

Identifying determinants of income inequality in the presence of multiple income sources: the case of Korean farm households

Ayal Kimhi¹, Yuko Arayama², Jong Moo Kim³

¹ Department of Agricultural Economics and Management, The Hebrew University of Jerusalem, Rehovot, Israel, ayal.kimhi@mail.huji.ac.il.

² School of Economics, Nagoya University, Nagoya, Japan, arayama@soec.nagoya-u.ac.jp.

³ School of Economics, Sung Kyun Kwan University, Seoul, Korea, jmkim100@skku.edu.



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Abstract

We extend the existing regression-based inequality decomposition methods to account for different income sources and different income regimes, and adequately correct for selectivity into the different income regimes. We apply these extensions to data on Korean farm households, and find that they lead to different and more informative conclusions. We also find that the correction for selectivity is essential. Overall, we found that non-farm labor income is an equalizing source of income while farm income is disequalizing. Our results imply that a continued increase in the variability of landholding distribution could worsen income inequality among farm households in Korea.

Introduction

The impact on inequality of the diversification of income sources by farm households has received some attention in the literature in the last decades (e.g., de Janvri and Sadoulet, 2001). As farmers worldwide are gradually shifting to part-time off-farm work, it is an empirical question whether this raises or lowers income inequality among them. It could decrease inequality if off-farm income compensates for low farm income, but it could increase inequality if the more qualified farmers earn more off the farm. For policy purposes, it is not sufficient to know whether off-farm income increases or decreases inequality, because we need to know the impact on inequality of various determinants of income, which are sensitive to policy measures. These include education, landholdings, etc.

The purpose of this research is to offer an empirical framework for identifying determinants of income inequality in societies in which significant fractions of households have multiple income sources. This is relevant for many low- and middle-income countries, and in particular for agricultural societies. The usefulness of this framework will be demonstrated using data on farm households in Korea. Korean agriculture has experienced structural transformations similar to many other developed economies. In particular, rural-to-urban migration resulted in a massive loss of rural population, which declined from about a third in 1970 to less than 10% in 2000. About a third of remaining farm households are engaged in off-farm labor activities, and the fraction of off-farm income in total farm-household income increases over time. Farm size disparities are also increasing over the years. The Gini index of per-capita income inequality among farm households (0.42) is larger now than among all Korean households (0.32).

Methodology

Two major empirical methods are used to study the sources and determinants of income inequality among Korean farm households. The first is inequality decomposition by income sources, which provides evidence on the relative importance of various income sources to inequality (Shorrocks, 1983). When the contribution of an income source to inequality is positive, an increase in inequality within that income source would lead to a higher overall income inequality (Kimhi, 2011). The method also allows the computation of the impact on the Gini index of inequality of a uniform increase in income from each source (Lerman and Yitzhaki, 1985). The second method is regression-based inequality decomposition, which allows the quantification of the contributions of various factors, which affect household income, to income inequality. In particular, a linear regression of income on these factors is estimated, and each factor multiplied by its estimated coefficient is treated as an “income source”, and then the method of inequality decomposition by income source can be applied (Kimhi, 2010). The above decomposition techniques could be combined and extended by breaking down the inequality contributions of the income determinants by income source (Adams, 2001). We do this by estimating a separate regression for each income source while correcting for selectivity, and then decomposing source-specific inequality by income determinants.

Data and results

We use data from the 2003 nationally-representative farm book-keeping survey that included 3,200 farm households. A farm household is defined as a household engaged in farming for the purpose of making a living, in which the farm operator manages at least 300 pyeong (about 0.1 ha) of cultivated land and generates annual sales of at least 500,000 Won (roughly \$420). Excluded are single-person households, foreigners, and those employing more than five full-time employees. The survey provides information about household income from various farm and non-farm sources, as well as assets, expenditures, and demographics.

It was found that farm business income, which accounts for 42% of total income, is responsible for 58% of total income inequality (table 1). On the other hand, off-farm labor income, which accounts for 20% of total income, is responsible for only 12% of inequality. This implies that off-farm labor income is an inequality-decreasing income source. In particular, marginal effect computations show that a one-percent uniform increase in off-farm income is expected to reduce the Gini coefficient by 0.033%.

