/Farm Reduced-form Estimator F-test (Month/Cash/Panel/Robust)

	Phase 1		Phase 2		Phase 1&2	
Dep. Var.	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$	A_{ji}	$ln(E_{ji})$
Test 1	6.07	34.91	3.18	2.40	1.19	1.33
	[0.0000]	[0.0000]	[0.0007]	[0.0098]	[0.2957]	[0.2070]
Test 2	1.69	3.60	1.19	1.14	1.96	1.24
	[0.1011]	[0.0007]	[0.2977]	[0.3381]	[0.0339]	[0.2614]
Test 3	2.30	6.35	1.60	1.48	1.66	1.35
	[0.0213]	[0.0000]	[0.1056]	[0.1475]	[0.0854]	[0.1979]
Test 4	2.00	6.71	1.64	1.60	1.11	1.45
	[0.0515]	[0.0000]	[0.1016]	[0.1125]	[0.3586]	[0.1622]
N	84	84	160	160	244	244

P-values in parentheses

10.3 Regression Results with the housholds, No.8 and No.10 (All sample households)

Table **??** to Table **??**.

10.4 Results with Income_2 and Income_3

Table **??** to Table **??**.

Table27 Non-farm/Farm Reduced-form Estimates (Monthly/Phase 1/w/o No.8 & 10/Cash/Robust)

	(1)		(2)	
	Month	Month×Z	Month	Month×Z
Jun.	–	−0.430	–	−2.598
		(1.211)		(1.876)
Jul.	−1.202	0.571	−0.805**	0.001
	(0.980)	(1.092)	(0.376)	(0.515)
Aug.	−0.893	0.255	−0.464	−0.371
	(1.014)	(1.117)	(0.374)	(0.513)
Sep.	−0.926	0.193	−0.293	−0.698
	(0.969)	(1.071)	(0.334)	(0.468)
Oct.	−0.340	−0.011	0.148	−0.511
	(1.031)	(1.136)	(0.332)	(0.538)
Nov.	0.532	−0.685	−0.179	−0.094
	(1.538)	(1.618)	(0.610)	(0.703)
Dec.	−0.437	0.704	−0.186	−0.132
	(0.996)	(1.146)	(0.392)	(0.572)
Jan.	−1.154	0.543	−0.544	−0.047
	(0.968)	(1.073)	(0.380)	(0.516)
Feb.	−1.214	0.583	−0.972**	0.091
	(0.967)	(1.077)	(0.407)	(0.543)
Mar.	−1.319	0.665	−0.779**	−0.234
	(0.977)	(1.076)	(0.390)	(0.507)
Apr.	−0.790	0.386	−0.491	−0.256
	(1.103)	(1.191)	(0.492)	(0.590)
May.	−1.115	1.783	−0.378	0.129
	(1.109)	(1.232)	(0.385)	(0.569)
N	144	–	144	–
R^2	0.275	–	0.735	–

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table28 Non-farm/Farm Reduced-form Estimates (Monthly/Phase 2/w/o No.8 & 10/Cash/Robust)

	(1)		(2)	
	Month	Month×Z	Month	Month×Z
Jun.	–	0.427	–	0.343
		(0.307)		(0.349)
Jul.	0.295	−0.259	−0.037	0.307
	(0.235)	(0.335)	(0.229)	(0.281)
Aug.	0.496**	−0.635**	0.019	0.123
	(0.241)	(0.309)	(0.207)	(0.256)
Sep.	0.074	−0.525**	−0.102	0.035
	(0.147)	(0.237)	(0.209)	(0.265)
Oct.	0.850	−1.265*	0.248	−0.448
	(0.723)	(0.744)	(0.315)	(0.359)
Nov.	0.095	−0.383	−0.188	−0.056
	(0.232)	(0.313)	(0.224)	(0.276)
Dec.	0.298	−0.282	−0.262	0.136
	(0.222)	(0.373)	(0.213)	(0.262)
Jan.	0.262	0.112	0.011	0.202
	(0.237)	(0.387)	(0.224)	(0.288)
Feb.	0.550**	−0.349	0.079	0.133
	(0.225)	(0.345)	(0.189)	(0.263)
Mar.	0.496*	−0.741**	0.256	−0.367
	(0.269)	(0.329)	(0.207)	(0.266)
Apr.	0.750	−0.180	0.377	−0.249
	(0.638)	(0.786)	(0.346)	(0.407)
May.	0.498	−0.643	0.056	0.012
	(0.365)	(0.420)	(0.225)	(0.289)
N	345	–	345	–
R^2	0.092	–	0.606	–

