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Drivers of Poverty Reduction in Lagging Regions

Evidence from Rural Western China

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Abstract

Using 2000-04 panel data this study analyses the pathways rural households followed out of poverty in two lagging provinces of China, Inner Mongolia and Gansu. Rising labour productivity in agriculture has been key, and still holds much promise. Labour mobility has also been important in Gansu. So far, rural diversification has not proven to contribute much to poverty reduction. Income transfers and agricultural tax abolishment have helped at the margin. Overall, the findings highlight that the scope for reducing poverty in lagging rural regions is often substantial in agriculture, also in countries where non-agriculture drives overall growth.

Keywords: agriculture, migration, rural nonfarm employment, lagging region, poverty

JEL classification: I32, J61, O12, O13, R23

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Acronyms

CPI consumer price index

GoC Government of China

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1 Introduction

As countries industrialize and urbanize, urban centres and activities increasingly drive economic growth, leaving many people behind in the more remote regions. How to best reduce poverty in these lagging regions, which are often agriculture based and also ethnically and/or religiously distinct, has posed a huge policy challenge throughout the history of development (World Bank 2007; World Bank 2009a). Nonetheless, robust empirical evidence to guide policymaking remains scant.

One fault line in the policy debate about lagging regions relates to the optimal pace of the rural-urban transition, and often boils down to the appropriate balance between place-based and people-based interventions (Partridge and Rickman 2008). Place-based interventions such as investments in agriculture, local infrastructure and regionally targeted subsidies aim to move jobs to people. They seek to generate employment locally in the rural economy. People-based policies such as formal schooling, training, and job matching programmes aim to move people to jobs. Many economists have argued that the cost effective path out of poverty for lagging rural areas usually lies in fostering urban outmigration (Hansen 1995).

The second fault line relates to the role of different activities within rural space (agriculture vis-à-vis the rural nonfarm sector). On the one hand, the (rural) nonfarm sector is seen as the new, dynamic sector, holding the key to poverty reduction (Ellis 2005). On the other hand, success in the rural nonfarm economy is often closely linked to success in agriculture given strong back and forward linkages, especially in more isolated economic regions (Haggblade, Hazell and Dorosh 2007). Many of the poor also have their livelihoods anchored in agriculture and often lack the skills and capital to access the more remunerative jobs in the rural nonfarm economy (Lanjouw and Murgai 2009).

Important new empirical light is being shed on these debates in an emerging literature following Ravallion and Datt (1996). These authors developed a methodology to empirically test whether the rural-urban and the sectoral output composition of overall income growth matters for poverty reduction. Using cross-country analysis (Loayza and Raddatz 2006; Christiaensen and Demery 2007; Ligon and Sadoulet 2007), longitudinal country data (Ravallion and Chen 2007) and within country cross-province panels (Suryahadi, Suryadarma and Sumarto 2009; World Bank 2009b), this literature finds that income generated in rural areas and in agriculture is on average more poverty reducing than income generated in urban areas or outside agriculture. The studies further suggest that as countries develop, it is rural income growth that matters more for poverty reduction rather than growth in agriculture per se. Within the rural nonfarm sector, it is income growth in services (rather than industry) that appears more poverty reducing. This holds controlling for the size of the respective sectors.

Some of these studies (Ravallion and Datt (1996) for India; Ravallion and Chen (2007) for China; and World Bank (2009b) for the Philippines) also explore the role of rural-urban migration for poverty reduction and do not find an important *direct* contribution. The *indirect* contribution of urbanization to poverty reduction, through a tightening of the rural agricultural labour market or increased remittances, is not attributed in this approach to urban migration as such. It is reflected in the growth of rural incomes.

Whether such indirect contributions from rural-urban migration are important, remains unclear.[1]

This study extends this literature to examine also the effects of remittances on poverty, as well as the effect of labour reallocation across sectors within the rural space, and the poverty effects of rural tax reforms, typically one of the first policy measures used to address spatial inequality.[2] It is the first application of this methodology to study the potential different pathways out of poverty in lagging regions *per se*. Four pathways out of poverty are distinguished:

1) the agricultural pathway (by raising agricultural labour productivity),
2) the rural diversification pathway (by raising labour productivity off the farm or labour reallocation into rural off-farm activities),
3) the migration pathway (through raising labour productivity of unskilled labour in urban activities, seasonal labour mobility, or remittances), and
4) the transfer pathway (by raising subsidies/income transfers or reducing taxes).

Using 5-year household panel data on 1500 households collected between 2000 and 2004, their relative role in poverty reduction is examined in remote lagging rural areas of two provinces in China, Inner Mongolia and Gansu, which share many similarities with other provinces in western China.

The study finds that agriculture has been driving poverty reduction in rural Inner Mongolia, while both agriculture and urban migration were important in Gansu. Increasing agricultural productivity continues to hold promise in both provinces. For Gansu, the challenge will be to help households sort themselves into agriculture and migration according to their comparative advantage. Because the poor had difficulties in accessing remunerative rural off-farm employment, rural diversification did not contribute much. Transfers (tax reductions in Inner Mongolia and private transfers in Gansu) helped at the margin, but are unlikely to be large enough to substantially reduce poverty. Given the similarities of Gansu and Inner Mongolia with other provinces in western China, these findings highlight that in remote rural areas the scope for reducing poverty through increasing incomes locally (including through agriculture) can be substantial, even though dependent on the cultural and agro-ecological endowments.

In the next section, the paper characterizes the sample areas and households, and descriptively explores which pathways households followed to exit poverty. The methodological framework and estimation strategy to robustly examine the relative

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1 The contribution of remittances to rural incomes is typically less than 10 to 15 per cent (Haggblade, Hazell and Reardon 2007). On the other hand, tightening rural agricultural labour markets following an increase in *rural* nonfarm employment has been important for poverty reduction in Bangladesh and India (Lanjouw 2007). But Lanjouw also cautions against ready generalizations about these indirect general equilibrium effects, as both countries have a large population of landless agricultural labourers.

2 As countries pass through their structural transformation, they switch from taxing agriculture to protecting and subsidizing agriculture (Hayami 2007).

potential of different pathways to reduce poverty are developed in section 3. Section 4 presents the econometric findings. Section 5 concludes.

2 Households in rural western China: Agriculture dominates livelihoods, but pathways out of poverty differ

Since 1978, China has witnessed impressive growth and poverty reduction. But, progress went hand in hand with rising geographic disparities, especially between coastal and remote inland areas and urban and rural sectors (Ravallion and Chen 2007). Especially those in remote and inaccessible upland areas, often characterized by fragile environments and higher population pressure, found themselves left behind, struggling to overcome their 'food and clothing problem'. They were often also disproportionately of ethnic minorities.

In response, the Government of China (GoC) initiated a series of integrated poor area development programmes targeted at 592 rural counties that were designated as 'national poor' (Park, Wang and Wu 2002). Special funds were allocated, focused on improving access to social services, strengthening the rural infrastructure base, and increasing labour productivity through the provision of agricultural loans and technical assistance, the generation of off-farm employment and the introduction of (voluntary) resettlement programmes.

The data used in this study were collected by the National Bureau of Statistics under the Western Poverty Reduction Project (WPRP), the third in a series of World Bank assisted poverty reduction operations in China in support of these poor area development programmes. The project operated in Inner Mongolia and Gansu between 1999 and 2005 in 40 of the 592 nationally designated poor counties and supported households in project villages mainly through the provision of rural, agricultural and environmental infrastructure (roads, irrigation, and land improvement), agricultural loans and technical assistance, and support to rural enterprises.

The WPRP project was similar in design to the previous World Bank assisted poverty-reduction projects in China operating in the provinces of Guangxi, Guizhou and Yunan (Ravallion and Chen 2005) and the Qinba Mountains (World Bank 2005), even though less emphasis was put on the provision of social services, which were already more widely available by then, and more emphasis on the introduction of environmentally sustainable crop and livestock development packages. Indeed, in their broad characterization, the lagging counties studied here are not atypical of many of the other 'national poor' counties in China, or even the remote, arid and upland areas elsewhere in the world. They were in essence poor, remote, agriculture dependent with fragmented landholdings, and located in unfavourable agro-ecological environments.

More specifically, Gansu was the poorer of the two provinces, characterized by poorer agro-ecological endowments and a higher population density, with many living in fragile uplands. The farms were more fragmented and agricultural productivity was low. The province also had a longstanding tradition of labour mobility in search of temporary employment, often in the rural towns and the large state-owned cotton farms in the neighbouring autonomous region Xinjiang. It is not unlike the other provinces in

northwestern China (especially Shaanxi and Ningxia) both in its socioeconomic structure and key agro-ecological resource endowments.

Inner Mongolia, on the other hand, was rich in mineral resources, with a buoyant mining sector, and enjoyed a higher average income per capita. It is also home to a larger ethnic minority—the Mongols make up 16 per cent of the population. Population density was much lower and farms larger, with a larger focus on free-grazing animal husbandry on its vast, arid planes, a livelihood system that was increasingly threatened by land degradation following continuing droughts and wind erosion and the introduction of the grazing ban. It shares many similarities with Xinjiang, another province well endowed with cultivated land, where agriculture also makes up about four-fifths of net household income per capita.

Fifteen project counties were sampled (eight in Inner Mongolia and seven in Gansu) for the survey. Within each sample county, ten villages were selected, each time in the ratio of six project villages to four similar non-project villages, serving as controls. Within each sample village, ten households were sampled randomly, yielding a sample of 800 households in Inner Mongolia and 700 in Gansu. Consumption and income data were collected annually between 2000 and 2004 on each household using the same daily diary method. Daily labour allocation across activities was collected for each household member through recall. There was no attrition across rounds. In what follows, all values are expressed in 1999 prices using provincial CPIs.

