A Cross-Country Comparison of Rural Income Generating Activities

BENJAMIN DAVIS
United Nations Children's Fund, Nairobi, Kenya

PAUL WINTERS
American University, Washington, DC, United States

GERO CARLETTO
The World Bank, Washington, DC, United States

KATIA COVARRUBIAS, ESTEBAN J. QUIÑONES, ALBERTO ZEZZA, KOSTAS STAMOULIS,
CARLO AZZARRI and STEFANIA DIGIUSEPPE [*]
Food and Agriculture Organization, Rome, Italy

Summary. — This paper uses a newly constructed cross-country database composed of comparable income aggregates to examine the full range of income generating activities carried out by rural households. The analysis paints a clear picture of multiple activities across rural space in countries on all four continents, though less so in the included African countries. For most countries the largest share of income stems from off-farm activities, and the largest share of households has diversified sources of income. Diversification, not specialization, is the norm. Nevertheless, agricultural sources of income remain critically important for rural livelihoods in all countries.
© 2009 Elsevier Ltd. All rights reserved.

Key words — rural non-farm income, income diversification, household surveys, cross-country comparison

1. INTRODUCTION

A widely accepted tenet of the development literature is that, in the process of structural economic transformation that accompanies economic development, the farm sector as a share of the country's GDP will decline as a country's GDP grows (Chenery & Syrquin, 1975). In rural areas, it is implied that a shrinking agricultural sector and expanding rural non-farm (RNF) activities, as well as a changing definition of rural itself, should be viewed as likely features of economic development. The available empirical evidence unequivocally points to the existence of a large RNF economy.[1] While few data sources exist that allow for consistent measurement of changes in RNF income and employment over time, available information points to an increasing role for RNF activities.[2]

It would be misleading, however, to see this growth in RNF activities in isolation from agriculture, as both are linked through investment, production, and consumption throughout the rural economy, and both form part of complex livelihood strategies adopted by rural households. Income diversification is the norm among rural households, and different income generating activities offer alternative pathways out of poverty for households as well as a mechanism for managing risk in an uncertain environment. It is therefore useful, when thinking about rural development, to think of the full range of rural income generating activities, both agricultural and non-agricultural, carried out by rural households. This can allow a better understanding of the relationship between the various economic activities that take place in the rural space and of their implications for economic growth and poverty reduction.

FAO (1998) characterizes three broad "stages" of transformation of the rural economy. In the first stage both production and consumption linkages between the farm and non-farm sectors are very strong and rural–urban links still relatively weak. During this stage, non-farm activities tend to be mainly in areas upstream or downstream from agriculture. The second stage is characterized by a lower share of households directly dependent on agriculture, and greater rural–urban links. Services take off more strongly and new activities like tourism are started, while labor-intensive manufacturing in rural areas finds increasing competition from more capital intensive urban enterprises and imported goods. The third stage is characterized by a maturing of these trends: stronger links with the urban sector, with migration, employment and income increasingly generated in sectors with little or no relation to agriculture.

In this context, the challenge for policy makers is how to assure that the growth of the RNF "sector" can be best harnessed to the advantage of poor rural households and how to identify the mechanisms to best exploit synergies across agricultural and non-agricultural sectors. The growing consensus is that although agriculture continues to play a central role in rural development, the promotion of complementary engines of rural growth is of paramount importance. Yet, the

poverty and inequality implications of promoting RNF activities are not straightforward. They depend on the access of the poor to RNF activities, on the potential returns to RNF activities, and on the share of RNF activities in total income. Just as for agriculture, the ability of poor individuals and/or households to participate in potentially more lucrative RNF activities may be limited given the barriers to entry in terms of liquidity or human capital constraints. When this is the case, a vicious circle may be established whereby poor households get relegated to low-return RNF activities that serve more as coping strategies than as a way out of poverty. Promotion of RNF activities may then leave poor households behind and exacerbate rural income inequality.

The underlying objective of this paper is to analyze rural income generating activities in order to contribute to the design of more effective and better targeted rural development policies. More specifically, we will examine the full range of rural income generating activities carried out by rural households in order to determine: (1) the relative importance of the gamut of income generating activities in general and across wealth categories, at the level of both the rural economy and the rural household; (2) the relative importance of diversification *versus* specialization in rural income generating activities at the household level; and (3) the influence of rural income generating activities on poverty and inequality.

While there has been some focus in the recent years on RNF activities in the development literature, a number of limitations suggest the need for further work. First, most of the previous literature has focused on diversification into RNF activities at the level of the rural economy. This is usually done by gauging the shares of different income sources over the rural population or over groups of rural households. This paper instead stresses as well the diversification and specialization of income generating strategies at the level of the rural household.

Second, the methodologies of past efforts have typically not been comparable across countries. For example, Lanjouw and Feder (2001) note that much of the observed variation among countries in the share of RNF activities stems from weaknesses in the data being used since for many countries data are outdated or missing altogether while for others, the only available data are often case studies of limited geographical reach and therefore not nationally representative. For those other countries for which nationally representative data and fairly recent country-specific studies are available, such as the World Bank poverty assessments, idiosyncratic methodologies are typically used which are not comparable with similar studies in other countries, as individual researchers tend to use definitions and methods tailored for a given country.

In order to address directly these data concerns, this paper takes advantage of a newly constructed cross-country database composed of comparable variables and aggregates from selected high-quality household surveys, which we refer to as the Rural Income Generating Activities (RIGA) database. The RIGA database allows for a systematic analysis of data from a range of countries and thus greater confidence in the comparability of results. Most importantly, these data permit cross-country comparisons which have not been sufficiently examined in the literature, due to lack of suitably comparable data, such as by level of development.

The paper continues as follows. In Section 2, we present and describe the construction of the RIGA database. In Section 3, we analyze the participation of rural households in income generating activities and the share of income from each activity in household income, over all households and by expenditure quintile. In Section 4, we move from the level of rural space to that of the rural household, examining patterns of diversification and specialization in rural income generating activities, again over all households, and by expenditure quintile. In Section 5, we decompose income inequality by income source, for all countries, using the Theil and Gini indices, followed by conclusions in Section 6.

2. DESCRIPTION OF THE RIGA DATABASE

The RIGA database is constructed from a pool of several dozen Living Standards Measurement Study (LSMS) and from other multi-purpose household surveys made available by the World Bank through a joint project with the Food and Agriculture Organization of the United Nations (FAO).[3] From this pool of possible surveys, the choice of particular countries was guided by the desire to ensure geographic coverage across the four principal developing regions—Asia, Africa, Eastern Europe, and Latin America—as well as adequate quality and sufficient comparability in codification and nomenclatures. Furthermore, an effort was made to include a number of IDA (International Development Association) countries as these represent developing countries with higher levels of poverty and are therefore of particular interest to the development and poverty reduction debate. Using these criteria, survey data from the list of countries in Table 1 were utilized. Each survey is representative for both urban and rural areas; only the rural sample was used for this paper. While clearly not representative of all developing countries, the list does cover a significant range of countries, regions, and levels of development and has proven useful in providing insight into the income generating activities of rural households in the developing world.

The construction of income aggregates that are comparable across countries was the principal output of the RIGA database,[4] an endeavor that required resolving a host of issues in order to establish a consistent methodology. The first key choice relates to the definition of rural and, correspondingly, which households are considered rural households for the analysis. Countries have their own unique mechanisms of defining what constitutes rural. Thus, government definitions tend not to be comparable across countries and this may play some part in explaining cross-country differences. On the other hand, it may make sense to use government definitions since presumably they reflect local information about what constitutes rural and are used to administer government programs. While recognizing the potential problem with using country-specific definitions of rural, the available survey data do not allow for a straightforward alternative definition[5] and therefore the government definition of what constitutes rurality is used. One additional caveat regarding rurality is that with the information available we identify rurality *via* the domicile of the household, and not the location of the job. It is probable that a number of rural labor activities identified in this report are located in nearby urban areas.[6]

The second choice is to determine how to disaggregate income data in a manner that is consistent across countries. One common initial division is between agricultural and non-agricultural activities although defining this distinction in a concise manner is potentially problematic. A second common division of income, for both agriculture and non-agricultural activities, is between wage employment and self-employment. Additionally, transfer payments, either from public or private sources may be included. For this study, seven basic categories of income have been identified: (1) crop production; (2) livestock production; (3) agricultural wage

Table 1. *Countries included in the analysis*

| Country | Name of survey | Year collected | Number of observations | | | *Per capita* GDP, PPP |
			Total	Rural	Urban	2005 USD
Eastern Europe						
Albania	Living Standards Measurement Study	2005	3,640	1,640	2,000	5,463
Bulgaria	Integrated Household Survey	2001	2,633	877	1,756	7,348
Africa						
Ghana	Ghana Living Standards Survey Round 3	1998	5,998	3,799	2,199	982
Madagascar	Enquête Permanente Auprès des Ménages	1993–94	4,505	2,653	1,852	862
Malawi	Integrated Household Survey-2	2004–05	11,280	9,840	1,440	650
Nigeria	Living Standards Survey	2004	17,425	13,634	3,791	1,682
Latin America						
Guatemala	Encuesta de Condiciones de Vida	2000	7,276	3,852	3,424	3,966
Ecuador	Estudio de Condiciones de Vida	1995	5,810	2,532	3,278	5,658
Nicaragua	Encuesta de Medición de Niveles de Vida	2001	4,191	1,839	2,352	2,145
Panama	Encuesta de Niveles de Vida	2003	6,363	2,945	3,418	8,267
Asia						
Bangladesh	Household Income–Expenditure Survey	2000	7,440	5,040	2,400	901
Indonesia	Family Life Survey-Wave 3	2000	7,216	3,786	3,430	2,724
Nepal	Living Standards Survey I	2003	5,071	3,655	1,416	926
Pakistan	Integrated Household Survey	2001	15,927	9,978	5,949	1,923
Tajikistan	Living Standards Survey	2003	4,160	2,640	1,520	1,283
Vietnam	Living Standards Survey	1997–98	6,002	4,272	1,730	1,448

employment, (4) non-agricultural wage employment; (5) non-agricultural self-employment; (6) transfer; and (7) other.[7] For some of the analysis, transfer income is further divided into public and private sources. In addition to this classification, non-agricultural wage employment income and non-agricultural self-employment income have been further disaggregated by industry using standard industrial codes.

