Sectoral Transitions as Pathways out of Poverty: A Long-Run Analysis of Indonesia

Deepak Singhania, Evidence for Policy Design at IFMR, India

Steven M. Helfand, University of California, Riverside

June 23, 2019

Abstract

This paper focuses on the causal effect of occupational transitions on consumption changes and poverty. Recent research has pointed out that sectoral transitions from the agricultural to the non-agricultural sector could be a successful pathway out of poverty due to higher productivity in the non-agricultural sector. But these studies face several limitations, such as the use of cross sectional or short panel data. We address some of these gaps and introduce two novel ways of defining sectoral transitions. Each of these definitions is used to exploit a fixed effects and an instrumental variable strategy with long run panel data on Indonesian households. Under both strategies we find that consumption growth is conditional on initial economic status and the nature of the transition—the growth was relatively higher only for those households who were either poor and agricultural in the baseline, or non-poor and non-agricultural. In terms of poverty, we find longer non-agricultural employment resulted in a positive probability of exiting poverty and a negative probability of becoming poor. Based on these findings we propose that pro-poor policies must be tailored to the agricultural or non-agricultural status of a household.

Keywords: Poverty, Ocupational choices, Indonesia

1 Introduction

Poverty elimination is one of the primary goals of economic development. The world poverty rate (measured at $1.90 a day) has declined by about 50 percent over the last two decades (**?**). Yet, poverty eradication continues to be an important goal in the United Nations' "2030 Agenda for Sustainable Development". Despite considerable effort at the national and international levels to fight poverty, there are substantial disparities in the success of poverty reduction across and within countries. For instance, more than 50% of Sub Saharan Africa's population lives below $2 a day. The majority of these people reside in rural areas dominated by agricultural activities.

Many studies have argued that improvements in the agricultural sector could be a viable pathway out of poverty. Some examples of these improvements include enhancement of agricultural productivity, improved access to land, better agricultural technology and elimination of market imperfections (**????**). However, support of the agricultural sectors in developing countries continues to face resistance due to a policy bias in favor of urban development (**?**). In recent years the role of the non-agricultural sector as a pathway out of poverty has gained considerable attention in the literature (**???**).

The increasing availability of high quality micro level data, and in particular of panel data, has made it possible for researchers to conduct refined microeconomic analyses to understand the comparative role of the agricultural and non-agricultural sectors in escaping poverty (**??????**). An important question has been whether movement from the agricultural to the non-agricultural sector improves individual welfare. A majority of these studies conclude that moving out of agriculture, or diversifying into non-agricultural activities, increases earnings or consumption. An exception to these studies is a recent paper by **?** who find low productivity gaps and zero consumption gaps between the agricultural and non-agricultural sector. We return to this study towards the end of this section. With few exceptions, most of the empirical studies estimate correlations between sector of occupation and welfare outcomes. Their estimated results are not necessarily causal. We discuss below some of the most important methodological limitations of these studies.

An important limitation of the literature relates to the use of cross sectional data in the majority of studies (?????). There have been several recent papers that have used panel data, but without exception these have been relatively short panels (??). The results based on cross-sectional data compare individuals engaged in different sectors at one point in time. Cross-sectional studies suffer from a variety of identification issues, such as reverse causality in the sense that employment in a particular sector could be a result of individual welfare rather than its cause, as well as omitted variables bias that results from a failure to include additional relevant variables in the analysis. The use of short panels would partially take care of this problem as it permits controlling for time-invariant characteristics of an individual and produces estimates that are based on sectoral transitions that hold individual characteristics constant. However, sectoral transitions can either be permanent or temporary in nature. In a short period it might be the case that certain kinds of sectoral transitions predominate, such as within informal occupations. Panel data that only covers a short period of time are unable to distinguish between these different types of transitions.

We employ a panel dataset which is one of the longest panels that has been used to explore the relationship between sectoral transitions and welfare. It is a panel of households from the Indonesian Family Life Survey (IFLS) that spans a period of two decades, from 1993 to 2014.[1] With this kind of data we can control for time invariant unobservables at the household level that could be endogenous to sectoral choices and poverty, a point strongly emphasized in ?. Moreover, we can observe sectoral transitions pertaining to both short and long periods of time.

Another limitation of the existing literature is that most studies utilize individuals as the unit of analysis to estimate the effects of sectoral transitions. But, in a developing country setting, particularly in rural areas, both sectoral choice and the intra-household distribution of resources are likely to be determined at the household level. Several individuals in a household may be engaged in the same economic activity, such as farming in a household based non-agricultural firm. Similarly, employment diversification of some

[1] We explore the Indonesian case because it is a country that has experienced one of the highest growth rates among developing nations. Its poverty rate fell from about 50% to 10% over the last two decades, suggesting that the fruits of growth have been spread widely. It thus provides an interesting example of a developing country that has made considerable progress, not only economically, but also in terms of democratization.

household members is a household decision and the returns from these economic activities accrue to the entire household, rather than just to an individual. Thus, we conduct our analysis at the household level by identifying sectors based on the proportion of total household labor hours worked, and by defining welfare using household consumption per capita.

In the first part of our analysis we observe households at four different points in time. We categorize households based on the number of survey rounds that they were observed in a particular sector in an attempt to divide them into groups defined by their permanent or temporary sectoral transitions.[2] Those who exited a particular sector in the first period and those who were employed in a sector across all survey rounds are permanent in nature. Alternatively, those who were employed in their baseline sector for two or three periods could include both temporary and permanent transitions.

In the second part of the analysis in this paper, we estimate the effect of sectoral transitions using the instrumental variable (IV) estimation technique with household fixed effects. This estimation technique is better than having just household fixed effects because it provides stronger causal identification by allowing us to deal with endogeneity issues due to time invariant as well as time varying factors. However, availability of just one valid instrument forces us to redefine our key variable of interest. In this part of the analysis we use all 22 years of data and categorize households based on the number of years in a particular sector. In the first stage we predict the number of years using the well-known Bartik shift-share instrument that decouples local labor demand from supply. Most of our findings based on the instrumental variable technique are consistent with what was found in the first part of the analysis.

Our study closely relates to **?**. Contrary to the results from two important studies (**??**) they find low and insignificant productivity gaps and zero consumption gaps between the agricultural and non-agricultural sectors and between the urban and rural areas. They argue that although education largely accounts for selection into different sectors or regions, a large part of selection is captured by individual fixed effects. Using the IFLS survey years 1993, 1997, 2000 and 2008 they create 21 years of panel from

[2] We conducted a similar analysis for rural vs. urban transitions, but the sectoral transitions appear to be much more important. They are what we focus on in this paper.

the recall data of individual occupation and income.[3] For consumption, however, they use information from the four survey years since it was not available for each year. In our study we are focusing on long term consumption changes from 1993 to 2014 while ignoring the short term changes as in **?**.

While we find positive consumption growth across the whole sample, based on our preferred IV specification, the marginal growth was lower due to non-agricultural employment compared to the employment in the agricultural sector. However, a sub-group analysis reveals that the benefits of non-agricultural employment are conditional upon other economic factors. Longer employment in the non-agricultural sector resulted in relatively higher consumption growth only for those households who were either poor and agricultural in the baseline, or non-poor and non-agricultural.

In terms of poverty transitions we find that the effect of longer employment in the non-agricultural sector was welfare improving. The effect on the probability of exiting poverty was significantly positive and on the probability of becoming poor was significantly negative.

The rest of this paper is organized as follows. Section two discusses the data and construction of variables for the analysis in the first part of this paper. In the third section we present descriptive statistics on sectoral transitions over the 22 year period along with the associated economic dynamics. We propose our fixed effects regression specification in the fourth section and provide results in the fifth section. In the sixth section we employ the instrumental variable technique for a stronger causal identification. The last section concludes.

2 Data and Summary

The household level data used in this paper comes from the Indonesian Family Life Survey (IFLS). It is a panel survey that spans a period of 22 years, from 1993 (7,224 households) to 2014 (15,761 households). We use a panel for four rounds—gathered every seven years—that successfully tracks about 90% of the

[3] In our study, we do not rely on recall of income data because we believe there could be misreporting of income and considerable measurement error. An individual is more likely to report similar annual income when asked to report historical incomes for the past 5-7 years. This could also be the reason behind insignificant estimates in **?**.

households surveyed in 1993.[4] IFLS is representative of about 83% of the Indonesian population living in 13 of the 26 provinces in 1993. This dataset has information at the household and community levels. The data cover, among other things, household consumption, individual sector of employment, individual income by sector of employment, and other household characteristics.