Table 1
Household welfare improves, but much less so in Gansu where labour mobility is also becoming more important

	Net income per capita	Expenditure per capita	Poverty head-count	Net agricultural income	Net rural non-farm income	Labour mobility wage income	Remittances
	(1999 yuan)		%		Shares		
Inner Mongolia							
2000	1596	1080	46	0.80	0.14	0.06	0.00
2001	1230	1148	37	0.74	0.19	0.06	0.01
2002	1546	1244	37	0.77	0.16	0.06	0.00
2003	1922	1307	31	0.84	0.12	0.04	0.00
2004	1992	1426	24	0.80	0.14	0.05	0.00
Gansu							
2000	930	819	70	0.66	0.20	0.12	0.02
2001	975	832	72	0.62	0.22	0.13	0.03
2002	1096	823	72	0.59	0.25	0.13	0.03
2003	1235	894	64	0.56	0.20	0.22	0.02
2004	1183	942	61	0.58	0.23	0.18	0.02

Notes: $1-day poverty line of 872 yuan is used to derive poverty estimates (in the World Bank poverty assessment report the dollar/day poverty line for China is established at 888 yuan in 2003 prices. Deflating by the rural CPI of 1.01877 (taking 1999 as the base year), we get a poverty line in 1999 prices of 872 yuan). Poverty measures are weighted by household size. Net agricultural income constructed by subtracting variable costs from business income from farming, animal husbandry, forestry and fishing. Net rural nonfarm income constructed by adding wages and salary (excluding wages from labour mobility) and net non-agricultural family business income from industry, construction, transport, trade and commerce, social service, health and education.

In both provinces average household welfare improved noticeably during the period under study, though much more so in Inner Mongolia than in Gansu (Table 1). This also translated into poverty reduction, with one-dollar-day poverty incidence in Inner Mongolia declining from 46 per cent in 2000 to 24 per cent in 2004, though only by 9 percentage points from 70 per cent to 61 per cent in Gansu.

Agriculture dominated livelihoods in both provinces with Gansu slightly more diversified and diversifying than Inner Mongolia. The share of agriculture in total net income fluctuated around 80 per cent in Inner Mongolia, with no sign of abatement, consistent with the evolution observed in the provincial statistics. Net rural nonfarm income accounted for around 15 per cent, and wage income from labour mobility only for about 5 per cent. In Gansu, the share of net agricultural income is somewhat less than in Inner Mongolia and declining (from 66 per cent in 2000 to 58 in 2004), mainly due to an increase in income from labour mobility whose contribution increased to about a fifth by 2004. Income from rural nonfarm activities contributes on average 20 to 25 per cent. Income from remittances was negligible in both provinces.

These different livelihood structures observed in the data are reflective of the broader differences in the cultural and natural endowments described above. The larger representations of ethnic minorities and better agro-ecological endowments in Inner Mongolia would seemingly reduce the desire and need for migration. Larger ethnic homogeneity and a less favourable agro-ecology combined with more established channels of migration would foster seasonal labour mobility in Gansu.

To shed light on the drivers behind the increase in *average* living standards, the change in net per capita income between 2000 and 2004 is decomposed into its different components (Table 2). Of the 447 yuan per capita net income *gain* between 2000 and 2004 in Inner Mongolia, 71 per cent followed from gains in net agricultural income. At 3 per cent, the average contribution from labour mobility was negligible, even though it may have been important for those few households that engaged in labour mobility. In Gansu, labour mobility contributed almost 40 per cent of the 259 yuan average income gain. The increase in rural nonfarm incomes accounted for about a third and the increase in agricultural incomes for about a quarter, even though still 66 per cent of income was derived from agriculture in 2000. Have the drivers of *poverty reduction* been the same?

Table 2
Agriculture drives average income growth in Inner Mongolia;
labour mobility most important in Gansu.

	Inner Mongolia		Gansu	
Net income change/capita (2004-2000)	1999 yuan	share (%)	1999 yuan	share (%)
Agricultural income	318	71	71	27
Rural nonfarm	64	14	87	34
Labour mobility wage income	14	3	97	37
Remittances	2	0	-2	1
Transfers	50	11	6	2
Total net income change	447		259	

Notes: Agricultural income constructed by subtracting variable costs from business income from farming, animal husbandry, forestry and fishing. Non-agricultural income constructed by adding wages and salary (excluding wages from labour mobility) and net non-agricultural family business income from industry, construction, transport, trade and commerce, social service, health and education.

To explore this, households are categorized in four groups depending on the evolution of their $1-day poverty status between 2000 and 2004:

1) those that were poor in both years;
2) those that escaped poverty;
3) those that fell into poverty; and
4) those that were never poor.

Subsequently, the absolute change in real net annual per capita income between 2000 and 2004 in agriculture, rural nonfarm income, income from labour mobility, remittances, and other transfers are examined across each of these groups (Table 3). Average per capita consumption is reported for reference.

Table 3
Sectoral income changes differ depending on a household's poverty evolution.

	Consump-tion per capita	No. obs	Agricul-tural income	Rural nonfarm income	Labour mobility wage income	Remit-tances	Other transfers	Tot. net income/ capita
				Inner Mongolia				
Poor 2000 / Poor 2004								
2000	650	77	969	66	111	2	20	1167
Change 2004-2000	68	77	314	80	2	-1	41	436
Poor 2000 / Non-poor 2004								
2000	661	224	1036	164	73	2	19	1295
Change 2004-2000	1057	224	468	73	52	3	93	689
Non-poor 2000 / Poor 2004								
2000	1739	76	1372	168	138	3	22	1704
Change 2004-2000	-1042	76	-133	-37	21	-3	55	-98
Non-Poor 2000 / Non-poor 2004								
2000	1516	423	1456	285	84	7	84	1916
Change 2004-2000	331	423	320	74	-6	2	28	418
Total								
2000	1215	800	1283	219	89	5	54	1650
Change 2004-2000	379	800	318	64	14	2	50	447
				Gansu				
Poor 2000 / Poor 2004								
2000	558	295	531	138	92	27	27	814
Change 2004-2000	39	295	9	47	87	-20	37	160
Poor 2000 / Non-poor 2004								
2000	621	138	573	156	124	13	107	974
Change 2004-2000	725	138	162	113	189	-2	-37	425
Non-poor 2000 / Poor 2004								
2000	1337	88	721	169	195	14	50	1150
Change 2004-2000	-686	88	-157	51	-7	1	-37	-149
Non-poor 2000 / Non-poor 2004								
2000	1611	179	724	289	92	26	61	1192
Change 2004-2000	-20	179	217	150	93	25	10	494
Total								
2000	938	700	613	184	111	22	54	985
Change 2004-2000	68	700	71	87	97	-2	6	259

Notes: $1-day is taken as poverty line.

Agriculture emerges as the driving factor in determining the evolution of poverty in Inner Mongolia, somewhat helped along by changes in non-agricultural incomes. Households that escaped $1-day poverty saw their agricultural income rise faster than those who stayed poor or those who were never poor, while loss in agricultural income was the largest contributor to the slide in income among those falling into poverty, a loss which was partly offset by gains in transfers and labour mobility. Changes in rural nonfarm incomes also contributed to income changes among those who escaped or fell back into poverty but to a much lesser extent. Households that advanced out of poverty were also slightly more fortunate in receiving transfers. The gains from labour mobility have on average been small in Inner Mongolia, also for those escaping poverty.

The evolution of poverty status was also closely correlated with the evolution in agriculture in Gansu, though labour mobility played a more important role in climbing out of poverty. About 38 per cent of the 425 yuan per capita income increase among those escaping poverty was derived from gains in agricultural earnings, about a quarter from gains in rural nonfarm incomes and 44 per cent from gains in labour mobility income—income from non-remittance transfers declined by 9 per cent. Those who fell back into poverty (about 12.5 per cent of the sample) saw especially their agricultural earnings go down. And those who stayed poor experienced only limited progress in agriculture, while trying their luck outside agriculture, with not enough success to leave poverty. In both provinces, the role of remittances in poverty reduction is negligible, possibly because the poor in China are less likely to migrate (Du, Park and Wang 2005).

Between 2000 and 2004 the GoC also gradually reduced rural/agricultural taxes to alleviate rural poverty.[3] The large reduction in tax payments in Inner Mongolia (from 174 yuan per capita to 40) resulted in a 30 per cent increase in after tax-income change (Table 4). As the non-poor paid more taxes to begin with, they also tended to gain most from the tax reforms. Nonetheless, tax reductions were instrumental in mitigating losses among those who fell back in poverty—they even reversed the average pre-tax income loss of 98 yuan per capita into a small after tax net income gain of 79 yuan. Households in Gansu were much poorer and much less taxed to start with (41 yuan per capita in 2000) and the reforms contributed much less to income gains and poverty reduction.

This descriptive analysis of the pathways out of poverty suggests that agriculture has been a driving force behind changes in poverty status in lagging counties of Inner Mongolia, helped along a bit by changes in non-agricultural incomes and tax reforms. In Gansu, labour mobility was more important in helping farmers escape poverty, even though agriculture contributed still substantially to changes in poverty status. Average rural nonfarm income increased among all groups, albeit more among those escaping poverty or those who were never poor. This echoes the much discussed dual nature of the rural nonfarm economy, illustrated further in section 3.3, Table 5. Those who are poorly endowed or unfortunate, are pushed into non-remunerative non-farm employment, while those who are better endowed or lucky, embark on remunerative non-farm opportunities (Barrett, Reardon and Webb 2001).[4]

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3 Four taxes were removed: 1) administrative fees levied by township governments; 2) educational fees; 3) the butchery tax; and 4) the labour tax (free labour for public work).