Although these seven categories form the basis of the analysis, in certain cases these are aggregated into higher level groupings depending on the type of analysis that is carried out. In one grouping, we distinguish between *agricultural* (crop, livestock, and agricultural wage income) and *non-agricultural* activities (non-agricultural wage, non-agricultural self-employment, transfer, and other income). In a second grouping, we refer to crop and livestock income as *on-farm* activities, non-agricultural wage and self-employment income as *non-farm* activities, and leave agricultural wage employment, transfer, and other income as separate categories. Finally, we also use the concept of *off-farm* activities, which includes all non-agricultural activities plus agricultural wage labor.

The third choice relates to whether, in the analysis, income shares should be analyzed as the mean of income shares or as the share of mean income. In the first case, income shares are calculated for each household, and then the mean of the household shares of each type of income (MS_i) is calculated, as shown below, with income source i, total income Y, household h, and the number of households n. In the second case (SH_i) shown below, income shares are calculated as the share of a given source of income over a given group of households

$$MS_i = \frac{\sum_{h=1}^{n} \frac{y_{ih}}{Y_h}}{n}, \quad SH_i = \frac{\sum_{h=1}^{n} y_{ih}}{\sum_{h=1}^{n} Y_h}.$$

The two measures have different meanings. The *mean of shares* reflects more accurately the household-level diversification strategy, regardless of the magnitude of income; while the *share of means* reflects the importance of a given income source in the aggregate income of rural households in general

or for any given group of households. If the distribution of the shares of a given source of income is constant over the income distribution, the two measures give similar results. If however, for example, those households with the highest share of crop income are also the households with the highest quantity of crop income, then the share of agricultural income in total income (over a given group of households) using the share of means will be greater than the value using the mean of shares.

We calculated income shares by both measures and indeed, for some countries the results are not the same.[8] For approximately half the countries, taking the share of means results in a lower share of agricultural income, most of which is driven by lower shares of crop income. For these countries, households with the highest share of crop income have relatively small quantities of crop income, that is, they are smaller, subsistence, farmers. For the remaining countries, the results are approximately the same. Given our emphasis on the household as the basic unit of analysis, we use the mean of shares throughout this paper.

The difference in the manner in which shares are described and in which rural income generating capacities in general are discussed has led to some confusion over the terminology used in the literature. In particular, the term diversification is often used to describe the rural economy as a whole when there is a clear range of activities from which rural households obtain income. But a diversified rural economy does not necessarily imply diversified households—that is, households that participate in and obtain income from a range of economic activities. It may be the case that households tend to specialize in certain activities although the rural economy as a whole is economically diverse. To avoid this confusion, we use the terms rural diversification to suggest diversification of the overall rural economy and household diversification to refer to household behavior.

For each of the countries listed in Table 1, income aggregates for rural households were created as described. Furthermore, a comparable set of household variables—including demographic characteristics, asset endowments, and access

to infrastructure and institutions—was created in order to facilitate the analysis of the data. As with the income aggregates, these variables were also created in a comparable manner across countries. As an indicator of welfare levels we used the consumption expenditure aggregates that accompanied the datasets, each of which had been constructed in a largely comparable fashion according to widely accepted and internationally recognized criteria. [9] The final set of data used for this analysis includes 16 nationally representative, comparable datasets with a consistent set of variables. [10]

3. RURAL DIVERSIFICATION OF INCOME SOURCES

Much of the literature on RNF activities focuses on the diversification of income sources over rural space, or over groups of households within the rural space. To examine this rural diversification, we begin by looking at the share of income from, and household participation in, rural income generating activities. Overall, as would be expected, the share of rural on-farm income falls, and the share of rural non-agricultural income increases, with increasing levels of GDP *per capita* (Figure 1). Off-farm sources of income account for 50% of total income in almost two-thirds of the countries of the dataset (Table 2). This is true for all the countries from Eastern Europe and Latin America and for all but Vietnam among the Asian countries. On-farm sources of income tend to be more important for the African countries, where the share ranges from 59% to 78% of total income. Joining together income from agricultural wage labor with crop and livestock production, around half (9 of 16) of the countries in this dataset had a majority of income from agricultural sources.

While RNF activities are important, thus meriting the increased attention which they have received in the literature and policy debates, the vast majority of rural households among the RIGA dataset countries still maintain on-farm production. As can be seen in Table 3, in all countries but one (Indonesia), about two-thirds or more of rural households participate in on-farm activities and in 13 countries the percentage is above 80%. [11] While for some of these households the importance of this participation is relatively minor, since it includes holding a few small animals or patio crop production—an issue we take up later in the section on household diversification and specialization—agriculture continues to play a fundamental role in rural household economic portfolios across countries. For non-farm activities and transfers, the range of participation ratios across countries is much greater, though in both cases for most countries the rate is at least 30%.

In contrast, relatively few rural households in the two Eastern European countries, as well as in Ghana and Nigeria, work in agricultural wage labor, while 20–40% do so in the Latin American and Asian countries and Madagascar. Over 50% work in agricultural wage labor in Malawi, the highest of all the countries in our dataset. It is worth noting that how agricultural wage income and employment are an activity for which it is hard to discern any clear relationship with GDP levels, or a hint of a regional pattern. It seems that for this activity, the country-specific institutions and customs determine its relative importance. In Albania, for instance, where a social stigma is attached to agricultural wage workers and a peculiar, egalitarian land reform process took place less than two decades ago, agricultural wage employment is almost non-existent. In Malawi on the contrary, where casual *ganyu* labor on other farms is traditionally widespread, the percentage participation is the highest among the countries in our sample.

Overall, the high incidence of participation in both agricultural and non-agricultural activities points to highly diversified rural income generating portfolios at the household level regardless of the level of development. We explore the extent of this household-level diversification in Section 3.

(a) *Disaggregation of rural income generating activities*

Participation rates in non-farm activities are further disaggregated into non-agricultural wage employment and self-employment in Table 3. While the rates of self-employment participation are lowest for the two countries in the Eastern European region and Tajikistan, in the other countries participation rates are generally high for this category and either exceed or mirror those for non-agricultural wage employment. Wage employment is clearly important for most countries, with approximately more than 30–50% of households participating in all countries with the exception of the African countries, where the range is from 9% to 18%.

The non-agricultural wage and self-employment component of non-farm income can be further broken down indicating which industries tend to be more important in the non-farm economy. We identify nine sectors in wage employment—mining, manufacturing, utilities, construction, commerce, transport, finance, services, and other—and 10 in self-employment with the addition of agriculture and fish processing. These sectors could be even further disaggregated revealing a broad range of industrial activities in which households are occupied. Focusing on the broader industrial sectors and considering non-agricultural wage and self-employment activities together, Figure 2 shows the share of non-farm income in the four most common sectors. Commerce and services in most cases represent the largest sectors of RNF income with a simple mean across countries of 27% and 45% of non-farm income. Manufacturing is next in importance followed by construction, the former apparently decreasing in importance as development progresses. Services are particularly important in the Latin American countries, while commerce is more important in the two Eastern European countries.

The relative importance of types of RNF activities differs by whether they are wage activity or self-employment activities. As seen in the same figure, services, primarily jobs in the public sector, are particularly important in non-agricultural wage employment, holding the greatest share of income in almost all countries. This is followed by manufacturing and then com-
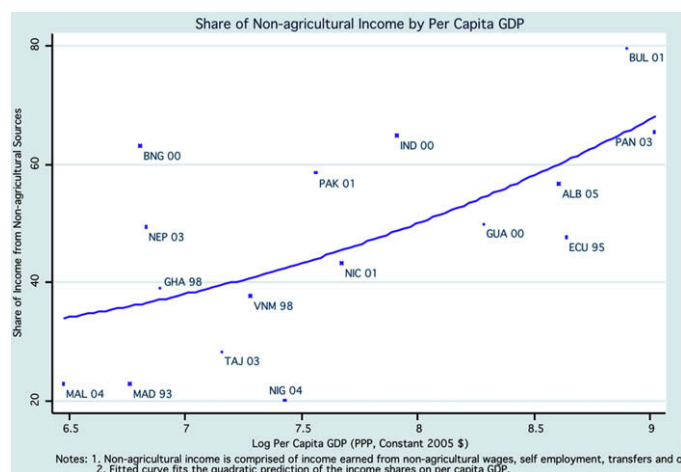

Figure 1. *Share of rural non-agricultural income by per capita GDP.*

Table 2. *Share of rural income generating activities in total income ("Means of Shares")*

Country and year	Per capita GDP, PPP 2005 USD	Group I							Group II		Group III				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1) + (2) + (3)	(4) + (5) + (6) + (7)	(1) + (2)	(4) + (5)	(6) + (7)	(3) + (4) + (5) + (6) + (7)	
		Agriculture–crops (%)	Agriculture – livestock (%)	Agricultural wage employment (%)	Non-farm wage employment (%)	Non-farm self-employment (%)	Transfers (%)	Other (%)	Agricultural total (%)	Non-agricultural total (%)	On-farm total (%)	Non-farm total (%)	Transfers & other (%)	Off-farm total (%)	
Malawi 2004	649.51	56.1	9.4	11.4	7.4	8.7	6.6	0.3	77.0	23.0	65.5	16.1	7.0	34.5	100.0
Madagascar 1993	861.53	57.3	13.2	6.5	6.1	8.5	6.2	2.2	77.0	23.0	70.5	14.6	8.4	29.5	100.0
Bangladesh 2000	901.33	15.5	1.2	20.2	19.9	16.4	13.4	13.4	36.9	63.1	16.6	36.4	26.8	83.4	100.0
Nepal 2003	926.36	20.3	17.7	12.6	21.1	9.2	16.8	2.4	50.6	49.4	38.0	30.2	19.2	62.0	100.0
Ghana 1998	981.71	55.0	4.4	1.4	9.6	20.5	8.5	0.5	60.9	39.1	59.4	30.1	9.0	40.6	100.0
Tajikistan 2003	1282.80	37.3	17.4	16.9	11.5	1.1	15.5	0.3	71.6	28.4	54.7	12.6	15.7	45.3	100.0
Vietnam 1998	1448.27	41.5	14.8	5.9	9.2	21.2	7.0	0.3	62.2	37.8	56.3	30.5	7.3	43.7	100.0
Nigeria 2004	1681.93	73.5	4.3	2.0	7.1	10.8	1.7	0.6	79.8	20.2	77.8	17.8	2.4	22.2	100.0
Pakistan 2001	1922.71	21.2	11.4	8.9	28.8	10.7	14.5	4.6	41.4	58.6	32.6	39.5	19.1	67.4	100.0
Nicaragua 2001	2145.27	21.1	14.3	21.4	21.3	11.1	6.1	4.6	56.9	43.1	35.4	32.5	10.7	64.6	100.0
Indonesia 2000	2724.16	23.8	2.1	9.7	20.3	17.6	22.9	3.6	35.5	64.5	25.8	37.9	26.5	74.2	100.0
Guatemala 2000	3965.69	27.6	2.6	19.9	20.2	12.4	16.9	0.5	50.1	49.9	30.2	32.6	17.3	69.8	100.0
Albania 2005	5462.94	17.2	23.3	2.8	18.1	7.4	28.0	3.2	43.3	56.7	40.5	25.5	31.2	59.5	100.0
Ecuador 1995	5657.64	9.0	3.4	10.3	39.1	23.2	8.9	6.0	22.8	77.2	12.5	62.3	14.9	87.5	100.0
Bulgaria 2001	7347.96	3.9	12.0	4.6	16.5	1.3	60.5	1.2	20.5	79.5	15.9	17.8	61.7	84.1	100.0
Panama 2003	8267.19	15.8	2.0	16.7	27.1	22.6	14.6	1.2	34.6	65.4	17.8	49.7	15.7	82.2	100.0
Simple mean		30.0	10.3	9.6	15.7	13.6	14.1	2.9	49.9	46.4	40.3	29.3	17.0	56.0	
Minimum		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum		73.5	33.8	24.3	29.2	37.6	60.5	23.5	79.8	79.5	77.8	53.4	61.7	84.1	

