The Influence of Colonial Institutions during Economic Booms and Distributional Policies*

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Abstract

Many studies have documented long-lasting negative impacts of colonial institutions. Yet, little is known about whether current policies could reduce those impacts. We focus on the *mita*, a forced labor system implemented from 1573 through 1812 in Peru. Prior work has shown large penalties for living with the area at the beginning of the 21st century. We find that in the last two decades, the *mita* penalty has worsened. However, the creation of cash transfer programs targeting the poorest households nationwide has eliminated the *mita*'s effects among both the youngest and poorest households.

Keywords: Forced labor, colonial legacies, growth, distributional policies.
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A growing number of studies have shown that historical institutions help explain modern economic development and human capital development (Sokoloff and Engerman, 2000; Acemoglu, Johnson and Robinson, 2001; Nunn, 2008; Jedwab, Kerby and Moradi, 2017; Buggle and Nafziger, 2021). African countries with greater slave exports have significantly lower real GDP than those that exported fewer (Nunn, 2008), a one standard deviation increase in the share of serfs reduces household expenditure by as large as 17% in Russia (Buggle and Nafziger, 2021), and in India, differences in land-tenure systems instituted during British rule led to differences in agricultural productivity and investment post-independence (Banerjee and Iyer, 2005). In many cases, coercive labor systems have a lasting impacts on inequality such as in Russia (Buggle and Nafziger, 2021), the United States (Bertocchi and Dimico, 2014), and Java (Dell and Olken, 2020).

Another salient example is the mining *mita*, an extensive forced labor system created in 1573 by the Spanish Empire in Peru and Bolivia. The system demanded that over 200 indigenous communities send one-seventh of their adult male population to work in mines at Potosí and Huancavelica. Prior work on the *mita* has shown that in 2001, households residing within the boundaries established for conscription had worse economic outcomes than their neighbors living outside the *mita* boundaries (Dell, 2010).

In the subsequent years, Peru experienced an unprecedented economic boom, with per capita GDP doubling and impressive annual growth rates averaging 5.3% between 2000 and 2010 (Group, 2017). Along with the economic growth, the country created distributional policies targeting the nation's poorest such as Juntos, a program targeting mothers with school-aged children, and Pensión 65, which targets senior citizens. These policies directly give qualifying households or individuals cash to assist with living. For the average household, these transfers can be substantial; we estimate that these two transfers account for 9% and 21% respectively, of a receiving household's total income. Between 2001 and 2019, poverty fell by more than half nationally (Figure 4a), and there has been an important reduction in other inequality measures such as Gini coefficients (Lustig et al., 2016, p.213-231).

Our paper uses household data from 2001 to 2019 to test whether these developments have reduced the penalty for living inside the *mita* boundaries. Due to lower initial consumption levels, the policies should be more impactful for those living in former *mita* areas compared to those outside the areas. We use a regression discontinuity design motivated by the discrete change in *mita* conscripts at the historical boundary to evaluate the differences in expenditures and income across the arbitrary boundary imposed during colonial rule. We find that both measures rose for all households over the 19-year period. In the years after 2001, those both inside and outside the former *mita* catchment area are wealthier and earn more. We show that the gap in absolute and relative terms is wider, and due to the need-based nature of the distributional policies, households in *mita* areas are more likely to receive transfers. The transfers reduce the magnitude of the income gap by 5.7 percentage points, and the gap in household poverty rates among the poorest households has vanished. Pooling 19 years of income and expenditure data, we increase the number of households surveyed within 100km of the border by 25-fold relative to 2001. We use the additional data to identify how various birth cohorts fare in the 21st Century. We find a persistent difference in both income and expenditures for households in which the head of the household was born between 1920 and 1989. However, we find that for younger households, in which the head of household was born between 1990 and 2000, there is no significant difference in income.

The results expand our knowledge on how colonial legacies can be abated. We contribute to the literature cited above by showing that targeted government interventions towards the poor, even when not specifically designed to address present-day inequality produced by historic insitutions, can reduce the inequality intitially generated by colonial institutions. Our paper is also related to the literature on the pro-poor nature of economic growth (Dollar and Kraay, 2002; Dollar, Kleineberg and Kraay, 2016; Ravallion, 2016) and whether "a rising tide lifts all boats" (Danziger and Gottschalk, 1986; Balke and Slottje, 1993; Forbes, 2000). Our results indicate that while the welfare of all households increase over the period of analysis, the overall gap has worsened. Finally, by extending analysis to multiple years, in which households faced different underlying economic conditions, we provide a robustness check along the lines of the work of Rosenzweig and Udry (2020) regarding the external validity of microeconomic studies.

1 Description of the Mining *mita*

The *mita* was originally a system created during the *Tahuantinsuyo* (as the Inca's ruling system was known) to provide labor for public goods in the Inca's territory (Rostworowski 2015, p.259; Flindell Klarén 2000, p.23). The initial system involved a rotation of manpower, which was fundamental to construction, state agriculture, husbandry, and forming the military (Ossio Acuña 2021, p.425). Construction included buildings, roads, irrigation channels, and cultivation platforms (Franco, Galiani and Lavado 2021; Ossio Acuña 2021, p.425). For complying with the system, communities benefited from state-provided nourishment during famines, technology such as the built irrigation channels, and protection against other aggressors (Ossio Acuña, 2021, p.425).

During the colonial period, Viceroy Franscico de Toledo transformed the system in order to recruit indigenous people to perform forced labor. Indigenous communities in Peru and Bolivia were required to send one-seventh of their male population to work in mines either in Potosí or Huancavelica for four months every seven years. Conscripts were to be paid to cover travel expenses and for their labor, but there is mixed historical evidence on payments, and laborers were often forced to work beyond the terms for lower wages than those legally set (Flindell Klarén 2000, p.67; Dore 1988, p.71; Wiedner 1960). Importantly, *mita* laborers would become indebted to local elite, with many choosing to stay as free-wage laborers (Dore 1988, p.73; Flindell Klarén 2000, p.68). The conditions in the mines were brutal; forced laborers would carry heavy baskets filled with ore for hundreds of feet through perilous tunnels to be greeted by freezing winds upon emergence (de Orsúa and Vela 1975, p.377-378).

Villages were frequently unable to send the required laborers, paying the difference with monetary payments (Dore 1988, p.70). The system would draw 13,500 forced laborers a year to Potosí; when accounting for families, as many as 50,000 people would move in and out each year (Flindell Klarén, 2000, p.67). The system constituted a great burden, leading to population collapse due to the poor working conditions and migration out of *mita* communities (Tandeter, 1993). The reduction in male workforce at villages, directly caused by the draft and indirectlly through evadement, would hurt agricultural production leading to malnutrition and famine in *mita* districts (Flindell Klarén, 2000, p.67). Historical records indicate that the Viceroy used distance to the mines and elevation to determine *mita* assignment (Cole 1985, p.; Dore 1988, p.68), and the system was legally abolished in 1812.

Existing literature has focused on measuring a variety of outcomes comparing those within and outside the *mita* to assess differences based on the historical boundary. The assignment of surnames, a consequence of mass baptisms after the conquest of Peru, allow Carpio and Guerrero (2020) to show that area-specific surnames in *mita* districts fell 47 log-points compared to non-*mita* surnames based on data from the Peruvian Electoral Roll of 2011. Dell (2010), using data from a national household survey in 2001, finds a large decline in welfare measured by per capita consumption. Families just inside the *mita* boundary had approximately 25% lower levels of consumption compared to their counterparts just outside the *mita* catchment area. Analogously, Natividad (2019) focuses on firms rather than households and also finds negative effects. Firms inside the *mita* have lower sales and fixed assets, and are less likely to either use a commercial name or have a registered tax ID. Huaroto and Gallego (2021) show there is greater social unrest during the late 18th Century, the 1980s-90s, and 2000s, and they find non-*mita* districts benefitted more from high global mineral prices during the early 2000s. An exception is Arroyo Abad and Maurer (2022), which compares indigenous re-settlements in Peru under Viceroy Toledo to show no difference in indigenous populations for settlements that experienced some form of labor coercion compared to those that were not. In *mita* settlements, literacy rates were no different in 1876 or 2007 compared to unforced settlements, but the percentage of land owned by indigenous people was greater in late and post-colonial periods.

Our contribution is to identify whether national reform has affected the penalty of living within the *mita* districts. We document changes in the *mita* penalty for households related to income, expenditures, and poverty and individual outcomes on years of schooling and literacy rates both by year and by birth cohort. The creation of welfare programs that target poor households disporportionately affects those living within the *mita* due to lower initial levels of income and assets. Therefore, the policies may reduce or eliminate aspects of the long-standing inequality experienced between *mita* and non-*mita* districts.

2 Data

We use 19 rounds of Peru's National Survey of Households (ENAHO). ENAHO is a large annual survey representative at the national and state level.[1] The survey is the main source used to measure income, expenditures, and poverty in Peru. Our sample starts with the 2001 round which was employed by Dell (2010), and we explore how the negative impact of the *mita* varies during the next two decades, which features impressive economic growth and the Peruvian government implements distributional policies. We focus on the portion of the boundary in which elevation and terrain are similar across *mita* and non-*mita* villages as explored in other papers (Dell, 2010; Carpio and Guerrero, 2020; Natividad, 2019; Huaroto and Gallego, 2021).[2] The following 18 years of additional ENAHO rounds increases the amount of districts within 100km of the *mita* boundary from 71 to 239.[3] For our preferred specification, restricting to within 50km of the boundary, we add 103 districts, which yields a 25-fold increase in the number of surveyed houesholds.

We measure welfare by examining household expenditures, income, and poverty as defined by Peru's statistical bureau (INEI). We also add extensive and intensive margins of government transfers to households. All monetary values are adjusted for yearly inflation after accounting for regional variation in prices (expressed in 2019 prices from the capital city).[4] In the 19 years of survey data, the methods used to calculate income, expenditure, and poverty changed once. The poverty line for surveys before 2010 used the 1997 Census

[1]ENAHO microdata are freely available from Peru's statistical bureau (Instituto Nacional de Estadistica de Informatica , INEI): `http://iinei.inei.gob.pe/microdatos/`.

[2]Existing boundary analysis is based on the total area within 100km, using 20x20km grids to estimate differences in elevation and slope. In Table 2 of the Appendix, we show there is no significant difference in mean elevation while mean slope is significant at the 10% for distance bandwidths fewer than 100km.

[3]Appendix Figure 6 shows the area we study within Peru, the districts considered in Dell (2010), and the districts considered in our study.

[4]We compute the natural log transformation, adding a one to the measures to avoid LN(0). We consider household equivalent measures (as opposed to simple per capita measures) by assigning a value of 0.4 for children aged 0 to 4, 0.5 for ages 5 to 14, and 1 for all people older than 14.

as a reference population, while 2010 and more recent years utilize the 2007 Census. To determined the poverty line, the cost of several food bundles that total 2300kcal are calculated; the extreme poverty line is determine by the least expensive bundle. Changes to the bundles have been made to adjust for recommendations regarding caloric requirements and nutriental content.[5] In Appendix B, we also show adjustments made to various components of income, in which the largest change occurs in the calculation of self-consumption. In Figure 2, we present the trends in average consumption under both methodologies, the previous methology overestimated the value of goods produced for the household's consumption. Our preferred specification excludes transfers and self-consumption, and we are robust to specifications including the omitted categories. For additional information on the construction of our variables and price adjustments, see Appendix B.

3 Methodology

Using the arbitrary elevation and distance to mine cutoff, we estimate the penalty associated with living in the *mita* on expenditures, income, and participation in distributional programs. To support the use of the boundary, numerous researchers have validated that for the area within 100km of the segment studied, there are no important discontinuities around the threshold (Dell, 2010; Carpio and Guerrero, 2020; Natividad, 2019; Huaroto and Gallego, 2021). For example, data prior to the *mita*'s implementation on local tribute (tax) rates and the allocation of tribute revenue are smooth around the cutoff. Using modern data, elevation, ruggedness, and ethnic identification also display no discontinuities at the threshold. This evidence, allows us to estimate the following equation:

$$\mathrm{Y}_{idbt} = \alpha + \beta mita_d + \mathrm{X}'_{id}\sigma + f(\text{geographic location}_d) + \gamma_t + \phi_b + \epsilon_{idbt}, \tag{1}$$

where Y_{idbt} represents the outcome for individual (or household) i, in district d, along segment b of the *mita* boundary, observed in year t. The *mita* penalty is captured by β. The vector of covariates, X'_{id}, includes mean area weighted elevation and slope for district d as well as household-level demographic variables for the number of infants, children, and adults. The function $f(\text{geographic location}_d)$ is a polynomial control for smooth functions of the each district.[6] This is done by merging the ENAHO data with geographical features at

[5] For additional information visit http://iinei.inei.gob.pe/iinei/srienaho/Descarga/DocumentosMetodologicos/2010-55/Informe-Tecnico-Pobreza.pdf

[6] We present estimates using a quadratic function as higher order polynomials can be noisy, sensitive to degree, and have substandard confidence intervals (Gelman and Imbens, 2019). Results with a cubic specification available upon request.

the district level. These features include the portion of the *mita* boundary with a smooth landscape and allows us to employ a sharp regression discontinuity design.

We consider three distance polynomials: longitude and latitude, Euclidean distance to Potosí, and Euclidean distance to the *mita* boundary.[7] Estimates are robust to all three specifications. ϕ_b is a fixed effect for segments of the boundary, while γ_t includes fixed effects for the two ENAHO methodologies spanning the survey years and survey year fixed effects. Standard errors are clustered at the district level. We consider four bandwidths: 25km, 50km, 75km, and 100km from the border.