4 A distinction is sometimes made between rural non-farm and rural off-farm employment, with the former excluding agricultural wage labour off the farm, but including on-farm non-agricultural

Table 4
Tax reforms increase incomes for all, but most among the non-poor and in Inner Mongolia.

	Inner Mongolia				Gansu			
	Total income p.c. before tax	Taxes/ capita	Total income p.c. after tax	Tax share in post-tax inc. change	Total income p.c. before tax	Taxes/ capita	Total income p.c. after tax	Tax share in post tax inc. change
Poor 2000 / Poor 2004								
2000	1167	133	1034		814	33	782	
Change 2004-2000	436	-99	535	0.23	160	-13	173	0.08
Poor 2000 / Non-poor 2004								
2000	1295	151	1144		974	47	927	
Change 2004-2000	689	-106	796	0.15	425	-25	450	0.06
Non-poor 2000 / Poor 2004								
2000	1704	211	1492		1150	47	1103	
Change 2004-2000	-98	-177	79	-1.81	-149	-24	-125	-0.16
Non-poor 2000 / Non-poor 2004								
2000	1916	187	1728		1192	48	1144	
Change 2004-2000	418	-148	566	0.35	494	-23	517	0.05
Total								
2000	1650	174	1476		985	41	944	
Change 2004-2000	447	-134	581	0.30	259	-19	278	0.07

Notes: All figures in 1999 yuan.

3 Methodological considerations

3.1 Methodological framework

To test the robustness of these hypotheses and explore whether the poverty-reducing capacity of the four pathways differs, a multivariate framework is developed. Let average income per capita $Y = \frac{L_a}{L}.\frac{G}{L_a}$ with L total population, L_a the number of able-bodied workers and $G = G_A + G_{NA} + G_M + G_R + G_U - T$ total disposable income after taxes with subscripts *A*, *NA*, *M*, *R*, and *U* referring to income from agriculture, rural non-agriculture activities, rural-urban migration, remittances, and unearned income/transfers respectively. *T* refers to taxes paid.

Denote by $s_L^a = \frac{L_a}{L}$ the dependency ratio or the share of able-bodied labourers in total labour and by $Y_a = \frac{G}{L_a}$ average household labour productivity. Total differentiation of *Y* and division by *Y* yields:

activities, and vice versa. Here, no such stark contrast is implied, even though off-farm agricultural wage employment is very limited in the areas studied.

$$\frac{dY}{Y} = \frac{dY_a}{Y_a} + \frac{ds_L^a}{s_L^a} \tag{1}$$

Let the total labour force $L_a = L_a^A + L_a^{NA} + L_a^M$ and Y_a can then be rewritten as:

$$Y_a = s_{L_a}^A \frac{G_A}{L_a^A} + s_{L_a}^{NA} \frac{G_{NA}}{L_a^{NA}} + s_{L_a}^M \frac{G_M}{L_a^M} + \frac{G_R}{L_a} + \frac{G_U}{L_a} - \frac{T}{L_a} \tag{2}$$

whereby $s_{L_a}^i = \frac{L_i}{L_a}$ represents the share of *i*=*A*, *NA*, *M* in the able-bodied labour force L_a.

Note that $ds_{L_a}^A = -ds_{L_a}^{NA} - ds_{L_a}^M$. Differentiation of (2) and division by Y_a yields:

$$\begin{aligned} \frac{dY_a}{Y_a} &= s_G^A \frac{dY_a^A}{Y_a^A} + s_G^{NA} \frac{dY_a^{NA}}{Y_a^{NA}} + s_G^M \frac{dY_a^M}{Y_a^M} + s_G^R \frac{dY_a^R}{Y_a^R} + s_G^U \frac{dY_a^U}{Y_a^U} - s_G^T \frac{dY_a^T}{Y_a^T} \\ &+ (Y_a^{NA} - Y_a^A) \frac{s_{L_a}^{NA}}{Y_a} \frac{ds_{L_a}^{NA}}{s_{L_a}^{NA}} + (Y_a^M - Y_a^A) \frac{s_{L_a}^M}{Y_a} \frac{ds_{L_a}^M}{s_{L_a}^M} \end{aligned} \tag{3}$$

With s_G^k representing the share of *k*=*A*, *NA*, *M*, *R*, *U*, *T* in total disposable income *G* respectively, and $Y_a^i = \frac{G_i}{L_a^i}$ labour productivity in sector *i*, or the income from *A*, *NA*, or M per labourer L_a^i in activity *i*=*A*, *NA*, *M* respectively, and $Y_a^j = \frac{G_j}{L_a}$ income from *j*=*R*, *U* or *T* per able bodied worker L_a.

From (3) the change in average labour productivity (i.e. disposable income after tax per able bodied worker) follows from (i) the change in sectoral labour productivity (the first three terms in (3)), (ii) the change in transfers (remittances, unearned income or taxes represented by terms 4-6 in (3)), and (iii) the occupational shift from agriculture to rural nonfarm employment (i.e. rural diversification) or from agriculture to urban nonfarm employment (rural-urban migration) (the last two terms in (3) respectively). Substituting (3) into (1), the change in per capita average disposable income after tax becomes:

$$\begin{aligned} \frac{dY}{Y} &= s_G^A \frac{dY_a^A}{Y_a^A} + s_G^{NA} \frac{dY_a^{NA}}{Y_a^{NA}} + s_G^M \frac{dY_a^M}{Y_a^M} + s_G^R \frac{dY_a^R}{Y_a^R} + s_G^U \frac{dY_a^U}{Y_a^U} - s_G^T \frac{dY_a^T}{Y_a^T} \\ &+ (Y_a^{NA} - Y_a^A) \frac{s_{L_a}^{NA}}{Y_a} \frac{ds_{L_a}^{NA}}{s_{L_a}^{NA}} + (Y_a^M - Y_a^A) \frac{s_{L_a}^M}{Y_a} \frac{ds_{L_a}^M}{s_{L_a}^M} + \frac{ds_L^a}{s_L^a} \end{aligned} \tag{4}$$

Expressing changes in discrete terms, an estimable equation can be derived, which permits to test whether the different pathways differ in their poverty reducing powers:

$$\begin{aligned} \Delta \ln P_t &= \sum_k \beta_k s_{G_{t-1}}^k \Delta \ln Y_{at}^k + \gamma_{NA} (Y_{at-1}^{NA} - Y_{at-1}^A) \frac{s_{Lat-1}^{NA}}{Y_{at-1}} \Delta \ln s_{Lat}^{NA} + \\ &\gamma_M (Y_{at-1}^M - Y_{at-1}^A) \frac{s_{Lat-1}^M}{Y_{at-1}} \Delta \ln s_{Lat-1}^M + \delta \Delta \ln s_{Lt}^a + e_t \end{aligned} \tag{5}$$

with P_t an additively decomposable poverty measure, k=A, NA, M, R, U, T, and e_t a random white noise error term. If $\beta_k = \gamma_{NA} = \gamma_M$, then (5) collapses to $\Delta \ln P_i = \beta \Delta \ln Y_{at} + \delta \Delta \ln s^a_{Lt} + e_t$. By testing whether $\beta_k = \gamma_{NA} = \gamma_M$ it can be determined whether the channel through which average labour productivity increases, i.e. sectoral labour productivity growth, growth in unearned disposable incomes/tax reforms, or sectoral migration, affects the rate of poverty reduction. This is the critical advantage of this specification, first highlighted by Ravallion and Datt (1996).

The coefficients can be interpreted as the relative change in poverty following a relative change in overall labour productivity (Y_a) originating in a particular sector (either through a productivity increase in that sector, transfers, or through labour movements across sectors). The elasticity of an increase in sectoral labour productivity (dY_k / Y_k) on poverty can be obtained by multiplying the sectoral coefficient by its share in total income. The elasticity of sectoral labour migration (rural diversification or rural-urban migration) can be obtained by multiplying the respective coefficient by the difference in relative labour productivity ($\frac{Y^i_{at-1}}{Y_{at-1}}$) between the destination sector (NA or M) and agriculture (A) multiplied by the share of labour in the destination sector. Consequently, it is possible that in agriculture-based societies, overall labour productivity growth originating outside agriculture is more poverty reducing than overall labour productivity growth originating in agriculture ($\beta_{NA} > \beta_A$), but that the elasticity of labour productivity growth in agriculture is nonetheless more poverty reducing because a larger share of income is derived from agriculture $s^{NA}_{Gt-1} < s^{A}_{Gt-1}$ and $\beta_{NA} s^{NA}_{Gt-1} < \beta_A s^{A}_{Gt-1}$.

Linking the discussion back to the four pathways discussed in the introduction, the increase in agricultural labour productivity represents the contribution of the agricultural pathway. The rural non-farm pathway acts through an increase in rural off-farm labour productivity and/or the reallocation of labour to more productive activities in the rural economy. The labour mobility pathway contributes through an increase in labour productivity in labour mobility and migration. One could also include remittances. The transfer pathway reflects the effects of unearned incomes/transfers and taxes.

3.2 Empirical estimation strategy

To estimate Equation (5), the 5-year 2000-04 household panel is used yielding four observations per household after differencing. The annual difference in the log of the $1-day (household) poverty gap is taken as dependent variable. Specification in logs is in keeping with the poverty-growth literature and permits easy calculation of the poverty elasticities. Four cases present themselves for the dependent variable: 1) households that are never poor ($\Delta \ln P_{ijt} = 0$); 2) households that escape poverty ($\Delta \ln P_{ijt} < 0$); 3) households that become poor ($\Delta \ln P_{ijt} > 0$); and 4)households that remain poor ($\Delta \ln P_{ijt} \leq or \geq 0$).