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table29 Non-farm/Farm Reduced-form Estimates (Monthly/Phase 1 & 2/w/o No.8 & 10/Cash/Robust)

	(1) Month	Month×Z	(2) Month	Month×Z
Jun.	–	0.163	–	0.408
		(0.407)		(0.336)
Jul.	−0.165	0.011	−0.273	0.236
	(0.358)	(0.426)	(0.201)	(0.264)
Aug.	0.069	−0.350	−0.129	−0.008
	(0.3166)	(0.410)	(0.186)	(0.247)
Sep.	−0.234	−0.298	−0.161	−0.167
	(0.329)	(0.375)	(0.187)	(0.246)
Oct.	0.484	−0.878	0.217	−0.465
	(0.590)	(0.617)	(0.246)	(0.308)
Nov.	0.229	−0.475	−0.185	−0.068
	(0.530)	(0.568)	(0.245)	(0.299)
Dec.	0.072	0.021	−0.239	0.055
	(0.358)	(0.445)	(0.204)	(0.270)
Jan.	−0.171	0.255	−0.161	0.136
	(0.355)	(0.438)	(0.195)	(0.260)
Feb.	0.018	−0.061	−0.235	0.123
	(0.359)	(0.426)	(0.195)	(0.267)
Mar.	−0.051	−0.313	−0.054	−0.325
	(0.377)	(0.418)	(0.202)	(0.261)
Apr.	0.282	0.002	0.115	−0.247
	(0.565)	(0.665)	(0.289)	(0.345)
May.	0.009	0.089	−0.082	0.056
	(0.416)	(0.489)	(0.196)	(0.269)
N	489	–	489	–
R^2	0.059	–	0.626	–

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table30 Non-farm/Farm Reduced-form Estimator (Monthly/Phase 1/Panel/Cash/Robust)

	(1)		(2)	
	Month	Month×Z	Month	Month×Z
Jun.	–	1.381*	–	2.448
		(0.694)		(1.534)
Jul.	0.086	−1.059	−0.254	−0.662
	(0.198)	(0.746)	(0.350)	(0.652)
Aug.	0.412**	−1.462*	0.174	−1.097*
	(0.198)	(0.738)	(0.266)	(0.616)
Sep.	0.607***	−1.772**	0.197	−1.260**
	(0.207)	(0.714)	(0.247)	(0.565)
Oct.	1.223	−2.139**	0.662***	−1.107
	(0.753)	(1.018)	(0.248)	(0.722)
Nov.	2.991	−3.717	0.839	−1.197
	(2.167)	(2.293)	(0.793)	(0.961)
Dec.	0.808***	−1.060	0.032	−0.375
	(0.229)	(0.839)	(0.322)	(0.710)
Jan.	0.248	−1.443**	−0.395	−0.239
	(0.264)	(0.714)	(0.257)	(0.596)
Feb.	0.145	−1.323*	−0.662	−0.484
	(0.249)	(0.711)	(0.535)	(0.760)
Mar.	0.147	−1.274*	−0.596**	−0.556
	(0.334)	(0.745)	(0.294)	(0.582)
Apr.	1.338*	−2.166**	0.572**	−1.313**
	(0.740)	(0.992)	(0.274)	(0.573)
May.	0.037	0.742	0.029	−0.328
	(0.377)	(1.069)	(0.316)	(0.724)
N	84	–	84	–
R^2	0.449	–	0.693	–

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table31 Non-farm/Farm Reduced-form Estimator (Monthly/Phase 2/Panel/Cash/Robust)

	(1)		(2)	
	Month	Month×Z	Month	Month×Z
Jun.	–	0.579	–	0.952***
		(0.382)		(0.422)
Jul.	−0.070	−0.468	−0.023	0.180
	(0.267)	(0.394)	(0.270)	(0.368)
Aug.	0.491	−0.897*	0.087	−0.059
	(0.398)	(0.501)	(0.283)	(0.344)
Sep.	0.061	−0.808**	−0.063	0.015
	(0.236)	(0.372)	(0.250)	(0.341)
Oct.	0.141	−0.881**	−0.063	−0.364
	(0.272)	(0.401)	(0.185)	(0.295)
Nov.	−0.247	−0..331	−0.395	0.069
	(0.184)	(0.349)	(0.254)	(0.332)
Dec.	0.325	−0.374	−0.108	−0.230
	(0.339)	(0.680)	(0.322)	(0.392)
Jan.	0.100	−0.217	−0.126	0.365
	(0.274)	(0.522)	(0.203)	(0.328)
Feb.	0.606*	−1.075**	0.201	−0.143
	(0.354)	(0.478)	(0.240)	(0.345)
Mar.	0.218	−0.562	0.322	−0.244
	(0.333)	(0.456)	(0.197)	(0.276)
Apr.	1.763	−0.685	0.625	−0.484
	(1.367)	(1.617)	(0.743)	(0.823)
May.	0.282	−0.632	0.354	−0.193
	(0.214)	(0.412)	(0.234)	(0.332)
N	160	–	160	–
R^2	0.226	–	0.678	–