The main tables and figures use the 50km bandwidth to be conservative and to allow for direct comparison with other studies utilizing the boundary, but the other specifications are included in Appendix A. We exclude the province of Cusco which includes eight non-*mita* and two *mita* districts. As the capital of the *Tahuantinsuyo*, its historical significance likely contributes to the area's relative prosperity. The inclusion of Cusco increases the magnitude of our estimates, and results are available upon request.

4 Results

4.1 Effects on expenditure and income

Table 1, Panel A, shows the main findings of our study. Combining all ENAHO years we show that both income and expenditures are lower for households just inside the *mita* catchment area relative to their counterparts just outside the *mita* border. For example, in column (1) we show there is a 26.5% all-source expenditure gap when considering the distance to the *mita*, which is as large as 40.7% with latitude and longitude specification. The gap grows when we exclude transfers and donations (column 2). Column (4) follows the methodolgy employed in Dell (2010), showing a 29.9% difference in consumption, an effect size 20% larger than the 25% estimate reported using the 2001 survey. We identify a similar disparity in income. Considering all income sources in column (4), we find a 28.7% gap between *mita* and non-*mita* households. In colummn (5), excluding transfers, the income gap balloons to 34.4% gap. The 5.7 percentage point reduction in the income gap is primarily the result of income transfers related to distributional programs; as we see in column (1) of Panel B, 18.6% more households are receiving assistance through a govermnment transfer, with most recieving Juntos transfers. Importantly, since expenditures (and income) have increased in real terms since 2001, the absolute gap is much larger suggesting a wider *mita* penalty during

[7] We specify a quadratic function using the Euclidean distance to Potosí as our sample region would have likely been sent to these mines due to the relative proximity compared to Huancavelica.

Peru's economic boom. As shown in Appendix A, these findings are robust to using other bandwidths.

We then consider the effects year by year, using a separate regression for each year, in Figure 3. The estimates shown are bounded by 95% confidence interals, adjusted for clustering at the district level. We find that throughout the 21st Century, both the expenditure and income effect move around the 30% penalty. Again, if the effect remains relatively constant as the baseline is increasing, implying that the absolute gap caused by the *mita* has increased in the 21st century. Moreover, the confidence intervals for the year-to-year estimates overlap, highlighting the robust disparity in welfare.

We explore this issue in more detail, focusing on birth cohorts by testing whether the effects vary by the age of the household head. We divide cohorts by decade of birth and consider those born in the 1920s to the 1990s. For both income and expenditure, we find that the effects are persistent for most birth cohorts. The one exception we find is that there is no significant difference between households in which the head was born in the 1990s. This novel result suggest important heterogeneity.

4.2 The Role of Distributive Policies

As in many developing countries, Peru implemented numerous distributional policies in the 21st century; within 50km of the boundary, 32% of all sampled households are recieving a government transfer. Before 2005, transfers represented a small portion of income, primarily through contributory pensions (Reynaga, 2017).[8] Between 2005 and 2007, Juntos, a conditional cash transfer program, began and expanded to cover most eligible districts as shown in Figure 1c. Eligibility for Juntos is based on living conditions and assets, such as the type of dwelling and access to public services, and disbursement is based on child and adolescent school attendance and health check-ups.[9] The eligible households that adhere to the conditions receive S./ 200 every other month ($59 USD in 2019). These houholds represent 18.5% of all households in our sample living within 50km of either side of the boundary, and, on average, the transfer is equivalent to 12% of their nontransfer income. When considering the pool of households that recieve any governmment transfer, 58% are Juntos recipients.

Transfers plateau in 2011 and again rapidly increased with the introduction of Pensión 65, a noncontributory pension for those aged 65 and older with similar assessed living condititons as the requirements for Juntos. The transfer is also bimonthly, and recipients recieve

[8] 2004 is the first round in which the ENAHO questionnaire has data on transfers, as there were no widespread government transfers to households previously.

[9] See Sánchez and Jaramillo (2012); Perova and Vakis (2012) for examples of papers describing the rollout of the program and its impacts.

S./ 250 ($75). For receiving households in our sample, Pensión 65 is roughly equal to 38% of the average nontransfer income. Bando, Galiani and Gertler (2020) shows that recipients increase their level of consumption by 40% and subjective well-being increases by .17 standard deviations. Beca 18 is a merit-basesd scholarship for low-income students attending university. Agüero, Galarza and Yamada (2020) shows that providing information about being a recipient increases the likelihood of a call-back for job interviews by 20%. The program covers tuition costs plus all living expenses, such as books, moving costs, a laptop, health insurance, and academic tutors. Bono Gas provides a subsidy for the installation of natural gas, increasing access to fuels and technologies for cooking (Ramírez-Candia, Curt and Domínguez, 2022).

For all the government transfers with large coverage (Juntos, Pensión 65, and Bono Gas), *mita* households are more likely to receive them as shown in Table 1 Panel B. In columnn (1), we estimate that those living within the boundary are between 15.6 and 18.4% more likely to recieve a government transfer. Importantly, in column (6) we show that *mita* households are significantly less likely to receive other government transfers, mainly contributory pensions. As greater proportion of those living within the *mita* receive a government transfer, we find these programs are significant contributors to the reduction of the penalty for living within the boundaries.

We then ask whether these programs have affected the *mita* penalty for those at the bottom of the income distribution. We first consider the impact of the *mita* on poverty status by survey year. In Figure 4, we find that point estimates have remained fairly consistent throughout most the the two decades with some decline in the very last years of our sample. Notably, we find a clear reduction in extreme poverty. Beginning in 2013, which was the first year there were both Juntos and Pensión 65 disbursements, the difference in extreme poverty rates is statistically insignificant. The estimates are indistinguishable from zero with very tight confidence intervals, signifying that the *mita* penalty has been eliminated for the ultra-poor.

4.3 Robustness and additional results

The online appendix contains further analysis briefly dicussed in this section. First, we show that the main results hold at 25, 75, and 100km bandwidths. Our preferred specifications rely on those living within our sample, but the appendix contains the results using households in which the head of household was born within the area, and the results are qualitatively similar both by year and by cohort, with smaller point estimates. Those born in the *mita* experience statistically significant lower levels of income and expenditures. While population collapse as a result of the *mita* is well documented (Dore, 1988; Carpio and Guerrero, 2020), we provide evidence regarding present-day out-migration using our data source. We are more likely to observe individuals born within the *mita* catchment living outside their birth district than non-*mita* individuals; the coefficient estimates are significant for older individuals. As mentioned in the methodology section, including individuals living in Cusco increases the magnitude of the results, and results are available upon request as well as the results using a cubic distance polynomials. Lastly, we explore differences in educational attainment and literacy rates. To do so, we break down age into four age groups: between 6 and 16, 17 and 35, 36 and 50, and 51 or older. Those older than 17 and living within the *mita* have less schooling and are more likely to be illiterate. The estimates are statistically significant for those aged 36 and older. For those under the age of 17, there are no differences in educational attainment or literacy rates.

5 Conclusions

We explore whether economic growth and the implementation of distributional policies could reduce the negative effects of colonial institutions. Taking advantage of Peru's impressive economic growth experience and the robust identification strategy provided by the sharp geographic discontinuity, we study the case of the Peruvian mining *mita*.

We find that during the boom, welfare increased for all households, regardless of whether they were inside or outside the former *mita* catchment area. However, the gap persists both in every year and for birth cohorts born the decades prior to 1990. In fact, we identify a larger gap in both relative and absolute terms between 2001 and 2019. We do observe that households in the former *mita* areas are receiving more government transfers, which reduces the overall income penalty by 5.7 percentage points. For the youngest cohort of households, we estimate a statistically insignificant difference in non-transfer income, and the gap between the ultra poor has vanished in the last years of our analysis. We attribute the results to the pro-poor policies implemented, namely Juntos and Pensión 65, as they provide substantial relief to households. All together, this evidence suggests that distributional policies could reduce, if not eliminate, the persistent negative effects of colonial institutions.

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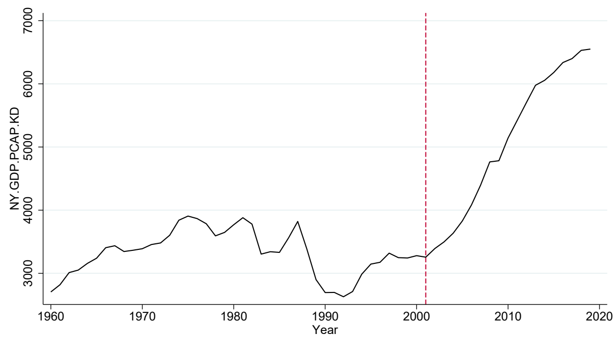
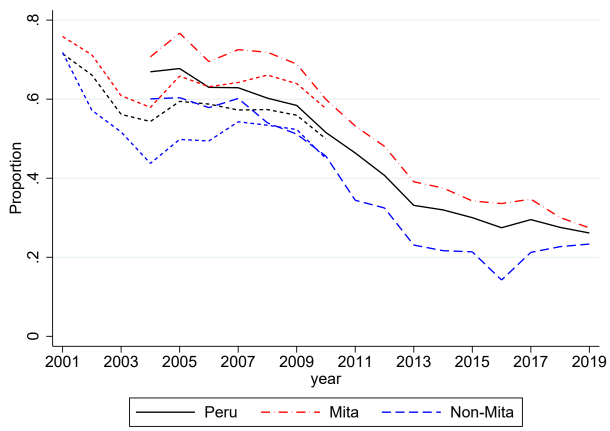
Figure 1: Evolution of Poverty Headcount & Introduction of Social Welfare Programs

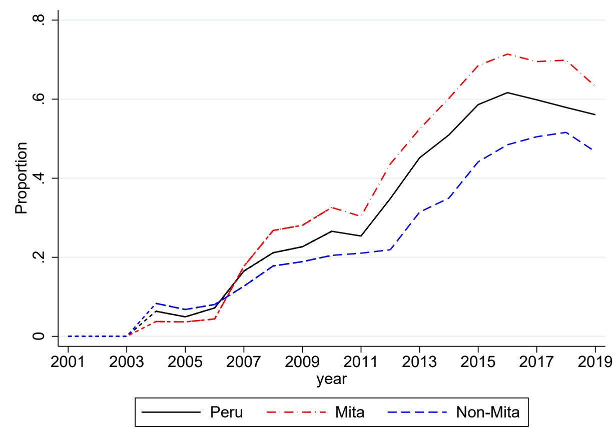
(a) GDP Trend



(b) Poverty Headcount

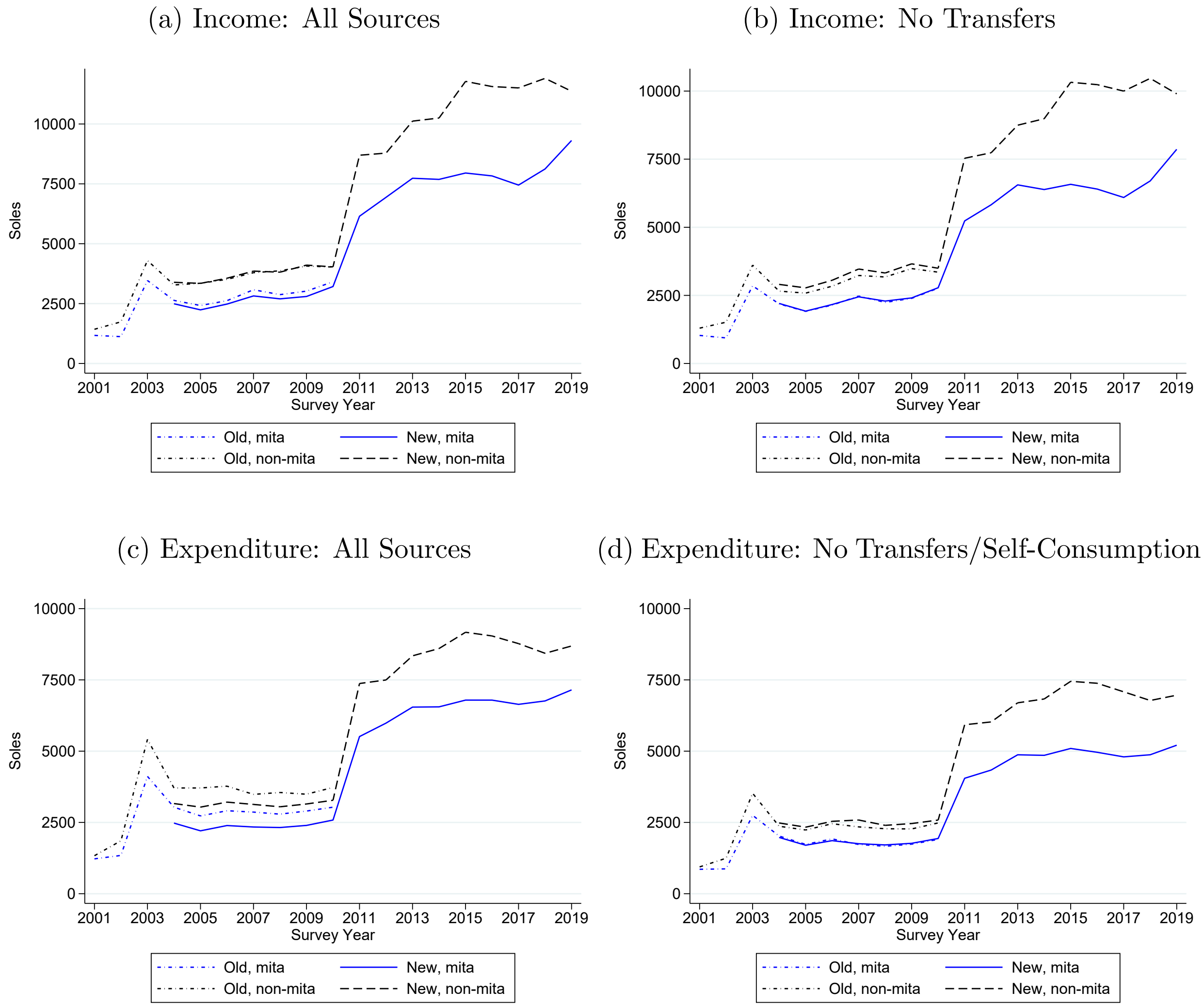


(c) Participation in Gov. Program



Note: Authors' calculation based on ENAHO's indicator for living in poverty and income reported for government transfers. We present both of ENAHO's methodologies that use data from the 1997 and 2007 census to determine the poverty line. The dashed line represents the old methodology, using the 1997 census as a reference, and the solid line uses the 2007 census.