Differences in the effect on poverty of the different sources of overall labour productivity growth permit identification of the coefficients. This is why it is key to use a poverty measure as dependent variable and not a change in household income or

consumption, which would change for rich and poor alike in response to rising labour productivity. Also, a poverty measure reflecting the depth of poverty is used instead of a categorical variable reflecting the household's poverty status only, because it permits one to also capture the changes in poverty of different sources of income among those who remain poor, yielding better identification. When using changes in a household's poverty status, those who are never poor cannot be distinguished from those who remain poor. These considerations yield the following estimable equation which can be estimated with OLS using standard heteroscedasticity corrections:

$$\Delta \ln P_{ijt} = \sum_k \beta_k s^k_{G_{t-1}} \Delta \ln Y^k_{aijt} + \gamma_{NA}(Y^{NA}_{aijt-1} - Y^A_{aijt-1}) \frac{s^{NA}_{Laijt-1}}{Y_{aijt-1}} \Delta \ln s^{NA}_{Laijt} + \tag{6}$$

$$+ \gamma_M (Y^M_{aijt-1} - Y^A_{aijt-1}) \frac{s^M_{Laijt-1}}{Y_{aijt-1}} \Delta \ln s^M_{Laijt} + \delta \Delta \ln s^a_{Lijt} + v_{jt} + w_{ij} + e_{ijt}$$

whereby i=1…N, the number of households, j=1…V, the number of villages, and t=1,…T, the number of time periods. Household fixed effects (w_{ij}), time varying village effects (v_{jt}), and (time variant) changes in the household dependency ratio ($\Delta \ln s^a_{Lijt}$) are included to help protect against potential endogeneity bias.[5]

For example, if it is the more entrepreneurial poor who tend to migrate first, and this is not controlled for, the poverty-reducing effect of migration may be overestimated, leading policymakers to overemphasize outmigration in reducing poverty. Household fixed effects (w_{ij}) protect against bias from such unobserved household heterogeneity. However, adding household fixed effects to the *change* equations forces identification to happen from the within household variation in the *change* variables. Given the much lower signal-to-noise ratios, this is empirically much more demanding. Most analyses of this nature have only controlled for the effect of time invariant unobserved household characteristics on poverty, and income and labour allocation *levels* (through differencing).

Household fixed effects also help protect against reverse causality—initial poverty causing migration—by controlling for the household's chronic poverty status. Though, because a household's poverty status may change over time, reverse causality can still not be fully excluded. The robustness of the results will be checked through the inclusion of initial poverty at t-2. Lagging twice is necessary to protect against measurement error or omitted variable bias. However, it reduces the sample size and thus the signal-to-noise ratio. Specifications without (twice lagged) initial poverty are therefore explored first.

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5 Analogously, changes in labour productivity ($\Delta \ln Y^k_{aijt}$) and labour reallocation ($\frac{s^Z_{Laijt-1}}{Y_{aijt-1}} \Delta s^Z_{Laijt}$ with Z=*NA* or *M*) could also be weighted by the income shares ($s^k_{G_{t-1}}$) or labour productivity differences ($Y^Z_{aijt-1} - Y^A_{aijt-1}$) respectively, observed at t. In the estimations, the weights have been averaged across t-1 and t. See Appendix A1 for a more detailed exposition.

Time varying village level dummies control for time varying unobserved implementation features of the project that was operating in a subset of the sample. For example, if, as the project proceeded, the project targeted its agricultural loans increasingly to the non-poor in the project villages, this could downwardly bias the effect of an increase in agricultural labour productivity. Inclusion of time varying village fixed effects also helps purge the estimated coefficients from the effects of changes in the agricultural terms of trade, such that the estimated poverty-reducing effects of changes in labour productivity reflect an increase in output productivity, and not just value.

Finally, inclusion of change in the dependency ratio helps protect against potential omitted variable bias, as households with larger dependency ratios tend to be poorer and changes in household composition likely also affect labour allocation decisions. The effect of demographic changes has typically not been controlled for in this literature.

Following Johnson and Rausser (1971) and Hu (1972), a small value 0.1 is added to the observations for which the regressand or the regressor has a zero value before the logarithm is taken. Robustness against the use of other values is checked. Similarly, while convenient for comparability, the choice of the $1-day poverty line (set at 872 yuan) is somewhat arbitrary, and robustness of the results is explored using China's official poverty line (625 yuan).

3.3 Sectoral labour productivity

The amount of labour time each household member spent on agriculture, rural nonfarm activities and in (urban) migration was directly reported in the survey, but potentially underreported for migration. For example, in 826 of the 7500 observations positive income had been reported from labour mobility, while there was no record of labour allocation to labour mobility. To enable inclusion of those observations with positive income from a particular activity, but zero reported labour allocation, labour allocation values were imputed based on separately estimated relationships between (positive) labour allocation to each of the activities (agriculture, rural nonfarm, and labour mobility), and a series of household correlates and time variant village effects. The amount of labour spent in each activity was predicted for each household except for those with zero reported income and zero reported time allocation. Those values were set to zero.[6]

Households spend on average about two-thirds of their labour time in agriculture (Table 5). Only about a quarter is allocated to rural nonfarm activities. The majority of households do not spend time in labour mobility, though it is more common in Gansu. From the net increase in average time spent in rural non-farm activities and labour mobility in Gansu and the net decline in Inner Mongolia, it can also be seen that the average share of time spent in agriculture declined in Gansu, while it slightly increased in Inner Mongolia, consistent with the evolution of per capita income sources.

Estimates of household labour productivity were obtained by dividing income from each of the three activities by their respective (predicted) labour allocations. As

6 The labour allocation regressions (not reported here) have an R^2 between 0.57 and 0.74.

expected, for the majority of households in Inner Mongolia, daily net labour productivity in agriculture is substantially higher throughout the study period than labour productivity in the other activities (see also difference in net labour productivity within the household). Nonetheless, for a minority, daily net labour productivity has been growing faster in rural nonfarm and migration than in agriculture.

In Gansu, labour productivity is higher in migration than in agriculture in more than half the sample. Labour productivity in labour mobility has on average also been growing much faster than in agriculture. This reflects especially the rather sluggish performance of agriculture in Gansu. While average labour productivity among (temporary) migrants is about the same in Inner Mongolia and Gansu (between 8 and 9 yuan per day on average),[7] average agricultural labour productivity in Inner Mongolia is more than twice that of Gansu (10.45 y/day versus 4.81 y/day respectively) and the gap has been growing over time (average annual net labour productivity changes equal to 0.34 y/day in Inner Mongolia versus 0.06 y/day in Gansu). Low levels of agricultural labour productivity and sluggish growth have been inducing labour mobility in Gansu.

The range in net labour productivity is largest for rural nonfarm activities. The distribution is more skewed to the left than that of agricultural labour productivity—reflected in lower minimum values, p5s, p25s, and medians—but also more spread out to the right—as reflected in higher p95s and maximum values. While rural nonfarm activities are less remunerative than agriculture for the majority of the population, they prove very lucrative for a small minority, consistent with the earlier observed existence of a dual labour market in the rural nonfarm economy.

In the regressions below, labour productivity is expressed in gross terms to increase comparability with other studies—surveys usually do not collect the information necessary to calculate net income. It also circumvents the challenge of dealing with negative incomes—income from farming or rural nonfarm activities was never negative in gross terms. Finally, while virtually all households devoted at least some time to agriculture, several households also diversified in and out of rural nonfarm activities or switched in and out of labour mobility. To enable incorporation of these 'corner solutions' in the proposed log linear framework, changes in labour productivity in rural nonfarm activities or labour mobility were set to zero if the households switched in or out of it. The change in overall productivity growth induced by this switch is captured through the sectoral migration channel as the difference in the labour productivity in the respective activity and agriculture relative to the overall labour productivity multiplied by the share of the activity in total labour allocation.[8]

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7 Dropping those observations with zero reported income from labour mobility increases the average to 11.2 yuan per day in Inner Mongolia and 9.8 per day in Gansu.

8 See Appendix A1 for a more detailed exposition.

Table 5
High and growing agricultural labour productivity keeps labour in agriculture in Inner Mongolia;
low and sluggish agricultural labour productivity induces labour mobility in Gansu.