Table 3. *Participation in rural income generating activities*

Country and year	Income-generating activity														
	Group I							Group II		Group III				Group IV	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1) + (2) + (3)	(4) + (5) + (6) + (7)	(1) + (2)	(4) + (5)	(6) + (7)	(3) + (4) + (5) + (6) + (7)		
	Agriculture-Crops (%)	Agriculture–livestock (%)	Agricultural wage employment (%)	Non-farm wage employment (%)	Non-farm self-employment (%)	Transfers (%)	Other (%)	Agricultural total (%)	Non-agricultural total (%)	On-farm total (%)	Non-farm total (%)	Transfers & other (%)	Off-farm total (%)	Transfers Public (%)	Transfers private (%)
Malawi 2004	96.3	65.3	54.8	16.0	29.8	88.9	6.6	97.0	93.4	95.0	41.7	89.6	97.1	54.1	77.4
Madagascar 1993	93.4	78.0	26.0	18.2	21.3	43.5	11.4	96.1	67.0	95.4	35.5	49.6	75.0	0.3	43.3
Bangladesh 2000	81.6	39.1	35.4	31.9	25.7	48.5	55.0	87.1	90.5	79.0	53.1	74.5	97.4	32.5	26.5
Nepal 2003	93.4	86.2	38.2	36.0	21.3	38.3	27.4	97.8	82.2	96.2	52.3	52.8	90.9	4.3	34.2
Ghana 1998	87.8	51.4	3.7	17.7	40.1	41.3	13.5	88.9	74.7	88.7	49.3	48.5	75.9	1.9	40.4
Tajikistan 2003	88.5	68.9	49.4	29.3	2.9	58.0	0.9	95.3	72.7	93.1	31.6	58.4	91.1	41.5	32.4
Vietnam 1998	97.8	90.8	20.1	31.9	38.3	36.4	19.3	99.0	79.7	98.5	58.6	48.4	85.8	19.6	21.9
Nigeria 2004	88.7	44.1	3.8	9.3	19.2	6.3	4.2	90.2	32.7	90.0	26.1	9.8	35.4	1.3	5.4
Pakistan 2001	40.5	64.6	20.0	48.5	17.8	31.4	15.7	74.5	78.1	69.7	57.9	41.2	84.8	14.5	20.5
Nicaragua 2001	84.8	71.9	39.4	35.2	26.2	38.7	19.5	95.0	72.8	91.6	51.9	42.8	87.3	2.4	37.7
Indonesia 2000	53.7	10.2	19.3	31.8	32.7	85.4	14.1	64.3	92.5	54.4	54.9	87.0	93.8	7.4	84.6
Guatemala 2000	87.8	66.0	42.6	34.5	30.7	65.3	3.7	93.5	84.1	91.2	53.4	66.5	94.6	58.1	18.6
Albania 2005	94.7	85.4	5.3	30.0	10.9	74.4	18.8	95.4	90.3	95.2	38.8	75.8	91.9	58.9	42.5
Ecuador 1995	73.5	76.2	39.1	34.4	38.8	27.3	48.4	93.0	85.3	88.3	56.6	61.6	94.1	2.0	25.7
Bulgaria 2001	68.3	64.1	8.4	26.5	2.4	89.3	12.5	78.1	95.4	75.7	28.5	90.6	96.8	87.9	9.1
Panama 2003	78.4	65.2	30.3	42.0	56.2	64.5	11.5	86.6	86.5	82.3	58.5	67.5	93.9	15.2	58.6
Simple mean	76.8	67.2	23.5	29.4	29.1	48.4	15.9	89.3	80.6	86.1	50.4	56.7	86.9	23.7	34.2
Minimum	0.0	10.2	3.7	9.3	0.0	6.3	3.3	64.3	32.7	54.4	24.2	9.8	35.4	0.3	5.4
Maximum	97.8	97.9	54.8	48.5	79.0	89.3	57.5	99.0	95.7	98.5	91.6	90.6	98.3	87.9	84.6

merce. This latter category is much more important among non-agricultural self-employment activities, in terms of both shares of income and participation rates (latter not shown).

(b) *Rural income generating activities by level of expenditure*

The previous section paints a picture of highly diversified rural economies in all countries considered, with the exception of those in Africa. Along with the heterogeneity in the types of

Figure 2. *Composition of total non-farm income, non-agricultural wage labor, and self-employment, by sector.*

rural income generating activities, there is likely to be significant variation in the returns to the different activities. For both agricultural and non-agricultural income generating activities, the literature indicates that there is often, on the one hand, a high productivity/high income sub-sector, confined mostly among privileged, better-endowed groups in high potential areas. There are usually significant barriers to entry or accumulation to these high return segments, in terms of land size and quality, human capital, and other productive assets. Entry barriers to the more productive activities may prevent vulnerable groups from participating and seizing the opportunities offered by the more dynamic segments of the rural economy. The relevance of entry barriers may result from a combination of lack of household capacity to make investments in key assets and the relative scarcity of low capital entry economic activities in rural areas (Reardon, Taylor, Stamoulis, Lanjouw, & Balisacan, 2000).

On the other hand, there is usually a low productivity segment that serves as a source of residual income or subsistence food production; a "refuge" for the vast majority of the rural poor. This low productivity segment includes subsistence agriculture, seasonal agricultural wage labor, and various forms of off-farm self-employment. Although very low, the resources generated through these often informal activities provide a "last resort" to ensure food security and complement an inadequate resource base, serving as an indispensable coping mechanism to reduce the severity of deprivation and avoid more irreversible processes of destitution to take place.[12]

These dual sectors often feed into each other. For those with few assets, seasonal, and insufficient income from subsistence agriculture, and/or lack of access to liquidity/credit, poorly remunerated off-farm activities may be the only available option. Households that are able to overcome financial or asset constraints may diversify or specialize in agricultural and non-agricultural activities, depending not only on access to specific assets but also on household demographic characteristics and the functioning of local labor and credit markets. The observed dualism also often appears to be drawn along gender lines, with women more likely to participate in the least remunerated agricultural and non-agricultural activities.

Given the existence of both low and high return rural income generating activities, with varying barriers to access, previous empirical studies—in most cases neither statistically representative nor comparable across countries—have shown a wide variety of results in terms of the relationship of rural income generating activities, and in particular RNF activities, to poverty. Studies reviewed in FAO (1998) found a higher share of RNF income among poorer rural households in Pakistan and Kenya and a higher share among richer households in Niger, Rwanda, Mozambique, and Vietnam. More recently, Lanjouw (1999) and Elbers and Lanjouw (2001) for Ecuador, Adams (2001) for Jordan and Isgut (2004) for Honduras find that the poor have a lower share of income from RNF activities than the non-poor, while Adams (2002) finds the opposite for Egypt. de Janvry, Sadoulet, and Zhu (2005) show that RNF activities have played a key role in falling poverty rates in China, as RNF activities provide an alternative to small landholdings.