Categorization of Households

In addition to tracking the originally surveyed households, IFLS also follows members who separated from original households and formed or became part of a new household, which they call split-off households. We divided households into the following four categories (**??**):

1. *Never Split*: These are the households whose members never formed a new household during the survey period. According to **??** below, by 2014, only 11% of households were in this group.

2. *Split – Parents*: These are original households that were split because at least one of their members split-off to form a new household. We call them *Split – Parents* because their members are largely from the first generation of the 1993 IFLS survey. *Split – Parents* accounted for 26.4% of all households in the year 2000. This proportion increased to around 30% in 2007 and 2014.

3. *Split – Children*: Two types of members separated from the original households to form a new household: children of household heads and everyone else. We call the first type *Split – Children*. This group accounted for 23% of all households surveyed in 2000, and rose to 38.8% in 2014.

4. *Split – Other*: These involve other members of the original households, such as siblings of household head that split-off to form new households. The proportion of such households increased from around 10.6% in 2000 to 21.1% in 2014.

In this paper, we limit the analysis to the first three groups. We further combine the first two groups, i.e. *Never Split* and *Split – Parents*, because they both derive primarily from the adults in the original

[4] There was another round conducted in 1997, but it was different than the other rounds because of the Asian Financial Crisis of 1997. Hence, we limit our analysis to four rounds.

set of households. Thus, we work with two groups defined by generation in this paper: *Parents* and *Children*.[5]

Households were categorized into agricultural and non-agricultural sectors based on the allocation of total adult labor hours worked by household members. If a household allocated more than three-quarters of its total adult labor hours to agricultural activities then that household was assigned to the agricultural sector. If more than three-quarters of the hours were allocated to non-agricultural activities the household was identified as non-agricultural, and households that did not fall into either of the two sectors were classified as *other*. We limit our analysis in this paper to households that were classified into the agricultural or non-agricultural sectors in the baseline. Approximately 6% of households were classified as *other* in the baseline, and were excluded for this reason, while 43% were classified as agricultural and 51% were classified as non-agricultural.

Summary Statistics

?? presents characteristics of the households surveyed in 1993 and 2014. The column "1993 All" includes the information for all of the households surveyed in 1993. In 2014, households are categorized as *2014 Parents* and *2014 Children*. 2014 Parents include both the *Never Split* and the *Split – Parents*. The proportion of households living in rural areas was close to 70% in 1993. By 2014, this proportion had declined to 51% for parents and 42% for children. Thus, children were more likely than their parents to exit rural areas. Households became smaller in this period, from an average of 4.69 members to about 3.65 members. The majority of households were male headed, but the share is lower in the *2014 Parents* category of households than in the *2014 Children* households. This is likely due to wives of original male heads taking over as new heads after their death. This is also evident in the slightly lower proportion of males in households belonging to this category. Because of the sample design, household heads are about 18 years younger in the *2014 Children* category compared to *2014 Parents* category. The median age among the members of the *2014 Children* households is also about 15 years lower.

[5] In future research we will confirm that the results are robust to the exclusion of the "other" group and the combination of the two types of parents. Preliminary descriptive analysis supported these decisions.

In terms of education, 76% of household heads in 1993 had attended no school or at most a primary education. The *2014 Parents* made some progress relative to 1993, with the share in these two categories falling to 63%. Because they are younger and were raised in a period when public schooling was expanding, the heads of newly formed households were more educated than their parents. Only 1% of the *2014 Children* had not attended any school compared to 13% of the *2014 Parents*. Furthermore, a higher proportion had attended higher schooling levels: 20% had attended junior high school, 34% had attended senior high school and 15% had attended college or higher, compared to 13%, 17%, and 7% respectively for the *2014 Parents* household heads. Finally, although the *2014 Children* households have higher levels of human capital, the households in the *2014 Parents* category are richer in terms of physical assets, probably due to a lifetime of asset accumulation.

3 Sectoral Transitions

Sectoral transitions in a two period survey can be conveniently studied using transition matrices. But, for a four period case it is not possible to use two-by-two transition matrices because of the need for higher dimensions. Hence, we condense the information contained in four-period sectoral transitions in a novel way. We categorize households by the number of survey rounds they were observed in their baseline sector. The baseline distribution of households by sector is presented in the fifth column of **??**. About 35.4% of the *Parents* households lived in rural areas and were engaged in agricultural activities, while 19.4% were rural and employed in the non-agricultural sector. In urban areas the shares in the agricultural and non-agricultural sectors were 9.8% and 35.3% respectively. Thus, in the baseline around two-thirds of rural households were agricultural, while close to 80% of urban households were non-agricultural. We use these categories to describe the households, their average consumption and baseline poverty.

Proportion of households that continued in their baseline sector in the follow-up survey rounds of IFLS

In **??** there are four columns — labeled 1 through 4 — under the heading "Rounds observed in 1993 sector". These column headings represent the total number of survey-rounds a household was observed in its baseline sector. By way of example, the first row provides the breakdown of the rural *Parents* households that were agricultural in the baseline, and shows the number of periods that they remained in agriculture. Only 23.2% of these households stayed in the agricultural sector across all four periods (see the last column), while 14.4% moved out of agriculture after the first round of the survey.[6] The share of households that stayed in agriculture for two or three survey-rounds was 23.9% and 38.6% respectively. Similarly, the second row provides the classification over the four survey rounds for the rural households that were initially engaged in the non-agricultural sector. A higher proportion of these households, more than 30%, continued in their baseline sector. This pattern of continuing in the baseline non-agricultural sector was even more pronounced in urban areas where more than 50% of the *Parents* households were observed in the non-agricultural sector across all the four rounds. A mere 7% of urban agricultural households continued as agricultural across all four rounds.

The sectoral dynamics of *Children – Split* households is also interesting. In these households, the baseline sector was assigned using their parents' sector. The overall picture of these second generation households is similar to what was observed for the *Parents* households. However, for these households the shares that transitioned out of agriculture, and that remained in the non-agricultural sector, are even higher.

We also conducted a similar transition analysis by location, i.e. the number of rounds that households were observed in rural or urban areas. Since transitions between rural and urban locations are quite low, we do not present the results here. About 80-90% of households continued in their baseline location for three or four rounds.

[6] Note that moving out of a baseline sector, e.g. the agricultural sector, means that the proportion of total household hours worked in the agricultural sector falls below 75%. This could imply 100% employment in the non-agricultural sector or diversification between the two sectors.

Per capita consumption of households that continued in their baseline sector

In the previous sub-section we discussed sectoral transitions of households in a four-period setting. In this sub-section we use the same structure to explore the economic gains and losses associated with such transitions. **??** is similar in structure to **??**, except that it now reports average real per capita consumption expenditure in 2014. First, for baseline rural households, we note that staying in the agricultural sector across all four periods for both *Parents* and *Children* households was associated with the lowest consumption level in 2014 within each respective group. In contrast, those that stayed in the non-agricultural sector for three or four periods experienced higher consumption levels. Employment in agriculture for lesser number of periods, particularly within the baseline rural households, was associated with higher consumption level in 2014. Similarly, the households that were employed in the non-agricultural sector for one or two periods had a lower consumption level than those engaged in it for longer period, irrespective of location.

?? presents the percent change in consumption levels between 1993 and 2014. Surprisingly, in most of the cases, the households in the agricultural sector in the baseline experienced larger percentage gains in consumption expenditure compared to the baseline non-agricultural households. But comparing these percentage changes to median consumption in the baseline helps to explain the reason behind such unexpected results. The households in the non-agricultural sector had higher median consumption in 1993 to begin with. For instance, within the baseline rural area *Parents* households engaged in non-agricultural activities had 50% more consumption than those engaged in the agricultural sector. Thus, the agricultural households experienced faster growth from a lower base.