	Inner Mongolia									Gansu								
	N	mean	min	p5	p25	p50	p75	p95	max	N	mean	min	p5	p25	p50	p75	p95	Max
Share of household labour allocated in[1)]																		
Agriculture	4000	0.66	0.00	0.41	0.57	0.66	0.78	0.89	1.00	3496	0.66	0.00	0.41	0.57	0.67	0.77	0.90	1.00
Rural nonfarm	4000	0.28	0.00	0.10	0.19	0.27	0.37	0.49	1.00	3496	0.24	0.00	0.07	0.16	0.23	0.32	0.42	0.67
Labour mobility	4000	0.05	0.00	0.00	0.00	0.00	0.00	0.26	0.57	3496	0.09	0.00	0.00	0.00	0.00	0.18	0.29	1.00
Annual change in household labour share in																		
Rural nonfarm	3200	-0.01	-0.62	-0.26	-0.09	-0.02	0.07	0.24	0.66	2796	0.010	-0.43	-0.169	-0.034	0.008	0.07	0.18	0.40
Labour mobility	3200	-0.01	-0.46	-0.23	0.00	0.00	0.00	0.20	0.39	2796	-0.003	-0.84	-0.195	-0.016	0.000	0.02	0.19	0.52
Net labour productivity (yuan/day)																		
Agriculture	3993	10.5	-27.60	0.29	4.35	8.56	14.43	27.19	96.64	3493	4.81	-6.68	0.86	2.28	3.96	6.12	11.8	118
Rural nonfarm	2946	6.86	-61.18	0.00	0.00	2.17	8.09	28.81	220.32	3205	6.19	-32.36	-0.20	0.00	2.31	8.10	25.8	150
Labour mobility[2)]	955	8.37	0.00	0.00	0.00	3.69	10.88	33.73	140.52	1713	8.72	0.00	0.00	2.32	6.51	11.8	25.9	86
Annual net labour productivity difference (yuan/day)																		
Agriculture	3189	0.34	-79.8	-15.56	-4.43	0.26	5.39	15.83	66.96	2791	0.06	-107.7	-5.79	-1.58	0.11	1.65	5.62	111
Rural nonfarm	1893	0.72	-134.5	-19.82	-3.20	0.00	4.26	23.58	158.7	2440	0.08	-129.3	-16.26	-2.66	0.00	2.9	15.93	126
Labour mobility[2)]	407	1.20	-96.9	-20.50	-3.69	0.00	5.03	24.60	117.1	1058	1.28	-69.48	-15.09	-3.91	0.41	6.46	18.88	69
Difference in net labour productivity (within household)(yuan/day)																		
Rural nonfarm - agriculture	2944	-3.42	-96.6	-24.90	-11.52	-4.81	1.71	24.22	193.02	3205	1.35	-70.83	-10.85	-4.34	-1.46	4.27	22.45	138
Labour mobility- agriculture[2)]	955	0.06	-51.4	-17.40	-8.26	-2.82	4.23	26.65	136.69	1713	4.31	-45.95	-7.29	-1.88	2.51	8.44	22.51	84

Notes: 1) Labour allocation figures are based on predicted labour time across activities based on estimated association between reported labour time and a series of correlates to enable incorporation of those observations with no time allocations reported even though income from that activity was positive. While the numbers are slightly different when using only reported numbers, the same patterns emerge.

2) In the absence of information about costs, reported gross and net labour productivity numbers from labour mobility are the same

4 Poverty reduction through agriculture and also labour mobility in Gansu

The estimated results in Table 6 confirm the continuing potential of agriculture for poverty reduction in both regions. The coefficients on agricultural labour productivity are large and statistically significant irrespective of the specification used (see also robustness tests). They are also substantially larger than those related to the rural diversification pathway, which would suggest that overall productivity gains originating in agriculture are on average more poverty reducing than those arising from gains in labour productivity in or labour reallocation to rural nonfarm activities.

The observed difference in poverty-reducing effects reflects the co-existence of good and bad jobs in rural nonfarm economies, with poorer households often diversifying in less remunerative jobs with less growth potential.[9] This is best illustrated by the change in the coefficient on rural nonfarm labour productivity gains in Gansu when controlling for a household's poverty status (through household and time varying village fixed effects) (Table 6, columns (3) and (4)). It almost doubles and the poverty-reducing effect is no longer statistically different from increasing agricultural productivity (p-value of Wald-test equals 0.14), even though still only about half the size.

The poverty-reducing effect of switching into rural nonfarm activities also increases when controlling for unobserved heterogeneity, and becomes statistically significant in Inner Mongolia. In Inner Mongolia, rural nonfarm activities are currently mainly occupied by the richer households and rural diversification appears more promising when focused on helping poorer households engage in (remunerative) rural nonfarm activities, even though increasing their agricultural labour productivity is still at least as poverty reducing. In sum, while rural diversification *can* be a path out of poverty, it often is not, because the poor lack skills and capital to engage in remunerative off-farm employment with growth potential. The poverty-reducing potential of agriculture holds more broadly.

Equality in poverty-reducing power between labour productivity gains originating in agriculture and those brought about through labour mobility (either through an increase in earnings as seasonal migrants (Gansu) or through labour reallocation out of agriculture into urban activities (Inner Mongolia and Gansu)) cannot be rejected. In other words, when they generate the same gain in overall labour productivity ($dlnY_a$), both the agricultural and the labour mobility pathway hold similar poverty-reducing potential.

This finding is not at odds with the earlier observation that migration did not play an important role in poverty reduction in Inner Mongolia. It implies that, based on the 2000-04 experience, overall labour productivity gains generated through labour mobility *can* be equally poverty reducing as those generated in agriculture. Yet, this pathway has not been frequently followed in Inner Mongolia, likely because agricultural labour productivity has been much higher. The results are somewhat stronger in Gansu where labour mobility can contribute to poverty reduction through both an increase in labour productivity in migration and migration itself, reflective of Gansu's low agricultural

9 As initially poorer households also experience a faster decline in poverty (see OLS estimations in Appendix Table A3), this leads to an underestimation of the poverty-reducing effect of an increase in rural nonfarm labour productivity.

productivity.[10] Nonetheless, overall, it is migration itself that appears to be more poverty reducing, rather labour productivity gains in migration.

Table 6
Increasing overall labour productivity through productivity gains in agriculture or urban migration yields similar poverty reducing effects[1)]

	Inner Mongolia		Gansu	
	OLS	OLS with hh & time varying village FE	OLS	OLS with hh & time varying village FE
Change in log ($1-day poverty gap)	Coeff / (p-value)	Coeff / (p-value)	Coeff / (p-value)	Coeff / (p-value)
	(1)	(2)	(3)	(4)
Agricultural pathway				
Agricultural labour productivity	-0.43***	-0.80***	-1.12***	-1.25***
	(0.00)	(0.00)	(0.00)	(0.00)
Rural diversification pathway				
Rural nonfarm labour productivity	-0.22*	-0.27	-0.34*	-0.66***
	(0.06)	(0.13)	(0.07)	(0.01)
Rural labour diversification	-0.01	-0.40**	-0.29	-0.66
	(0.89)	(0.02)	(0.30)	(0.20)
Migration pathway				
Labour productivity in migration	-0.50*	-0.35	-0.69**	-0.74*
	(0.10)	(0.44)	(0.01)	(0.10)
(Urban) migration	-0.77**	-0.91**	-0.83	-1.56*
	(0.05)	(0.05)	(0.19)	(0.08)
Remittances	0.07	-0.41	0.07	-1.19*
	(0.95)	(0.84)	(0.88)	(0.07)
Transfers				
Gifts	-0.09	0.00	-0.32	-0.61**
	(0.43)	(0.99)	(0.14)	(0.05)
Taxes	1.42***	1.37	2.47	-0.52
	(0.01)	(0.14)	(0.12)	(0.69)
Share of able bodied adults	-0.67*	-0.54	-1.21**	-1.56**
	(0.08)	(0.17)	(0.04)	(0.02)
R^2	0.01	0.19	0.02	0.24
F	3.25	17.20	4.84	70.17
N	3186	3186	2790	2790
Coeff on agricultural labour productivity equals (p-value of Wald-test)				
Rural diversification pathway				
Rural nonfarm labour productivity	0.25	0.00	0.03	0.14
Rural labour diversification	0.00	0.10	0.00	0.00
Migration pathway				
Labour productivity in migration	0.84	0.31	0.28	0.32
Urban migration	0.41	0.81	0.66	0.71
Transfers				
Taxes	0.00	0.02	0.01	0.11

Notes: *, **, *** indicate statistical significance at the 10%, 5%, 1% level respectively; OLS with heteroscedasticity corrected at village level; zeroes are replaced by 0.1

[10] Note, however, that the statistically significant effect on remittances in Gansu (Table 6, col 4) is not robust to alternative specifications (Appendix Tables A1-A3).

Follow-up analysis suggests that it is those in remote villages in the plains, where the ethnic minorities are concentrated, who are more likely to migrate in Inner Mongolia, while in Gansu, it is the land poor and unskilled close to the rural centres who are more likely to migrate. This may explain the increase in poverty reducing effects of (urban) migration in both regions when controlling for unobserved heterogeneity.[11]

The core insights are robust to the use of alternative values for the undefined observations (such as 0.001, 0.1 and 1 instead of 0.1), and the use of the official poverty line (Appendix Tables A1 and A2). There are also no signs of reverse causality after controlling for unobserved household and time varying village heterogeneity. Additional inclusion of (twice lagged) initial poverty did not affect the size, sign or statistical significance of the coefficient on migration or the other variables (Appendix Table A3).

In Inner Mongolia there appear also important poverty-reducing powers from tax abolishment, even larger than those associated with gains in agricultural labour productivity (when statistically significant). This does not hold in Gansu, where taxation was much lower to begin with. The coefficients are less precisely estimated when controlling for time varying village effects. This is due to the fact that tax removals were only gradually introduced and unevenly implemented across villages until their complete abolishment in 2005. While tax reforms helped reduce poverty in Inner Mongolia, gifts/transfers were poverty reducing in Gansu, even though their poverty-reducing potential proves only half as large as increasing labour productivity in agriculture. They are also less robust to changes in the specifications than the findings for agriculture, counselling caution in overly reliance on income transfers for poverty reduction, one of the strategies currently pursued by the GoC (Huang et al. 2009).

To explore how poverty would respond to an increase in sectoral labour productivity or sectoral labour reallocation *per se* (as opposed to an increase in their *weighted* sectoral labour productivity or labour reallocation), the coefficients in Table 6 (columns 2 and 4) are multiplied by their respective weights. This yields the respective poverty elasticities (Table 7). Given the study's focus on the poorer segments of the population, elasticities are calculated using average weights among the poor.