Conversely, Lanjouw and Shariff (2002) find that the importance of RNF activities by income level varies by state in their study of India. For those states with a high share of income from RNF activities, the shares are greater for better off households; for those states with a lower share of income from RNF activities, the opposite is true. This stems in part from the type of RNF activities associated with poverty status. The share of income from casual wage employment is highest
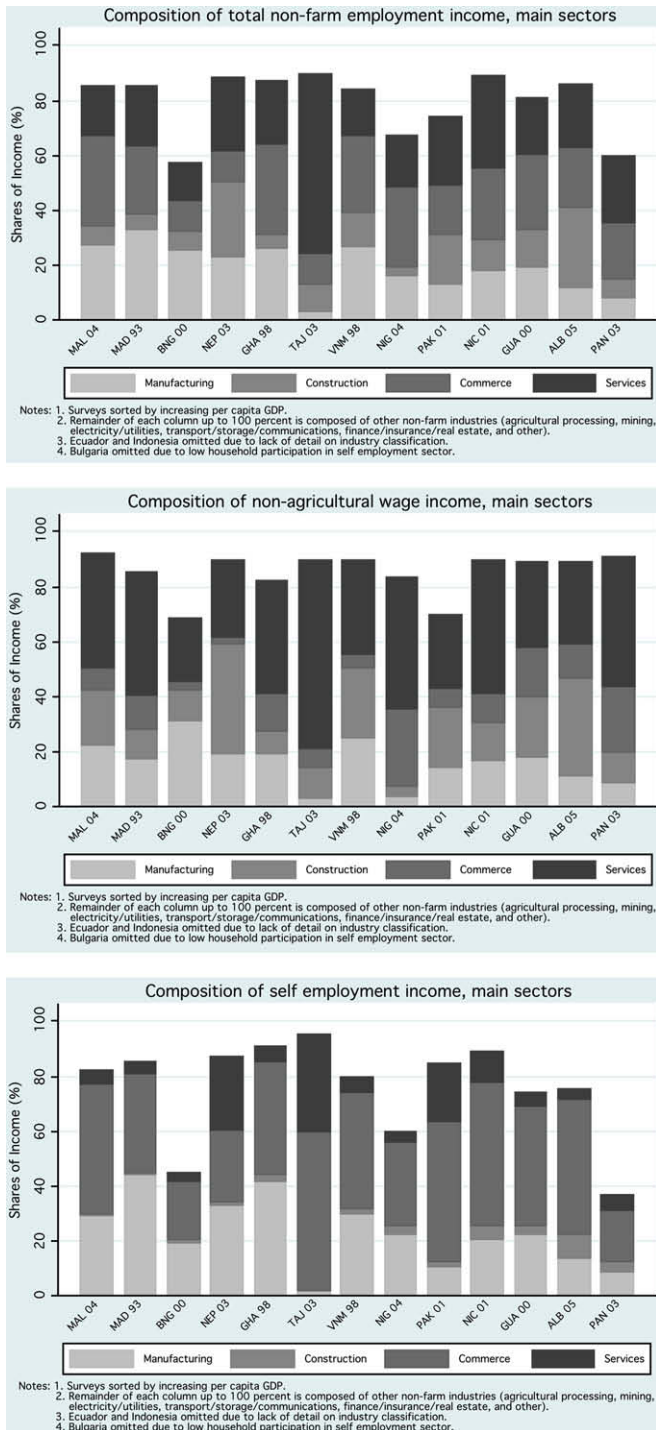
among the poor, while the share from regular wage employment is highest among the rich.

To explore the relationship across countries between rural income generating activities and poverty and to identify activities generally associated with wealth, for each country we examine activities by expenditure quintile. The results, presented in the figures in this section, indicate a number of consistent trends across countries in terms of the variation of the importance for some, but not all, of the sources of income, by household wealth status.

Figure 3 charts average participation in the three of the four main income categories by expenditure quintile (transfers are omitted), and fitted quadratic curves for the poorest, middle, and richest expenditure quintiles. The figure conveys evidence of a number of clear patterns across countries and expenditure quintiles. First, focusing on on-farm activities, we find that participation in on-farm activities is relevant for a majority
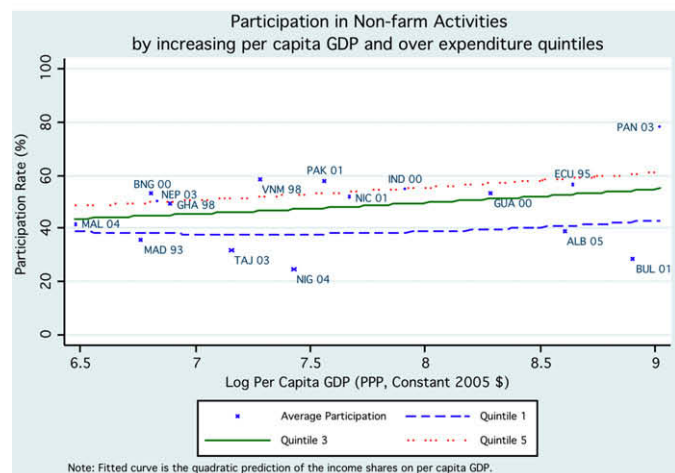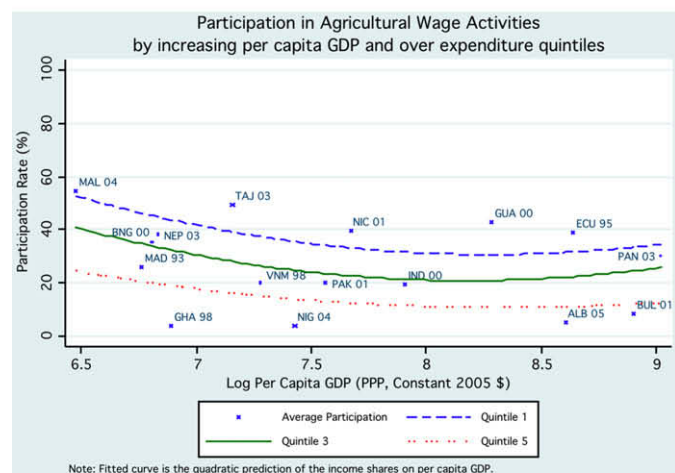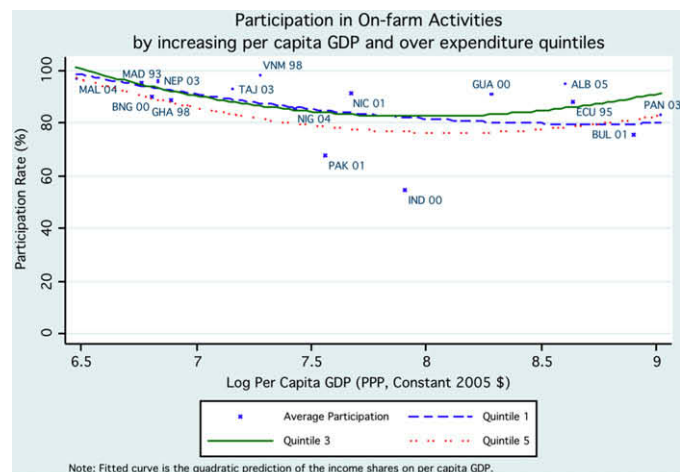

Figure 3. *Percent of households participating in main income generating activities, by first, third, and fifth expenditure quintile.*
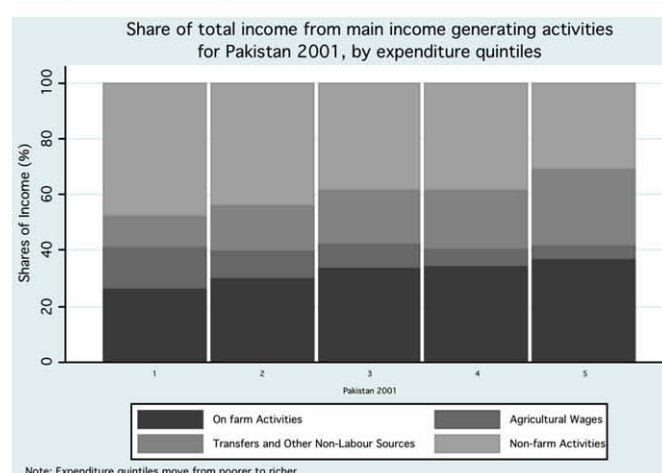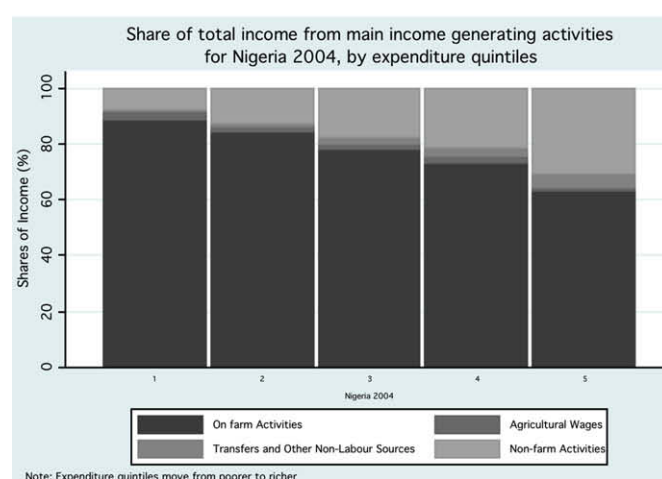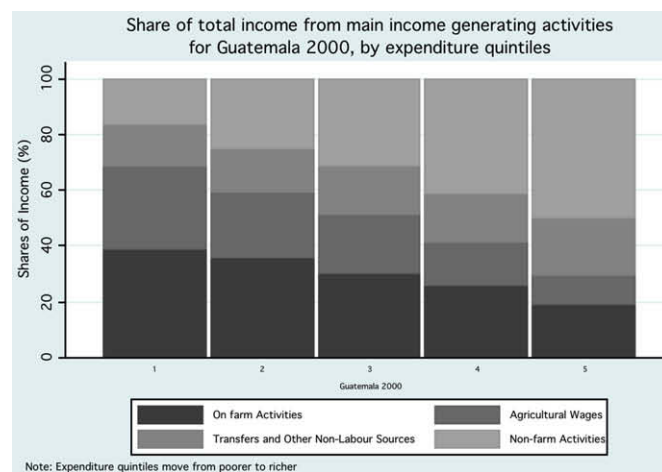

Figure 4. *Percent of total income from main income generating activities, by expenditure quintile.*

of households across the expenditure spectrum and level of development (Figure 3). At least 50% of households in all expenditure categories had on-farm activities, and participation rates appear to be very weakly associated with GDP levels at least within the range in which the countries in our sample are included.

For most countries, participation in, and share of income from, on-farm activities is either greater for poorer households or more or less constant across quintiles. Figure 4 reports the share of total income for the four main categories by expenditure quintiles for three countries (Guatemala, Nigeria, and Pakistan) that exemplify the trends observed in the overall dataset. [13] Of the entire sample, only in Pakistan (see figure), Bangladesh, and Bulgaria does the share of on-farm income unambiguously increase across quintiles.

Participation in, and shares of income from, agricultural wage labor show a clear negative correlation with the level of expenditure across countries. With the exception of four countries that have negligible agricultural labor wage markets (Albania, Bulgaria, Ghana, and Nigeria), poorer rural households have a much higher rate of participation in agricultural wage employment. Similarly, the share of income from agricultural wage labor is more important for poorer households in these 12 countries, and the relationship holds regardless of the level of development. With all the due caveats against generalizing based on this relatively small set of countries, it is worth noting that agricultural wage employment is particularly important for the poor in the four Latin American countries as well as in Bangladesh. However, for all three quintiles the share of participation in agricultural wage labor first falls with increasing levels of development, then increases again for wealthier countries, driven in large part by the experience of the Latin American countries.

