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Economic convergence, intragenerational economic mobility, and inequality in a native Amazonian small-scale society of Indigenous People in Bolivia

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ABSTRACT

Adult intragenerational mobility reflects society's ability to reward effort and tame society-wide inequality. In developed economies, mobility is modest and correlates negatively with economic inequality. Little is known quantitatively from direct observations about long-term intragenerational mobility in small-scale societies of the Global South. To assess the external validity of findings about patterns of intragenerational mobility from developed economies, we use a yearly survey panel dataset (2002–2010) of adults from a society of native Amazonians (Tsimane') in Bolivia practicing farming, fishing, hunting, and plant gathering. We estimate (a) convergence rates (or the speed of catch up) of adults in the bottom quintile to the rest of the population sample, (b) mobility defined as the change in quintile rank in economic outcomes between 2002 and 2010, and (c) the associations of economic mobility in rank between 2002 and 2010 with society-wide economic inequality in 2010, measured with the Gini coefficient. Outcomes included flows (income, barter) and wealth measured with the value of livestock, locally produced goods, and commercial goods. We found unambiguous evidence of convergence (those at the bottom were fast approaching the rest) and considerable evidence of both upward and downward mobility among women and men across all outcomes. Mobility and economic inequality correlated negatively. We did not observe the modest economic mobility typical of developed economies, but we found pockets of immobility at the top and an inverse relation between upward mobility and inequality.

> I am of the opinion that our first duty is to inquire whether a thing be or not, before asking wherefore it is. William Harvey, 1628.

1. Introduction

Adult intragenerational economic mobility reflects society's ability to reward effort and tame society-wide inequality. In developed economies,[1] what happens during adulthood to a person's rank in economic indicators, such as income, affects their well-being. Intragenerational economic mobility, or the ability of individuals to move up the economic ladder, has ripple effects on their psychological and physical health, fertility, social relations, and political preferences (Bartley & Plewis, 2007; Berman, 2022a; Billingsley, 2012; Breen & Ermisch, 2024; Claussen et al., 2005; Houle, 2011; Khairuddin et al., 2021). The amount of intragenerational economic mobility matters not just for the individual but also for society because economic mobility tends to correlate negatively with economic inequality and reflects equality of opportunities to move up in status (Becchetti et al., 2022; Chetty et al., 2014; Corak, 2013; Durongkaveroj, 2018; Fisher & Johnson, 2020; Hirschman & Rothschild, 1973; Jantti & Jenkins, 2015). The study of economic

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[1] We follow the International Monetary Fund's (IMF, 2023) convention of equating a developed or advanced economy with a high Gross Domestic Product (GDP), export diversification, and integration into the world's financial system. The economy of a developing country lacks these traits.

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mobility helps to understand how a society works and rewards individuals. Higher intragenerational mobility suggests a society that rewards effort and innovation, allocates resources more efficiently because it is better at matching talent with opportunities, and fosters social cohesion because people believe they have a fair chance of improving their lives. Despite the importance of intragenerational economic mobility in developed economies, almost nothing is known about the topic in nature-dependent, small-scale societies of farmers, hunters, plant gatherers, fishers, or pastoralists in the rural Global South (hereafter *small-scale societies*). One reason for the research gap is that direct observation of adult intragenerational economic mobility often requires panel data – multi-year measurements of the same outcomes with the same method of data collection from the same adults – and such data is absent from nearly all small-scale societies.[2] In this article, we provide the first quantitative assessment of intragenerational mobility in a small-scale society by addressing two questions: *[1]* What is the amount of adult intragenerational mobility among Tsimane', a society of farmers and foragers in the Bolivian Amazon largely removed from national Bolivian society and *[2]* what is the correlation between intragenerational mobility and economic inequality in their society?

The article has four related goals. The first goal is to estimate and describe intragenerational economic mobility among Tsimane' because of the absence of direct quantitative observations of intragenerational mobility in small-scale societies. The second goal is to assess the external validity of findings about the amount of intragenerational economic mobility and immobility from developed economies. Third, we want to broaden the approach to the study of intragenerational economic mobility by looking at other economic outcomes besides income. The fourth goal is to test the hypothesis that intragenerational economic mobility correlates negatively with economic inequality.

In this article, we assess intragenerational economic mobility by using a unique yearly panel dataset (2002–2010, inclusive) that measured economic outcomes in a small-scale society of Indigenous native Amazonians in Bolivia known as Tsimane'. Their livelihood depends on slash-and-burn farming, fishing, hunting, and gathering wild plants from the rainforest. At the start of the study in 2002, the Tsimane' Amazonian Panel Study (TAPS) team interviewed 633 people ≥16 years of age (women = 308; men = 325) from 245 households about their living conditions and surveyed them every year until 2010.

We focus on economic mobility in resources such as asset wealth, monetary income, and the value of goods received in barter, but recognize that most of the theoretical and empirical literature about mobility comes from sociology and deals with mobility in status, occupation, or class. Because economic and social mobility correlate positively in developed economies (Asadullah, 2012; Meschede et al., 2016; Steckel, 1990; Varghese et al, 2021), we sometimes turn to the sociological literature for insights, but our interest lies foremost in economic mobility. When we refer to mobility we mean economic mobility, and when we talk about other types of mobility (e.g., social, occupational) we specify so.