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table32 Non-farm/Farm Reduced-form Estimator (Monthly/Phase 1 & 2/Panel/Cash/Robust)

	(1)		(2)	
	Month	Month×Z	Month	Month×Z
Jun.	–	0.848**	–	1.034***
		(0.342)		(0.393)
Jul.	−0.018	−0.665*	−0.100	−0.101
	(0.200)	(0.349)	(0.197)	(0.332)
Aug.	0.465	−1.086***	0.116	−0.405
	(0.286)	(0.409)	(0.189)	(0.311)
Sep.	0.243	−1.129***	0.024	−0.410
	(0.183)	(0.333)	(0.182)	(0.307)
Oct.	0.502	−1.295***	0.179	−0.609*
	(0.325)	(0.431)	(0.202)	(0.357)
Nov.	0.832	−1.454	0.017	−0.351
	(0.873)	(0.925)	(0.376)	(0.455)
Dec.	0.486**	−0.598	−0.062	−0.276
	(0.240)	(0.507)	(0.222)	(0.363)
Jan.	0.149	−0.642	−0.216	0.146
	(0.210)	(0.413)	(0.144)	(0.292)
Feb.	0.452	−1.166***	−0.086	−0.283
	(0.302)	(0.418)	(0.276)	(0.385)
Mar.	0.194	−0.809**	0.016	−0.375
	(0.261)	(0.388)	(0.230)	(0.336)
Apr.	1.622*	−1.215	0.608	−0.779
	(0.922)	(1.105)	(0.485)	(0.566)
May.	0.200	−0.138	0.252	−0.246
	(0.228)	(0.492)	(0.171)	(0.319)
N	244	–	244	–
R^2	0.163	–	0.631	–

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table33 OLS&IV Regression [1] (Month/Robust)

	Inc_1			*Inc_2*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	4.554***	4.682***	5.452***	4.570***	4.707***	5.478***
	(0.326)	(0.321)	(0.458)	(0.329)	(0.326)	(0.474)
Aji	0.050**	0.051***	0.037	0.033	0.035**	0.010
	(0.021)	(0.019)	(0.046)	(0.020)	(0.017)	(0.050)
lnYi	0.174**	0.159**	0.174***	0.174**	0.159**	0.174**
	(0.068)	(0.064)	(0.066)	(0.068)	(0.065)	(0.068)
Z	◯	–	–	◯	–	–
month×Z	–	◯	*IV*	–	◯	*IV*
N	489	489	489	489	489	489
R^2	0.668	0.717	0.668	0.663	0.712	0.660

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table34 OLS&IV Regression [2] (Month/Robust)

	Inc_3			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	4.551***	4.672***	5.458***	2.905***	3.122***	3.228***
	(0.321)	(0.317)	(0.453)	(0.382)	(0.400)	(0.620)
Aji	0.055**	0.057***	0.033	0.343***	0.336***	0.386***
	(0.021)	(0.019)	(0.041)	(0.035)	(0.033)	(0.086)
lnYi	0.173***	0.158**	0.174***	0.449***	0.449***	0.447***
	(0.067)	(0.064)	(0.066)	(0.086)	(0.085)	(0.087)
Z	◯	–	–	◯	–	–
month×Z	–	◯	*IV*	–	◯	*IV*
N	489	489	489	489	489	489
R^2	0.671	0.720	0.669	0.741	0.771	0.739

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table35 IV Regression [1] (Month/Robust)

	Inc_1			Inc_2		
	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$	$Ph.2$	$Ph.1\&2$	$Ph.1$	$Ph.2$	$Ph.1\&2$
_cons	1.125	5.707***	5.452***	1.165	5.759***	5.478***
	(0.719)	(0.622)	(0.458)	(0.709)	(0.584)	(0.474)
Aji	0.054	0.115*	0.037	0.012	0.065	0.010
	(0.040)	(0.059)	(0.046)	(0.052)	(0.051)	(0.050)
lnYi	0.783***	0.201**	0.174***	0.784***	0.201***	0.174**
	(0.107)	(0.084)	(0.066)	(0.105)	(0.078)	(0.068)
N	144	345	489	144	345	489
R^2	0.642	0.585	0.668	0.634	0.612	0.660