In contrast to agricultural wage employment, greater participation in non-farm (wage and self-employment) sources of income is associated with greater level of household expenditures, for all countries, with the exception of Pakistan. Wealthier households in rural areas have a higher share of income from non-farm activities, and again this is true for all countries, with the exception of Pakistan. Thus while a large percent of better off rural households maintain on-farm production, a key characteristic of these households is greater access to non-farm sources of income.

Besides highlighting regularities, it is also interesting to look to the exceptions. The fact that Pakistan and Bangladesh are the only two countries where the share of farm income appears to be increasing with overall welfare, is most likely linked to the widespread landlessness among the poor in both countries, as observed in earlier country case studies (for Pakistan see Adams, 1995; World Bank, 2007; for Bangladesh see Nargis & Hossain, 2006). In these cases the highly unequal distribution of land, and the exclusion of large segments of the rural population from land ownership, lead poorer households to derive a substantial amount of their income from low paying off-farm jobs, including not only agricultural wage employment, but also from employment outside agriculture. Higher shares of on-farm income are in these cases a characteristic of relatively (land) richer households.

Finally, transfers to rural households tend not to be progressively distributed (not shown). Public transfers to rural households are disproportionately provided to households in poorer quintiles only in Albania, Malawi, and Guatemala. In many countries, the relationship is nonlinear or even regressive. For some countries this likely reflects the fact that pensions, which are a key source of public transfers in developing countries, often go to wealthier households. This may also represent poor targeting of programs meant for the poor.

Similarly, the percentage of rural households receiving private transfers tends to be regressively distributed. Only in one country, Madagascar, are the households in the poorest quintile most likely to receive private transfers while in almost all other countries households in the richest quintile are most likely to receive transfers.

4. DIVERSIFICATION AND SPECIALIZATION AMONG RURAL HOUSEHOLDS

The results presented thus far show a highly diversified rural economy and suggest that rural households employ a wide range of activities. The question remains, however, over whether households tend to specialize in activities with diversity in activities across households or, alternatively, whether households themselves tend to diversify their activities thereby obtaining income from a range of activities. To answer this question, we need to establish what constitutes diversification or specialization at the level of the household. We therefore examine the degree of specialization and diversification by defining a household as specialized if it receives more than 75% of its income from a single source and diversified if no single source is greater than that amount. [14] This will provide a sense of the degree of specialization and of the activities through which households specialize, although we are limited by the way in which household survey data are typically collected from delving into the details of this diversification. The apparent diversification shown in the data may be due to aggregation across seasons (with households specializing seasonally) or across individuals, with specific household members specializing in different activities.

Household diversification, not specialization, is the norm, as can be seen in the data presented in Table 4. Not only are most rural economies highly diversified, but rural households are as well. With the exception of the African countries where it is still common to specialize in on-farm activities, the largest share of rural households is diversified. When households do specialize, in a majority of cases this specialization is in on-farm activities, although the percentages become lower the higher the *per capita* GDP. At higher GDP levels specialization in non-agricultural wage becomes more important, whereas no distinct association between GDP levels and specialization in agricultural wage or self employment is suggested by the data.

This is illustrated in Figure 5 with the average country shares of specialization and diversification identified by the country data points. The share of diversified rural households increases only at the higher levels of *per capita* GDP. Clearer patterns linked to the level of development emerge for specialization in farming (declining with GDP), and in non-agricultural wage labor (increasing with GDP). In the former case two countries appear to be significantly distant from the pattern set by the others: Nigeria (high share of farm specializers for its GDP level) and Bangladesh (low share). In the latter case, the only significant "outlier" is Pakistan with a relatively high share of non-agricultural wage specializers for its GDP level.

A rural household may have multiple activities for a variety of reasons: as a response to market failures, such as in credit markets, and thus earning cash to finance agricultural activities, or insurance markets, and thus spreading risks among different activities; failure of any one activity to provide enough income; or different skills and attributes of individual household members. Diversification into RNF activities can reflect activities in either high or low-return sectors, as described

Table 4. *Percent of rural households with diversified and specialized income generating activities*

	Diverse Income Portfolio (%)	Principal Household Income Source ($\geqslant$75% of Total Income)					
		Ag Wage (%)	Non-Ag wage (%)	Self emp (%)	Transfers (%)	Other (%)	Farm (%)
Malawi 2004	39.3	5.5	5.6	5.0	2.5	0.0	42.0
Madagascar 1993	30.6	1.3	2.8	4.0	1.4	0.4	59.4
Bangladesh 2000	52.4	11.4	12.2	10.5	5.5	2.2	5.9
Nepal 2003	52.5	4.3	11.7	4.9	6.9	0.3	19.4
Ghana 1998	24.0	0.6	6.2	15.4	3.4	0.2	50.1
Tajikistan 2003	54.3	4.5	3.7	0.6	4.8	0.0	32.0
Vietnam 1998	44.3	2.1	1.9	12.8	1.2	0.1	37.7
Nigeria 2004	14.7	1.0	5.5	7.8	0.9	0.2	69.9
Pakistan 2001	36.1	5.4	19.3	6.6	9.1	1.6	21.9
Nicaragua 2001	43.8	12.7	14.1	6.2	0.7	0.4	22.1
Indonesia 2000	41.5	5.9	14.0	10.5	11.5	1.1	15.6
Guatemala 2000	54.6	8.7	12.8	5.6	5.0	0.1	13.2
Albania 2005	54.8	1.4	9.1	5.0	9.8	0.5	19.4
Ecuador 1995	45.5	13.2	11.7	8.9	2.3	1.1	17.4
Bulgaria 2001	41.1	1.8	9.3	1.4	43.1	0.1	3.4
Panama 2003	48.8	9.6	20.0	10.0	6.6	0.1	4.8

Outlined cells represented the greatest share of households for a given country dataset; shaded cells represent the highest among specializing households.

above. RNF activities may or may not be countercyclical with agriculture, both within and between years, and particularly if not highly correlated with agriculture, they can serve as a consumption smoothing or risk insurance mechanism. Thus, the results raise an interesting question regarding whether diversification is a strategy for households to manage risk and overcome market failures, or whether it represents specialization within the household in which some members participate in certain activities because they have a comparative advantage in those activities. If the latter is the case and it tends to be the young who are in off-farm activities, diversification may simply reflect a transition period as the household moves out of farm activities.

The empirical relationship between diversification and wealth is thus not straightforward. A reduction in diversification as household wealth increases could be a sign that those at lower income levels are using diversification to overcome market imperfections. Alternatively, a reduction in diversification as household wealth decreases could be a sign of inability to overcome barriers to entry in a second activity thus indicating that poorer households are limited from further specialization. Alternatively, an increase in diversification as household wealth increases could be a sign of using profitability in one activity to overcome threshold barriers to entry in another activity, or complementary use of assets between activities.

This inability to conceptually sign a priori the correlation between diversification and household wealth status emerges from the data. Figure 6 explores the relationship between diversification and expenditure—the proxy used for wealth. Diversification of income generating strategies shows few consistent patterns by wealth status in the RIGA countries. In some cases the share of households with diversified sources of income increases with wealth, in a few countries diversification decreases with wealth, and in a few more there is no pattern across quintiles.

Looking back at Figure 5 and focusing now on the fitted lines for the poorest, third and fifth quintiles, it is also evident how while there is no clear pattern of association between diversification and welfare levels, richer households do seem more likely to specialize in non-agricultural wage and less likely to specialize in farming, with these patterns becoming more apparent the higher the *per capita* GDP. We go into a

bit more detail on the relationship between specialization and wealth.

The most common specialization is in on-farm activities; however, as in the case with the share of farm income in the rural space, for nearly half of the countries (7 of 16), the share of households specializing in on-farm activities clearly decreases with wealth, while for only two countries (Pakistan and Tajikistan), does the share increase, reaching 26% and 46% of households respectively in the top expenditure quintile.[15] Once again, Pakistan stands out as an exception due to its peculiar land distribution features and the limited access the poor have to productive agricultural land. Nevertheless, for all the African countries in our sample, at least 30% of the top quintile are on-farm specializers, reaching 53–61% in Nigeria and Madagascar, respectively. Given the ranges between the poorest and richest diversifying households and on-farm specializers, however, the type of activity trumps differentiation by wealth; that is, most rural households in our Latin American and Eastern European countries, rich or poor, are diversified, while most rural households in the African countries (with the exception of Malawi), rich or poor, are on-farm specializers.

High levels of diversification at the household level, in any case, do not necessarily signify disengagement from agricultural activities. In all countries except for three in Africa, diversified households account for a least 30% of the total value of both marketed and overall agricultural production, as can be seen in Figure 7. In eight countries diversified households account for a greater share of the total value of agricultural production than on-farm specializing households, and in five of these countries (Albania, Bangladesh, Bulgaria, Ecuador and Guatemala) diversified households account for at least 60% of the total value.