Figure 2: Trends in Income & Expenditures around the *mita* Boundary, Living within 50km



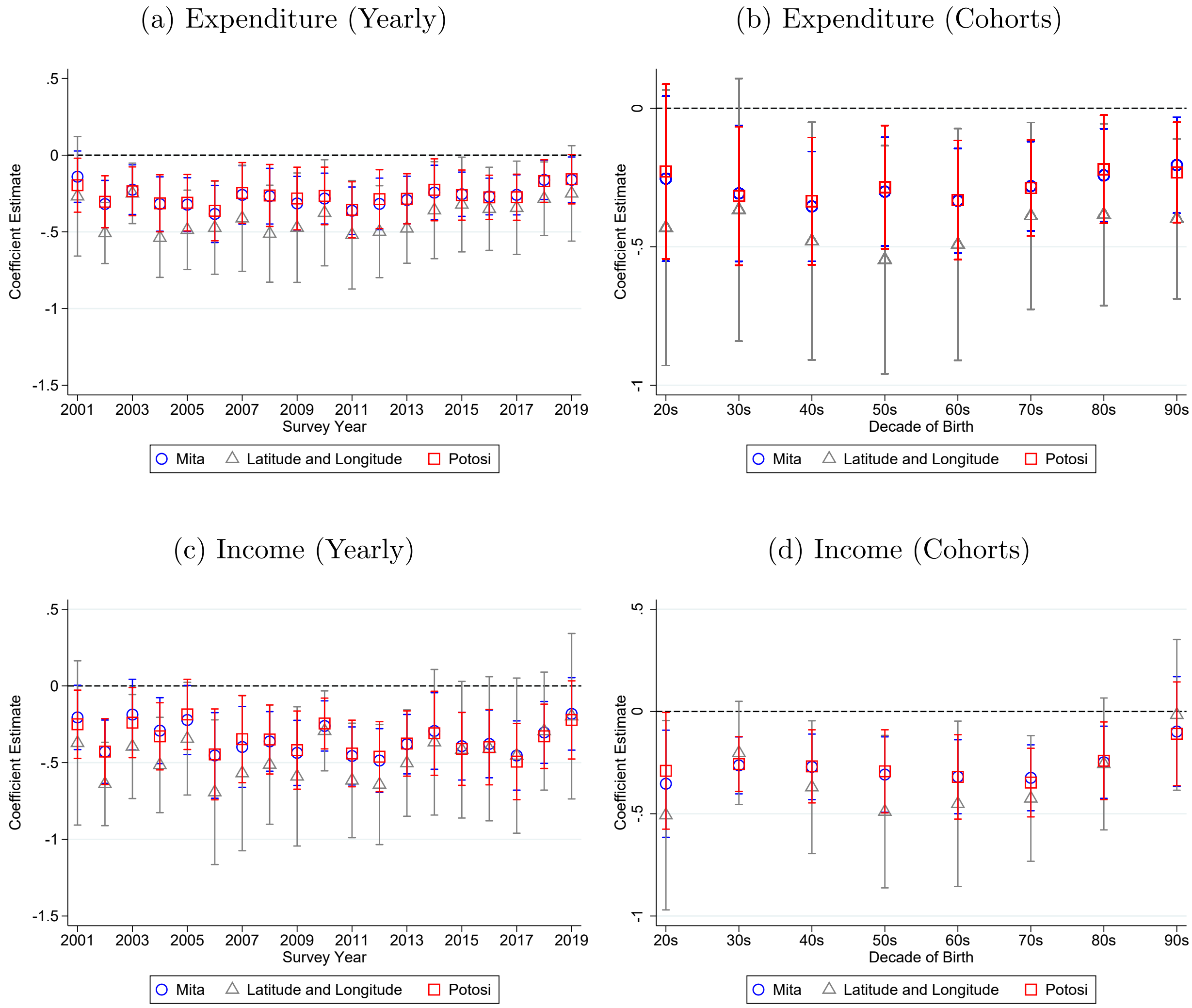
Note: Lines reflect average measures (per capita) for household 50km inside and outside of the *mita* border. We exclude those living or born in Cusco. Income and expenditure household equivalent use weights assigning a value of 1 to adults, .5 to children, .4 to infants.

Table 1: Log Household Equiv. Income & Expenditure, Living within 50km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.407	-0.524	-0.433	-0.419	-0.455	1.075
	(0.132)	(0.214)	(0.143)	(0.164)	(0.180)	(0.310)
Polynomial in Distance to Potosí						
Mita	-0.257	-0.351	-0.291	-0.288	-0.347	0.939
	(0.074)	(0.112)	(0.079)	(0.088)	(0.094)	(0.190)
Polynomial in Distance to Mita						
Mita	-0.265	-0.353	-0.299	-0.287	-0.344	0.945
	(0.063)	(0.098)	(0.067)	(0.079)	(0.083)	(0.186)
Non-*mita* Mean Nuevo Soles	5623.19	4355.36	5117.65	6816.51	5915.79	396.92
Clusters	155	155	155	155	155	151
Observations	31925	31925	31925	31925	31925	29253
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.186	0.202	0.133	0.148	0.005	-0.034
	(0.055)	(0.060)	(0.041)	(0.062)	(0.004)	(0.015)
Polynomial in Distance to Potosí						
Mita	0.155	0.150	0.109	0.132	0.003	-0.021
	(0.033)	(0.036)	(0.024)	(0.033)	(0.002)	(0.009)
Polynomial in Distance to Mita						
Mita	0.156	0.156	0.106	0.121	0.003	-0.019
	(0.032)	(0.036)	(0.021)	(0.031)	(0.002)	(0.009)
Non-*mita* Mean Take-Up	0.25	0.12	0.05	0.06	0.00	0.07
Clusters	151	149	138	134	134	151
Observations	29253	25343	12861	11572	11572	29245
Intial Year	2004	2006	2012	2013	2013	2004

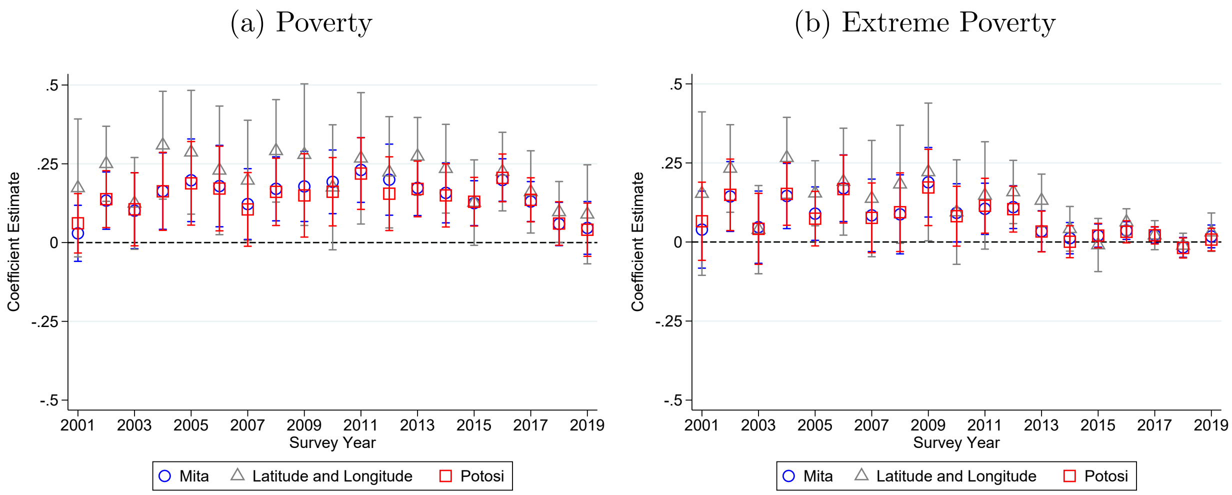
Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Figure 3: Effect on Household Expenditure & Income, Living within 50km



Note: Regressions in Panel (A), (C) and Panel (B), (C) are estimated separately for each survey year and for each cohort based on the age of the household head, respectively. Confidence interval are computed using clusters at the district level. Expenditure excludes transfers and self-consumption, and income excludes government transfers. We assign weights to each household member using a value of 1 for adults, .5 for children, .4 for infants. All individuals included are head of households, who were living in districts in the *mita* and non-*mita* sample. We exclude those living or born in Cusco.

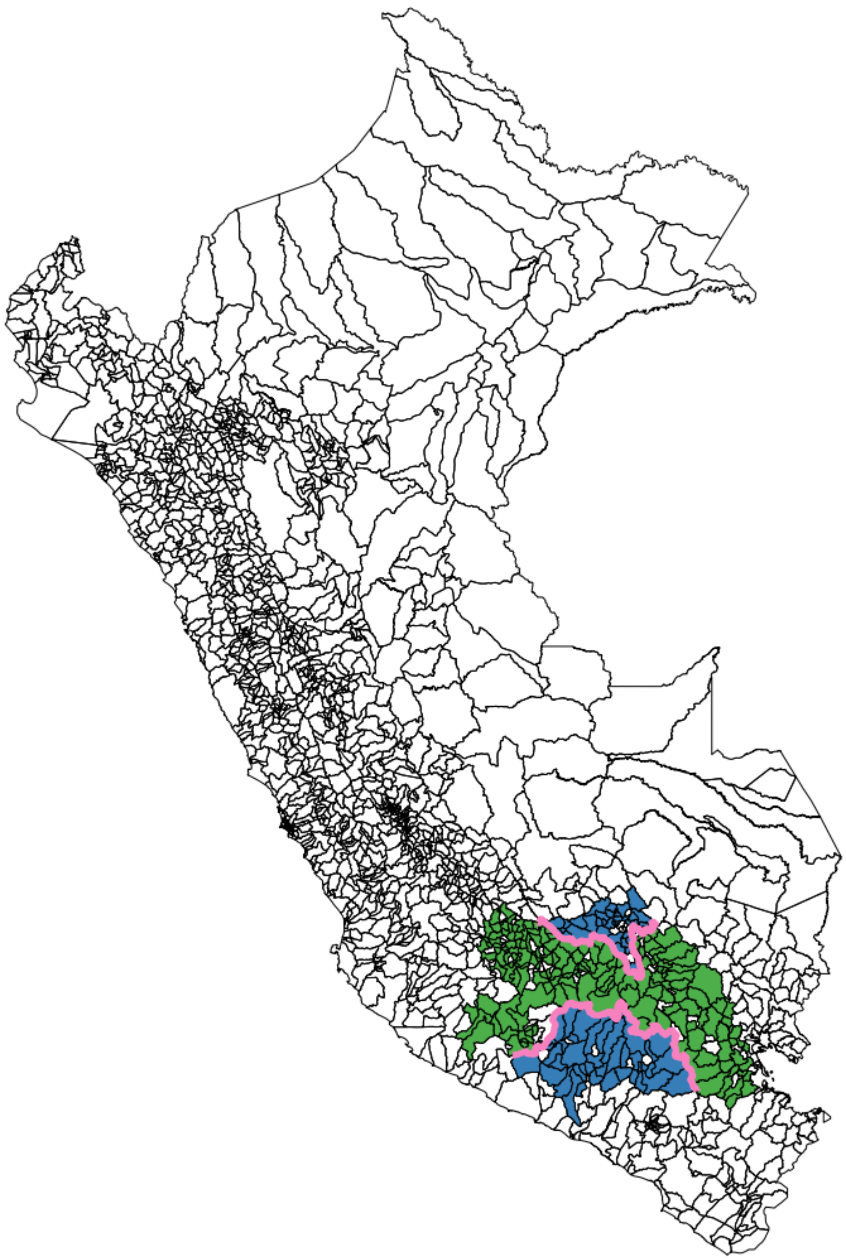
Figure 4: Effect on Household Poverty Status by Year, 50km



Note: Regressions are estimated separately for each survey year. Sample includes household who were living in districts in the *mita* and non-*mita* sample. We exclude those living or born in Cusco. 95% confidence intervals, computed using clusters at the district level.