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table36 IV Regression [2] (Month/Robust)

	Inc_3			$Cash$		
	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$	$Ph.2$	$Ph.1\&2$	$Ph.1$	$Ph.2$	$Ph.1\&2$
_cons	1.109	5.747***	5.458***	4.342***	3.600***	3.228***
	(0.717)	(0.577)	(0.453)	(0.761)	(0.761)	(0.620)
Aji	0.064*	0.086**	0.033	0.532***	0.421***	0.386***
	(0.039)	(0.042)	(0.041)	(0.098)	(0.085)	(0.086)
lnYi	0.784***	0.200**	0.174***	0.919***	0.449***	0.361***
	(0.107)	(0.078)	(0.066)	(0.118)	(0.095)	(0.086)
N	144	345	489	144	345	489
R^2	0.645	0608	0.669	0.761	0.687	0.739

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table37 Regression with an interaction $A_{ji} \times Farm_i$ $[Inc\_1]$ (Month/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	*Ph.*1		*Ph.*2		*Ph.*1&2	
_cons	4.074***	4.371***	5.572***	5.290***	4.591***	4.754***
	(0.391)	(0.311)	(0.599)	(0.616)	(0.428)	(0.412)
Aji	−0.016	−0.003	0.133*	0.131**	0.082	0.087
	(0.026)	(0.030)	(0.072)	(0.065)	(0.065)	(0.054)
lnYi	0.373***	0.373***	0.201**	0.219***	0.174**	0.159**
	(0.063)	(0.047)	(0.082)	(0.076)	(0.068)	(0.064)
$\mathbb{1}$(Farm = 1)	−0.047	−0.520***	0.217*	0.290	0.859***	0.202
	(0.145)	(0.167)	(0.119)	(0.222)	(0.165)	(0.282)
$Aji \times \mathbb{1}(Farm = 1)$	0.087*	0.061	−0.101	−0.103	−0.043	−0.047
	(0.050)	(0.105)	(0.074)	(0.067)	(0.066)	(0.056)
month×Z	–	○	–	○	–	○
N	144	144	345	345	489	489
R^2	0.649	0.762	0.623	0.695	0.670	0.719

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table38 Regression with an interaction $A_{ji} \times Farm_i$ $[Inc\_2]$ (Month/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	*Ph.*1		*Ph.*2		*Ph.*1&2	
_cons	4.074***	4.371***	5.573***	5.138***	4.590***	4.755***
	(0.379)	(0.287)	(0.598)	(0.610)	(0.431)	(0.418)
Aji	−0.016	−0.003	0.133*	0.131**	0.082	0.087
	(0.026)	(0.030)	(0.072)	(0.065)	(0.065)	(0.054)
lnYi	0.373***	0.373***	0.201**	0.219***	0.174**	0.159**
	(0.061)	(0.042)	(0.082)	(0.076)	(0.069)	(0.065)
$\mathbb{1}$(Farm = 1)	0.064	−0.494***	0.216*	0.430**	0.878***	0.528*
	(0.144)	(0.168)	(0.119)	(0.196)	(0.165)	(0.294)
$Aji \times \mathbb{1}(Farm = 1)$	−0.023	−0.060	−0.099	−0.097	−0.063	−0.065
	(0.046)	(0.043)	(0.074)	(0.066)	(0.067)	(0.056)
month×Z	–	○	–	○	–	○
N	144	144	345	345	489	489
R^2	0.642	0.770	0.625	0.698	0.666	0.715

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table39 Regression with an interaction $A_{ji} \times Farm_i$ [Inc_3] (Month/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$		$Ph.2$		$Ph.1\&2$	
_cons	4.062***	4.508***	5.543***	5.377***	4.574***	4.710***
	(0.396)	(0.391)	(0.543)	(0.532)	(0.412)	(0.399)
Aji	−0.003	−0.057	0.130**	0.150**	0.104*	0.117**
	(0.051)	(0.086)	(0.064)	(0.063)	(0.059)	(0.052)
lnYi	0.373***	0.373***	0.199**	0.215***	0.173***	0.157**
	(0.063)	(0.047)	(0.079)	(0.076)	(0.067)	(0.064)
$\mathbb{1}$(Farm = 1)	−0.035	−0.657**	0.215*	0.208	0.882***	0.509**
	(0.159)	(0.291)	(0.116)	(0.198)	(0.165)	(0.230)
$Aji \times \mathbb{1}(Farm = 1)$	0.075	0.115	−0.098	−0.121*	−0.064	−0.076
	(0.067)	(0.132)	(0.066)	(0.064)	(0.061)	(0.054)
month×Z	–	○	–	○	–	○
N	144	144	345	345	489	489
R^2	0.648	0.763	0.627	0.702	0.674	0.724