Specialization in off-farm activities shows a more consistent correlation with household level of expenditure across countries. Figure 8 reports on the trends in specialization in off-farm income activities by wealth in three countries in our sample, two that exemplify the general patterns observed across most of the dataset (Guatemala and Nigeria), and the one that deviates from that general pattern (Pakistan).[16] For these countries in which a significant share of the rural population specializes in agricultural wage labor activities (mostly those
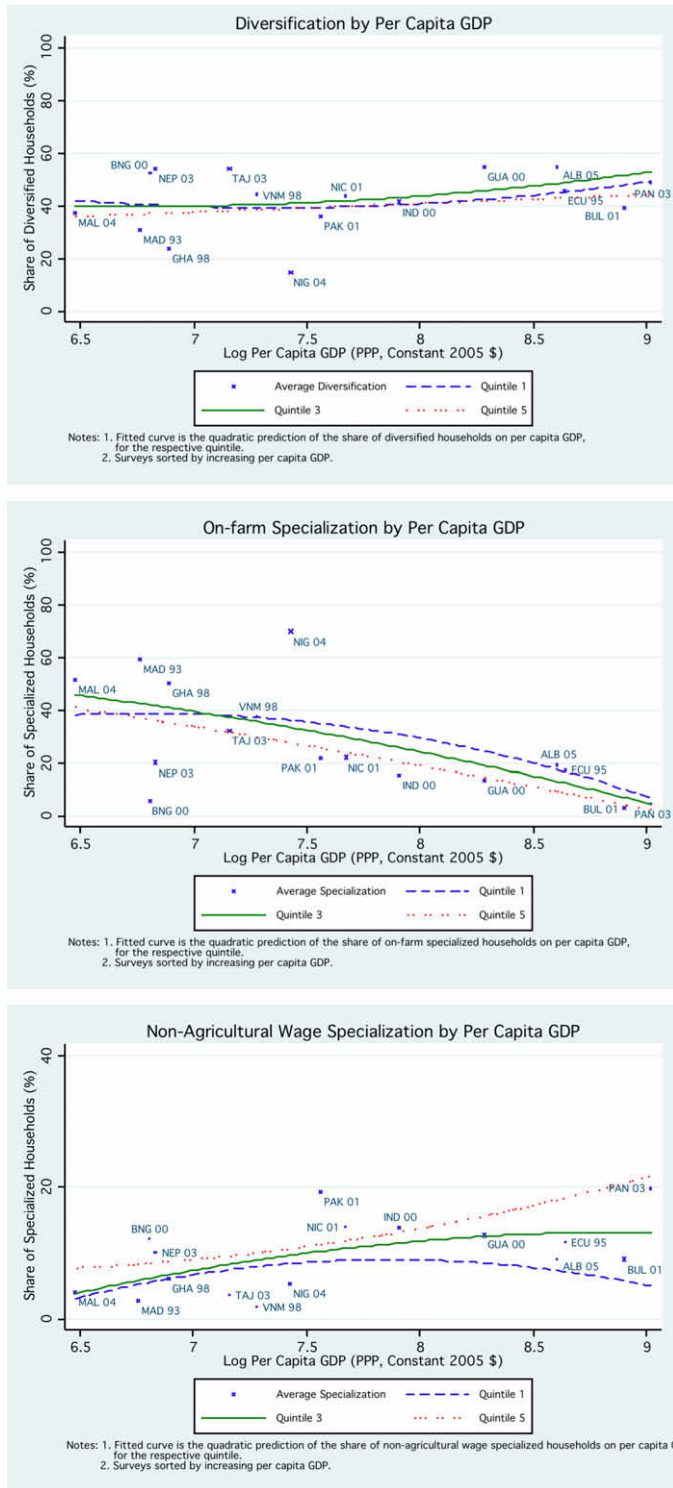
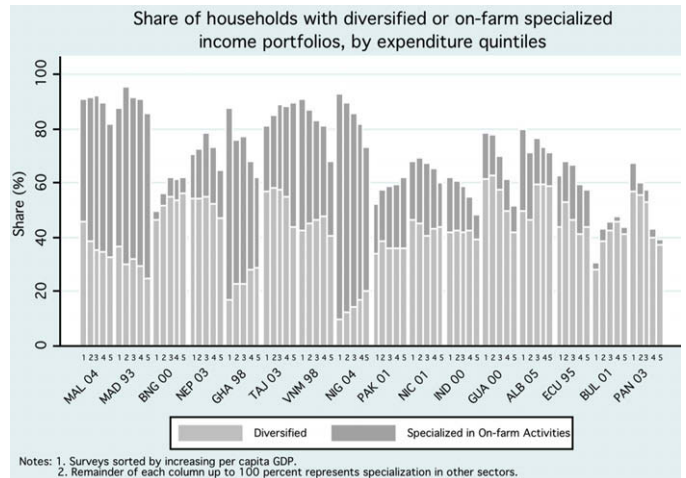Figure 5. *Share of diversified, on-farm, and non-agricultural wage special-izing households, by per capita GDP.*

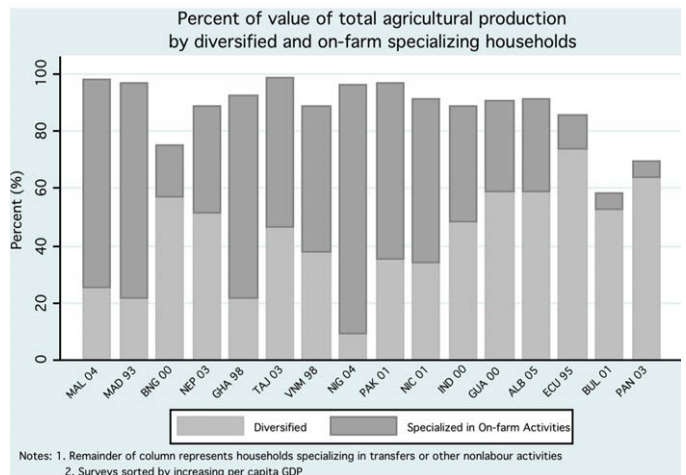Figure 6. *Percent of rural households with diversified or specialized income portfolio, by expenditure quintile.*

Figure 7. *Percent of value of total agricultural production, by diversified, and on-farm specializing households.*

in Latin America and Asia), the poorest households tend to specialize in this activity. Conversely, where there is specialization in RNF employment, whether non-agricultural wage or non-agricultural self-employment, it tends to be among those in the higher wealth categories, with the clear exception of Pakistan for non-agricultural wage and self-employment. The results confirm the earlier conclusions in that, with few exceptions, specialization in agricultural wage employment is associated with poverty and rural non-agricultural activities with wealth.

5. DECOMPOSITION OF INEQUALITY BY INCOME SOURCE

One concern with the increasing importance of RNF activities and the correlation with greater wealth is the exacerbation of income inequality in the rural space. Income inequality, which has been on the rise in many parts of the developing world, has come under increased scrutiny as a potential brake on economic growth. While most of this literature has looked at economy wide effects, one source of this income inequality may stem from changes in the rural economy. Given the often higher returns in the RNF economy, and the key role of access to specific private and public assets, in particular education, the hypothesis is that RNF activities are likely to be inequality increasing. However, the answer may depend on where a par-
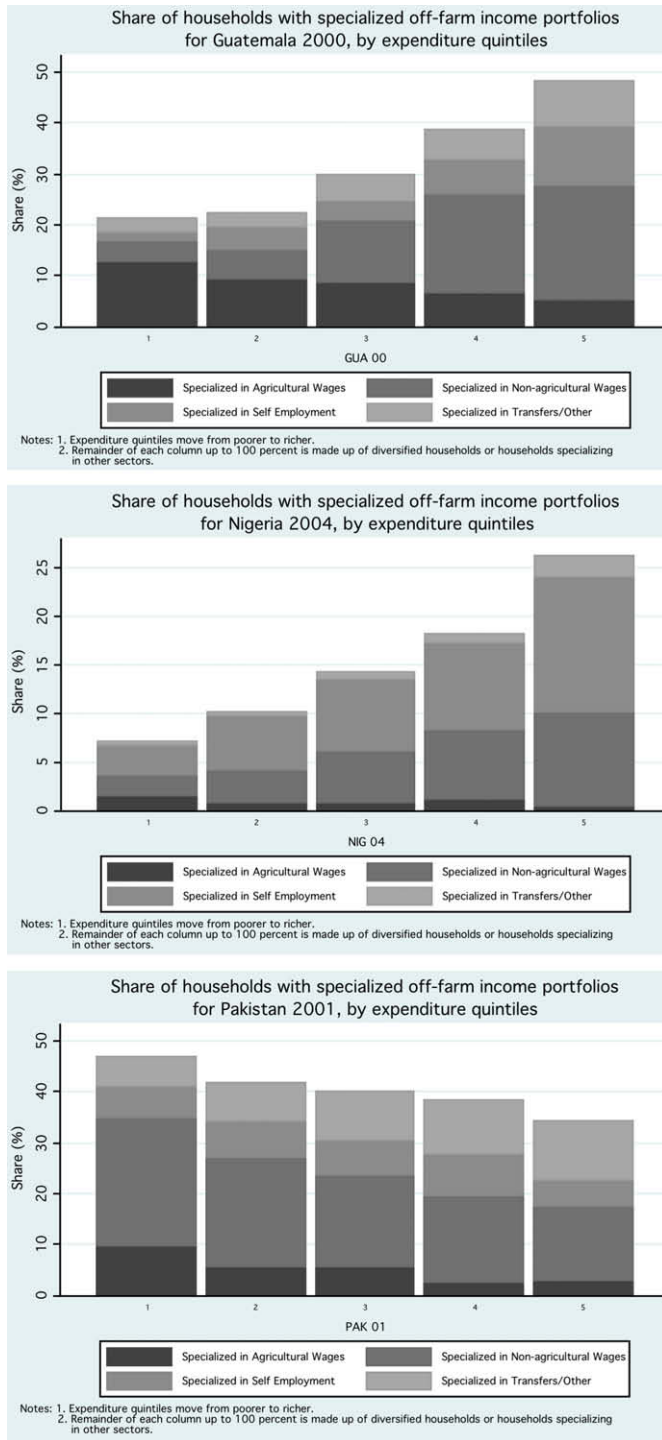
Figure 8. *Percent of rural households specializing in main income generating categories, by expenditure quintile.*

ticular country or region is located in the development process, and at which point in the stages of growth of RNF economy. Further, the answer may also depend on the relative access to different assets, for example Adams' (2001) comment that in land rich and labor-poor situations (such as parts of Africa), agricultural income is inequality reducing and RNF income inequality increasing, while in land poor and labor rich situations (e.g., parts of Latin America or Asia), agricultural in-

come is inequality increasing and RNF income inequality decreasing.

Few consistent patterns, however, have emerged in the literature regarding the impact of RNF activities on inequality. Reflecting conventional wisdom, studies by Elbers and Lanjouw (2001) in Ecuador, Adams (2001) in Jordon, Burgess (1997) in China, Reardon and Taylor (1996) in Burkina Faso and Collier, Radwan, and Wangwe (1986) in Tanzania indicate that RNF income may be, in fact, inequality increasing. While participation in RNF activities may improve rural income as a whole, as discussed earlier there are barriers to participation associated with access to certain assets—particularly education—thus leading to increased income disparities, particularly in poorer areas.

Conversely, Adams (1995) in Pakistan, Lanjouw (1999) in Ecuador, Adams (2002) in Egypt, Chinn (1979) in Taiwan and de Janvry *et al.* (2005) in China find that non-farm income is associated with a reduction in overall rural income inequality in these countries. This result is often attributed to the lack of access of the poorest households to the key productive asset in rural areas—land. de Janvry *et al.* (2005), in a study on China, show that participation in non-farm activities was associated with greater improvement in the income of the poorest households, while the most proficient farmers remained in agriculture.