Increasing labour productivity in agriculture holds a lot of promise in terms of poverty reduction potential both in Inner Mongolia and Gansu, as indicated by its larger elasticity of poverty. This follows both from the large share of agriculture in total income and the fact that overall labour productivity gains generated in agriculture are at least as poverty reducing as overall labour productivity gains obtained through labour productivity gains in other sectors or labour reallocation.

By way of illustration, if agricultural labour productivity among the poor in Gansu would be increased from the level currently reached by the 25 percentile of the poor to

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11 If those who are more likely to migrate live in remote areas where the decline in poverty reduction is likely slower, the effect of migration on poverty reduction is likely underestimated. The same holds if the landless and less educated are more likely to migrate, as they are also likely to experience a slower decline in poverty. Furthermore those in remote villages in the plains are often ethnic minorities, and likely employed in jobs with slower wage growth. This may explain the overestimation of the poverty reducing effect of labour productivity growth in migration in Inner Mongolia when using OLS.

Table 7
The elasticity of poverty to an increase in agricultural labour productivity holds most promise

	Inner Mongolia			Gansu		
	Coeff.[1)]	Avg weight[2)] among the poor	Elasticity of poverty	Coeff.[1)]	Avg weight[2)] among the poor	Elasticity of poverty
Agricultural pathway						
Agricultural labour productivity	**-0.80**[3)]	**0.66**	**-0.53**	**-1.25**	**0.58**	**-0.73**
Rural diversification pathway						
Nonagriculatural labour productivity	-0.27	0.27	-0.07	**-0.66**	**0.25**	**-0.16**
Rural labour diversification	**-0.40**	**-0.04**	**0.02**	-0.66	0.10	-0.07
Migration pathway						
Labour productivity in labour mobility	-0.35	0.04	-0.01	**-0.74**	**0.13**	**-0.09**
(Urban) migration	**-0.91**	**-0.13**	**0.12**	**-1.56**	**0.11**	**-0.18**
Remittances	-0.41	0.00	0.00	**-1.19**	**0.02**	**-0.02**
Transfers						
Gifts	0.00	0.02	0.00	**-0.61**	**0.02**	**-0.01**
Taxes	1.37	0.04	0.06	-0.52	0.03	-0.01
Share of able bodied adults in household	-0.54	0.77	-0.42	**-1.56**	**0.69**	**-1.07**

Notes: 1) Coefficients taken from Table 6 column (2) for Inner Mongolia and column (4) for Gansu.

2) Weight is given by the respective income share for labour productivity and unearned income variables and by the difference in labour productivity between rural nonfarm/urban migration and agriculture relative to the overall labour productivity times the share of time spent on rural nonfarm or urban migration respectively.

3) Bolded if coefficient is statistically significant.

the 75 percentile, poverty would be reduced by 58 per cent. Similarly, bringing labour productivity in rural nonfarm and labour mobility activities up from the level reached by the 25 percentile of the poor to the 75 percentile would reduce poverty by 30 and 15 per cent, respectively.[12] Even at the 75 percentile among the poor in Gansu, agricultural labour productivity (6.8 yuan/day) is still well below median agricultural labour productivity (among the poor) in Inner Mongolia (estimated at 11 yuan/day), unlike labour productivity in rural nonfarm activities or in migration which at the 75 percentile is already on par or above the median in Inner Mongolia.

Similarly, bringing agricultural labour productivity in Inner Mongolia up from the 25 percentile level among the poor to the 75 percentile level (a 90 per cent increase) would reduce poverty by 48 per cent. When looking at the elasticities of poverty to labour productivity gains outside agriculture, they are small and statistically insignificant.

12 The 25 percentile labour productivity in agriculture, rural nonfarm and labour mobility among the poor in Gansu are 3.1, 1.9 and 2.3 respectively, while they are 6.8, 11.9, 11.5 among the 75 percentile poor. Bringing households up from the 25 to the 75 percentile thus entails an increase by ln(6.8)-ln(3.1)=0.79 or 79 per cent, ln(11.9)-ln(1.9)=1.83 or 183 per cent, ln(11.15)-ln(2.3)=1.56 or 156 per cent. Multiplied by their respective elasticities (-0.73, -0.16, -0.09) this yields a reduction in poverty by 58, 30 or 15 per cent.

Caution is warranted when interpreting the elasticities of poverty to sectoral labour reallocation. They are very small because the *average* weights are small (even positive in Inner Mongolia). Averaging the weight across poor households may be misleading as sectoral labour reallocation may not be optimal for those with high labour productivity in agriculture, while it could be the path out of poverty for those with low agricultural labour productivity (e.g. those with limited land). The small share of labour time allocated outside agriculture by many poor households further weighs down the average weight.

For comparison, elasticities of poverty to labour reallocation are recalculated assuming a switch into rural nonfarm or urban labour mobility activities instead (starting from zero). Assuming that such households reallocate 25 per cent of their time to rural nonfarm and urban activities[13] and that their relative labour productivity difference among these activities and agriculture equals this of the 75 percentile among the poor, then the elasticity of poverty to rural labour diversification and urban migration is -0.06 and -0.18, respectively, in Inner Mongolia.[14] In Gansu, they become -0.16 and -0.51, bringing the potential of the migration channel more on par with this of agriculture.

Similarly, the elasticities of gifts are quite small, because the average share of gifts in total income has been quite small. Yet, because gifts start from rather low levels, substantial per cent increases are plausible in principle. Nonetheless, they are unlikely to be a driving factor in poverty reduction. The role of remittances (unlike income from labour mobility) has been negligible.

5 Concluding remarks

How to best reduce poverty in lagging rural regions remains an important policy challenge. This study contributes to this debate by documenting the paths followed out of poverty during the first half of the 2000s in poor rural areas in two lagging provinces in China, Inner Mongolia and Gansu. Both provinces saw their average living standards increase and poverty decline, with progress most pronounced in Inner Mongolia. Agriculture dominated livelihoods in both regions, but more so in Inner Mongolia, where it also drove poverty reduction. Labour mobility emerged as an important alternative path out of poverty in Gansu where labour productivity in agriculture remained low.

Nonetheless, the econometric findings suggest that fostering labour productivity growth in agriculture continues to hold substantial poverty-reducing potential in both provinces. Doubling agricultural labour productivity, which corresponds to bringing labour

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13 Less than 5 per cent of households currently spend more than 25 per cent of their time in labour mobility in both Inner Mongolia and Gansu.

14 The formula to calculate the elasticity of poverty labour reallocation in case of a switch from zero is given by $(Y_{kt} - Y_{kt})/Y_{at-1} * s_{at}^{k}$ with k=NA or M, $[(Y_{NAt} - Y_{At})/Y_{at-1}]_{75\%} = 0.64$ in Inner Mongolia and 0.99 in Gansu and $[(Y_{Mt} - Y_{At})/Y_{at-1}]_{75\%}$ is undefined in Inner Mongolia—the 90 percentile (which equals 0.80) is taken instead—and 1.30 in Gansu. The labour share is put at $s_{at}^{NA} = s_{at}^{M} = 0.25$.

productivity from levels currently reached by the 25 percentile of the poor to the 75 percentile poor, would more than halve the poverty gap. This should be well within reach, also in Gansu, despite its lower agro-ecological endowments.

The (urban) labour mobility pathway also holds promise in Gansu, and the policy challenge is to help households sort themselves along the different pathways according to their comparative advantage. To halve poverty in Inner Mongolia through labour migration much larger productivity differentials will be necessary between agriculture and urban labour mobility than those currently observed. Given its more diverse ethnic composition and dynamic agriculture, this is less likely in the immediate future.

For rural diversification to be a promising pathway out of poverty, the poor must be assisted in overcoming barriers to remunerative rural nonfarm jobs such as lack of skills and access to capital. Income transfers (either through the abolishment of taxes or an increase in transfers) can help in reducing poverty, but are unlikely to be sufficient, even though substantial increases are possible as they start from a low base.

Finally, while the lagging regions studied here have their own peculiarities, they also share many of the characteristics of other lagging regions in western China and beyond, in that they are remote, populated with ethnic minorities and characterized by unfavourable environments such as degraded highlands and arid plains. As such, the results are seen as useful case study inputs into a broader debate, albeit case study results which stand out for two reasons.

First, the continuing promise of the agricultural pathway in poverty reduction in these lagging areas is observed in an environment where agriculture has long ceased to be the trigger or major contributor to national growth. Second, in Inner Mongolia the critical contribution of agriculture to poverty reduction in its lagging areas was observed while its mining industry was booming. This resonates well with the finding from cross-country analysis that the presence of a mining sector substantially reduces the poverty-reducing powers of growth outside agriculture (Christiaensen, Demery and Kuhl 2010).

Overall, the experience in Inner Mongolia and Gansu suggests that during the early phases of development, the scope to reduce poverty in rural lagging regions by increasing incomes locally, including in agriculture, should not be discarded, also not when non-agriculture clearly drives national growth, and especially not in mineral resource rich settings.