We examine economic mobility through two complementary lenses: *convergence* and *relative intragenerational mobility* (hereafter *mobility* unless noted otherwise). *Convergence* captures the speed of catch-up among those who initially had the least amount of an economic resource, such as income or wealth. We want to assess how fast individuals at the bottom move closer to the average growth rate of individuals in the rest of the sample — not to the growth rate in the rest of the country or to the growth rate of an international reference group. Put simply, convergence refers to how fast those at the bottom catch up or move closer to the rest or to those at the top. In contrast, *mobility*, as used in this article, refers primarily to changes in the economic quintile position of an individual between the start (2002) and the end of the panel (2010). (Later we explain why nine years is a meaningful span of time to examine mobility). From the beginning to the end of the study, an individual could have moved up or down in their quintile position or remained in the same place. *Convergence* and *mobility* need not go together. For instance, the monetary income of people in the lowest income quintile could be growing faster than the average monetary income of people in other quintiles — those at the bottom would be *converging* — and perhaps even surpassing a threshold, such as a poverty line (*absolute mobility*). However, at the end of a study, those who were initially at the bottom quintile could remain there and would have thus experienced no *relative mobility,* even though they had *converged* (moved closer to the rest) and experienced *absolute mobility*.

2. What is known

[a] Quantitative studies of intragenerational mobility. We know less about intragenerational mobility than about intergenerational mobility (Berman, 2022b; Burkhauser et al., 2012).[3]

Developed economies. In the USA, researchers have found limited income mobility and a secular decline in income mobility (Fisher & Johnson, 2020). Auten et al. (2013) used income-tax data from the USA between 1987 and 2007 and found that half the people between the ages of 35 and 40 in the top quintile in 1987 were still there in 2007. Berman (2022a) used 1962–2014 data on income from the USA and found high within-person correlations of income (range 0.7–0.8) between baseline and endline dates over different four-year periods. As in the USA, in the UK, intragenerational income mobility did not change (Jenkins, 2011) and in Israel, the intragenerational mobility of top-income earners declined between 1995 and 2013 (Federman et al., 2023). Fisher and Johnson (2020) go beyond the focus on income and use panel data (>10 years) on consumption, wealth, and income from the USA. They found modest mobility; within-person correlations of initial and endline rank in different economic outcomes were >0.8. There was more mobility in consumption than in income and least mobility in wealth. Like others, Fisher and Johnson found that intragenerational mobilities declined or remained stagnant during the 20th century.

Global South. Studies in China, Thailand, and Korea also found limited mobility (Muthitacharoen & Burong, 2023; Oh & Choi, 2018). Davis & Baulch (2011) used two survey waves a year apart (2006, 2007) from a panel in rural Bangladesh to construct transition matrices (as in Table 3) and found that mobility varied by economic outcome (e.g., wealth, expenditures).

Intragenerational mobility and economic inequality. An early literature review by Burkhauser et al. (2012) on intragenerational mobility and economic inequality in developed economies concluded there was a weak relation between income inequality and mobility, but a more recent study by Fisher and Johnson (2020) using a longer panel

[2] A consortium of institutions in the UK is identifying and cataloguing all active and finished panel datasets worldwide that relied on observational data (Arseneault, 2023). Thus far, it has identified a total of 3608 panel datasets and catalogued 1622, of which only two refer to adults in small-scale societies. We stress panels constructed from direct observations of the same person at multiple times but recognize that panels can also be formed retrospectively by asking study participants in a one-time survey to recall events for the current and for past periods; answers to the same question for different time periods are appended to form a panel of retrospective responses (Mayer, 2008). Retrospective panels have been used in studies of social mobility and aging (Cheng et al., 2020; Song & Mare, 2015). Panels formed by repeatedly visiting participants and asking them contemporaneous data provide more accurate data, as is the case in this study. Intragenerational mobility studies can also be done with qualitative methods without relying on a panel (See *Mixed Methods* in the section on *Future studies*).

[3] A search on 12/31/2024 in the abstracts, keywords, and titles of items catalogued in the electronic database *Scopus* showed that of all the studies mentioning intergenerational or intragenerational mobility, 10 times more studies dealt with intergenerational (n=110) than with intragenerational mobility (n=11).

(1968–2017) from the USA found a negative relation between income inequality and mobility.

[b] Quantitative studies from current small-scale societies about predictors of economic inequalities. Most of the studies in this genre have centered on wealth inequality rather than on inequality in economic flows. Among the predictors of wealth inequality, researchers found that the intergenerational transmission of different wealth types contributed to wealth disparities (Borgerhoff Mulder et al., 2009; Bowles et al., 2010; Germano, 2022; Gurven et al., 2010). In particular, the transmission of material wealth that could be easily defended bore a positive association with wealth disparities (Mattison et al., 2023; Mattison et al., 2016). Among the causes of income inequality, the average level of village income has been singled out to test the Kuznets hypothesis of income inequality (Godoy et al., 2004). In Madagascar, Tucker et al. (2015) found that the Gini coefficient of total income, which they defined as monetary earnings plus the monetary value of consumption, across four villages varied by the subsistence type of the village.

In summary, the literature shows restricted intragenerational mobility in developed economies and has identified a few determinants of inequality in small-scale societies. In this article, we add evidence about intragenerational mobility by bringing in evidence from small-scale societies and complement studies on the predictors of economic inequality in small-scale societies by examining the role of intragenerational mobility and convergence in economic inequality.

3. The setting: Tsimane'

At the time of our research, Tsimane' numbered ~17,000 people (INE, 2015) and lived in ~125 villages, mostly along the banks of the rivers Maniqui and Apere, department of Beni (Fig. 1). Our research centered on 13 villages along the river Maniqui that varied in proximity to two market towns, San Borja and Yucumo. Some aspects of Tsimane' society and culture would lead one to anticipate high intragenerational mobility, but other aspects would lead one to expect the opposite. But before discussing these aspects we make a commentary about Tsimane' households.