6 Appendix A: Additional Results and Robustness

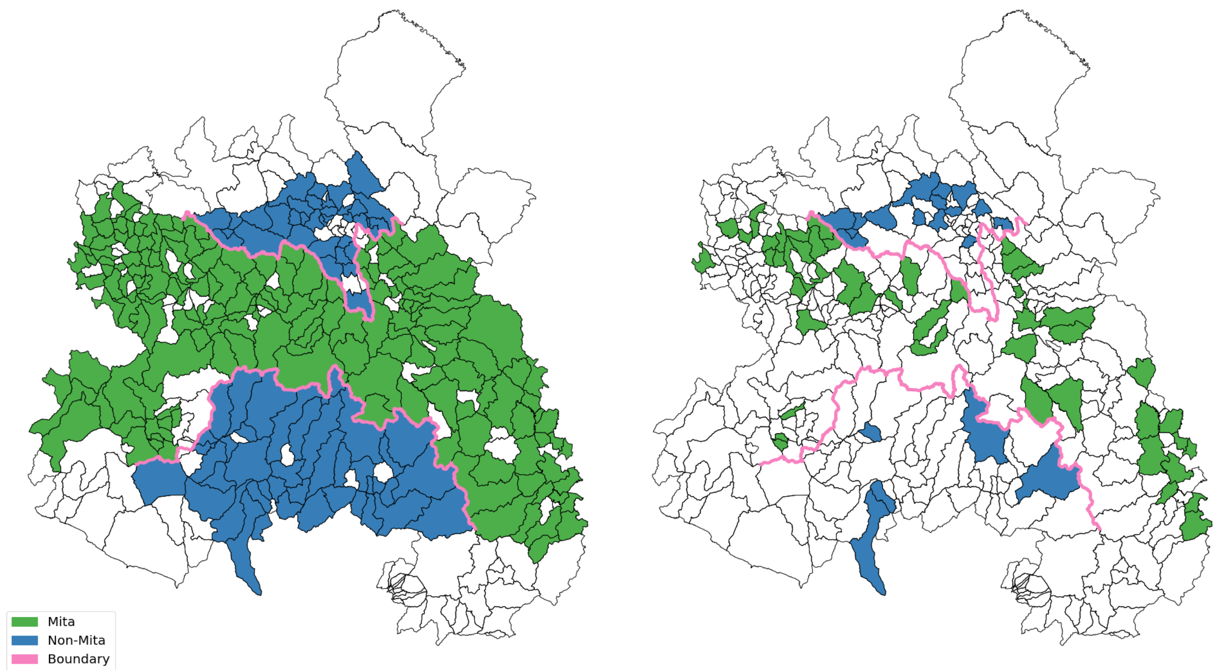
Figure 5: Study Region



Note: Districts within 100km.

Figure 6: Study Region Comparison

(a) Our Sample (b) Dell (2010) Sample



Note: Districts within 100km.

Table 2: Balance Test for Districts

	(1) 25km	(2) 50km	(3) 75km	(4) 100km
Elevation				
Mita	51.290	60.332	-36.801	3.908
	(99.591)	(77.108)	(75.275)	(73.730)
Slope				
Mita	-1.523	-1.174	-0.880	-1.615
	(0.873)	(0.634)	(0.542)	(0.523)
Mean Elevation	3772	3856	3925	3865
Mean Slope	10	9	9	9
Observations	77	155	199	243

Notes: * $p < .1$, ** $p < .05$, *** $p < .01$. We regress mean district elevation and slope on *mita* status for districts within 100km of the boundary.

Table 3: Log Household Equiv. Income & Expenditure, Living within 25km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.374	-0.452	-0.396	-0.364	-0.396	1.047
	(0.130)	(0.206)	(0.140)	(0.166)	(0.180)	(0.302)
Polynomial in Distance to Potosí						
Mita	-0.269	-0.347	-0.292	-0.294	-0.334	0.903
	(0.080)	(0.121)	(0.086)	(0.097)	(0.104)	(0.200)
Polynomial in Distance to Mita						
Mita	-0.251	-0.315	-0.271	-0.269	-0.305	0.879
	(0.072)	(0.111)	(0.076)	(0.092)	(0.097)	(0.204)
Non-*mita* Mean Nuevo Soles	5580.29	4299.42	5051.13	6691.05	5743.76	420.60
Clusters	77	77	77	77	77	76
Observations	17287	17287	17287	17287	17287	15753
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.181	0.178	0.140	0.151	0.004	-0.026
	(0.055)	(0.057)	(0.045)	(0.066)	(0.005)	(0.015)
Polynomial in Distance to Potosí						
Mita	0.153	0.158	0.106	0.113	0.001	-0.023
	(0.035)	(0.038)	(0.031)	(0.044)	(0.004)	(0.010)
Polynomial in Distance to Mita						
Mita	0.149	0.155	0.104	0.111	0.001	-0.021
	(0.035)	(0.040)	(0.030)	(0.044)	(0.004)	(0.010)
Non-*mita* Mean Take-Up	0.25	0.12	0.05	0.06	0.00	0.07
Clusters	76	75	69	69	66	76
Observations	15753	13437	6829	6171	5330	15748
Intial Year	2004	2006	2012	2013	2014	2004

Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Table 4: Log Household Equiv. Income & Expenditure, Living within 75km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.349	-0.439	-0.371	-0.381	-0.406	0.910
	(0.128)	(0.205)	(0.138)	(0.154)	(0.168)	(0.288)
Polynomial in Distance to Potosí						
Mita	-0.259	-0.349	-0.290	-0.298	-0.359	0.955
	(0.072)	(0.111)	(0.077)	(0.086)	(0.092)	(0.187)
Polynomial in Distance to Mita						
Mita	-0.263	-0.345	-0.296	-0.288	-0.350	0.996
	(0.061)	(0.094)	(0.065)	(0.074)	(0.080)	(0.179)
Non-*mita* Mean Nuevo Soles	5665.70	4389.99	5154.16	6979.61	6083.55	386.09
Clusters	199	199	199	199	199	195
Observations	36862	36862	36862	36862	36862	33837
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.160	0.181	0.120	0.142	0.004	-0.039
	(0.051)	(0.056)	(0.040)	(0.056)	(0.004)	(0.014)
Polynomial in Distance to Potosí						
Mita	0.156	0.149	0.109	0.134	0.002	-0.016
	(0.032)	(0.035)	(0.023)	(0.031)	(0.002)	(0.010)
Polynomial in Distance to Mita						
Mita	0.162	0.154	0.106	0.121	0.002	-0.012
	(0.030)	(0.034)	(0.020)	(0.028)	(0.002)	(0.009)
Non-*mita* Mean Take-Up	0.24	0.11	0.05	0.06	0.00	0.06
Clusters	195	193	179	175	175	195
Observations	33837	29407	14967	13492	13492	33828
Intial Year	2004	2006	2012	2013	2013	2004

Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Table 5: Log Household Equiv. Income & Expenditure, Living within 100km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.259	-0.322	-0.273	-0.311	-0.336	0.905
	(0.132)	(0.206)	(0.142)	(0.152)	(0.167)	(0.274)
Polynomial in Distance to Potosí						
Mita	-0.296	-0.398	-0.324	-0.346	-0.405	1.008
	(0.072)	(0.110)	(0.077)	(0.084)	(0.090)	(0.185)
Polynomial in Distance to Mita						
Mita	-0.271	-0.355	-0.301	-0.301	-0.363	1.014
	(0.058)	(0.088)	(0.062)	(0.070)	(0.075)	(0.164)
Non-*mita* Mean Nuevo Soles	5655.25	4365.11	5123.11	7036.24	6132.89	371.65
Clusters	243	243	243	243	243	239
Observations	49792	49792	49792	49792	49792	45776
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.153	0.159	0.099	0.129	0.002	-0.024
	(0.049)	(0.053)	(0.039)	(0.054)	(0.003)	(0.015)
Polynomial in Distance to Potosí						
Mita	0.165	0.158	0.109	0.145	0.002	-0.014
	(0.032)	(0.034)	(0.023)	(0.031)	(0.002)	(0.010)
Polynomial in Distance to Mita						
Mita	0.162	0.155	0.105	0.116	0.002	-0.007
	(0.028)	(0.031)	(0.020)	(0.028)	(0.002)	(0.009)
Non-*mita* Mean Take-Up	0.23	0.10	0.05	0.06	0.00	0.06
Clusters	239	236	218	211	218	239
Observations	45776	39588	19691	17694	19691	45757
Intial Year	2004	2006	2012	2013	2012	2004

Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Table 6: Years of Schooling and Literacy, Living within 25km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	-0.144	-1.916	-2.340	-2.335	-0.005	-0.047	-0.094	-0.130
	(0.158)	(0.870)	(1.228)	(1.238)	(0.020)	(0.026)	(0.042)	(0.086)
Polynomial in Distance to Potosí								
Mita	-0.045	-1.106	-1.511	-1.699	-0.001	-0.041	-0.071	-0.124
	(0.120)	(0.602)	(0.783)	(0.693)	(0.017)	(0.019)	(0.032)	(0.048)
Polynomial in Distance to Mita								
Mita	-0.043	-0.972	-1.450	-1.560	-0.001	-0.041	-0.069	-0.116
	(0.139)	(0.586)	(0.758)	(0.632)	(0.020)	(0.020)	(0.034)	(0.044)
Non-*mita* Mean	3.91	9.63	7.20	4.22	0.72	0.94	0.83	0.58
Clusters	77	77	77	77	77	77	77	77
Observations	22410	15807	10721	14023	22409	15812	10723	14023
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Table 7: Years of Schooling and Literacy, Living within 50km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	-0.300	-2.493	-3.001	-2.451	-0.019	-0.069	-0.136	-0.162
	(0.196)	(0.882)	(1.207)	(1.135)	(0.026)	(0.024)	(0.042)	(0.074)
Polynomial in Distance to Potosí								
Mita	0.087	-0.676	-1.155	-1.345	0.012	-0.023	-0.058	-0.102
	(0.130)	(0.598)	(0.711)	(0.612)	(0.016)	(0.017)	(0.029)	(0.041)
Polynomial in Distance to Mita								
Mita	0.065	-0.801	-1.265	-1.435	0.007	-0.028	-0.067	-0.119
	(0.131)	(0.524)	(0.643)	(0.530)	(0.016)	(0.017)	(0.028)	(0.036)
Non-*mita* Mean	3.86	9.49	6.98	4.12	0.72	0.94	0.83	0.59
Clusters	155	155	155	155	155	155	155	155
Observations	41189	28963	19967	26280	41186	28974	19969	26280
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Table 8: Years of Schooling and Literacy, Living within 75km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	-0.223	-2.218	-2.885	-2.374	-0.016	-0.059	-0.125	-0.162
	(0.190)	(0.836)	(1.127)	(1.052)	(0.024)	(0.022)	(0.037)	(0.064)
Polynomial in Distance to Potosí								
Mita	0.115	-0.579	-1.031	-1.230	0.013	-0.019	-0.043	-0.084
	(0.132)	(0.589)	(0.698)	(0.607)	(0.016)	(0.016)	(0.029)	(0.040)
Polynomial in Distance to Mita								
Mita	0.115	-0.621	-1.047	-1.256	0.011	-0.023	-0.051	-0.104
	(0.126)	(0.505)	(0.608)	(0.508)	(0.016)	(0.015)	(0.027)	(0.035)
Non-*mita* Mean	3.84	9.47	6.97	4.06	0.71	0.94	0.84	0.59
Clusters	198	199	198	199	198	199	198	199
Observations	46971	33194	22816	30682	46967	33207	22818	30682
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

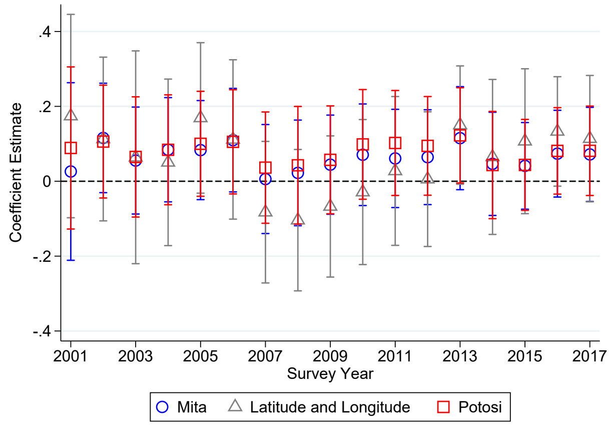
Table 9: Years of Schooling and Literacy, Living within 100km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	-0.072	-1.614	-1.992	-1.633	-0.004	-0.047	-0.096	-0.119
	(0.178)	(0.860)	(1.137)	(1.042)	(0.021)	(0.020)	(0.034)	(0.060)
Polynomial in Distance to Potosí								
Mita	0.073	-0.762	-1.273	-1.399	0.006	-0.020	-0.045	-0.094
	(0.128)	(0.589)	(0.694)	(0.591)	(0.016)	(0.016)	(0.028)	(0.038)
Polynomial in Distance to Mita								
Mita	0.062	-0.653	-0.952	-1.120	0.005	-0.023	-0.051	-0.108
	(0.116)	(0.477)	(0.590)	(0.491)	(0.014)	(0.014)	(0.026)	(0.033)
Non-*mita* Mean	3.87	9.52	7.04	4.07	0.72	0.94	0.84	0.61
Clusters	242	242	242	243	242	242	242	243
Observations	60494	46310	31341	41535	60486	46327	31343	41536
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

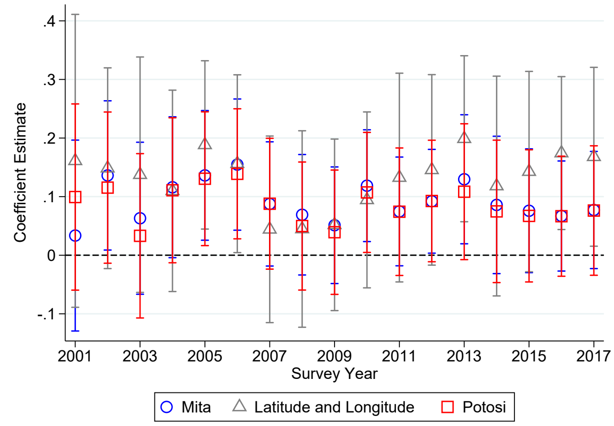
Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Figure 7: Migration Probability by Survey Year

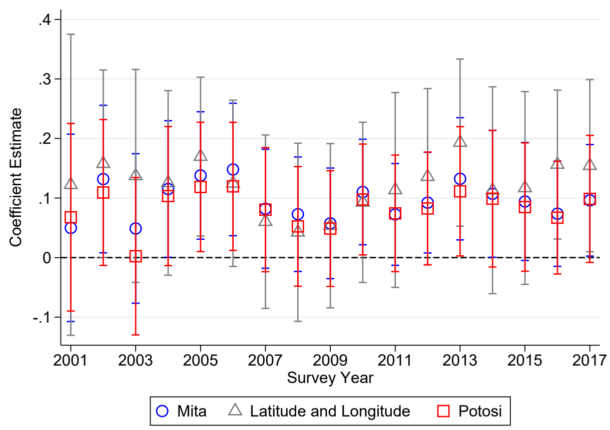
(a) Within 25km



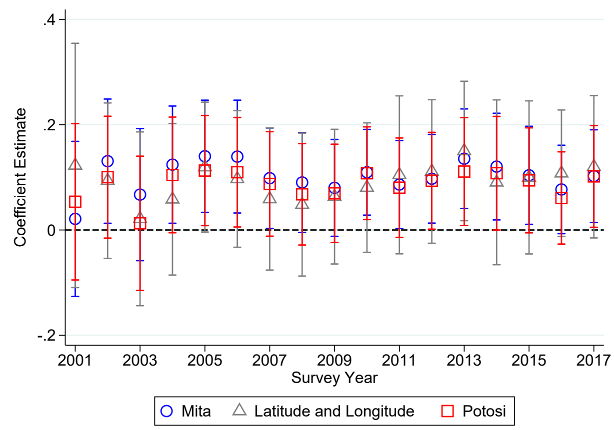
(b) Within 50km



(c) Within 75km



(d) Within 100km



We regress an indicator for whether the head of household had moved from his or her birth district on each polynomial from distance to the boundary for each survey year. We exclude those living or born in Cusco. ENAHO surveys for 2018 and 2019 did not have the necessary variable to determine birth district. 95% confidence intervals, computed using clusters at the district level.