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Appendix A1

Handling changes in the log of sectoral labour productivity or labour reallocation when switching in or out of an activity

To illustrate how Y_a can be decomposed in discrete terms when households switch in and out of certain activities over time, recall Equation (2):

$$Y_a = s_{L_a}^{A}\frac{G_A}{L_a^A} + s_{L_a}^{NA}\frac{G_{NA}}{L_a^{NA}} + s_{L_a}^{M}\frac{G_M}{L_a^M} + \frac{G_R}{L_a} + \frac{G_U}{L_a} - \frac{T}{L_a},$$

To simplify notation, let's assume that there are only two activities (A and NA) and one unearned income source (U). Generalization to include the other terms is straightforward. Adding time subscripts *t* and *t*-1 and differencing across time, (2) becomes:

$$Y_{at} - Y_{at-1} = s_{at}^{A}Y_{At} + s_{at}^{NA}Y_{NAt} + Y_{Ut} - s_{at-1}^{A}Y_{At-1} - s_{at-1}^{NA}Y_{NAt-1} - Y_{Ut-1} \qquad (2')$$

Equation (2′) can be decomposed in two ways. First, add and subtract $s_{at}^{A}Y_{At-1}$ and $s_{at}^{NA}Y_{NAt-1}$, divide by $Y_{at\text{-}1}$, note that $\Delta s_{at}^{NA} = -\Delta s_{at}^{A}$, and (2′) becomes:

$$\frac{\Delta Y_{at}}{Y_{at-1}} = s_{at}^{A}\frac{Y_{At-1}}{Y_{at-1}}\frac{\Delta Y_{At}}{Y_{At-1}} + s_{at}^{NA}\frac{Y_{NAt-1}}{Y_{at-1}}\frac{\Delta Y_{NAt}}{Y_{NAt-1}} + (Y_{NAt-1} - Y_{At-1})\frac{s_{at-1}^{NA}}{Y_{at-1}}\frac{\Delta s_{at}^{NA}}{s_{at-1}^{NA}} + \frac{Y_{Ut-1}}{Y_{at-1}}\frac{\Delta Y_{Ut}}{Y_{Ut-1}} \qquad (3')$$

Similarly, add and subtract $s_{at-1}^{A}Y_{At}$ and $s_{at-1}^{NA}Y_{NAt}$, divide by $Y_{at\text{-}1}$, note that $\Delta s_{at}^{NA} = -\Delta s_{at}^{A}$, and (2′) becomes:

$$\frac{\Delta Y_{at}}{Y_{at-1}} = s_{at-1}^{A}\frac{Y_{At-1}}{Y_{at-1}}\frac{\Delta Y_{At}}{Y_{At-1}} + s_{at-1}^{NA}\frac{Y_{NAt-1}}{Y_{at-1}}\frac{\Delta Y_{NAt}}{Y_{NAt-1}} + (Y_{NAt} - Y_{At})\frac{s_{at-1}^{NA}}{Y_{at-1}}\frac{\Delta s_{at}^{NA}}{s_{at-1}^{NA}} + \frac{Y_{Ut-1}}{Y_{at-1}}\frac{\Delta Y_{Ut}}{Y_{Ut-1}} \qquad (3'')$$

Taking the average of (3′) and (3′′) yields an exact decomposition:

$$\begin{aligned}\frac{\Delta Y_{at}}{Y_{at-1}} = {} & \frac{s_{at}^{A} + s_{at-1}^{A}}{2}\frac{Y_{At-1}}{Y_{at-1}}\frac{\Delta Y_{At}}{Y_{At-1}} + \frac{s_{at}^{NA} + s_{at-1}^{NA}}{2}\frac{Y_{NAt-1}}{Y_{at-1}}\frac{\Delta Y_{NAt}}{Y_{NAt-1}} + \\ & \frac{(Y_{NAt} - Y_{At}) + (Y_{NAt-1} - Y_{At-1})}{2}\frac{s_{at-1}^{NA}}{Y_{at-1}}\frac{\Delta s_{at}^{NA}}{s_{at-1}^{NA}} + \frac{Y_{Ut-1}}{Y_{at-1}}\frac{\Delta Y_{Ut}}{Y_{Ut-1}}\end{aligned} \qquad (4')$$

Using these insights, Equation (6) can then be rewritten (in % terms) as:

$$\frac{\Delta P_{ijt}}{P_{ijt}} = \beta_A \frac{s_{at}^A + s_{at-1}^A}{2} \frac{Y_{At-1}}{Y_{at-1}} \frac{\Delta Y_{At}}{Y_{At-1}} + \beta_{NA} \frac{s_{at}^{NA} + s_{at-1}^{NA}}{2} \frac{Y_{NAt-1}}{Y_{at-1}} \frac{\Delta Y_{NAt}}{Y_{NAt-1}}$$
$$+ \beta_M \frac{s_{at}^M + s_{at-1}^M}{2} \frac{Y_{Mt-1}}{Y_{at-1}} \frac{\Delta Y_{Mt}}{Y_{Mt-1}} + \beta_R s_{Gt-1}^R \frac{\Delta Y_{Rt}}{Y_{Rt-1}} + \beta_U s_{Gt-1}^U \frac{\Delta Y_{Ut}}{Y_{Ut-1}} + \beta_T s_{Gt-1}^T \frac{\Delta Y_{Tt}}{Y_{Tt-1}}$$
$$+ \gamma_{NA} \frac{(Y_{NAt} - Y_{At}) + (Y_{NAt-1} - Y_{At-1})}{2} \frac{s_{at-1}^{NA}}{Y_{at-1}} \frac{\Delta s_{at}^{NA}}{s_{at-1}^{NA}} \qquad (6')$$
$$+ \gamma_M \frac{(Y_{Mt} - Y_{At}) + (Y_{Mt-1} - Y_{At-1})}{2} \frac{s_{at-1}^M}{Y_{at-1}} \frac{\Delta s_{at}^M}{s_{at-1}^{NA}} + \delta \frac{\Delta s_{Lijt}^a}{s_{Lijt-1}^a} + v_{jt} + w_{ij} + e_{ijt}$$

As virtually all households in the sample allocated time to agriculture ($L_a^A > 0$) and earned some (gross) income in agriculture,[15] $\log(Y_{at})$ is defined for virtually all households. However, there are 120 observations where both income derived from and labour allocated to rural nonagricultural activities are zero and 4829 observations where both income derived from and labour allocated to rural-urban migration are zero. To incorporate these observations, following principles were followed. When households switch into or out of an activity, there is no change in the labour productivity in that activity, and the change in labour productivity in that activity has been put to zero. When households switch into an activity (s_{at-1}^k=0 with *k*=*NA* or *M*), the gain in overall labour productivity can be approximated by the difference in the labour productivity between the new activity and agriculture (at t) relative to the overall labour productivity at t-1 times the share of labour allocated to the new activity at t. When households switch out of an activity (s_{at}^k=0 with *k*=*NA* or *M*), the loss in overall labour productivity is approximated by the difference in the labour productivity between the new activity and agriculture (at *t*-1) relative to the overall labour productivity at *t*-1 times the share of labour allocated to the new activity at *t*-1 (terms 7 and 8 in Equation 6′). When households remain unengaged in an activity, the change in labour productivity for that activity is zero, and so is the change in time allocated to the activity. Expressing the per cent changes in logarithmic terms, the equation estimated becomes:

$$\Delta \ln P_{ijt} = \beta_A \frac{s_{at}^A + s_{at-1}^A}{2} \frac{Y_{At-1}}{Y_{at-1}} \Delta \ln Y_{At} + \beta_{NA} \frac{s_{at}^{NA} + s_{at-1}^{NA}}{2} \frac{Y_{NAt-1}}{Y_{at-1}} \Delta \ln Y_{NAt}$$
$$+ \beta_M \frac{s_{at}^M + s_{at-1}^M}{2} \frac{Y_{Mt-1}}{Y_{at-1}} \Delta \ln Y_{Mt} + \beta_R s_{Gt-1}^R \Delta \ln Y_{Rt} + \beta_U s_{Gt-1}^U \Delta \ln Y_{Ut} + \beta_T s_{Gt-1}^T \Delta \ln Y_{Tt}$$
$$+ \gamma_{NA} \frac{(Y_{NAt} - Y_{At}) + (Y_{NAt-1} - Y_{At-1})}{2} \frac{s_{at-1}^{NA}}{Y_{at-1}} \Delta \ln s_{at}^{NA} \qquad (6'')$$
$$+ \gamma_M \frac{(Y_{Mt} - Y_{At}) + (Y_{Mt-1} - Y_{At-1})}{2} \frac{s_{at-1}^M}{Y_{at-1}} \Delta \ln s_{at}^M + \delta \Delta \ln s_{Lijt}^a + v_{jt} + w_{ij} + e_{ijt}$$

15 Out of 7500 observations, there were only 88 observations for which total household labour allocated to agriculture was zero, and only 5 observations for which both total labour allocated to agriculture and total gross income from agriculture were zero.

whereby the value for observations with both zero labour allocation to and zero (gross) income from rural nonfarm activities or urban labour mobility have been replaced as indicated in the table below.