Households are nuclear and pool resources in farming and other subsistence activities. Adults and children in the household collaborate in forest clearing, planting, weeding, and harvesting. Some subsistence activities are done mostly by men (e.g., making dugout canoes), other mostly by women (e.g., plant collection), or by both sexes (e.g., fishing), but the fruits of the labor are available to all household members (Bauchet et al., 2021). Although households pool resources, individuals have well-defined concepts of individual private ownership of assets and individual use of their earnings. Each adult knows how many fishhooks they own or who decides on the money they earned (Godoy et al., 2006). This does not mean households cannot use the assets of someone else in the household, but the right to dispose of the asset rests on the person who obtained it. Even though the economic mobility of a family is likely highly correlated with the economic mobility of individual family members owing to intra-household pooling of resources, we did the mobility analysis at the level of the adult rather than the household for

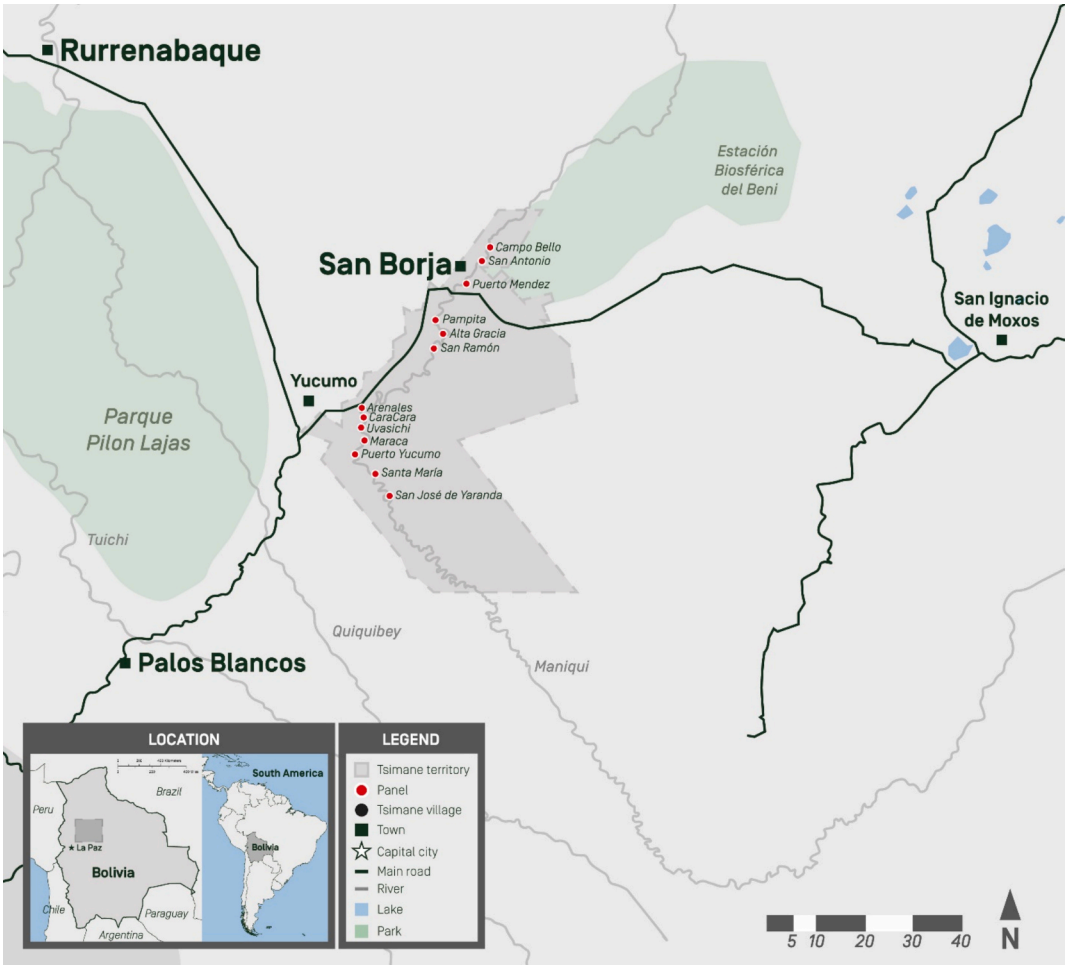

Fig. 1. Tsimane' villages in the panel study 2002–2010, department of Beni, Bolivia. Notes: The square symbols and letters in each town are approximately proportional in size to the town population. The Tsimane' territory is an administrative division that does not reflect the lands inhabited by the Tsimane.

two reasons. First, households are unstable, for they split up or fuse due to marriage, migration, or caregiving, making it difficult to follow them over time. In response to these challenges, one must use and validate arbitrary rules to decide if one is dealing with the same or with a different household over the nine years of the panel. No such challenges arise when tracking an individual. Second, even if one had convincing rules for deciding when households were formed or ceased to exist, one would need to adjust household-level measures of economic resources by the demographic composition of the household because needs and contributions vary by the sex and age of household members. One could divide the resource by a head count to obtain *per capita* values, but this would ignore the age and sex composition of the household. Dividing by male (or female) adult equivalents would solve this problem, but using adult equivalents for Tsimane' households is not applicable because many adults do not know their age.