Baseline poverty

?? presents the baseline share of poor households within each sectoral category. This table helps us shed light on selection of households into different sectoral categories based on their baseline economic status. We have used the official Indonesian poverty lines for different provinces to identify poor households. There is a clear relationship within rural households that were employed in the agricultural sector in the

baseline. The groups that continued longer in the agricultural sector had higher shares of poor households in the baseline. On the other hand, the rural households that succeeded in staying in the non-agricultural sector for more periods had a much lower share of poor compared to the household that remained in the non-agricultural sector for only one or two periods. These relationships suggest self-selection on baseline characteristics. These patterns are distinct for urban households. Among the urban non-agricultural *Parents*, for example, only those that left after the first period were clearly poorer. Another interesting observation is that the proportion of poor in each respective category is generally higher among the *Children – Split* households than among their *Parents*. This suggests a possible association between baseline poverty and the splitting of households.

Dominance Analysis of Sectoral Strategies: Consumption distributions in 1993 and 2014 by number of rounds observed in each sector (Parents)

So far we presented averages of household consumption by different sectoral categories, but these averages could be an insufficient representation of an entire distribution. In this section we present the distributions of log real per capita consumption expenditure by the number of rounds households were observed in their baseline sector. Figures **??** and **??** depict these distributions in 1993 and 2014, respectively, for *Parents* that began in the agricultural sector, while Figures **??** and **??** do the same for the *Parents* initially in the non-agricultural sector. In each of these figures, the vertical line represents the national poverty line for Indonesia in 2014. For all categories of households, both within the baseline agricultural and non-agricultural sectors, the level of consumption increased between 1993 and 2014. This is clear from the shifting of the distributions to the right, as well as the scaling up of the consumption levels on the horizontal axis.

As with **??**, the figures also suggest that there was self-selection into different pathways. Figures **??** and **??** show that those households that stayed in agriculture for three or four periods had consumption distributions that were dominated by the households that stayed in agriculture for only one or two periods. Thus, those households that were already better off in the baseline were more likely to leave.

By 2014, the hierarchy was even more clear. The distribution of consumption for households engaged in the agricultural sector for only one period dominated all of the other distributions. The same pattern is observed with the remaining consumption distributions: the distribution of households that worked in agriculture for two periods dominated the distribution for three periods, and the distribution for three periods dominated the one for four periods.

A slightly different relationship between baseline distributions and pathway choices is observed for the households that began in the non-agricultural sector. Households that were engaged in the non-agricultural sector for three or four periods had consumption distributions that were quite similar in both 1993 and 2014, and these distributions dominated the other two groups. Thus, these households were already observably better off in the baseline and remained so twenty years later. The households that were observed in the non-agricultural sector only in the baseline period had a consumption distribution that was already dominated by the other three groups in 1993, and continued to be dominated by them in 2014. The consumption distribution of the households that were in the non-agricultural sector for two periods lie between the other groups. In 2014, however, among the households in the neighborhood of the poverty line, only the group that was in the non-agricultural sector for just one period was clearly distinct from the other three.

Overall, these consumption distributions reveal the following major points. Almost every household experienced an overall increase in real per capita consumption expenditure. A longer period of engagement in the agricultural sector, and likewise a lesser period of engagement in the non-agricultural sector, was associated with lower consumption distributions relative to the other groups. However, from the dominance of these distributions one cannot conclude very much about causal effects. Moreover, there appears to be selection of households into different categories: those engaged in agricultural activities for more periods, or in the non-agricultural sector for fewer periods, had relatively lower consumption levels to begin with. Hence, there is a need for a more sophisticated analysis to tease out the causal relationship between sectoral transitions and household welfare. We take a step in this direction using

regression techniques in the next section.

4 Regression Specification

A basic specification using OLS to estimate the effect of sectoral transitions is:

$$Y_{ht} = \alpha + \sum_{s=1}^{3} \beta_s Ag\_s_h + \sum_{s=1}^{4} \beta_{s+3} Non\text{-}Ag\_s_h + \gamma X_{ht} + \theta * t + \epsilon_{ht} \quad (1)$$

In the equation above, Y_{ht} represents the household level outcome for the years 1993 and 2014.[7] It captures household welfare in terms of three different outcomes: real per capita consumption, an indicator for exiting poverty, and an indicator for becoming poor. Ag_s_h and $Non\text{-}Ag\_s_h$, where s takes the value 1-3 for *Ag* and 1-4 for *Non-Ag*, are indicator variables for whether agricultural and non-agricultural households, respectively, were observed in their baseline sectors for one, two, three or four periods. Households that were in the agricultural sector for all four periods are excluded from the regression and used as a comparison group, and thus the estimated coefficients β_1 through β_7 capture the difference of each sectoral transition in relation to this excluded group. X_{ht} represents household specific time-varying controls, and t is a time dummy.

A problem with **??** is that it does not account for the fact that a household's occupation in a particular sector could be correlated with its inherent characteristics or some selected unobservables. The estimates from this specification would be biased due to unobserved cross-sectional variation among households that leads them to choose different sectoral categories. Since the IFLS data tracks the same households over time, it allows us to carry out a within household fixed effects analysis for which the following specification is used:

$$Y_{ht} = \alpha_h + \sum_{s=1}^{3} \beta_s Ag\_s_h * t + \sum_{s=1}^{4} \beta_{s+3} Non\text{-}Ag\_s_h * t + \gamma X_{ht} + \theta t + \epsilon_{ht} \quad (2)$$

[7] We focus only on 1993 and 2014 outcomes because we want to test for long period, instead of short-term, welfare changes.

This specification is similar to **??**, except that it includes fixed effects (α_h) that control for household specific time invariant characteristics affecting sectoral transitions and welfare outcomes. Also, since sectoral categories are fixed over time, they are interacted with a time dummy in order to capture the effect of sectoral transitions while controlling for the effect of belonging to these categories through the fixed effects. The identifying assumption that is necessary for these to be causal estimates is that, after controlling for the time varying observables (X_{ht}), the residuals are independent of any unobserved time varying factors that could be affecting household decisions over sectoral transitions. This assumption may or may not be valid, and thus claims about causality can only be made with caution. We relax this assumption to account for time-varying unobservables by employing the instrumental variable technique in the sixth section.

5 Regression Results

The regression results for three different outcomes—log of consumption, probability of exiting poverty and probability of becoming poor—are presented in tables **??** through **??**. These regressions were carried out only with the *Parents* sample. In **??**, the first two columns present OLS estimates using **??** with and without time-varying controls, while the final three columns are estimated with the fixed effects model in **??**. According to the first column, compared to the households that were employed in the agricultural sector for all four periods, all other households achieved significantly higher consumption growth. Once we control for household specific time varying factors, such as education, the magnitude of all the estimates, and the significance of some, declines.

Surprisingly, these estimates become insignificant or negative when household fixed effects are included (column 3). This indicates that, once we control for time-invariant unobservables, the rate of growth of consumption was the same for all agricultural households—regardless of the number of periods in agriculture—and slower for non-agricultural households compared to the households that were always agricultural. Additionally, the negative coefficients are in the range of 21-24 percent and statistically significant at 5% level for the households that were employed in non-agricultural activities for more than

one period. These results do not support what has been argued in the literature about comparatively higher returns from the non-agricultural sector. They suggest that the benefits of working in the non-agricultural sector result from fixed unobservable characteristics that likely cause self-selection into these sectors. Once these unobservables are captured with the fixed effects, the gains from transitioning into the non-agricultural sector either disappear or become negative. These results echo the findings of **?** who find zero impact of transitioning from agriculture to non-agriculture. The main differences between **?** and our study is that they use only one dummy variable for transitions and unlike them we use long term consumption changes between 1993 and 2014.

In order to get a better understanding of these surprising results we divide households into baseline poor and non-poor groups and present the estimates separately in columns (4) and (5) respectively. These estimates capture heterogeneity of outcomes based on initial poverty status, and provide a different picture compared to the estimates based on the entire sample. Column (4) shows that among the baseline poor, six of the seven groups experienced consumption growth that was not statistically different from the control agricultural households. The only exception is the group that moved out of the agricultural sector in the first period. Households in this group experienced 17% higher consumption compared to the control group, although this was statistically different only at the 10% level of significance. In summary, among the baseline poor, the differences in the growth of consumption across groups were either statistically insignificant (in six cases) or small (in one case).

The same is not true for the baseline non-poor households (see column 5). Those who were engaged in the non-agricultural sector for three or more survey rounds experienced 50% higher consumption growth compared to the control group, at the 1% level of significance. Similarly, the households that left the agricultural sector after the first survey round, and worked in the non-agricultural sector for the next three rounds, experienced 40% faster consumption growth at the 5% level of significance. Thus, unlike the baseline poor, the baseline non-poor could experience stronger consumption growth if they were employed in the non-agricultural sector for three or more periods, regardless of which sector they began in. The

households observed in the non-agricultural sector for two of the four survey-rounds also experienced faster consumption growth, but only at the 10% level of significance. The rest of the groups were not significantly different from the control group.