Table 10: Log Household Equiv. Income & Expenditure, Born within 25km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.221	-0.255	-0.240	-0.214	-0.255	0.562
	(0.097)	(0.149)	(0.106)	(0.121)	(0.132)	(0.202)
Polynomial in Distance to Potosí						
Mita	-0.184	-0.225	-0.206	-0.201	-0.243	0.482
	(0.059)	(0.088)	(0.065)	(0.070)	(0.077)	(0.140)
Polynomial in Distance to Mita						
Mita	-0.177	-0.209	-0.194	-0.189	-0.228	0.477
	(0.053)	(0.080)	(0.058)	(0.065)	(0.071)	(0.138)
Non-*mita* Mean Nuevo Soles	5812.69	4663.63	5309.70	7174.76	6316.28	356.25
Clusters	93	93	93	93	93	93
Observations	23836	23836	23836	23836	23835	21672
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.092	0.095	0.082	0.071	0.004	-0.005
	(0.037)	(0.048)	(0.032)	(0.038)	(0.005)	(0.014)
Polynomial in Distance to Potosí						
Mita	0.080	0.091	0.067	0.058	-0.000	-0.011
	(0.024)	(0.030)	(0.021)	(0.025)	(0.004)	(0.009)
Polynomial in Distance to Mita						
Mita	0.079	0.091	0.067	0.060	-0.001	-0.009
	(0.023)	(0.029)	(0.020)	(0.025)	(0.004)	(0.009)
Non-*mita* Mean Take-Up	0.19	0.07	0.02	0.03	0.00	0.08
Clusters	93	93	93	91	91	93
Observations	21672	18126	7643	6611	5309	21667
Intial Year	2004	2006	2012	2013	2014	2004

Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Table 11: Log Household Equiv. Income & Expenditure, Born within 50km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.268	-0.333	-0.288	-0.286	-0.331	0.593
	(0.089)	(0.139)	(0.098)	(0.108)	(0.119)	(0.184)
Polynomial in Distance to Potosí						
Mita	-0.206	-0.264	-0.234	-0.216	-0.262	0.498
	(0.048)	(0.071)	(0.052)	(0.056)	(0.061)	(0.116)
Polynomial in Distance to Mita						
Mita	-0.220	-0.282	-0.250	-0.228	-0.274	0.508
	(0.043)	(0.065)	(0.047)	(0.052)	(0.056)	(0.111)
Non-*mita* Mean Nuevo Soles	5913.62	4779.47	5422.23	7258.86	6401.68	366.05
Clusters	185	185	185	185	185	185
Observations	44122	44122	44122	44122	44120	40156
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.099	0.113	0.077	0.077	0.001	-0.012
	(0.033)	(0.042)	(0.028)	(0.034)	(0.003)	(0.013)
Polynomial in Distance to Potosí						
Mita	0.081	0.091	0.072	0.065	0.001	-0.011
	(0.020)	(0.024)	(0.015)	(0.018)	(0.002)	(0.008)
Polynomial in Distance to Mita						
Mita	0.084	0.096	0.073	0.062	0.001	-0.012
	(0.019)	(0.023)	(0.013)	(0.017)	(0.002)	(0.007)
Non-*mita* Mean Take-Up	0.18	0.07	0.02	0.03	0.00	0.08
Clusters	185	185	185	183	183	185
Observations	40156	33900	14289	12308	12308	40146
Intial Year	2004	2006	2012	2013	2013	2004

Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Table 12: Log Household Equiv. Income & Expenditure, Born within 75km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.240	-0.290	-0.258	-0.261	-0.297	0.506
	(0.080)	(0.125)	(0.088)	(0.096)	(0.106)	(0.172)
Polynomial in Distance to Potosí						
Mita	-0.197	-0.250	-0.222	-0.212	-0.252	0.467
	(0.045)	(0.068)	(0.049)	(0.053)	(0.058)	(0.113)
Polynomial in Distance to Mita						
Mita	-0.214	-0.269	-0.240	-0.225	-0.267	0.518
	(0.040)	(0.061)	(0.044)	(0.048)	(0.052)	(0.108)
Non-*mita* Mean Nuevo Soles	5974.66	4841.50	5474.03	7470.95	6601.83	367.81
Clusters	239	239	239	239	239	239
Observations	51841	51841	51841	51841	51839	47186
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.085	0.105	0.069	0.078	0.002	-0.017
	(0.030)	(0.038)	(0.026)	(0.030)	(0.003)	(0.012)
Polynomial in Distance to Potosí						
Mita	0.077	0.086	0.072	0.065	0.001	-0.011
	(0.019)	(0.023)	(0.014)	(0.017)	(0.002)	(0.008)
Polynomial in Distance to Mita						
Mita	0.086	0.094	0.073	0.063	0.000	-0.009
	(0.018)	(0.022)	(0.013)	(0.016)	(0.002)	(0.007)
Non-*mita* Mean Take-Up	0.18	0.06	0.02	0.03	0.00	0.08
Clusters	239	239	239	237	237	239
Observations	47186	39824	16868	14556	14556	47175
Intial Year	2004	2006	2012	2013	2013	2004

Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

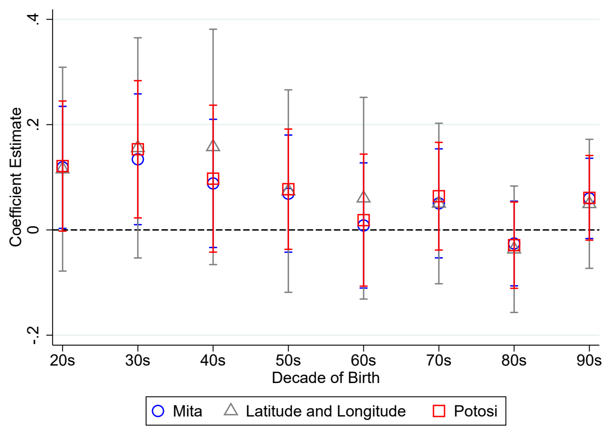
Table 13: Log Household Equiv. Income & Expenditure, Born within 100km

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effects on Expenditure and Income						
	Expenditure	Expenditure	Expenditure	Income	Income	Gov. Transfers
Polynomial in Longitude and Latitude						
Mita	-0.196	-0.231	-0.210	-0.213	-0.243	0.520
	(0.078)	(0.120)	(0.086)	(0.090)	(0.101)	(0.165)
Polynomial in Distance to Potosí						
Mita	-0.227	-0.288	-0.249	-0.247	-0.282	0.471
	(0.044)	(0.066)	(0.048)	(0.052)	(0.057)	(0.113)
Polynomial in Distance to Mita						
Mita	-0.238	-0.299	-0.264	-0.257	-0.296	0.497
	(0.039)	(0.057)	(0.042)	(0.047)	(0.049)	(0.100)
Non-*mita* Mean Nuevo Soles	6082.04	4931.94	5557.26	7724.00	6804.94	391.42
Clusters	289	289	289	289	289	289
Observations	67336	67336	67336	67336	67334	61302
Initial Year	2001	2001	2001	2001	2001	2004
Panel B: Effects on Program Participation						
	Gov Transfers	Juntos	Pensión 65	Bono Gas	Beca 18	Other
Polynomial in Longitude and Latitude						
Mita	0.085	0.093	0.066	0.071	0.001	-0.010
	(0.029)	(0.035)	(0.025)	(0.028)	(0.002)	(0.012)
Polynomial in Distance to Potosí						
Mita	0.080	0.090	0.074	0.073	0.001	-0.013
	(0.019)	(0.022)	(0.014)	(0.016)	(0.002)	(0.008)
Polynomial in Distance to Mita						
Mita	0.084	0.095	0.077	0.061	0.000	-0.012
	(0.016)	(0.020)	(0.012)	(0.015)	(0.002)	(0.008)
Non-*mita* Mean Take-Up	0.18	0.05	0.02	0.02	0.00	0.08
Clusters	289	289	289	287	289	289
Observations	61302	51580	21693	18664	21693	61282
Intial Year	2004	2006	2012	2013	2012	2004

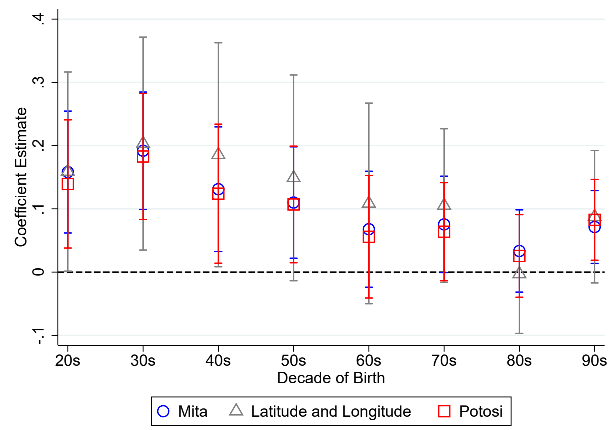
Notes: For each dependent variable in Panel A, we add a one to avoid log(0). In column (1) expenditure is defined as all spending reported to ENAHO, including self-consumption and donations, which are excluded in (2). Expenditure in column (3) follows Dell (2010). In column (4), income is defined as all earning reported to ENAHO, including any transfers, such as those from Juntos and Pensión 65, and donations. In (5), such transfers are exluded as well as donations. In (6), we report the amount recieved via transfers from the Peruvian government. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Each dependent variable in Panel B is a binary indicator that equals 1 if a household recieves any money from the particular program and 0 otherwise. Methodology by survey year fixed effects are included and standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Figure 8: Migration Probability by Cohort

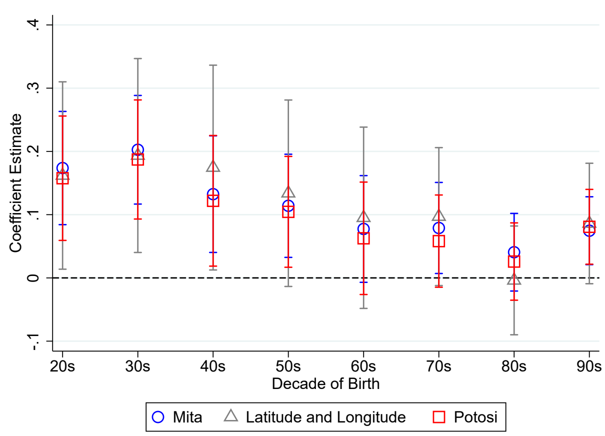
(a) Within 25km



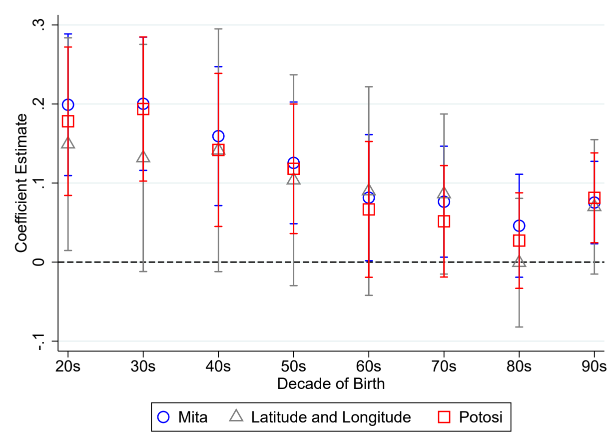
(b) Within 50km



(c) Within 75km



(d) Within 100km



We regress an indicator for whether the head of household had moved from his or her birth district on each polynomial from distance to the boundary for each survey year. We exclude those living or born in Cusco. ENAHO surveys for 2018 and 2019 did not have the necessary variable to determine birth district. 95% confidence intervals, computed using clusters at the district level.