Why expect high intragenerational mobility? During the study, the cornerstone of the Tsimane' household economy was slash-and-burn farming. Households had unfettered rights to carve out farmlands from rainforests, a common-property resource. Households could cut as much rainforest as they needed, conditional on the health and number of workers in the household and limited by the fact that the rainforest they planned to use was not a fallow rainforest that other households had recently used or were about to use again. Tsimane' households have equal rights of access to farmlands they clear from the rainforest. In addition, Tsimane' enjoy ample freedom. Villages do not have a supreme leader who dictates what to do (Gurven et al., 2008). In the 1980s, Protestant Missionaries helped Tsimane' create a tutelary government for Tsimane' along the river Maniqui to defend them against encroachment from loggers, cattle ranchers, and settlers from the highlands (Kempf & Kempf, 2017), but this Council does not have the resources or legitimacy to implement its will in villages. The same applies to the Bolivian government. Other than vaccination campaigns and the occasional visit to garner political support for municipal or national elections, government officials rarely come to villages. Until recently, ample land allowed households to clear forest away from villages and towns, and, in fact, the ethnohistorical record indicates that Tsimane' chose to move away from Westerners and the marketplace to settle in secluded places to retain their freedom (Godoy, 2025). One final fact about the possibility of upward mobility is worth noting. Bolivian census data suggests that between 1994 and 2012, the share of Tsimane' living in the department of Beni (their historic homeland) declined from 99 % to 90 % (Godoy, 2025). Emigration might have been sparked by a wish for upward mobility or a better life, but whether it did so is unclear (See section on *Attrition* under *Methods*). In summary, there are few barriers to making a living from the land. Anyone can farm, fish, and hunt.

Why expect low intragenerational mobility? Several hurdles in Tsimane' society would lead one to expect low intragenerational mobility. Fluency in speaking Spanish and physical strength limit some jobs to men. For example, less than 3 % of women worked for wages during the study, compared with 50 % of men (Table 2). Gender norms limit the creation of some types of wealth assets to one gender. Only women weave cotton carrying bags; only men make dugout canoes from tree trunks. These gender differences motivated us to estimate convergence and intragenerational mobility for the full sample and for each sex separately. There are few opportunities for individuals to distinguish themselves from their peers because most everyone farms, fishes, gathers wild plants, and hunts, and few have the specific skills to obtain blue-collar or white-collar jobs in towns. Access to higher education was limited due to the absence of middle schools and high schools in the villages we studied. Informal and formal safety nets are weak, suggesting that recovery from downward mobility after an adverse shock might take a long time (Undurraga et al., 2014). Tsimane' scored low on prosocial behavior in cross-cultural framed field experiments (Henrich et al., 2005). Poor health and insufficient labor help in the household during the forest clearing season curtail the amount of farmland households can clear from forests to grow subsistence and cash crops. Land is becoming scarce due to a 3 %–4 % yearly population growth (McAllister et al., 2012, p. 795; Reyes-Garcia, 2001, p. 68) and to encroachment by non-Tsimane' (Reyes-García et al., 2011).

The context of intragenerational mobility. Three aspects of Tsimane' society deserve stress to understand the context of the study and interpret results.

Snapshot of baseline material conditions. Tsimane' scored low in material standards of living. In 2002, the average daily *per capita* real (inflation-adjusted but not adjusted by PPP) monetary income and the value of meals were USD 0.65 and 1.7, below the World Bank's (2022) daily monetary poverty line for Bolivia of USD 1.9 per person. In 2002, the wealth held in privately owned material assets by an adult reached an average of 1063 *bolivianos* (USD 151) (Table 2). With daily meals valued at USD 1.7, an adult could survive for merely 89 days if they sold all their private physical assets and had no other way of obtaining food besides earnings from selling these assets. Growth stunting, an indicator of material deprivation, was ubiquitous. A third of adults, 52 % of boys and 43 % of girls, were growth stunted (Foster et al., 2005; Godoy, 2025). Last, inequalities in income, consumption, and various types of material wealth varied widely, often exceeding levels in developed economies (Godoy et al., 2024).

Trends in quality of life. If instead of looking at snapshots, we examine time trends during 2002–2010, we see that quality of life cratered (Godoy, 2025). Many aspects of well-being, such as farming, diet, sociality, and health worsened. The staple farm crops fared poorly during the nine years of the study. The *per capita* amount of land cultivated with two staples (plantain, manioc) declined yearly, as did yields of maize and rice, the latter one of the main subsistence and cash crops of Tsimane'. Farming became less diversified. Every year, households were less likely to grow other crops besides the big four staples — manioc, rice, plantain, and maize — and used fewer plots. In parallel, food consumption declined as did diet quality. The *per capita* consumption of all macronutrients (besides fats) and 13 of the 21 food items measured in our dietary surveys fell over time, while the *per capita* amount of processed foods like pasta, cooking oil, and white refined sugar increased. Sociality frayed too. All indicators of pro-social behavior we measured weakened. Adults were less likely to drink *chicha,* the traditional beverage of choice fermented at home and imbibed in groups to show sociality. They were less likely to receive visitors and give or receive help. In health, the number of self-perceived morbidities, the likelihood of being overweight or having obesity, and men's tendency to smoke cigarettes increased.

Trends in exposure to the marketplace. During the study, Tsimane' both eschewed and moved closer to the marketplace to meet their needs. Tsimane' autarky increased along some dimensions. Adults' real wage earnings, days worked, and the real value of goods obtained in barter (which Tsimane' often obtain from town traders) fell during 2002–2010. The likelihood that a household would earn no monetary income from wage labor or from selling farm crops, livestock, livestock products, or forest goods during the past fortnight rose by one percentage point a year and the probability a household would not engage in barter in the past two weeks increased yearly by two percentage points. These metrics show more economic self-sufficiency, made possible perhaps by the spread of a variety of governmental cash transfer programs (Bauchet et al., 2018). But other indicators showed increasing participation in the marketplace to obtain money to cover food deficits, purchase productive assets (e.g., tools), and pay for healthcare. The amount of real earnings by adults from selling crops, livestock (or livestock products), and forest goods, and the amount of monetary expenditures they made on durable assets and services (e.g., healthcare, transport fares) increased. The number of durables purchased (especially clothes) rose yearly by 3 %. The chances that an entire household would spend money on durable goods in the past year or on goods and services in the past two weeks increased every year by 15.7 and 10.2 percentage points. Tsimane' did not become supine victims of the marketplace; rather, they leveraged the marketplace to meet their needs.