The analysis to this point has been conducted in comparison to the households that were employed in the agricultural sector across all four survey rounds. Using the results from columns 4 and 5 in **??**, we also test for the equality of coefficients across all groups. The results from these pairwise tests are presented in tables **??** and **??** for the baseline poor and non-poor, respectively. Among poor households, **??**, shows that almost all groups appear to have similar consumption growth regardless of their sectoral transitions. Only those households that left the agricultural sector after the first period performed better than almost all other groups of poor households.

The same is not true within non-poor households (see **??**). From this table we observe two important points. The consumption growth experienced by the households that left the agricultural sector after the first period was similar to the ones that were always non-agricultural and thus better than those that were always agricultural. On the other hand, the households that left the non-agricultural sector after the first period experienced significantly lower consumption growth compared to the ones that were always non-agricultural, but equivalent to those that were always agricultural.

Poverty Analysis

Consumption growth provides an indication of improvement in economic status for all households, but it doesn't say much about exit from, or entry into, poverty. For estimating these changes in relative positions we use two different outcomes: an indicator variable for exiting poverty and an indicator variable for becoming poor. The results are presented in Tables **??** and **??**. In both tables, the third column shows our preferred fixed effects specification. In **??**, the sample is restricted to the baseline poor and the coefficients represent the probability of moving out of poverty. The results are quite different to what was observed for consumption growth among the baseline poor households in **??**. In that case, all groups experienced similar consumption growth other than the group that left agriculture after the

first period, and even for this group it was only different at the 10% level of significance. A focus on poverty exit gives a very different picture. According to the third column of **??**, the households that were engaged in the non-agricultural sector for more periods, or in the agricultural sector for fewer periods, had between a 7.4 and 10.6 percentage point (pp) higher probability of exiting poverty relative to the households that remained in agriculture for all four periods. Stated differently, poor households that worked in agriculture for three or four periods, regardless of which sector they began in, had a lower probability of exiting poverty than the other groups.

The estimates for the probability of entering poverty are presented in **??**. Here, the results are broadly consistent with what was observed for consumption growth in **??**. The households that were engaged in non-agricultural activities for two, three or four periods and the ones that left the agricultural sector after the first period continue to perform better than the control group. The only group that experienced a significantly lower probability of becoming poor, at the 1% level of significance, is the group that was employed in the non-agricultural sector for all four survey rounds. The reason for similarity in the results based on consumption growth and the probability of exiting poverty could be an overall growth experienced by a majority of Indonesian households and the resulting substantial drop in poverty.

So far the comparison of poverty entry and exit probabilities has been against the households that were employed in the agricultural sector for all four periods. In Tables **??** and **??** we present the results for tests of equality of coefficients between all possible pairs using the estimates from column 3 in Tables **??** and **??**, respectively. Households that were engaged in the agricultural sector for only one or two periods, and those that were engaged in the non-agricultural sector for at least two periods, had a significantly higher probability of exiting poverty compared to those that were agricultural for three or four periods. There is no significant difference in the probability of exiting poverty across the baseline non-agricultural households. In terms of the probability of becoming poor, **??** does not exhibit any clear pattern beyond what was observed in **??**—most groups are less likely to become poor than the group that worked in agriculture the entire time.

6 Instrumental Variable Estimation

So far we have estimated the key variable of interest after controlling for time varying observables and time invariant unobservables that could be correlated with the choice of sector and household outcomes. However, this does not account for omitted time varying factors such as changes in market opportunities in favor of a particular sector. Such time varying factors could be biasing the estimates depending on local demand for labor in different sectors. In order to correct for this potential bias, we re-estimate the effect of sectoral employment on consumption and poverty by predicting our endogenous variable using an instrument. However, the availability of just one valid instrument requires modifying the indicator variables for sectoral transition. Earlier there were eight distinct groups for which we would require at least seven valid instruments which are not feasible in our case. Thus, we update our key explanatory variables by condensing the eight groups into a single continuous variable. Below, we first discuss our instrument and then we explain the modified explanatory variable.

Instrument – Bartik Shift-Share

Household sectoral choices reflect labor supply decisions. We use a measure of local labor demand for predicting these sectoral choices. We create this measure based on the national employment growth by industry-occupation along with local industry-occupation employment shares in the baseline.[8] This instrumental variable (IV) is widely known as Bartik shift-share instrument (**?**). It is a standard IV where local labor demand is decoupled from labor supply. The basic procedure is to fix the employment shares of local industry-occupation at an initial baseline year and use the national employment growth to estimate the demand for labor in these local cells. This measure of regional labor demand shocks is likely to directly affect sectoral labor supply of households. For example, we would expect households to shift labor supply from the agricultural sector to non-agriculture if the regional labor demand from the non-agricultural sector grows faster. We create the measure of shift-share using the following formula:

[8] There are nine industries and 5 occupations. The industries are agriculture, mining/quarrying, industrial processing, electricity/gas/water, construction, wholesale/retail/restaurant, transportation/communication, finance/insurance and social services. The occupations include self-employed without family workers, self-employed with family workers, employer, employee, and family workers.

$$S_d = \sum_i \sum_o G_{io(2014-1992)} * \frac{E_{iod,1992}}{E_{d,1992}} \tag{3}$$

In this equation S_d represents the shift-share estimate for a district d. G_{io} is the national employment growth in industry i and occupation o between 1992 and 2014. A district weight is obtained by taking the ratio of $E_{iod,1992}$ and $E_{d,1992}$, i.e. the employment share of industry-occupation in a district's total employment in 1992. This formula is similar to the existing applications of the shift-share instrument (**??**). We use this instrument to predict our modified endogenous regressor which we discuss below.

Number of years in the non-agricultural sector

For exact identification of two-stage least squares estimation we cannot rely on the multiple endogenous regressors that we have been using so far. Certainly, segregating households into distinct groups is a better indicator of sectoral employment since it allows flexibility in estimation without imposition of a functional form. However, it has limitations when it comes to a two-stage least squares technique which is a stronger method for establishing causality in the case of omitted time-varying correlates. So, we redefine the key variable of interest as the number of years employed in the non-agricultural sector. To the best of our knowledge we are the first to employ this definition of sectoral employment. In most of the literature it is defined as a dummy variable of moving into or out of a sector.

In the IFLS surveys, individuals were asked information related to employment and income from the year preceding the survey-round all the way back to the previous survey year. Recall information on income is highly likely to be misreported but the same is not true for the sector of employment. We use the retrospective information on the sector of employment to create a variable for the number of years employed in the non-agricultural sector.

The distribution of households by the number of years they were employed in the non-agricultural sector is presented in **??**.[9] About 23 percent of the households were employed in the non-agricultural

[9] We assign the number of years in a sector to a household based on the retrospective information of its primary working member. We plan to further refine this definition based on the total household hours in future research.

sector during the entire twenty-two years of the survey. This group is similar to the *nag4* group in the analysis in the previous section. Similarly, about 12 percent of the households were not employed in the non-agricultural sector at all during the survey period, which is to say that they were employed in the agricultural sector for the entire 22 years. This group is similar to the *ag4* group. **??** shows that each bin of different number of years had between 2 and 8 percent of households engaged in the non-agricultural sector. Note that it is not clear from this figure whether these were continuous years or not.

It would make sense to differentiate households that have been engaged in the non-agricultural sector for continuous years from those with spells of temporary employment in it. **??** presents the share of households with continuous years and the average number of sectoral transitions for each group (defined by the number of years in the non-agricultural sector). For obvious reason the share that is continuous is one within the groups of households engaged in the non-agricultural sector for 0, 1 and 22 years. For all the other groups the pattern is not clear. For instance, among those households that were engaged in the non-agricultural sector for 2 to 8 years, the proportions that were employed continuously varied from about 0.33 to 0.88. The remaining groups in which a large proportion of households were engaged continuously in the non-agricultural sector are 14, 15, and 21 years. The proportion in the rest of the groups was mostly under 0.1 implying that most households moved in and out. Since there is no clear pattern, we do not separately analyze the households engaged in the non-agricultural sector for continuous years. The last column of **??** reports the average number of transitions between the two sectors. The average number of transitions varied between 1.3 and 3.6. Relatively higher transitions, more than three, are observed primarily within the households engaged in the non-agricultural sector for 9 to 13 years. A further refinement would be to look at a specific point in time that a household transitions from the agricultural to the non-agricultural sector. We leave this for the future work.