Table 14: Years of Schooling and Literacy, Born within 25km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	0.037	-1.251	-1.525	-0.997	0.025	-0.023	-0.055	-0.070
	(0.128)	(0.722)	(0.842)	(0.751)	(0.018)	(0.022)	(0.037)	(0.068)
Polynomial in Distance to Potosí								
Mita	0.040	-0.644	-1.024	-1.031	0.022	-0.023	-0.040	-0.091
	(0.112)	(0.466)	(0.519)	(0.405)	(0.017)	(0.015)	(0.027)	(0.037)
Polynomial in Distance to Mita								
Mita	0.027	-0.600	-0.945	-1.001	0.018	-0.025	-0.036	-0.090
	(0.130)	(0.446)	(0.490)	(0.376)	(0.019)	(0.015)	(0.027)	(0.035)
Non-*mita* Mean	3.90	9.21	7.09	4.40	0.71	0.94	0.85	0.63
Clusters	90	92	93	93	90	92	93	93
Observations	21356	19384	14915	19090	21358	19387	14913	19091
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Table 15: Years of Schooling and Literacy, Born within 50km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	-0.080	-1.695	-1.956	-1.417	0.016	-0.043	-0.086	-0.114
	(0.150)	(0.732)	(0.773)	(0.648)	(0.020)	(0.021)	(0.033)	(0.055)
Polynomial in Distance to Potosí								
Mita	0.102	-0.400	-0.832	-1.035	0.022	-0.015	-0.040	-0.100
	(0.104)	(0.457)	(0.449)	(0.336)	(0.014)	(0.013)	(0.023)	(0.030)
Polynomial in Distance to Mita								
Mita	0.075	-0.495	-0.945	-1.182	0.017	-0.020	-0.048	-0.113
	(0.109)	(0.410)	(0.411)	(0.306)	(0.014)	(0.012)	(0.022)	(0.028)
Non-*mita* Mean	3.88	9.16	6.99	4.47	0.71	0.94	0.85	0.65
Clusters	180	184	185	185	180	184	185	185
Observations	39086	34978	27555	36007	39087	34982	27553	36008
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Table 16: Years of Schooling and Literacy, Born within 75km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	-0.018	-1.517	-1.839	-1.414	0.016	-0.036	-0.075	-0.116
	(0.137)	(0.670)	(0.684)	(0.576)	(0.018)	(0.018)	(0.029)	(0.047)
Polynomial in Distance to Potosí								
Mita	0.127	-0.294	-0.642	-0.974	0.023	-0.011	-0.027	-0.085
	(0.100)	(0.444)	(0.426)	(0.328)	(0.013)	(0.012)	(0.021)	(0.028)
Polynomial in Distance to Mita								
Mita	0.107	-0.372	-0.799	-1.075	0.019	-0.017	-0.037	-0.100
	(0.104)	(0.399)	(0.390)	(0.292)	(0.013)	(0.012)	(0.021)	(0.026)
Non-*mita* Mean	3.87	9.20	7.06	4.48	0.72	0.94	0.86	0.65
Clusters	229	237	239	239	229	237	239	239
Observations	44287	40627	32190	42679	44288	40631	32188	42680
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

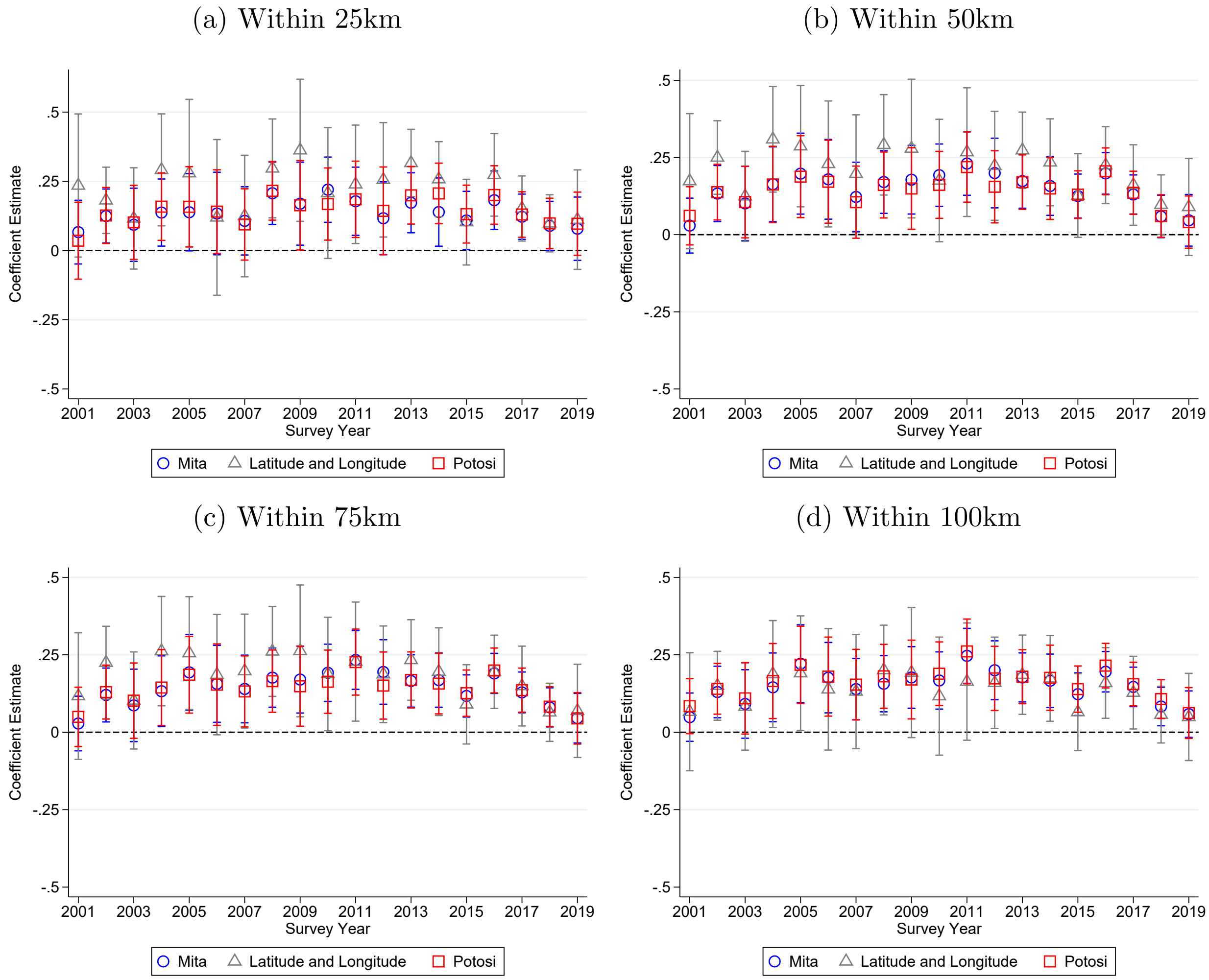
Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Table 17: Years of Schooling and Literacy, Born within 100km

	Years of Schooling				Literacy			
	(1) 16 and Under	(2) 17-35	(3) 36-50	(4) 51 and Over	(5) 16 and Under	(6) 17-35	(7) 36-50	(8) 51 and Over
Polynomial in Longitude and Latitude								
Mita	0.086	-1.150	-1.448	-1.026	0.024	-0.030	-0.062	-0.088
	(0.117)	(0.654)	(0.665)	(0.551)	(0.015)	(0.016)	(0.026)	(0.044)
Polynomial in Distance to Potosí								
Mita	0.110	-0.411	-0.825	-1.139	0.018	-0.012	-0.027	-0.093
	(0.096)	(0.432)	(0.415)	(0.318)	(0.013)	(0.012)	(0.021)	(0.027)
Polynomial in Distance to Mita								
Mita	0.057	-0.392	-0.836	-1.175	0.014	-0.017	-0.039	-0.113
	(0.098)	(0.372)	(0.371)	(0.292)	(0.012)	(0.011)	(0.019)	(0.024)
Non-*mita* Mean	3.91	9.26	7.20	4.66	0.72	0.95	0.86	0.67
Clusters	278	287	289	289	278	287	289	289
Observations	56878	54478	41879	55953	56879	54483	41879	55954
Initial Year	2001	2001	2001	2001	2001	2001	2001	2001

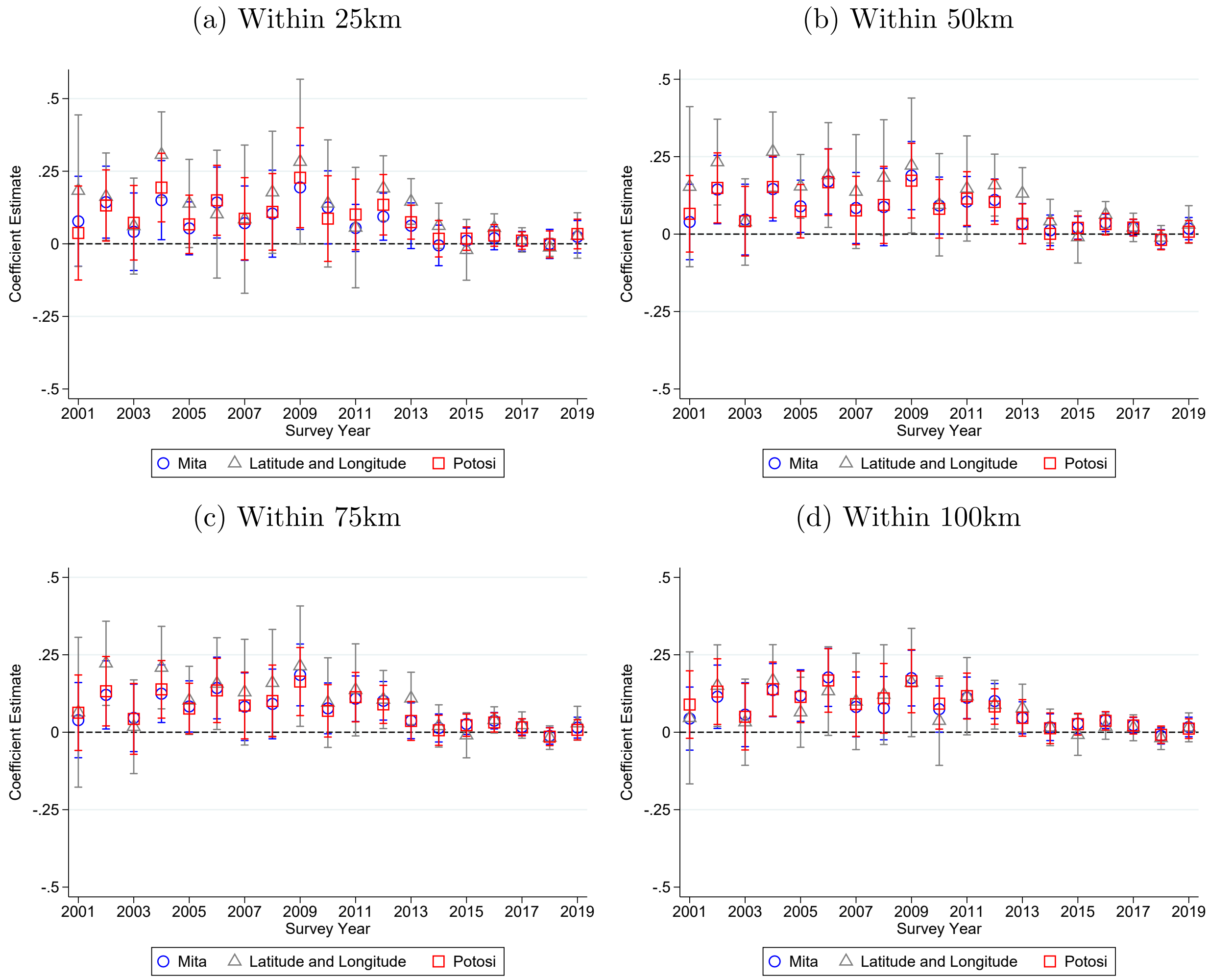
Notes: We present years of schooling and literacy rates for four age groups: 16 and under (subject to compulsory schooling), 17-35, 36-50, and 51 and over. Methodology by survey year fixed effects included and standard errors are adjusted for clustering at the district level.

Figure 9: Effect on Household Poverty Status by Year, Living within Sample



Note: Regressions are estimated separately for each year of ENAHO. Sample includes household who were living in districts in the *mita* and non-*mita* sample. We exclude those living or born in Cusco. 95% confidence intervals, computed using clusters at the district level.

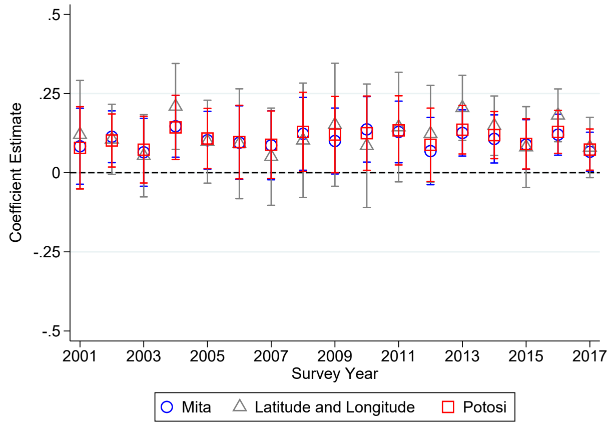
Figure 10: Effect on Household Extreme Poverty Status by Year, Living within Sample



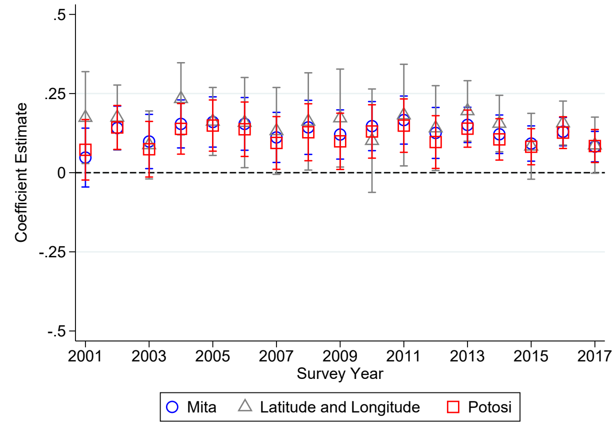
Note: Regressions are estimated separately for each year of ENAHO. Sample includes household who were living in districts in the *mita* and non-*mita* sample. We exclude those living or born in Cusco. 95% confidence intervals, computed using clusters at the district level.