4. Methods

4.1. Economic outcomes

Table 1 has definitions of the seven economic outcomes used in this study, all measured at the level of the individual adult, because we want to assess the mobility of the individual. Three outcomes captured economic flows, and four outcomes captured economic stocks. The flows included: *i)* monetary wage earnings (only for men), *ii)* cash earnings or retail earnings from selling farms and forests goods, and *iii)* the monetary value of goods received in barter, which is as a form of income instead of expenditure, as it translates into resources available to the person. Among stocks, we measured the monetary value of the following privately owned physical assets: *a)* livestock, *b)* articles produced by Tsimane' from plants, and *c)* commercial goods. We also calculated *d)* the sum of these three types of wealth. Table 2 contains summary statistics of the outcomes at baseline for the entire sample and for women and men separately.

4.2. Survey implementation

The surveys took place during the dry season, from about May until September. Limiting data gathering to the dry season has drawbacks and advantages. Economic flows like cash earnings vary by season; collecting data on flows during the same months every year produces a wrong picture of what happens on average in a year. On the plus side, gathering data during the same time of the year erases the effects of seasonality on yearly trends. To collect data, we put together teams comprised of a senior university-trained Bolivian researcher and a Tsimane'. The teams interviewed adults, defined as people ≥16 years of age. All the information about economic outcomes refers to the adult who answered the survey questions. The analysis of convergence in wage earnings is restricted to adult men because few women worked for wages.

4.3. Recall period for flow variables

We asked participants to provide separate information about economic flows for the week and for the two weeks before the interview. For the analysis, we added the value of the two weeks for each of the three flow variables.

Table 1
Definition of economic outcomes measured yearly among individual adults during 2002–2010.

Name	Definition
[A] Flow variables (daily amounts for the past fortnight)	
Wage	Daily monetary earnings of men from wage labor
Retail	Daily monetary earnings of adults from the sale of farm goods (e.g., crops, livestock, or animal products) and forest goods
Barter	Daily monetary value of goods received in barter by adults
[B] Stock variables (asset wealth). The monetary value of asset bundles owned by the individual	
Total *[Wealth-T]*	Sum of 22 assets divided into Local, Marketplace, and Animal assets.
Local *[Wealth-Local]*	5 goods made by Tsimane' women or men from local plants: canoe, mortar, cotton bag, wooden quern, set of bow and arrows
Marketplace *[Wealth-M]*	13 commercial goods from the marketplace: axe, bicycle, cooking pot, cutlass, hook (fishing), knife, mill (hand), mosquito bed net, fishing net, radio, rifle, shotgun, wristwatch
Animal *[Wealth-Ani]*	4 domesticated animals raised at home: cow (or bull), duck, hen (or chicken), pig

Notes: For stock variables we have put in brackets and italics in the first column the name of the variables as they appear in the tables of the article or in tables S1-S2 of Supplementary Material.

Table 2
Descriptive statistics of economic outcomes at baseline (2002).

Variable	N	Mean	SD	Median	% zeros
[I] Total: Women and men					
[A] Flow variables					
Wage (only men)	303	5.24	8.63	0	51
Retail	605	3.36	25.35	0	57
Barter	605	0.46	1.06	0	67
[B] Stock variables (asset wealth)					
Total	604	1063	1157	669	0
Local	604	264	227	200	6
Marketplace	604	636	819	289	4
Animals	604	164	539	30	36
[II] Women					
[A] Flow variables*					
Retail	302	1.62	4.59	0	60
Barter	302	0.38	0.77	0	68
[B] Stock variables (asset wealth)					
Total	302	529	472	381	1
Local	302	235	165	200	5
Marketplace	302	191	311	65	8
Animals	302	103	212	40	32
[III] Men					
[A] Flow variables					
Wage	303	5.24	8.63	0.00	51
Retail	303	5.10	35.47	0.00	53
Barter	303	0.54	1.29	0.00	66
[B] Stock variables (asset wealth)					
Total	302	1597	1374	1290	0
Local	302	292	273	207	8
Marketplace	302	1080	923	884	0
Animals	302	225	727	20	40

Notes: For definition of variable see Table 1. SD = standard deviation. Values are in current nominal *bolivianos*. 1 USD ≈ 7 *bolivianos*. In the analysis, we converted values into inflation-adjusted (real) monetary values using Bolivia's Consumer Price Index (CPI). We applied an inverse hyperbolic sine transformation to real values to avoid losing adults with values of zero for economic outcomes. No wage data used for women because < 3 % of women worked for wages.

4.4. Measurement of wealth in privately owned material assets

In several pilot studies from 1999 to 2000, before the start of the panel, we identified a basket of private goods adults owned, and based on that assessment, we made an inventory of 22 goods or durable assets we would eventually ask about in the yearly surveys of the panel starting in 2002. The inventory captured the privately owned goods of all villagers, from the poorest to the richest, and was done considering that Tsimane' women and men own different assets. Table 1 contains a description of all the assets measured, grouped by type (e.g., marketplace, livestock). Assets were valued at the village selling or buying price at the time of the interview and converted to inflation-adjusted (real) prices using Bolivia's Consumer Price Index (Table 2).

4.5. Time span

We chose to examine mobility using the maximum span of time in the panel (nine years) for two reasons. First, a longer span enhances the ability to detect lasting (structural) mobility or immobility and lowers the chances of measuring mobility from stochastic events (Berman, 2022a; Jantti & Jenkins, 2015; Naschold & Barrett, 2011). Second, since Tsimane' life expectancy during the study was 53 years (Gurven et al., 2007), and young people establish independent households by 16 years

Table 3
Illustrative cross-tabulation of quintile (Q) change in an economic outcome of individuals from baseline (2002) to endline (2010).