The last result that describes our new endogenous regressor is presented in **??**. This figure plots the average of log real per capita consumption in 1993 by the number of years in the non-agricultural sector. There is a clear upward trend that is increasing in the number of years in the non-agricultural sector. This

implies that there is selection into the number of years of employment in the non-agricultural sector which is similar to what was observed in the third section above. Households with higher baseline consumption were subsequently engaged in the non-agricultural sector for a longer period. In order to deal with this problem we employ an instrumental variable estimation strategy with household fixed effects, which is an improvement over the fixed effects estimation strategy in the previous section.

Estimation with the number of years in the non-agricultural sector

We estimate the effect of employment in the non-agricultural sector for an additional year using the following fixed effects estimation:

$$Y_{ht} = \alpha_h + \beta(Years\ in\ non\text{-}ag.)_h * t + \gamma X_{ht} + \theta t + \epsilon_{ht} \tag{4}$$

?? is same as **??** except that now we have only one β to estimate unlike the earlier case when there were separate coefficients corresponding to seven groups. For the IV estimation strategy we predict *Years in non-ag.* using the Bartik shift-share instrument in the first stage.

The results using **??** are presented in Tables **??** through **??**. **??** reports estimates for the effect of the number of years in the non-agricultural sector on log of real per capita consumption. The first column is a simple OLS estimate, similar to column 2 in the **??** earlier. On average an additional year of employment in the non-agricultural sector results in about a 0.5 percent increase in consumption at the 1% level of significance. But according to the fixed effects (FE) estimate in column 2 there is significantly lower consumption growth by about 0.9% per year of employment in the non-agricultural sector, which is around 1% per year of the 80% consumption growth for the entire sample period of 1993-2014. These two estimates are qualitatively similar to what we found in the previous section.

The last column presents the estimate from the FE-IV approach. Note that the *F-statistic* from the first stage in the last row confirms the relevance of our instrument. The coefficient on the Bartik index from the first stage estimates implies that a positive labor demand shock to one's region leads to longer

employment in the non-agricultural sector. The FE-IV estimate from the second stage has the same sign as the FE estimate but with three times the magnitude. Economically the consumption change of about 2% due to the non-agricultural employment might seem small, but when converted into a longer period this results into a change of about 20% over 10 years which is one-fourth of the consumption growth in the entire sample period.

When we divide the sample into baseline poor and non-poor households we get a very different picture (see **??**). Now, consumption growth is relatively lower only for the baseline poor households. They are relatively higher, in contrast, for those who were non-poor in the baseline. Results from a further sub-group classification, similar to that in the previous section, are presented in **??**. Here, in addition to poverty status, we also differentiate by households that were agricultural in the baseline versus those that were not. The result identifies two separate groups but in a more refined way than what was presented in **??**. We find that relatively faster growth in consumption was experienced by those who were poor but agricultural in the baseline and by those who were non-poor but non-agricultural. In contrast, those who were poor and non-agricultural in the baseline together with those who were non-poor and agricultural both experienced slower consumption growth by continuing for an additional year in the non-agricultural sector.

Consumption changes are indicative of absolute economic status, but they don't tell us about changes in poverty status. For this purpose, we also look at transitions in and out of poverty as in the previous section. From Tables **??** and **??** we find that an additional year of employment in the non-agricultural sector resulted in about a 0.7 percent increase in the probability of exiting poverty and about a 0.4 percent decrease in the probability of becoming poor. We found similar results for poverty transitions in the previous section as well.

7 Conclusion

The debate surrounding productivity differences between the agricultural and non-agricultural sectors is an old one. It goes back to the early 20th century when the Soviet government was planning collectivization of agriculture and forcing the surplus labor to move to the non-agricultural sector for rapid industrialization. It has also been a focus of the literature on economic development, particularly in terms of the roles of the agricultural and non-agricultural sectors in reducing poverty. While some studies suggest that improvements in the agricultural sector can play a major role in reducing poverty, others have advocated for policies that promote employment in the non-agricultural sector.

In this paper we revisit this question using one of the longest household panels in a developing country. Our outcomes are consumption changes and poverty transitions over a period of 22 years, between 1993 and 2014. First, we show through descriptive analysis that there is a possibility of selection of households into different sectoral groups. Households with lower baseline consumption in 1993 were subsequently engaged in agriculture for more periods and in non-agriculture for less. In order to deal with the selection problem we re-define sectoral employment in two novel ways to be consistent with two different estimation strategies—household fixed effects and instrumental variables. While the magnitudes of the estimates differ, the qualitative results are robust to the choice of method. With the estimation based on the entire sample we find lower consumption growth due to non-agricultural employment compared to employment in the agricultural sector. However, a sub-group analysis reveals that the benefits of non-agricultural employment are conditional upon other economic factors. Longer employment in the non-agricultural sector resulted in relatively higher consumption growth only for those households who were either poor and agricultural in the baseline, or non-poor and non-agricultural.

In terms of poverty transitions, the findings suggest that non-agricultural employment had a positive effect for poor and non-poor households. A longer period of employment in the non-agricultural sector resulted in a higher probability of moving out of poverty and a lower probability of becoming poor.

Overall, the non-agricultural sector does appear to be a pathway out of poverty, but moving into this sector does not always result in higher consumption growth compared to engaging in agricultural activities. It depends on the initial economic status as well as on the nature of the sectoral transitions. This is an important result for public policy. Gains from both sectors can be exploited by targeting policies specific to the initial economic status and sector. Agricultural poor households could be incentivized to diversify into productive employment in the non-agricultural sector. A different set of policies, in contrast, is required for the non-agricultural poor. It is likely that these involve human capital acquisition that permits moving up the non-agricultural employment ladder. This is an important topic for future research.

Tables and Figures

Table 1: Original Households and Their Splits

	1993	2000	2007	2014
Never Split	100.0	40.0	19.0	11.0
Split - Parents	0.0	26.4	31.0	29.1
Split - Children	0.0	23.0	34.6	38.8
Split - Other	0.0	10.6	15.4	21.1
No. of HH	7,224	10,508	13,590	15,761

Table 2: Household Characteristics by Household Type

	1993 All	2014 Parents	2014 Children
Rural	0.69	0.50	0.43
	(0.46)	(0.50)	(0.49)
Demographics:			
HH size	4.69	3.79	3.68
	(2.05)	(1.93)	(1.47)
Male HH head	0.86	0.77	0.91
	(0.35)	(0.42)	(0.29)
Male proportion in HH	0.48	0.46	0.51
	(0.19)	(0.23)	(0.22)
HH head age	45.42	54.91	36.91
	(13.92)	(13.03)	(8.83)
Median age in HH	25.93	40.01	25.24
	(14.37)	(17.13)	(8.89)
Highest school attended by HH head:			
No School	0.21	0.13	0.01
	(0.41)	(0.33)	(0.11)
Primary	0.55	0.50	0.28
	(0.50)	(0.50)	(0.45)
Jr. high	0.10	0.13	0.20
	(0.30)	(0.34)	(0.40)
Sr. high	0.10	0.17	0.34
	(0.31)	(0.38)	(0.47)
College or higher	0.03	0.07	0.15
	(0.18)	(0.26)	(0.36)
Assets:			
Owns farm land	0.36	0.37	0.22
	(0.48)	(0.48)	(0.41)
Farm land value (IDR 100,000)	125.65	451.86	335.22
	(625.46)	(803.27)	(649.65)
Farm land size (ha.)	.	0.78	0.90
	(.)	(2.08)	(3.66)
Other assets value (IDR 100,000)	301.03	638.43	465.71
	(3155.15)	(1308.00)	(908.27)

Standard deviation in parentheses.

HH: Household.