Figure 11: Effect on Household Poverty Status by Year, Born within Sample

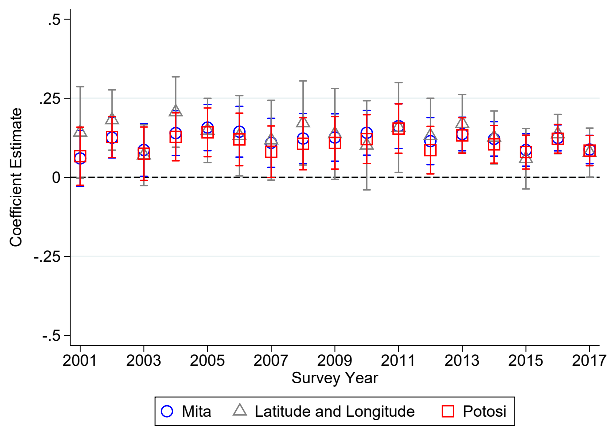
(a) Within 25km



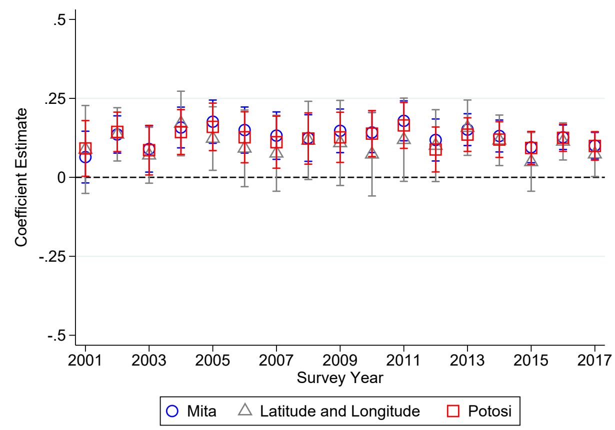
(b) Within 50km



(c) Within 75km



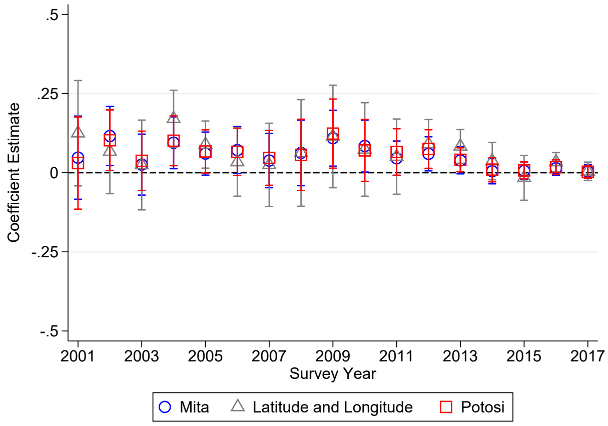
(d) Within 100km



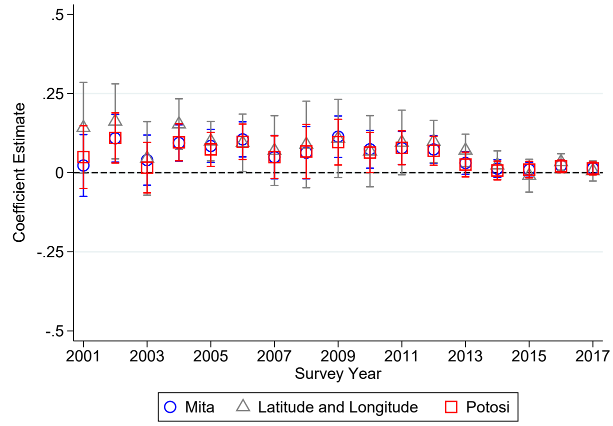
Note: Regressions are estimated separately for each year of ENAHO. Sample includes household who born living in districts in the *mita* and non-*mita* sample. We exclude those living or born in Cusco. 95% confidence intervals, computed using clusters at the district level.

Figure 12: Effect on Household Extreme Poverty Status by Year, Born within Sample

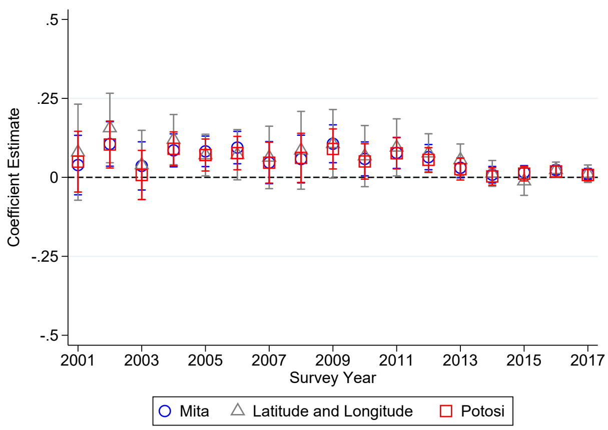
(a) Within 25km



(b) Within 50km



(c) Within 75km



(d) Within 100km

Note: Regressions are estimated separately for each year of ENAHO. Sample includes household who born living in districts in the *mita* and non-*mita* sample. We exclude those living or born in Cusco. 95% confidence intervals, computed using clusters at the district level.

7 Appendix B: Variable Construction

In the 19 years of survey data, the methods used to calculate income, expenditure, and poverty had one major change. The poverty line for surveys before 2010 used the 1997 Census as a reference population, while 2010 and more recent years utilize the 2007 Census. In both censuses, the poverty line is determined by calculating the cost of several different bundles of food that total 2300kcal and that would be an adequate source of nutrients; changes have also been made to adjust for recommendations regarding caloric requirements and nutrient content.[10] The extreme poverty line is determine by the least expensive bundle. In Figure 13 we show that there have been adjustments made to components of expenditure, with the largest change in the self-consumption category. In Figure 13c, we present the trends in self-consumption under both methodologies, the previous methology overestimated the value of goods produced for the household's consumption.

In 2018, INEI published an inflation adjustment file to adjust all ENAHO surveys to the 2018 Lima Metropolitan area. The adjustments are made for prices at the region, expenditure category, and year levels. We apply the adjustments and divide annual income by the number of household members, weighted using Deaton values i.e., 1 for adults, .5 for children between 5 and 14, and .4 for those under 5. In Figures 14 and 15, we present the time series of income and expenditure, total and log respectively, between 2001 and 2019. To make comparison between the survey years more readable, we exclude transfers and self-consumption from our main estimates. Figures 15b, 15d, and 15f document how excluding the transfers and self-consumption impact the trend in expenditure. With each restriction, average household equivalent expenditure falls, but the general trend is consistent, as average household equivalent incomes rose so did expenditure. The two measures experience large increases in the early 2000s and 2010s, in which we see a steady growth of both up to 2019.

Dell (2010) uses the deflator that is specific to the 2001 ENAHO survey and a cubic

[10] For additional information visit `http://iinei.inei.gob.pe/iinei/srienaho/Descarga/DocumentosMetodologicos/2010-55/Informe-Tecnico-Pobreza.pdf`

polynomial for distance to the boundary. For consistency, in Table 18, we present the original estimates for Dell (2010) at the 50km bandwidth under the new price adjustments and quadratic specification in column (1). In the subsequent columns, we specify a quadratic polynomial for the distance to the boundary with the same deflator (2), without the deflator (3), and with the new deflator (4). The estimates are robust across specifications.

In Figure 16, we present trends on participation in various government transfers programs. Figure 16a documents the rise in participation over the 21st Century. At the beginning of our sample, there are relatively few transfers, primarily contributory pensions such as tretirement and survial pensions. We focus on Juntos and Pensión 65 as they constitute the largest transfers to poor and ultra-poor households. For households living in the sampled area, those receiving either transfer earn S/. 3837, pre-transfer, compared to S/. 6042 for those recieving any other government transfer.

In 2005, the conditional cash transfer Juntos is introduced. From 2005 to 2009, the program made a monthly fixed transfer of S/. 100 to eligible households, which has since changed to be a S/. 200 bimonthly transfer. To recieve payments, children under 5 must attend regular health and nutrition check ups, children between 6 and 14 in primary school must attend school at least 85% of the school year, and pregnant or breastfeeding mothers must attend prenatal or post-natal checks Perova and Vakis (2009). For our sample of *mita* and no-*mita* recipients, the Juntos payment is equivalent to 12% of their non-transfer income. The second largest transfer that is introduced is Pensión 65, a non-contributory pension designed for elderly, low income individuals. Eligibile individuals recieve S/. 250 Soles every other month. For recieving households in our sample, the transfer is equivalent to 39% of their non-transfer income.

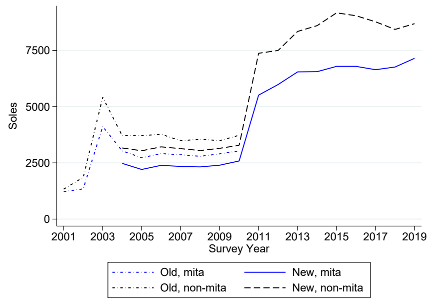
Table 18: Dell (2010) and INEI Deflators, 50km

	(1) Cubic	(2) Quadratic	(3) No Deflator Quadratic	(4) New Deflator Quadratic
Polynomial in Longitude and Latitude				
Mita	-0.331	-0.353	-0.359	-0.283
	(0.219)	(0.230)	(0.220)	(0.195)
Polynomial in Distance to Potosí				
Mita	-0.329	-0.284	-0.305	-0.226
	(0.096)	(0.098)	(0.093)	(0.086)
Polynomial in Distance to Mita				
Mita	-0.224	-0.199	-0.219	-0.158
	(0.092)	(0.093)	(0.091)	(0.082)
Clusters	52	52	52	52
Observations	1013	1013	1013	1013
Non-*mita* Mean Soles	3903.740	1530.100	1697.450	3903.740

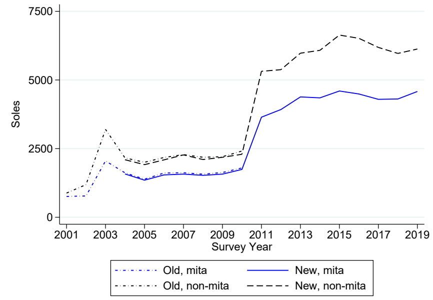
Notes: * $p < .1$, ** $p < .05$, *** $p < .01$. We regress household equivalent expenditure at the 50km bandwidth to compare the new price adjustments, quadratic specifications, and cubic specifications for 2001. Column (1) folllows Dell (2010), a cubic polynomial for distance to the boundary with the original price deflator. Column (2), we specify a quadratic polynomial for the distance to the boundary with the same deflator. In columns (3) and (4), we specify a quadratic polynomial without the deflator and with the new deflator, respectively. Household equivalent income and expenditures are calculated by assigning weights of 1 for adults, .5 for children between 14 and 5, and .4 for those under 5. Standard errors are adjusted for clustering at the district level. We exclude those living or born in Cusco.

Figure 13: Trends Expenditure Categories, Living within 50km

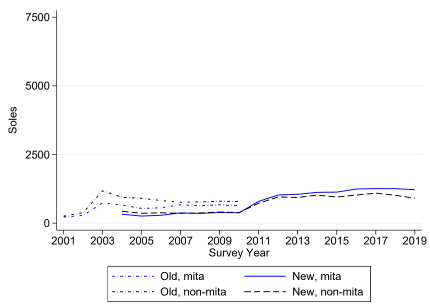
(a) Total Expenditure



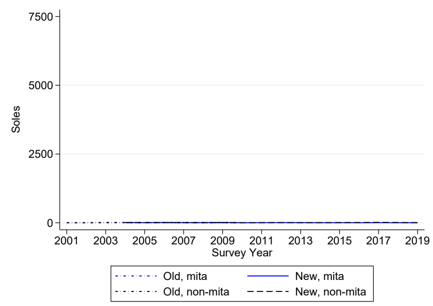
(b) General Expenses



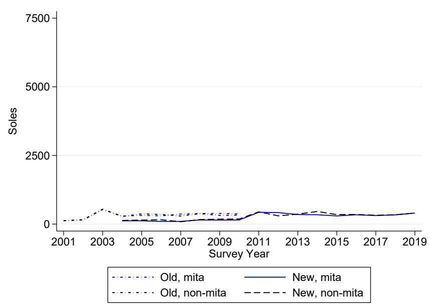
(c) Self-Consumption



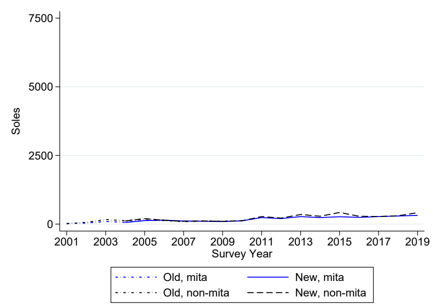
(d) Payment-in-Kind



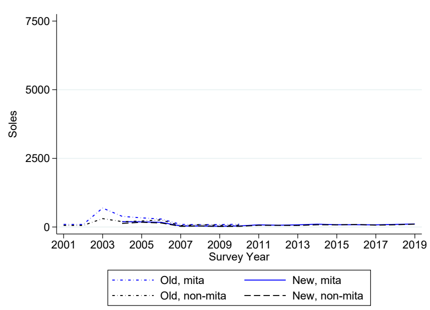
(e) Private Transfers



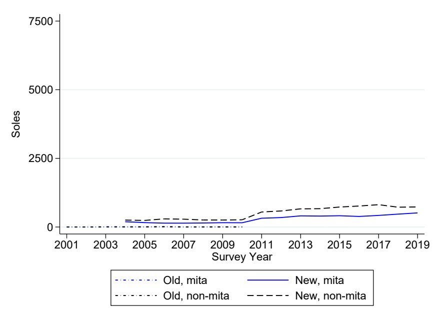
(f) Public Transfers



(g) Other Expenses



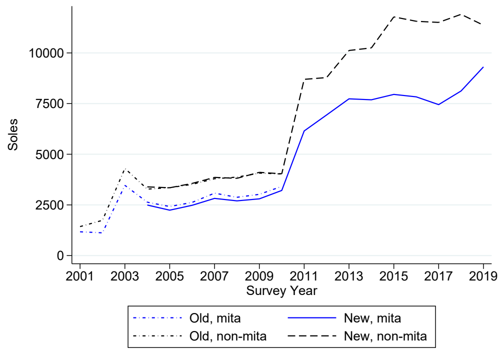
(h) Imputed Costs



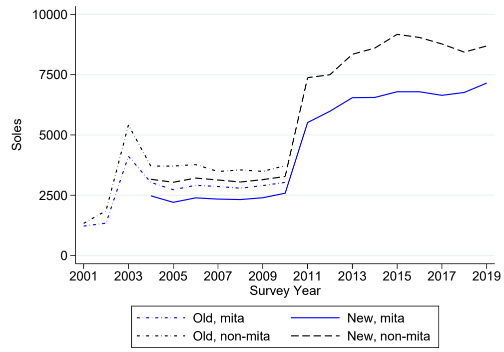
Note: Lines reflect average measures (per capita) for household 50km inside and outside of the *mita* border. We exclude those living or born in Cusco. Income and expenditure household equivalent use weights assigning a value of 1 to adults, .5 to children, .4 to infants.