Baseline (2002):	Endline (2010)				
	Q1	Q2	Q3	Q4	Q5
Q1	Stuck bottom				Extreme ↑
Q2					
Q3					
Q4					
Q5	Extreme ↓				Stuck top

Notes: The word *Extreme* captures maximum upward (Q1 → Q5, ↑) or downward (Q5 → Q1, ↓) mobility.

of age, a span of nine years covers a large portion of an adult's working life, but not the entire adult lifespan. A life expectancy of 53 years at birth in this context most likely reflects an extremely high childhood mortality, especially under-five mortality. If childhood mortality is high, those who reach adulthood might have a life expectancy well beyond 53 (conditional on surviving past 5 years), possibly into their 60s or even 70s. Above ~60 years of age, people rely on retail to earn cash. The use of a nine-year span puts our study toward the upper range of time spans of intragenerational studies, which vary from a minimum of 2–4 to 10–20 years (Bevis & Barrett, 2015; Federman et al., 2023; Naschold & Barrett, 2011).

4.6. The unit of analysis and data used for convergence and mobility analysis

Unit. The unit of observation and analysis is the individual adult, not the average *per capita* (or adult-equivalent) value for the household. A focus on the individual enables us to obtain high resolution on mobility, whereas *per capita* household estimates are prone to errors from changes in household size and composition (Witoelar, 2013). Data. Convergence analysis is less stringent in data requirements than the analysis of mobility in rank. One can assess the speed of catch-up with an imbalanced panel because one can control for the number of times the subject was measured. Convergence allows one to use the full panel even if some participants were surveyed in only a few years. In contrast, mobility, as defined in this article, restricts us to the use of participants surveyed in 2002 *and* 2010. If a participant were present in all eight yearly surveys during 2002–2009 but was absent from the 2010 survey, that participant would be excluded from the mobility analysis owing to the way we measured mobility.

Attrition. If attritors left the sample because they emigrated to improve their living standards, as ethnographies reviewed by Vaid (2021) suggest, sample attrition would bias conclusions about convergence and mobility (Fuwa, 2011; Kanyangarara et al., 2020; Rozensweig, 2003; Schoeni & Wiemers, 2015). We address attrition bias in convergence and mobility in different ways. Convergence. Only 4.42 % of the baseline sample left after 2002 and 38 % were present in all nine years of the study. Excluding these two percentages, the rest of the sample was present an average and a median of six times out of the seven yearly surveys. We deal with attrition in the convergence analysis by using regressions with individual fixed effects (see below) and, in additional analysis (Table S2, Supplementary Material), by controlling

Table 4
Unconditional probability of economic mobility from baseline (2002) to endline (2010) among Tsimane' adults (age ≥16 years): [A] Any mobility, [B] Extreme mobility, and [C] Immobility.

	People	[A] Any mobility			[B] Extreme mobility		[C] Immobility; stuck at:	
		None	Up	Down	Up: B20 → Top20	Down: Top20 → B20	Top20	B20
[I] Average: women and men								
Retail	351	49	23	28	16.49	38.16	32.89	67.02
Barter	351	58	16	26	9.91	71.05	17.11	79.33
Wealth:								
Total	350	40	38	22	4.35	1.35	77.03	30.43
Local	350	31	36	33	9.84	1.49	68.66	27.87
Marketplace	350	41	39	20	1.3	1.33	73.33	37.66
Animal	350	34	35	31	11.67	23.19	40.58	50.83
Grand mean		42	31	27	9	23	52	49
[II] Women								
Retail	184	60	18	22	16.19	43.90	34.15	69.52
Barter	184	80	1	19	13.33	78.38	21.62	85.83
Wealth:								
Total	184	32	29	39	19.51	5.00	52.5	26.83
Local	184	32	29	39	12.00	9.09	42.42	32
Marketplace	184	29	41	30	17.95	2.70	54.05	25.64
Animal	184	31	38	31	13.83	18.18	30.56	48.33
[III] Men								
Retail	167	44	27	29	15.66	35.48	32.26	63.86
Barter	167	68	14	17	14.71	65.85	20.00	72.55
Wealth:								
Total	166	36	45	20	8.33	2.86	57.14	29.17
Local	166	31	40	28	3.85	0	62.86	26.92
Marketplace	166	25	52	23	3.85	6.06	42.42	19.23
Animal	166	40	30	31	10.00	33.33	51.52	53.33

Notes: The row "Grand mean" is the average of all the values in the column.

for the number of times we surveyed an adult. Mobility. Of the ~600 participants surveyed in 2002 (Table 2), ~350 were present in 2010 (Table 4). We did not try to find all the adults who had been present in 2002 but were missing in 2010. However, in 2005–2006, ten households from two villages in the panel permanently resettled in Undumo, a rural area outside the department of Beni that was not inhabited by Tsimane'. Because we followed them to their destination and surveyed them there, we can estimate a change in their rank and address how their attrition could affect the results of the mobility analysis.

4.7. The bottom 20 % defined

Table 2 shows that all the flow variables were heavily censored at zero; between 51 % and 67 % of the sample received no earnings from wage labor or retail and did not barter. The same was true of livestock wealth; 36 % of adults (women = 32 %; men = 40 %) did not own livestock. For outcomes censored at zero, the "bottom 20 %" refers to people with a value of zero at baseline, which exceeded 20 % of the sample size. For the three outcomes with a continuous distribution and few zero values — local wealth, marketplace wealth, and total wealth — the "bottom 20 %" refers literally to those at the bottom 20 % of the distribution at baseline. We use the expression *bottom 20 %* (or simply *bottom*) as a shorthand for both cases.