Some of these differences in outcomes may be due to differences in types of household data, definitions of what consists of RNF activities and the particular method of decomposing income inequality. Further, due to the time dimension, the relationship between inequality and RNF activities may be U-shaped; that is, at initial stages of development RNF activities are inequality increasing but as the sector develops and expands RNF activities are inequality decreasing.

The objective of this section is thus to determine if growth in RNF activities leads to increased inequality, or more broadly, to ascertain the role of each type of rural income generating activity in reducing or increasing household income inequality. We use two common approaches to decompose income inequality by income source: the Theil index and the Gini index. Although the Theil index provides a cleaner and more intuitive decomposition of income inequality by income source, the Gini is commonly used for decompositions and results are potentially sensitive to the choice of decomposition method so results for both approaches are presented here.

We estimate the Theil T inequality index for total income and the components of total income following the approach described by Morduch and Sicular (1998). This index gives a measure of inequality that accounts for the population share of each individual as well as the share of income in total income for the individual level of observation. The following equation describes how the Theil for each income component is obtained, where $1/n$ represents the population share of each observation, y_i^k is the individual-level income from component k, μ_y is the mean total *per capita* income (such that y_k/μ_y is the proportion of individual-level income from component k to total average income), and y_i is total *per capita* income:

$$T(Y^k) = \left(\frac{1}{n}\right) \sum_{i=1}^{n} \left\{ \frac{y_i^k}{\mu_y} \ln\left(\frac{y_i}{\mu_y}\right) \right\}.$$

The sum of the component Theils ($T(Y^k), k = 1, \ldots, K$) is then equal to the overall Theil T index, $T(Y)$, illustrated by the following equation:

$$T(Y) = \left(\frac{1}{n}\right) \sum_{i=1}^{n} \left\{ \frac{y_i}{\mu_y} \ln\left(\frac{y_i}{\mu_y}\right) \right\}.$$

A Theil index of zero indicates equality since it implies that the share of income held by each individual is equal to the individual's population share (such that y_i/μ_y equals one and its logarithm equals zero). The larger the value of the Theil index, the greater the inequality, such that the value of the overall index is restricted to the range $[0, \ln(n)]$ where n is the sample size. When the Theil is decomposed into its components, the index is subject only to an upper bound such that: $T(Y^k) \leqslant \ln(n)$. A negative index, $T^k \leqslant 0$, indicates an inequality reducing effect for component k, whereas a positive index, $0 \leqslant T(Y^k) \leqslant \ln(n)$, indicates an inequality increasing effect, with the effect growing as $T(Y^k)$ approaches $\ln(n)$. Equality is still represented by $T(Y^k) = 0$.

A similar decomposition can be done using the Gini. When incomes are ordered such that $y_1^k \leqslant y_2^k \leqslant y_3^k, \ldots, \leqslant y_n^k$, the Gini for each income component can be written as:

$$G(Y^k) = \left(\frac{2}{n^2\mu_y}\right) \sum_{i=1}^{n} \left(i - \left(\frac{n+1}{2}\right) y_i^k\right).$$

The sum of the component Ginis $(G(Y^k), k = 1, \ldots, K)$ is then equal to the overall Gini index, $G(Y)$, illustrated by the following equation:

$$G(Y) = \left(\frac{2}{n^2\mu_y}\right) \sum_{i=1}^{n} \left(i - \left(\frac{n+1}{2}\right) y_i\right).$$

A key difference between the decomposition using the Gini instead of the Theil is that the Gini decomposition violates the assumption of uniform additions—that is, that inequality should fall if everyone in the population is provided with a transfer of equal size (Morduch & Sicular, 1998). Interpretation of the Gini follows that of the Theil where a negative index indicates an inequality reducing effect for component k, a positive index indicates an inequality increasing effect, and equality represented by $G(Y^k) = 0$.

Calculating the proportional contribution, s_k, of each income source k in the overall inequality for the Theil and the Gini requires simply dividing the individual contribution by the overall contribution as follows:

$$s_{Theil}^k = \frac{T(Y^k)}{T(Y)}, \qquad s_{Gini}^k = \frac{G(Y^k)}{G(Y)}.$$

For each country analyzed using the Theil and Gini decompositions, Table 5 presents the contribution to total inequality for each of the seven income generating activities. Note that by definition the sum of each the total contribution sums to 100%.

Table 5 shows that in contrast to the range of results from the literature discussed above, non-farm sources of income are consistently associated with increasing income inequality. In two-thirds of the countries under study non-agricultural wage and self-employment income are inequality increasing, and in fact in terms of magnitudes, self-employment, followed by wage employment, is responsible for the largest share of income inequality in most countries. The results are largely consistent for both the Theil and the Gini index. Where RNF activities are not responsible for the largest share, it tends to be in the poorer countries, with the exception of Ecuador, and in these cases it is crop income that drives inequality. Even in these cases, non-agricultural wage income still generally accounts for a large share of income inequality. The only country in which non-farm activities tend not to be inducing greater inequality is Tajikistan. The results suggest that non-farm income induces greater income inequality in rural areas, with this effect strengthening with the level of development.

Table 5. *Percent contribution of income sources to total inequality: Theil and Gini indexes*

	Crop		Livestock		Ag wage		Non-Ag wage		Self-emp		Transfers		Other	
	Theil (%)	Gini (%)	Theil (%)	Gini (%)	Theil (%)	Gini (%)	Theil (%)	Gini (%)	Theil (%)	Gini (%)	Theil (%)	Gini (%)	Theil (%)	Gini (%)
Malawi 2004	**28.7**	**43.1**	10.8	13.3	1.7	4.9	**39.0**	**21.8**	20.1	15.3	-0.7	1.4	0.2	0.3
Madagascar 1993	32.3	**43.8**	12.1	15.7	0.7	4.0	-0.5	1.9	**52.2**	**30.1**	1.1	2.6	2.0	1.9
Bangladesh 2000	-0.9	6.1	1.1	1.1	-9.3	0.1	17.1	21.2	**55.3**	**36.7**	32.0	**26.1**	4.7	8.7
Nepal 2003	-1.6	6.8	4.1	11.3	-6.5	0.2	**42.5**	**36.4**	22.8	15.5	31.3	**24.9**	7.4	5.0
Ghana 1998	18.4	25.8	1.1	2.3	1.6	1.5	15.4	14.6	**61.2**	**53.2**	2.3	2.5	0.0	0.1
Tajikistan 2003	**38.0**	**41.4**	34.8	26.4	3.8	9.3	12.8	11.6	5.8	3.8	3.8	6.6	0.9	0.8
Vietnam 1998	-10.2	7.5	-2.9	3.9	-2.0	1.3	1.1	6.0	**113.9**	**78.8**	-0.1	2.3	0.2	0.2
Nigeria 2004	12.7	**39.5**	0.5	1.7	**42.1**	20.1	35.3	24.9	8.9	13.1	0.1	0.5	0.2	0.3
Pakistan 2001	10.9	22.2	1.9	9.6	2.3	1.4	25.4	20.3	**31.7**	**24.5**	11.9	11.0	16.0	11.1
Nicaragua 2001	-0.2	8.3	7.5	8.8	5.1	11.4	36.6	**34.7**	**41.4**	28.3	3.8	3.9	5.9	4.5
Indonesia 2000	0.7	7.8	1.8	1.8	6.6	7.9	**53.0**	**41.8**	32.4	29.8	3.3	8.1	2.3	2.7
Guatemala 2000	-5.7	8.1	0.2	1.3	5.0	11.4	**55.7**	**42.8**	36.3	25.1	5.3	9.7	3.3	1.5
Albania 2005	-4.2	6.8	-10.2	4.6	4.5	4.3	24.3	29.0	**82.7**	**39.3**	1.7	13.0	1.3	3.0
Ecuador 1995	**46.1**	**25.6**	0.3	2.4	3.6	13.9	13.0	19.0	28.3	**28.1**	0.5	1.6	8.2	9.4
Bulgaria 2001	1.5	5.5	6.8	12.5	4.5	7.6	**66.0**	**36.8**	0.0	6.5	20.8	**30.3**	0.4	0.9
Panama 2003	-3.6	2.5	2.0	1.3	4.3	9.0	**62.0**	**55.0**	27.2	21.8	6.1	8.9	2.0	1.6

Note: Highest contributer is bold and underlined. Second highest is in bold.

6. CONCLUSION

The analysis of the income generating activities of rural households from the RIGA cross country dataset paints a clear picture of multiple activities across rural space and diversification across rural households. This is true across countries at all levels of development and in all four continents, though less so in the African countries included in the dataset. Given the careful construction of comparable cross country income variables with the RIGA dataset, we can be reasonably certain that the diversity of results is real and not a function of different methods or data. For most countries the largest share of income stems from off-farm activities, and the largest share of households have diversified sources of income. This diversification may function as a household strategy to manage risk and overcome market failures, or represent specialization within the household deriving from individual attributes and comparative advantage. Therefore diversification can be into either high or low-return sectors, reflect push or pull forces, and represent a pathway out of poverty or a survival strategy.

The results reveal that diversification, not specialization, is the norm, although most countries show significant levels of household specialization in non-agricultural activities as well. Nevertheless, agricultural-based sources of income remain critically important for rural livelihoods in all countries, in terms of both the overall share of agriculture in rural incomes and the large share of households that still specialize in agricultural and on-farm sources of income.

While the nature of the diversification response will vary by a given household, in each country, overall greater reliance on non-farm sources of income is associated with greater wealth. In almost all cases, wealthier households in rural areas have a higher level of participation in, and greater share of income from, non-farm activities, while both public and private transfers tend to be regressively, or neutrally, distributed. Similarly, wealthier households have a larger share of specialization into non-agricultural wage and self-employment activities.

Conversely, agricultural sources of income are generally most important for the poorest households. Income from crop and livestock activities, as well as from agricultural wage labor, represents a higher share of total income for poorer households in almost all countries. Furthermore, a higher share of households specializing in on-farm activities, and particularly agricultural wage employment, is found at the low end of the wealth distribution.

As would stand to follow from these trends, non-farm sources of income are associated with increasing income inequality. In almost all countries under study, non-agricultural wage and self-employment income are inequality increasing, and in fact in terms of magnitudes, self-employment, followed by wage employment, account for the largest share of income inequality in most countries.