Table 3: Proportion of Households by Number of Periods in Baseline Sector

HH Type	1993 Location	1993 Sector	1993 Proportion	Rounds oberved in 1993 sector			
				1	2	3	4
Parents	Rural	Ag	35.4	14.4	23.9	38.6	23.2
		Non-Ag	19.4	14.5	22.1	32.2	31.2
	Urban	Ag	9.8	43.1	31.2	18.7	7.0
		Non-Ag	35.3	4.5	12.9	30.0	52.6
Children - Split	Rural	Ag	35.2	18.5	31.8	33.2	16.5
		Non-Ag	20.5	6.3	21.9	33.3	38.5
	Urban	Ag	8.7	47.6	31.9	13.3	7.2
		Non-Ag	35.6	2.2	9.9	29.4	58.6

Table 4: 2014 Per Capita Consumption by Number of Periods in Baseilne Sector (1000s of IDR per month)

HH Type	1993 Location	1993 Sector	Rounds oberved in 1993 sector			
			1	2	3	4
Parents	Rural	Ag	1094	931	885	762
		Non-Ag	974	996	1209	1192
	Urban	Ag	1289	1136	1180	1341
		Non-Ag	1086	1320	1507	1343
Children - Split	Rural	Ag	1185	1156	1077	935
		Non-Ag	1178	1336	1498	1397
	Urban	Ag	1486	1561	1255	1214
		Non-Ag	1399	1603	1717	1549

Table 5: Percentage Change in Per Capita Consumption Between 1993 and 2014 by Number of Periods in Baseline Sector

HH Type	1993 Location	1993 Sector	Median Consumption in 1993	Rounds oberved in 1993 sector			
				1	2	3	4
Parents	Rural	Ag	194	126	108	110	114
		Non-Ag	287	110	107	99	99
	Urban	Ag	336	81	104	75	117
		Non-Ag	401	61	69	85	87
Children - Split	Rural	Ag	185	146	133	133	127
		Non-Ag	270	128	141	129	126
	Urban	Ag	317	109	106	130	96
		Non-Ag	343	105	107	111	114

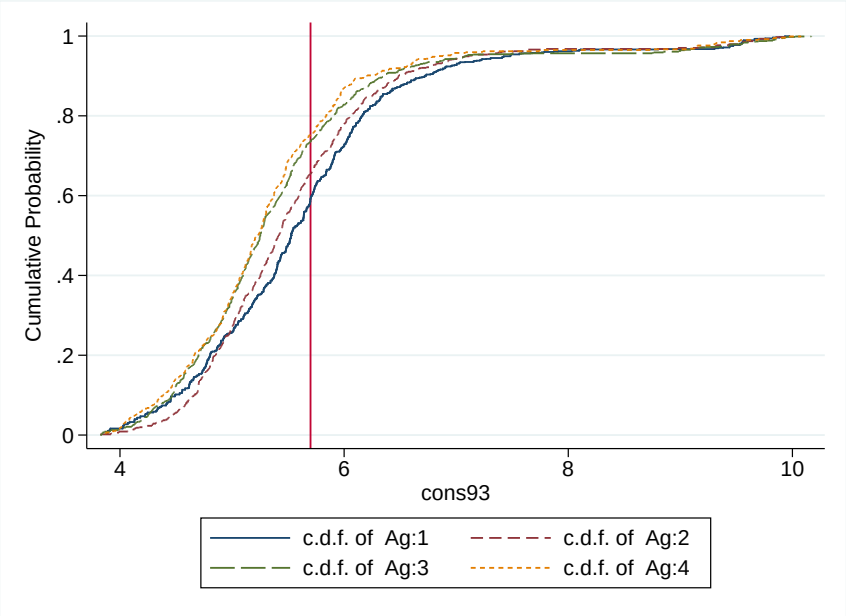
Table 6: Proportion of Poor Households in 1993 by Number of Periods in Baseline Sector

HH Type	1993 Location	1993 Sector	Rounds oberved in 1993 sector			
			1	2	3	4
Parents	Rural	Ag	65	66	73	77
		Non-Ag	58	59	46	39
	Urban	Ag	40	49	51	41
		Non-Ag	45	36	33	37
Children - Split	Rural	Ag	71	69	79	80
		Non-Ag	65	59	49	48
	Urban	Ag	45	43	66	65
		Non-Ag	61	39	40	45

CDF Plots - Parents (by sector)

Figure 1: Consumption Distribution, by Number of Rounds Observed in Agricultural Sector

(a) 1993



(b) 2014

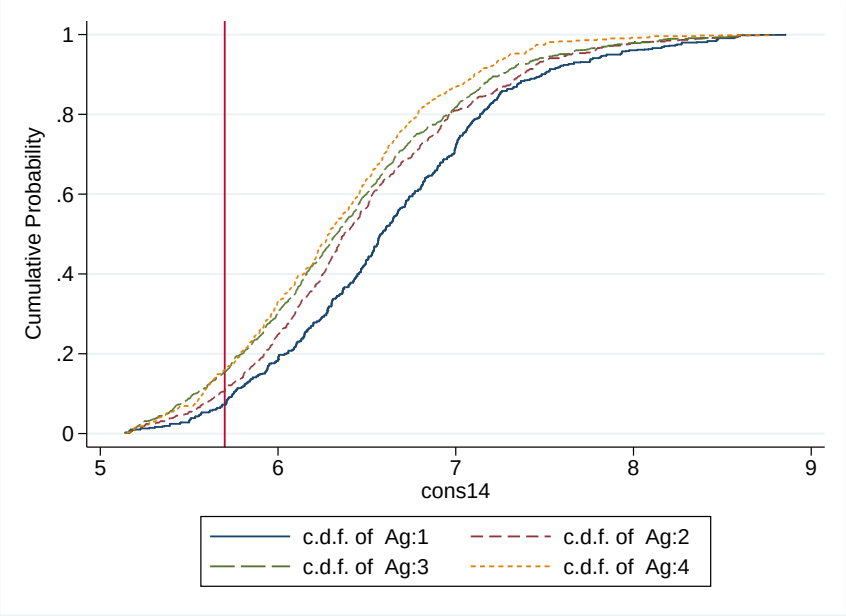
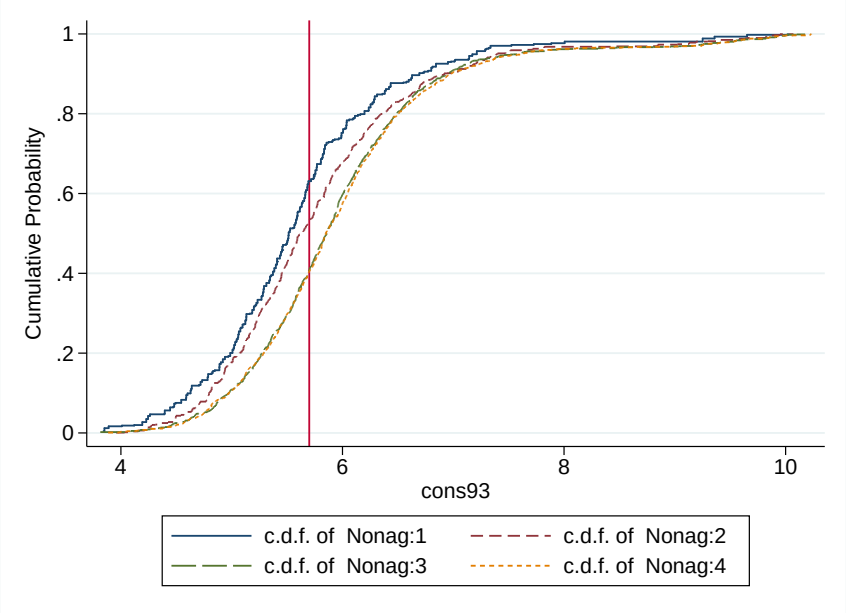


Figure 2: Consumption Distribution, by Number of Rounds Observed in Non-Agricultural Sector