4.8. Rationale for the use of quintiles

We split economic outcomes into quintiles for two reasons. First, the use of quintiles facilitates cross-cultural comparisons with developed economies because researchers often use quintiles to describe mobility in developed economies (Davidai & Gilovich, 2018). Second, since our sample was small, splitting it by deciles would have produced groupings with too few observations and less trustworthy results. The total sample of adults surveyed at baseline and endline had ~350 people, producing quintiles that should have an average of ~70 individuals. Had we broken up the sample by deciles, each group would have had half as many individuals.

4.9. A gender perspective

We estimate convergence and intragenerational mobility for the full sample and for each sex separately because, as Table 2 suggests, women and men differed significantly in the level of economic resources at their disposal at baseline.

5. The analytical approach to convergence and relative intragenerational mobility

5.1. Convergence

We use the following model to estimate convergence:

$$Y_{jivt} = \alpha + \beta_1 \cdot Year \cdot Bottom20_{jivt=2002} + \beta_2 \cdot Year + \beta_3 \cdot Bottom20_{jivt=2002} + \mu_i + \nu_v + \varepsilon \quad (1)$$

Y stands for the economic outcomes (Table 1). *Year* refers to the year of the survey. Subscript *j* on the left side indexes the economic outcome, and subscripts *i*, *v*, and *t* stand for individuals, village, and time (year). The parameters are estimated with panel regressions that include individual (μ_i) and village (ν_v) fixed effects. The use of fixed effects for individuals removes the confounding role of any trait of the individual that might have remained fixed during the study (e.g., maximum schooling, number of times surveyed), and the use of village fixed effects reins in the influence of village attributes that did not change during the study, like proximity to town. Our approach allows us to assess conditional convergence. *Bottom20* is a binary variable for those at the bottom of the quintile distribution of the outcome (*Y*) during 2002. Because *Bottom20* does not change, it is unnecessary to include it in Eq. (1) (or control for the number of times we surveyed participants) with individual fixed effects regressions but is needed with ordinary least squares regressions, which we implement as a robustness check (Table S2, Supplementary Material). Even if unnecessary, *Bottom20* is included in Eq. 1 for clarity. We estimate parameters with robust standard errors clustered by individuals and do so for the full sample, then separately for women and men.

Convergence requires that β_1 be > 0 and statistically significant. In addition, the estimate should be realistic, by which we mean that β_1 should be large enough so that those at the bottom reach the endline average or median of the sample of the better off in a reasonable number of years during adulthood. Later, in Fig. 4, we provide estimates of catch-up times.

Mobility. We assess the unconditional probability that someone in a quintile of the distribution of an economic outcome in 2002 would remain in that quintile or move (up or down) to another quintile of the distribution by the end of the study. We analyze each gender separately but also provide an average for the combined sample of women plus men.

Unlike the analysis of convergence, which requires regressions, the analysis of mobility can be done with unconditional cross-tabulations or two-way contingency tables. We prefer this simple approach instead of conditional probability owing to the small sample size. Table 3 provides an example of how we used cross-tabulations. The dark diagonal cells show people who did not change quintiles between 2002 and 2010; the cells include people in the same quintile in both times. The greenish-blue shaded area above the diagonal line captures all the individuals who moved up in their quintile ranking, while the pink-reddish area below the diagonal line shows all the people who moved down in their quintile ranking. When describing the results of the analysis, we pay attention to the share of people who moved up from the first quintile (Q12002) to the fifth quintile (Q52010) or who moved down from the top quintile (Q52002) to the bottom quintile (Q12010) at endline. In Tables 3–4 we call these changes in quintile *Extreme*. In addition, we report the total probability of upward mobility (all the greenish-blue area) or downward mobility (all the pink-reddish area) for each economic outcome (Table 3).

Mobility, convergence, and their relation to economic inequality. For each of the seven economic outcomes, we computed a Gini coefficient of inequality for 2010 based on individual-level measurements of the economic outcome. The Gini coefficient has become the standard way to measure economic inequalities and can range from zero or complete equality, in which each household or person owns an equal share of the total resource, to 100, in which one person or household owns the entire resource (Tucker et al., 2015). In graphical analysis we put the Gini coefficient on the y-axis and along the x-axis we put the following, each in a different graph: *i)* convergence rate (Fig. 5A), *ii)* the share of people who moved up (Fig. 5B), *iii)* the share of people who moved down (Fig. 5C), and *iv)* the share who remained in the same quintile (Fig. 5D) between 2002 and 2010. We could have estimated 13 Gini coefficients and 13 mobility rates for each of the 13 villages, but those estimates would have been less trustworthy because of a much smaller sample size. For the mobility analysis, we drew on ~350 adults surveyed in 2002 and 2010; had we done the analysis of mobility and inequality at the village level, the average sample per unit of analysis would have dropped to 27 observations (27 = 350/13).

6. Results

6.1. Descriptive statistics

The mean age of the 633 study participants interviewed at baseline was 34 years (median = 30; SD = 16) and was the same for women and men. Table 2 shows descriptive statistics of the outcomes at baseline and two noteworthy findings. First, it shows low amounts of monetary

income and privately owned wealth assets. Second, women had less economic resources than men. Men earned more than twice as much as women selling farm and forest goods, and owned twice as much total assets, marketplace assets, and livestock assets. The monetary value of goods received in barter was 43 % higher for men than for women.

6.2. Convergence

Table S1 (Supplementary Material) contains regression results, and Fig. 2 displays the results of the convergence analysis for the total sample. The numbers on the y-axis show the percentage-point (pp) difference in the growth rate of the bottom 20 % of the sample compared with the growth rate of the rest of the sample. The results show unmistakable evidence of convergence, with much variation in rates between economic outcomes. To give one example: during 2002–2010, the inflation-adjusted total wealth of adults at the top 80 % of the asset distribution grew annually by 5 %, but the comparable rate for those at the bottom 20 % was 14.2 %, which yields a net difference of 9.2 pp in favor of people at the bottom, which is the number shown in Fig. 2 (Wealth-T) and in the first row of Table S1. Convergence rates were higher for livestock wealth (46.4 pp) and most other outcomes, but lower for barter (8.1 pp). The median and average yearly convergence rate for the seven outcomes was ~20 pp.