Figure 14: Trends in Income and Expenditure, Living within 50km

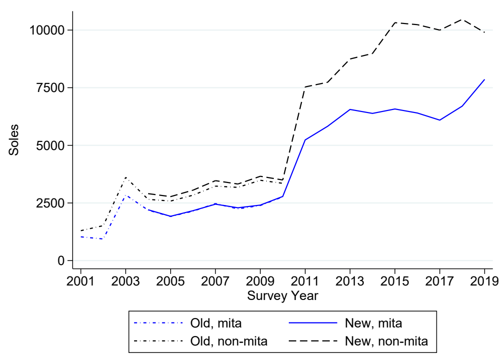
(a) Income:
All Sources



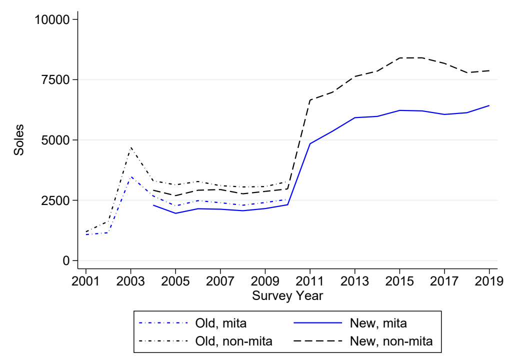
(b) Expenditure:
All Sources



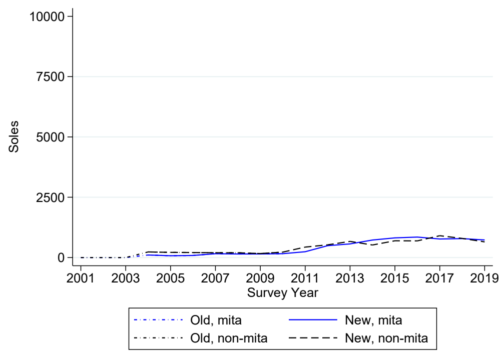
(c) Income:
No Transfers



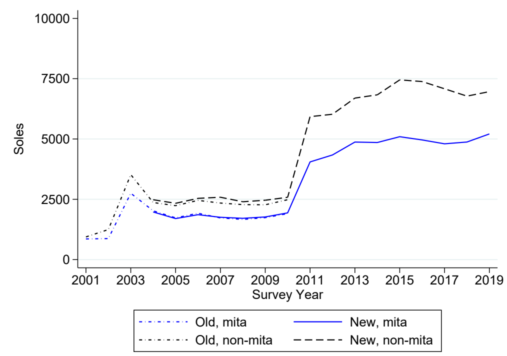
(d) Expenditure:
No Transfers



(e) Government Transfers



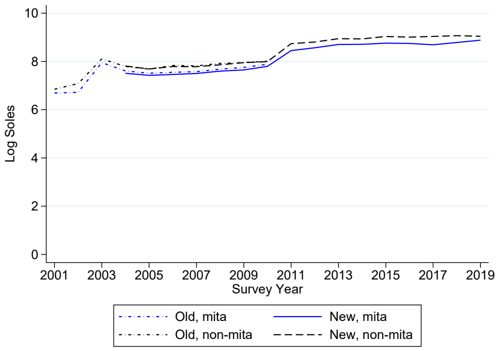
(f) Expenditure:
No Transfers/Self-Consumption



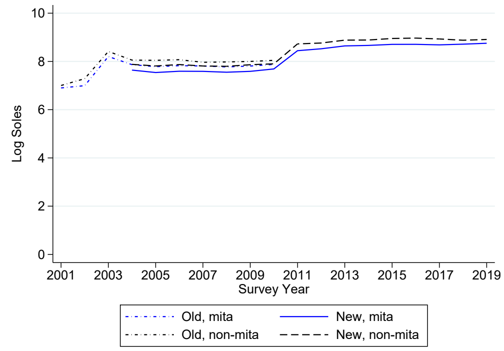
Note: Lines reflect average measures (per capita) for household 50km inside and outside of the *mita* border. We exclude those living or born in Cusco. Income and expenditure household equivalent use weights assigning a value of 1 to adults, .5 to children, .4 to infants.

Figure 15: Trends in Log Income and Expenditure, Living within 50km

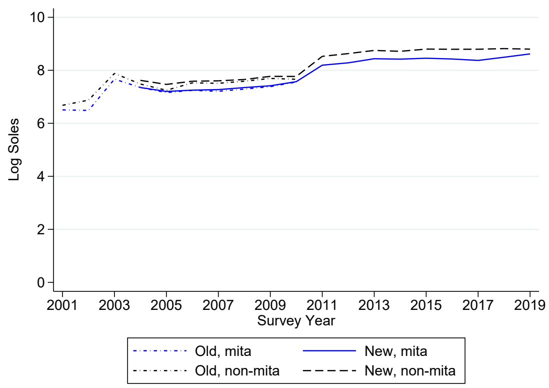
(a) Income:
All Sources



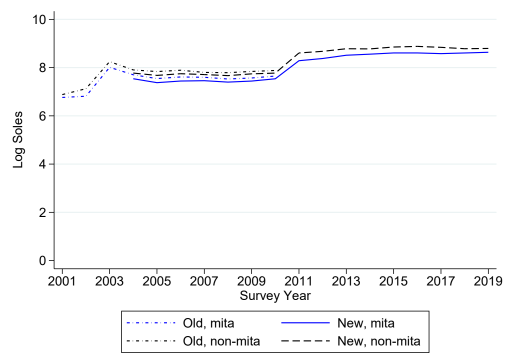
(b) Expenditure:
All Sources



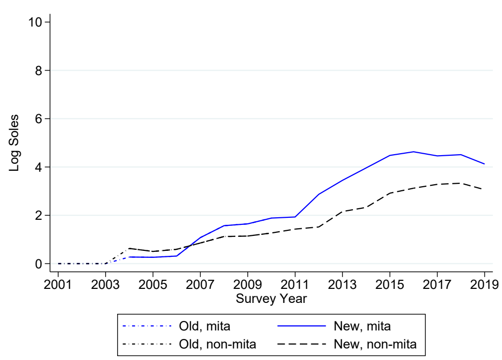
(c) Income:
No Transfers



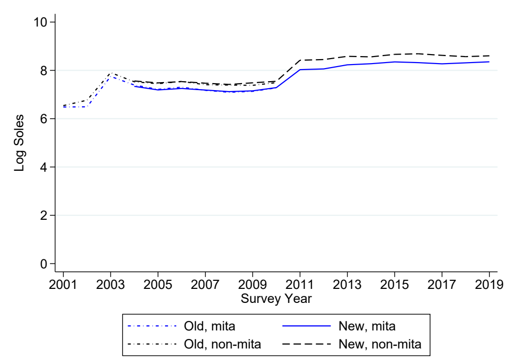
(d) Expenditure:
No Transfers



(e) Government
Transfers



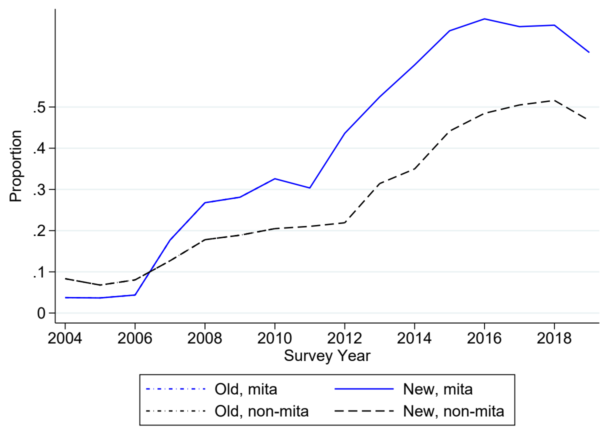
(f) Expenditure:
No Transfers/Self-Consumption



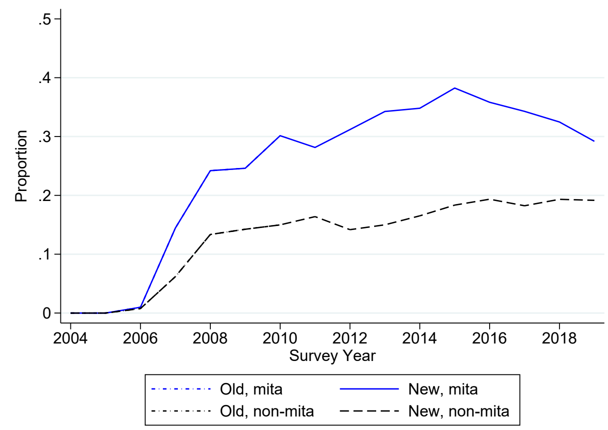
Note: Lines reflect average measures (per capita) for household 50km inside and outside of the *mita* border. We exclude those living or born in Cusco. Income and expenditure household equivalent use weights assigning a value of 1 to adults, .5 to children, .4 to infants.

Figure 16: Trends in Government Program Participation, Living within 50km

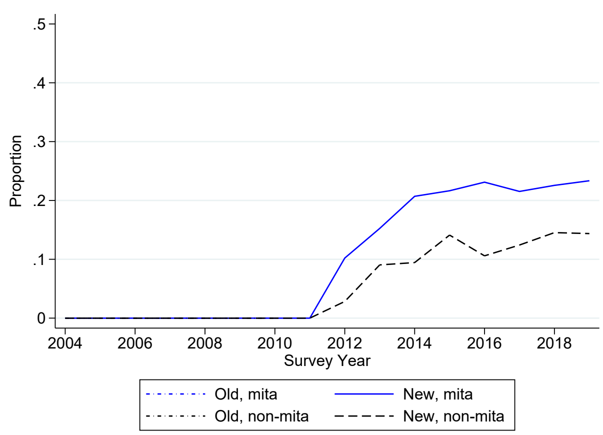
(a) Any Program



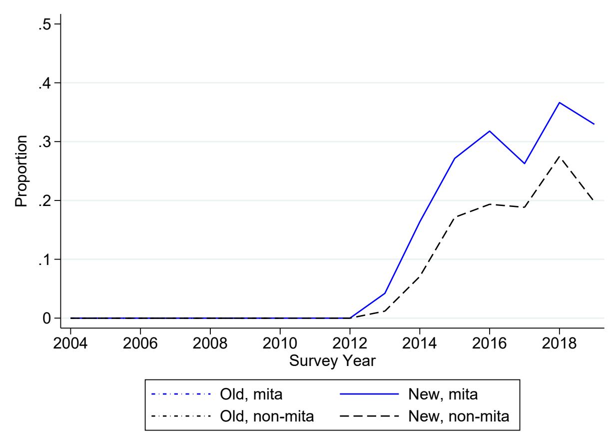
(b) Juntos



(c) Pensión 65

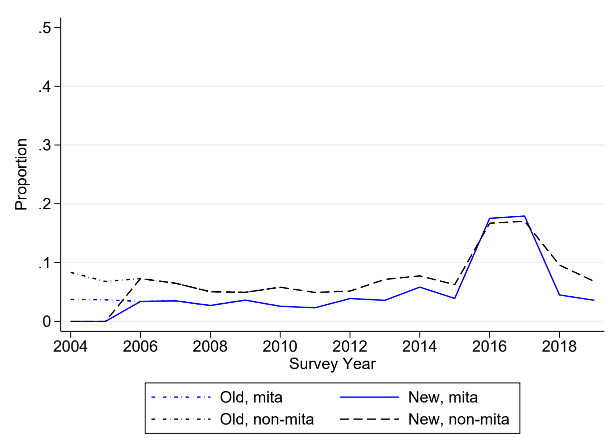


(d) Bono Gas



(e) Beca 18

(f) Other



Note: Lines reflect proportion of households recieving government transfers for households 50km inside and outside of the *mita* border. We exclude those living or born in Cusco.