(a) 1993



(b) 2014

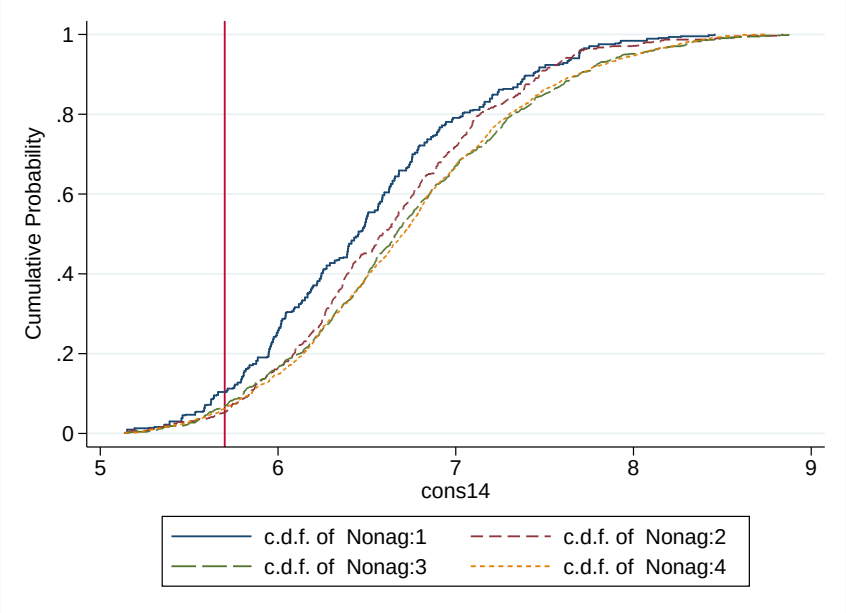


Table 7: Sectoral Transitions and Consumption Changes.
Dep. Var.: "Log of Consumption"

	OLS		Fixed Effects		
	(1)	(2)	(3)	(4) Baseline poor	(5) Baseline nonpoor
ag1	0.158***	0.128***	-0.001	0.171*	0.406**
	(0.02)	(0.02)	(0.10)	(0.09)	(0.20)
ag2	0.077***	0.066***	-0.103	-0.015	0.204
	(0.02)	(0.02)	(0.09)	(0.07)	(0.17)
ag3	0.035*	0.022	-0.080	-0.029	-0.009
	(0.02)	(0.02)	(0.08)	(0.05)	(0.17)
nag1	0.086***	0.053*	-0.214*	0.072	0.085
	(0.03)	(0.03)	(0.12)	(0.10)	(0.22)
nag2	0.133***	0.076***	-0.242**	-0.078	0.338*
	(0.02)	(0.02)	(0.10)	(0.08)	(0.18)
nag3	0.195***	0.121***	-0.233**	-0.106	0.532***
	(0.02)	(0.02)	(0.09)	(0.07)	(0.17)
nag4	0.187***	0.121***	-0.229**	-0.094	0.528***
	(0.02)	(0.02)	(0.09)	(0.07)	(0.17)
N	11103	11099	11111	5701	5410
R^2	0.55	0.58	0.32	0.75	0.06
Controls	No	Yes	Yes	Yes	Yes
Cons. Growth	0.94	0.94	0.94	1.48	0.32

Table 8: Between Group Comaprison of Coefficients in Column 4 of Table 7 (For the Baseline Poor)

Sector	ag4	ag3	ag2	ag1	nag1	nag2	nag3	nag4
ag4	-							
ag3	-	-						
ag2	-	-	-					
ag1	*	**	**	-				
nag1	-	-	-	-	-			
nag2	-	-	-	***	-	-		
nag3	-	-	-	***	-	-	-	
nag4	-	-	-	***	*	-	-	-

Table 9: Between Group Comaprison of Coefficients in Column 5 of Table 7 (For the Baseline Non-Poor)

Sector	ag4	ag3	ag2	ag1	nag1	nag2	nag3	nag4
ag4	-							
ag3	-	-						
ag2	-	-	-					
ag1	**	**	-	-				
nag1	-	-	-	*	-			
nag2	*	**	-	-	-	-		
nag3	***	***	**	-	***	*	-	
nag4	***	***	**	-	***	*	-	-

Table 10: Sectoral Transitions and Poverty Exit
Dep. Var.: "Dummy for baseline poor becoming non-poor".

	OLS		Fixed Effects
	(1)	(2)	(3)
ag1	0.051***	0.048***	0.106***
	(0.01)	(0.01)	(0.03)
ag2	0.038**	0.035**	0.086***
	(0.01)	(0.01)	(0.03)
ag3	-0.009	-0.013	-0.014
	(0.01)	(0.01)	(0.03)
nag1	0.028	0.021	0.052
	(0.02)	(0.02)	(0.04)
nag2	0.038**	0.040***	0.102***
	(0.02)	(0.01)	(0.03)
nag3	0.030**	0.020	0.074**
	(0.01)	(0.01)	(0.03)
nag4	0.037***	0.030**	0.093***
	(0.01)	(0.01)	(0.03)
N	5716	5702	5725
R^2	0.74	0.75	0.86
Controls	No	Yes	Yes

Table 11: Between group comaprison of coefficients in Column 3 of Table 8

Sector	ag4	ag3	ag2	ag1	nag1	nag2	nag3	nag4
ag4	-							
ag3	-	-						
ag2	***	***	-					
ag1	***	***	-	-				
nag1	-	-	-	-	-			
nag2	***	***	-	-	-	-		
nag3	**	***	-	-	-	-	-	
nag4	***	***	-	-	-	-	-	-

Table 12: Sectoral Transitions and Poverty Entry Dep. Var.: "Dummy for baseline non-poor becoming poor".

	OLS		Fixed Effects
	(1)	(2)	(3)
ag1	-0.030*	-0.023	-0.062*
	(0.02)	(0.02)	(0.03)
ag2	-0.016	-0.013	-0.030
	(0.02)	(0.02)	(0.04)
ag3	-0.031*	-0.028	-0.059*
	(0.02)	(0.02)	(0.04)
nag1	-0.019	-0.019	-0.048
	(0.02)	(0.02)	(0.04)
nag2	-0.043**	-0.033**	-0.079**
	(0.02)	(0.02)	(0.03)
nag3	-0.035**	-0.023	-0.062*
	(0.02)	(0.02)	(0.03)
nag4	-0.044***	-0.034**	-0.085***
	(0.02)	(0.01)	(0.03)
N	5438	5435	5435
R^2	0.04	0.05	0.07
Controls	No	Yes	Yes

Table 13: Between group comaprison of coefficients in Column 3 of Table 9

Sector	ag4	ag3	ag2	ag1	nag1	nag2	nag3	nag4
ag4	-							
ag3	*	-						
ag2	-	-	-					
ag1	*	-	-	-				
nag1	-	-	-	-	-			
nag2	**	-	**	-	-	-		
nag3	*	-	-	-	-	-	-	
nag4	***	-	**	-	-	-	*	-

Figure 3: Distribution of households by
the number of years in the non-agricultural sector