Non-agricultural activities	$\frac{s_{at}^{NA}+s_{at-1}^{NA}}{2}\frac{Y_{NAt-1}}{Y_{at-1}}\Delta\ln Y_{NAt}$	$\frac{(Y_{NAt}-Y_{At})+(Y_{NAt-1}-Y_{At-1})}{2}\frac{s_{at-1}^{NA}}{Y_{at-1}}\Delta\ln s_{at}^{NA}$
$L_{NAt-1}>0, L_{NAt}>0$	idem	idem
$L_{NAt-1}=0, L_{NAt}>0$	0	$(Y_{NAt}-Y_{At})\frac{s_{at}^{NA}}{Y_{at-1}}$
$L_{NAt-1}>0, L_{NAt}=0$	0	$(Y_{NAt-1}-Y_{At-1})\frac{-s_{at-1}^{NA}}{Y_{at-1}}$
$L_{NAt-1}=0, L_{NAt}=0$	0	0

Urban migration	$\frac{s_{at}^{M}+s_{at-1}^{M}}{2}\frac{Y_{Mt-1}}{Y_{at-1}}\Delta\ln Y_{Mt}$	$\frac{(Y_{Mt}-Y_{At})+(Y_{Mt-1}-Y_{At-1})}{2}\frac{s_{at-1}^{M}}{Y_{at-1}}\Delta\ln s_{at}^{M}$
$L_{Mt-1}>0, L_{Mt}>0$	idem	idem
$L_{Mt-1}=0, L_{Mt}>0$	0	$(Y_{Mt}-Y_{At})\frac{s_{at}^{M}}{Y_{at-1}}$
$L_{Mt-1}>0, L_{Mt}=0$	0	$(Y_{Mt-1}-Y_{At-1})\frac{-s_{at-1}^{M}}{Y_{at-1}}$
$L_{Mt-1}=0, L_{Mt}=0$	0	0

Appendix Table A1
Inner Mongolia – Equality of poverty reducing potential for agriculture and labour mobility
and their superiority over rural diversification is robust against alternative poverty lines and replacement values[1)]

	Official poverty line, zero replaced by:				$1-day poverty line, zero replaced by:			
	0.001	0.01	0.1	1	0.001	0.01	0.1	1
	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)
Agricultural labour productivity	-0.92*** (0.00)	-0.82*** (0.00)	-0.67*** (0.00)	-0.48*** (0.00)	-1.90*** (0.00)	-1.64*** (0.00)	-0.80*** (0.00)	-0.62*** (0.00)
Rural nonfarm labour productivity	-0.31 (0.17)	-0.26 (0.16)	-0.20 (0.16)	-0.13 (0.15)	-0.88** (0.02)	-0.76** (0.01)	-0.27 (0.13)	-0.21* (0.09)
Rural labour diversification	-0.48* (0.05)	-0.39** (0.04)	-0.29** (0.03)	-0.18** (0.03)	-0.17 (0.67)	-0.19 (0.55)	-0.40** (0.02)	-0.30** (0.02)
Labour productivity in migration	-0.01 (0.97)	-0.10 (0.74)	-0.25 (0.43)	-0.46* (0.09)	-0.86 (0.20)	-1.00 (0.15)	-0.35 (0.44)	-0.73 (0.13)
(Urban) migration	-1.23** (0.03)	-1.02** (0.02)	-0.78** (0.01)	-0.50** (0.01)	-2.14** (0.02)	-1.72** (0.02)	-0.91** (0.05)	-0.62* (0.06)
Remittances	-0.24 (0.86)	-0.23 (0.87)	-0.20 (0.89)	-0.02 (0.96)	-0.56 (0.73)	-0.29 (0.89)	-0.41 (0.84)	0.12 (0.87)
Transfers	0.04 (0.78)	0.01 (0.96)	-0.01 (0.94)	0.01 (0.94)	-0.96** (0.03)	-1.13** (0.01)	0.00 (0.99)	0.00 (1.00)
Taxes	0.77 (0.15)	0.90 (0.14)	0.98 (0.15)	0.46 (0.31)	-0.45 (0.56)	-0.57 (0.51)	1.37 (0.14)	0.93 (0.18)
Dependency ratio	-0.14 (0.63)	-0.28 (0.40)	-0.45 (0.17)	-0.41* (0.09)	-0.62 (0.27)	-1.00 (0.13)	-0.54 (0.17)	-0.59* (0.06)
R^2	0.19	0.19	0.20	0.20	0.18	0.18	0.19	0.19
F	79.28	59.99	13.08	7.00	33.99	26.21	17.20	6.76
N	3186	3186	3186	3186	3186	3186	3186	3186

Note: [1)] Ordinary least squares with heteroscedasticity correction. Household fixed effects and time varying village effects included but not reported.

Appendix Table A2

Gansu – Equality of poverty reducing potential for agriculture and labour mobility and their superiority over rural diversification is robust against alternative poverty lines and replacement values[1)]

	Official poverty line, zero replaced by:				$1-day poverty line, zero replaced by			
	0.001	0.01	0.1	1	0.001	0.01	0.1	1
	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)	Coeff/ (p-value)
Agricultural labour productivity	-1.77*** (0.00)	-1.42*** (0.00)	-1.05*** (0.00)	-0.68*** (0.00)	-2.80*** (0.00)	-2.26*** (0.00)	-1.25*** (0.00)	-0.88*** (0.00)
Rural nonfarm labour productivity	-0.51** (0.04)	-0.54** (0.02)	-0.53*** (0.01)	-0.43*** (0.00)	-0.51*** (0.01)	-0.56*** (0.00)	-0.66*** (0.01)	-0.56*** (0.00)
Rural labour diversification	-0.67 (0.34)	-0.55 (0.31)	-0.43 (0.29)	-0.26 (0.33)	-0.44 (0.54)	-0.41 (0.48)	-0.66 (0.20)	-0.49 (0.18)
Labour productivity in migration	-0.34 (0.40)	-0.46 (0.25)	-0.55 (0.13)	-0.52* (0.07)	-1.17** (0.03)	-1.31** (0.01)	-0.74* (0.10)	-0.77** (0.04)
(Urban) migration	-2.05* (0.08)	-1.72* (0.07)	-1.37* (0.05)	-0.96** (0.04)	-1.39 (0.25)	-1.24 (0.21)	-1.56* (0.08)	-1.15* (0.07)
Remittances	-0.60 (0.15)	-0.73 (0.11)	-0.96* (0.07)	-0.88 (0.19)	-0.04 (0.92)	-0.13 (0.79)	-1.19* (0.07)	-1.41 (0.14)
Transfers	-0.47* (0.08)	-0.52* (0.05)	-0.50** (0.04)	-0.37* (0.06)	-0.42 (0.51)	-0.55 (0.39)	-0.61** (0.05)	-0.48* (0.07)
Taxes	-0.77 (0.51)	-0.69 (0.56)	-0.40 (0.72)	-0.04 (0.96)	-1.46 (0.35)	-1.47 (0.36)	-0.52 (0.69)	-0.056 (0.96)
Dependency ratio	-1.05 (0.31)	-1.23 (0.11)	-1.20** (0.03)	-0.88** (0.02)	-2.83*** (0.01)	-2.69*** (0.00)	-1.56** (0.02)	-1.27*** (0.01)
R^2	0.24	0.25	0.26	0.27	0.26	0.27	0.24	0.24
F	42.86	56.92	11.22	74.53	22.09	127.42	70.17	35.56
N	2790	2790	2790	2790	2790	2790	2790	2790

Note: 1) Ordinary least squares with heteroscedasticity correction. Household fixed effects and time varying village effects included but not reported.

Appendix Table A3
Controlling for initial poverty does not affect the coefficients on the other regressors[1)]

Change in log ($1-day pov gap)	Inner Mongolia				Gansu			
	OLS		OLS with household and time varying village fixed effects		OLS		OLS with household and time varying village fixed effects	
coeff/p-value	Restricted sample	With lagged poverty	Restricted sample	With lagged poverty	Restricted sample	With lagged poverty	Restricted sample	With lagged poverty
Agricultural labour productivity	-0.49** (0.01)	-0.52*** (0.01)	-0.65** (0.03)	-0.66** (0.02)	-0.94*** (0.00)	-0.93*** (0.01)	-0.86** (0.03)	-0.82** (0.04)
Rural nonfarm labour productivity	-0.11 (0.24)	-0.05 (0.54)	-0.32 (0.22)	-0.32 (0.21)	-0.47** (0.04)	-0.50** (0.02)	-0.84*** (0.00)	-0.80*** (0.00)
Rural labour diversification	-0.11 (0.11)	-0.06 (0.31)	-0.29 (0.22)	-0.28 (0.21)	-0.16 (0.46)	-0.26 (0.17)	-0.87 (0.13)	-0.80 (0.15)
Labour productivity in migration	-0.27 (0.26)	-0.19 (0.44)	0.16 (0.69)	0.15 (0.72)	-0.77*** (0.00)	-0.79*** (0.01)	-0.67 (0.18)	-0.65 (0.19)
(Urban) migration	-0.72* (0.08)	-0.78* (0.06)	-1.08** (0.04)	-1.11** (0.03)	-1.28* (0.08)	-1.28* (0.07)	-1.48 (0.14)	-1.45 (0.15)
Remittances	0.05 (0.97)	0.24 (0.86)	-1.51 (0.51)	-1.60 (0.48)	-0.51 (0.40)	-0.63 (0.26)	-1.57 (0.12)	-1.54 (0.13)
Transfers	-0.03 (0.84)	0.05 (0.69)	0.19 (0.42)	0.19 (0.42)	-0.34 (0.23)	-0.40 (0.18)	-0.69 (0.24)	-0.61 (0.29)
Taxes	0.46 (0.52)	0.83 (0.24)	0.97 (0.44)	0.92 (0.46)	2.82 (0.23)	2.73 (0.24)	-1.73 (0.54)	-1.63 (0.55)
Dependency ratio	-0.83*** (0.01)	-0.88*** (0.01)	-0.82** (0.04)	-0.83** (0.04)	-1.92*** (0.00)	-1.90*** (0.00)	-2.02** (0.01)	-2.03** (0.01)
Log (poverty gap) at *t*-2		-0.08*** (0.00)		0.05 (0.22)		-0.09*** (0.00)		0.09* (0.06)
R^2	0.01	0.02	0.17	0.18	0.02	0.03	0.22	0.22
F	2.51	3.00	17.55	30.95	4.37	5.57	26.19	132.07
N	2391	2391	2391	2391	2095	2091	2095	2091

Note: 1) Zeroes replaced by 0.1.