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table40 Regression with an interaction $A_{ji} \times Farm_i$ [$Cash$] (Month/Robust)

	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$		$Ph.2$		$Ph.1\&2$	
_cons	2.869***	3.340***	3.465***	3.404***	2.442***	2.681***
	(0.483)	(0.445)	(0.706)	(0.758)	(0.483)	(0.497)
Aji	0.349***	0.314***	0.373***	0.347***	0.365***	0.349***
	(0.039)	(0.057)	(0.053)	(0.048)	(0.039)	(0.038)
lnYi	0.489***	0.489***	0.443***	0.457***	0.449***	0.447***
	(0.075)	(0.067)	(0.091)	(0.085)	(0.086)	(0.087)
$\mathbb{1}$(Farm = 1)	−0.042	−0.682***	0.275*	0.317	0.843***	0.536*
	(0.199)	(0.198)	(0.162)	(0.272)	(0.239)	(0.319)
$Aji \times \mathbb{1}(Farm = 1)$	0.123*	0.107	−0.092	−0.097	−0.037	−0.022
	(0.068)	(0.082)	(0.078)	(0.074)	(0.064)	(0.062)
month×Z	–	○	–	○	–	○
N	144	144	345	345	489	489
R^2	0.777	0.830	0.690	0.737	0.741	0.771

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table41 OLS&IV Regression [1] (Month/w/o No.8 & 10/Robust)

	Inc_1			*Inc_2*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	5.002***	4.987***	6.100***	5.019***	5.013***	6.130***
	(0.318)	(0.324)	(0.449)	(0.323)	(0.331)	(0.475)
Aji	0.037***	0.039***	0.016	0.019	0.022	−0.016
	(0.013)	(0.013)	(0.042)	(0.014)	(0.013)	(0.042)
lnYi	0.082	0.082	0.082	0.082	0.82	0.082
	(0.067)	(0.067)	(0.067)	(0.070)	(0.068)	(0.070)
Z	○	−	−	○	−	−
month×Z	−	○	*IV*	−	○	*IV*
N	448	448	448	448	448	448
R^2	0.669	0.719	0.667	0.664	0.715	0.657

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table42 OLS&IV Regression [2] (Month/w/o No.8 & 10/Robust)

	Inc_3			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	4.998***	4.979***	6.091***	3.085***	3.234***	3.534***
	(0.318)	(0.323)	(0.446)	(0.454)	(0.462)	(0.701)
Aji	0.040***	0.042***	0.024	0.351***	0.345***	0.382***
	(0.014)	(0.014)	(0.036)	(0.039)	(0.037)	(0.091)
lnYi	0.082	0.085	0.082	0.407***	0.414***	0.407***
	(0.067)	(0.067)	(0.066)	(0.097)	(0.094)	(0.095)
Z	○	−	−	○	−	−
month×Z	−	○	*IV*	−	○	*IV*
N	448	448	448	448	448	448
R^2	0.670	0.720	0.669	0.738	0.775	0.737

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table43 OLS&IV Regression [1] (Month/Panel/Robust)

	Inc_1			*Inc_2*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	4.964***	4.949***	5.995***	4.969***	4.994***	5.970***
	(0.485)	(0.482)	(0.611)	(0.488)	(0.491)	(0.612)
Aji	0.023	0.036	0.001	0.015	0.013	0.026
	(0.019)	(0.026)	(0.025)	(0.021)	(0.023)	(0.033)
lnYi	0.099	0.092	0.100	0.100	0.092	0.100
	(0.093)	(0.090)	(0.091)	(0.093)	(0.091)	(0.091)
Z	○	–	–	○	–	–
month×Z	–	○	*IV*	–	○	*IV*
N	244	244	244	244	244	244
R^2	0.698	0.765	0.696	0.697	0.763	0.697

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table44 OLS&IV Regression [2] (Month/Panel/Robust)