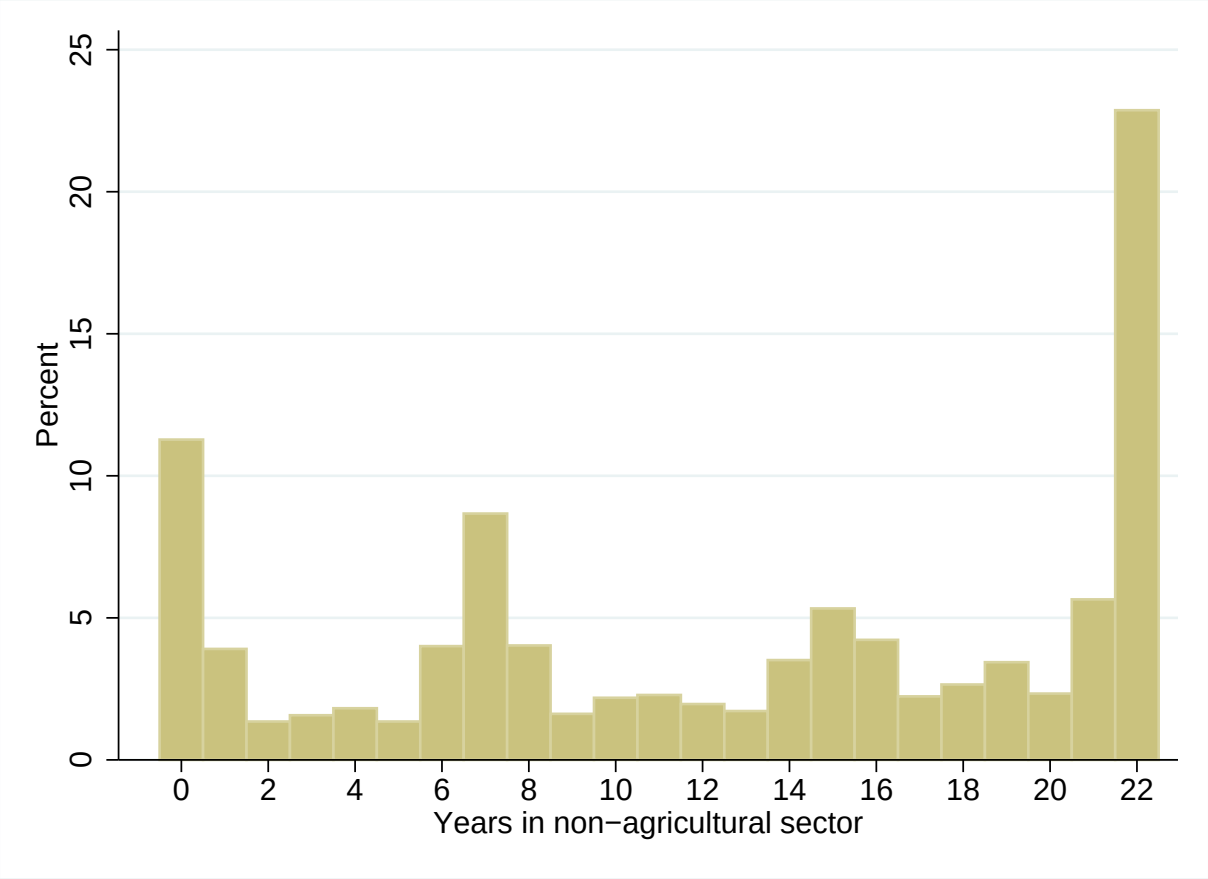


Table 14: Share of households with continuous years of employment in non-agriculture and average number of transitions between sectors

No. of years in non-agricultural sector	No. of households	Percent of HHs with continuous years	Average number of transitions
0	459	1	0
1	159	1	1.3
2	55	0.33	2.6
3	64	0.70	2.5
4	74	0.49	2.7
5	55	0.40	2.9
6	163	0.82	2.3
7	353	0.88	1.5
8	164	0.35	2.4
9	66	0.09	3.5
10	89	0.10	3.4
11	93	0.02	3.6
12	80	0.03	3.3
13	70	0.14	3.3
14	143	0.51	2.3
15	217	0.49	2.0
16	172	0.07	2.5
17	91	0.18	3.1
18	108	0.06	2.8
19	140	0.05	2.4
20	95	0.12	2.4
21	230	0.40	1.6
22	931	1	0

Figure 4: Average baseline consumption by
the number of years in the non-agricultural sector

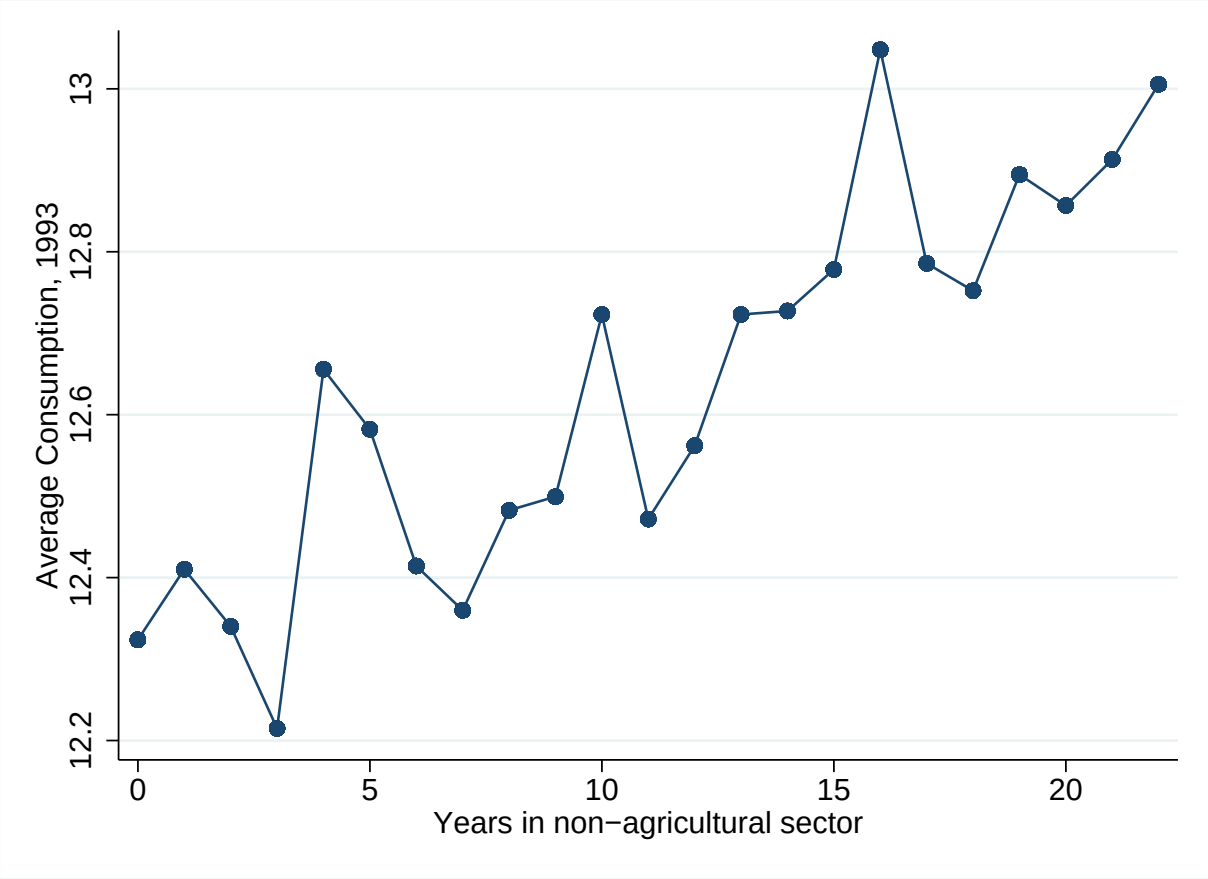


Table 15: Effect of number of years in a sector on consumption changes

	(1) OLS	(2) FE	(3) FE-IV
Non-ag. years	0.0048***	-0.0088**	-0.0245***
	(0.00)	(0.00)	(0.01)
N	8131	8132	8122
R^2	0.58	0.35	0.34
Cons. Growth	0.80	0.80	0.80
First Stage			
Bartik			2.82***
			(0.17)
F-stat			275.51
Prob.¿F			0.0000

Table 16: Effect of number of years in a sector on consumption changes (Within poor and non-poor)

	Baseline poor		Baseline non-poor	
	(1) FE	(2) FE-IV	(3) FE	(4) FE-IV
Non-ag. years	-0.0029	-0.0217***	0.0192***	0.0276**
	(0.00)	(0.01)	(0.01)	(0.01)
N	4311	4306	3822	3818
R^2	0.74	0.73	0.04	0.04
Cons. Growth	1.28	1.28	0.25	0.25
First Stage				
Bartik		3.09***		2.21***
		(0.22)		(0.17)
F-stat		198.81		164.85
Prob.¿F		0.0000		0.0000

Table 17: IV estimates of the effect of number of years in a sector on consumption changes (conditional on baseline sector and poverty status)

	Baseline poor		Basline non-poor	
	(1)	(2)	(3)	(4)
Non-ag.	0.0724***		-0.0907*	
years*baseline ag.	(0.02)		(0.05)	
Non-ag.		-0.0147***		0.0197*
years*baseline non-ag.		(0.00)		(0.01)
N	4306	4306	3816	3816
R^2	0.71	0.75	-0.04	0.06
Cons. Growth	1.28	1.28	0.25	0.25
First Stage				
Bartik	-0.78***	3.86***	-0.61***	2.81***
	(0.12)	(0.24)	(0.07)	(0.20)
F-stat	44.29	250.47	66.63	190.44
Prob.¿F	0.0000	0.0000	0.0000	0.0000

Table 18: Effect of number of years in a sector on the probability of exiting poverty

	(1) FE	(2) FE-IV
Non-ag. years	0.0042***	0.0067***
	(0.00)	(0.00)
N	4311	4306
R^2	0.86	0.86
First Stage		
Bartik		3.08***
		(0.22)
F-stat		193.60
Prob.¿F		0.0000

Table 19: Effect of number of years in a sector on the probability of becoming poor

	(1) FE	(2) FE-IV
Non-ag. years	-0.0009	-0.0042**
	(0.00)	(0.00)
N	3821	3816
R^2	0.07	0.06
First Stage		
Bartik		2.20***
		(0.17)
F-stat		169.07
Prob.¿F		0.0000