These results are not uniform among all countries and Pakistan, for example, is the one country which bucks most of these trends. Greater share of agricultural sources of income, and greater specialization in agricultural activities, are associated with wealth, while the opposite is true for non-farm employment. Similarly, crop income is inequality increasing in Pakistan. These trends may be due to the particularly strong unequal land access in Pakistan, and in particular the large number of landless among the poor, with the landless forced to depend on low-return wage employment, both agricultural and non-agricultural.

For policy makers, the results offered here suggest the need to carefully consider how to promote rural development. While the diversification of rural households clearly indicates the need to look beyond agriculture in rural development policies, the overall importance of agriculture, particularly for poorer households, suggests that the promotion of RNF activities ought to constitute a key component of any strategy. Policy makers must also be careful that any intervention deal with the likelihood that barriers to entry may limit the ability of poor households to take advantage of opportunities, particularly the most remunerative, and thus exacerbate inequalities. The links between certain assets and activities imply that due consideration be given to those assets, or combination of assets, which will ensure broad growth in the rural economy. This complexity means that a particular policy is unlikely to fit different situations across countries and even within regions in a given country and that location-specific policies are necessary. This ultimately calls for an institutional structure that allows for the diversity of policy measures to match closely the diversity of the rural economy.

NOTES

1. See, among others, FAO, 1998; Reardon, Berdegue, & Escobar, 2001; Lanjouw & Lanjouw, 2001; Haggblade, Hazell, & Reardon, 2005.

2. Evidence in this direction is provided for Latin America by FAO (1998) and for Asia by Haggblade *et al.* (2005).

3. Up to date information on the RIGA database can be found at http://www.fao.org/es/ESA/riga/index_en.htm.

4. Details of the construction of the income aggregates can be found in Carletto, Covarrubias, and Krausova (2007).

5. To define a comparable measure of rurality across countries would require, for example, data on population densities which implies having access to census or similar data that can be linked to the survey. These are generally not available.

6. See Barrett, Reardon, and Webb (2001) for a discussion of this point.

7. Other refers to miscellaneous non-labor sources of income, such as gross rental income or interest from savings accounts.

8. Results available upon request from the authors.

9. We do not make cross-country comparisons using absolute poverty lines, as these are generally not considered comparable across countries. Instead we use relative poverty lines, in this case quintiles of household expenditure.

10. Note that the data come from national surveys designed to be representative of the population although in most cases the poor have been over sampled. Thus most calculations presented in the paper use sample weights to provide accurate estimates of the true values for the rural population.

11. Participation is defined as the receipt of any household income (negative or positive) by any household member from that income generating activity.

12. See Lanjouw and Lanjouw (2001) and Lanjouw and Feder (2001) for a general discussion relevant to non-farm activities and Fafchamps and Shilpi (2003) for Nepal and Azzari, Carletto, Davis, Fatchi, and Vigneri (2006) for Malawi, for example, regarding the role of agricultural wage labor.

13. The same information for the entire dataset is summarized in Annex Figure 1.

14. Other definitions of diversification and specialization are possible. We also looked at using 100% and 50% of income from a single source as alternative thresholds to define specialization, in order to ascertain the robustness of our results. The extent of diversification is clearly affected by the choice of the threshold, which drops to around 10% or less in all cases when using the 50% definition and climbs to around 90% when using the 100% definition. The broad patterns by country and by level of welfare discussed in this section, however, do not change with the choice of the threshold. Similarly, alternative groupings of income categories are also possible, such as joining together agricultural and non agricultural wage labor, or non agricultural wage labor and non agricultural self-employment, which would increase the share of household specializing.

15. Not shown, but data and figures available upon request.

16. The same information for the entire dataset is summarized in Annex Figure A2.

REFERENCES

Adams, R. (1995). Sources of income inequality and poverty in rural Pakistan. *Research Report 102*. Washington, DC: International Food Policy Research Institute.

Adams, R. (2001). Non-farm income, inequality and poverty in rural Egypt and Jordan. *Policy Research Working Paper 2572*. Washington DC: The World Bank.

Adams, R. (2002). Nonfarm income, inequality and land in rural Egypt. *Economic Development and Cultural Change, 50*(2), 339–363.

Azzari, C., Carletto, C., Davis, B., Fatchi, T., & Vigneri, M. (2006). Food and nutrition security in Malawi. In *Background paper prepared for the World Bank Malawi Poverty and Vulnerability Assessment*. Rome: FAO.

Barrett, C., Reardon, T., & Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics and policy implications. *Food Policy, 26*(4).

Burgess, R. (1997). *Diversification and welfare in rural China*. Mimeo: London School of Economics.

Carletto, G., Covarrubias, K., & Krausova, M. (2007). *Rural income generating activities (RIGA) study: Income aggregate methodology*. Agricultural Sector in Economic Development Service, Food and Agriculture Organization.

Chenery, H., & Syrquin, M. (1975). *Patterns of development*. London: Oxford University Press.

Chinn, D. (1979). Rural poverty and the structure f farm household income in developing countries: Evidence from Taiwan. *Economic Development and Cultural Change, 27*, 283–301.

Collier, P., Radwan, S., & Wangwe, S. (1986). *Labour and poverty in rural Tanzania*. Oxford: Claredon Press.

de Janvry, A., Sadoulet, E., & Zhu, N. (2005). The role of non-farm incomes in reducing poverty and inequality in China. *CUDARE Working Paper 1001*. Berkeley: University of California.

Elbers, C., & Lanjouw, P. (2001). intersectoral transfer, growth and inequality in rural Ecuador. *World Development, 29*(3), 481–496.

Fafchamps, M., & Shilpi, F. (2003). The spatial division of labour in Nepal. *Journal of Development Studies, 39*(6), 23–66.

FAO (1998). *The state of food and agriculture: Rural non-farm income in developing countries*. Rome: Food and Agriculture Organization.

Haggblade, S., Hazell, P., & Reardon, T. (2005). *Transforming the rural nonfarm economy*. Mimeo.

Isgut, A. (2004). Non-farm income and employment in rural Honduras: Assessing the role of locational factors. *Journal of Development Studies, 40*(3), 59–86.

Lanjouw, P., & Shariff, A. (2002). Rural non-farm employment in India: Access, income and poverty impact. *NCAER Working Paper Series No. 81*. New Delhi: NCAER.

Lanjouw, P. (1999). Rural nonagricultural employment and poverty in Ecuador. *Economic Development and Cultural Change, 48*(1), 91.

Lanjouw, P., & Feder G. (2001). Rural nonfarm activities and rural development: From experience towards strategy. *Rural Development Strategy Background Paper #4*. Washington, DC: The World Bank.

Lanjouw, J., & Lanjouw, P. (2001). The rural nonfarm sector: Issues and evidence from developing countries. *Agricultural Economics, 26*(1), 1–23.

Morduch, J., & Sicular, T. (1998). Rethinking inequality decomposition, with evidence from rural China. *Development Discussion Paper No. 636*. Harvard Institute for International Development, Harvard University. May.

Nargis, N., & Hossain, M. (2006). Income dynamics and pathways out of rural poverty in Bangladesh, 1998–2004. *Agricultural Economics, 35*(Supplement), 425–435.

Reardon, T., & Taylor, J. E. (1996). Agroclimatic shock, income inequality, and poverty: Evidence from Burkina Faso. *World Development, 24*(4), 901–914.

Reardon, T., Taylor, J. E., Stamoulis, K., Lanjouw, A., & Balisacan, P. (2000). Effects of non-farm employment on rural income inequality in developing countries: An investment perspective. *Journal of Agricultural Economics, 51*(2), 266–288.

Reardon, T., Berdegue, J., & Escobar, G. (2001). Rural nonfarm employment and incomes in Latin America: Overview and policy implications. *World Development, 29*(3), 549–560.

World Bank (2007). Pakistan. Promoting rural growth and poverty reduction. *Report No. 39303-PK*. Washington, DC: The World Bank.
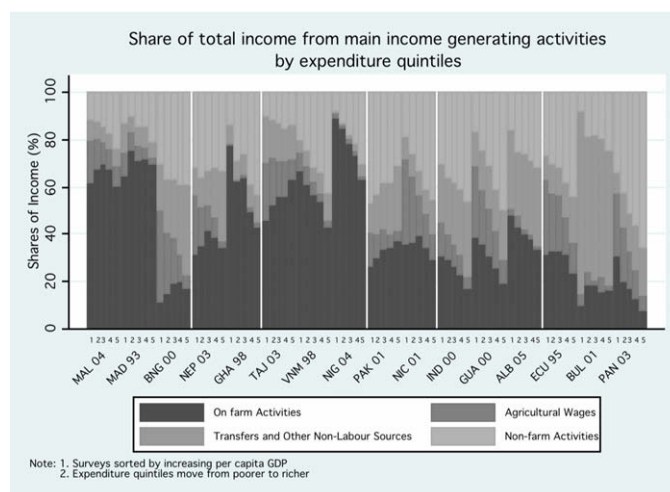
APPENDIX

See Figures A1 and A2.

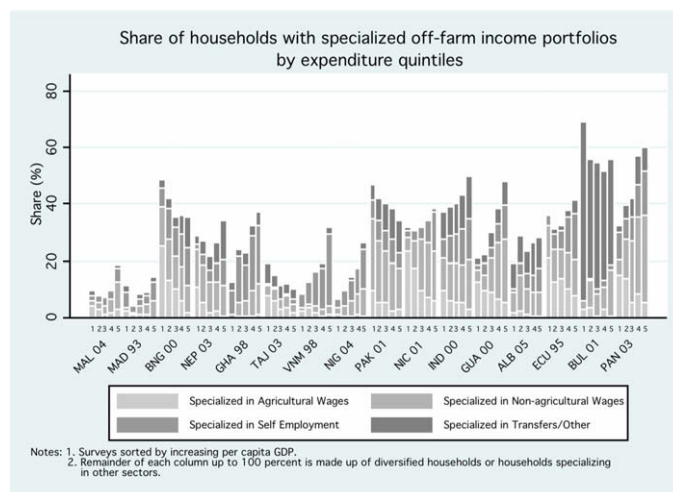Figure A1. *Percent of total income from main income generating activities, by expenditure quintile.*

Figure A2. *Percent of rural households specializing in main income generating categories, by expenditure quintile.*