	Inc_3			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	OLS	*OLS*	*IV*	*OLS*	*OLS*	*IV*
_cons	4.956***	4.944***	6.001***	2.957***	3.020***	3.733***
	(0.485)	(0.478)	(0.614)	(0.683)	(0.743)	(0.943)
Aji	0.030	0.056*	−0.006	0.329***	0.354***	0.286***
	(0.020)	(0.031)	(0.026)	(0.082)	(0.053)	(0.082)
lnYi	0.099	0.091	0.100	0.392***	0.401***	0.392***
	(0.092)	(0.090)	(0.091)	(0.134)	(0.139)	(0.128)
Z	○	–	–	○	–	–
month×Z	–	○	*IV*	–	○	*IV*
N	244	244	244	244	244	244
R^2	0.699	0.769	0.695	0.732	0.791	0.730

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table45 IV Regression [1] (Month/w/o No.8 & 10/Robust)

	Inc_1			Inc_2		
	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$	$Ph.2$	$Ph.1\&2$	$Ph.1$	$Ph.2$	$Ph.1\&2$
_cons	1.131	6.522***	6.100***	1.175*	6.578***	6.130***
	(0.717)	(0.615)	(0.449)	(0.709)	(0.577)	(0.657)
Aji	0.047	0.102*	0.016	0.001	0.048	−0.016
	(0.040)	(0.057)	(0.042)	(0.049)	(0.044)	(0.042)
lnYi	0.783***	0.091	0.082	0.784***	0.091	0.082
	(0.107)	(0.084)	(0.067)	(0.105)	(0.078)	(0.070)
N	120	328	448	120	328	448
R^2	0.653	0.607	0.667	0.645	0.639	0.657

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table46 IV Regression [2] (Month/w/o No.8 & 10/Robust)

	Inc_3			$Cash$		
	(1)	(2)	(3)	(1)	(2)	(3)
	$Ph.1$	$Ph.2$	$Ph.1\&2$	$Ph.1$	$Ph.2$	$Ph.1\&2$
_cons	1.112	6.544***	6.091***	−0.236	3.944***	3.534***
	(0.717)	(0.591)	(0.446)	(0.722)	(0.788)	(0.701)
Aji	0.061	0.080**	0.024	0.472***	0.445***	0.382***
	(0.037)	(0.039)	(0.036)	(0.093)	(0.092)	(0.091)
lnYi	0.784***	0.091	0.082	0.918***	0.396***	0.407***
	(0.107)	(0.080)	(0.066)	(0.113)	(0.097)	(0.095)
N	120	328	448	120	328	448
R^2	0.657	0.625	0.669	0.754	0.683	0.737

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table47 IV Regression [1] (Month/Panel/Robust)

	Inc_1			*Inc_2*		
	(1)	(2)	(3)	(1)	(2)	(3)
	Ph.1	*Ph*.2	*Ph*.1&2	*Ph*.1	*Ph*.2	*Ph*.1&2
_cons	2.198***	6.243***	5.995***	2.204***	6.173***	5.970***
	(0.301)	(0.991)	(0.611)	(0.304)	(0.950)	(0.612)
Aji	0.060	−0.011	0.001	0.054	0.058	0.026
	(0.045)	(0.027)	(0.025)	(0.052)	(0.045)	(0.033)
lnYi	0.632***	0.141	0.100	0.632	0.141	0.100
	(0.051)	(0.134)	(0.091)	(0.051)	(0.130)	(0.091)
N	84	160	244	84	160	244
R^2	0.618	0.672	0.696	0.580	0.678	0.697

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table48 IV Regression [2] (Month/Panel/Robust)

	Inc_3			*Cash*		
	(1)	(2)	(3)	(1)	(2)	(3)
	Ph.1	*Ph*.2	*Ph*.1&2	*Ph*.1	*Ph*.2	*Ph*.1&2
_cons	2.185***	6.240***	6.001***	1.600***	4.431***	3.733***
	(0.300)	(0.989)	(0.614)	(0.307)	(0.997)	(0.943)
Aji	0.073	−0.007	−0.06	0.459***	0.268***	0.286***
	(0.047)	(0.025)	(0.026)	(0.076)	(0.097)	(0.082)
lnYi	0.632***	0.141	0.100	0.663***	0.354***	0.392***
	(0.050)	(0.134)	(0.091)	(0.054)	(0.121)	(0.128)
N	84	160	244	84	160	244
R^2	0.624	0.672	0.695	0.732	0.715	0.730

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$