Table 1. Sources of Farm household Income and their Contribution to Inequality

Income Component	Income Share	Proportional Contribution to Gini	Marginal Contribution to Gini
Farm business income	0.4247	0.581	0.1560 (0.0148) **
Nonfarm business income	0.0778	0.083	0.0057 (0.0105)
Nonfarm labor income	0.1987	0.118	-0.0809 (0.0075) **
Capital income	0.0300	0.023	-0.0069 (0.0023) **
Transfer income	0.0846	0.045	-0.0396 (0.0035) **
Irregular income	0.1843	0.150	-0.0343 (0.0078) **

Notes:

bootstrapped standard errors in parentheses.

* significant at 5%; ** significant at 1%.

It was found that landholdings explain more than 4% of income inequality, which is almost a quarter of the explained part of income inequality. This implies that an increase in landholdings inequality is likely to increase income inequality. However, a uniform one-percent increase in landholdings is expected to reduce the Gini by 0.02%. Family size also explains more than 4% of income inequality, and a uniform one-percent increase in family size is expected to increase the Gini by 0.16%. Family composition explains more than 6% of income inequality. Education explains slightly over 1% of income inequality, and an increase in education is expected to reduce inequality.

Breaking down the inequality contributions by income source (table 3), we find that landholdings contribute to income inequality mostly through farm income, which makes much sense. Family size also contributes to inequality mostly through farm income, while family composition contributes mostly through non-farm labor income. Location also contributes to income inequality mostly through non-farm labor income.

Discussion

It was found that family size and land ownership contribute to income inequality mostly through farm income, while family composition contributes mostly through non-farm labor income. The conclusion is that the process of farmland concentration and farm size polarization is likely to increase income inequality within the farm sector in Korea. Non-farm labor opportunities could weaken or even reverse this trend.

Table 2. Regression-Based Inequality Decomposition Results

Variable	Regression Coefficient	Student-t Statistic	Inequality Contribution	Income Share	Marginal Contribution to Gini
Female head	-1.146	-1.50	0.094	-0.004	0.002
Age	0.504	3.27**	-2.834	3.090	-1.293
Age squared/100	-0.449	-3.28**	5.007	-1.619	0.692
Elementary school	0.628	1.31	0.023	0.027	-0.011
Middle school	1.183	2.11*	0.111	0.024	-0.009
High school	1.488	2.61**	0.371	0.036	-0.013
Higher education	4.188	4.80**	0.613	0.017	-0.005
Family size	-0.988	-8.10**	4.214	-0.331	0.155
Fraction adult males	4.219	5.30**	3.187	0.127	-0.039
Fraction adult females	4.151	4.89**	2.926	0.131	-0.042
Landless	-3.156	-4.43**	1.245	-0.014	0.011
Land owned per capita	1.532	7.72**	2.933	0.076	-0.019
Center-east	-0.317	-0.81	-0.055	-0.011	0.004
South-west	-1.767	-4.71	0.445	-0.081	0.035
Intercept	-4.487	-1.09	0.000	-0.468	0.194
Residual			81.721	0	0.339

Notes:

$R^2=12.87\%$.

* coefficient significant at 5%; ** coefficient significant at 1%.

Table 3. Regression-Based Source-Specific Contributions to Inequality

Variable	Total income	Farm income	Non-farm business income	Non-farm labor income	Capital income	Transfer income
Female head	0.094	0.819	0.013	0.166	0.000	-0.004
Age	-2.834	0.204	0.584	-8.220	0.480	2.061
Age squared/100	5.007	0.627	0.712	8.982	-0.087	0.397
Elementary school	0.023	0.143	-0.005	0.144	-0.015	0.277
Middle school	0.111	0.037	0.077	-0.069	-0.003	-0.116
High school	0.371	0.056	0.023	0.036	0.069	-0.616
Higher education	0.613	-0.042	-0.010	-0.006	0.167	-0.142
Family size	4.214	2.628	0.052	1.341	0.098	0.899
Fraction adult males	3.187	0.416	0.528	2.812	0.028	0.410
Fraction adult females	2.926	0.738	0.229	1.015	0.002	0.056
Landless	1.245	0.595	0.139	-0.027	0.357	0.092
Land owned per capita	2.933	4.315	0.277	0.848	0.018	0.007
Center-east	-0.055	0.206	-0.016	0.112	0.086	0.046
South-west	0.445	-0.036	0.183	0.325	-0.001	0.008
Intercept	0.000	0.000	0.000	0.000	0.000	0.000
Residual	81.721	a	a	a	a	a

a. Source-specific contributions are computed as percentages of overall inequality, hence they do not sum up to total source-specific inequality.

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