Fig. 3 shows convergence rates for women and men separately. Besides the convergence rate for commercial assets or marketplace assets, all other convergence rates were higher for men than for women. The advantage in the growth rate in favor of men ranged from 14.3 pp for wealth in livestock to a barely discernible growth rate of 0.8 pp in favor of men for the value of goods received in barter. In short, everyone at the bottom of the distribution converged (Fig. 2), but men converged faster than women (Fig. 3). We did additional analyses of convergence and found support for the results just presented.[4]

Fig. 4 provides estimates of how long it would take for those at the bottom to converge to their higher-ranking peers in three types of asset wealth: total, local, and marketplace. We only excluded livestock wealth because 36 % of adults had no livestock. Someone in the bottom 20 % of the distribution of total wealth in 2002, with a mean or median *per capita* total wealth of about 260 *bolivianos*, would take 17 years to converge to the mean total wealth of all adults in 2010. The same person would take 21 years to converge to the mean of total wealth of adults in the top half of the total wealth distribution in 2010. The time to converge to the mean value of assets made from local plants was 6–7 years. The number of years to reach the average of the marketplace wealth of all adults in 2010 or the mean of the wealth in marketplace assets of the wealthiest half in 2010 was about the same, close to 15 years. Across asset types, the number of years to reach the level of the better-off in 2010 was lower if we compute wait time with median values, as shown in the six histogram bins to the right of Fig. 4.

6.3. Mobility

Figs. 5A–C draw on Table 4 and show the results of the analysis of mobility between 2002 and 2010. To avoid misunderstanding, before discussing results, we provide a commentary about the percentages in the three columns of section [A] and show more generally how we computed the shares of Table 4. The percentages in the three columns represent the share in the total sample surveyed of adults present in 2002 and 2010 who moved up, down, or remained in the same rank. The percentages correspond to the areas of the transition matrix of Table 3. Specifically, the statistics of the three columns of section [A] correspond to *a)* the share of people who moved up (greyish blue), *b)* the share of people who moved down (reddish pink), and *c)* the black diagonal line for those who did not change rank. By construction, the sum of the shares across the three columns adds up to 100 %. Because of the way we estimated the shares, the share of adults moving up does not have to equal the share of people moving down; this would happen only if everyone moved, and nobody stayed in the same rank. In Table S3 (Supplementary Material), we use the example of mobility in total asset wealth to illustrate how the shares of people moving up or down or staying in the same rank were calculated and why the percentages of people moving up or down do not have to offset each other.

Average mobility and immobility for all economic outcomes for women and men combined. The bottom row of section AI of Table 4 shows that, averaged across all outcomes and both sexes, immobility was more marked than mobility, and that upward mobility was more marked than downward mobility. Between 2002 and 2010, in the total sample of all adults, an average of 42 % of adults did not change quintile rank in any economic outcome, but 31 % moved up, while 27 % moved down. Nonetheless, the bottom row of section IB shows that the likelihood of extreme upward mobility — the probability of someone in the bottom 20 % in 2002 reaching the top 20 % in 2010 — was 9 %, compared with the average chance of extreme downward mobility (from the top 20 % in 2002 to the bottom 20 % in 2010), which was more than twice as high (23 %). The total averages of section AI hide differences in mobility between stocks and flows, and between women and men.

Comparison of mobility between flows and stocks for women and men combined. Fig. 5A shows that immobility was more marked with economic flows than with any type of asset wealth. An average of 49 % of adults remained in the same quintile of retail earnings, and 58 % remained in the same quintile in the value of goods received in barter (section AI, Table 4). Nevertheless, 31 %–40 % remained in the same quintile rank in various types of asset wealth. Averaged across both women and men, there was more immobility in wealth in marketplace goods (41 %) than in livestock wealth (34 %) or wealth in goods Tsimane' made from plants (31 %) (section AI, Table 4). The share of women and men who remained in the same quintile of asset wealth was similar (figures 5B-5C), but women were more likely than men to stay in

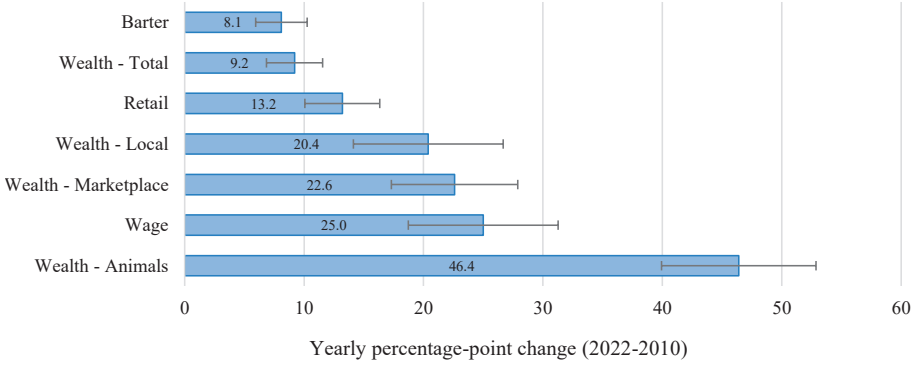

Fig. 2. Differential growth rate (percentage points/year, 2002–2010) in economic outcomes between adults in the bottom 20% of the distribution at baseline and the rest of the sample. Notes: Results show the coefficient β1 from Eq. [1]. For definition of variables see Table 2. Regression results are under the heading Total in Table S1, Supplementary Material. All differential growth rates were statistically significant at the 1% level.

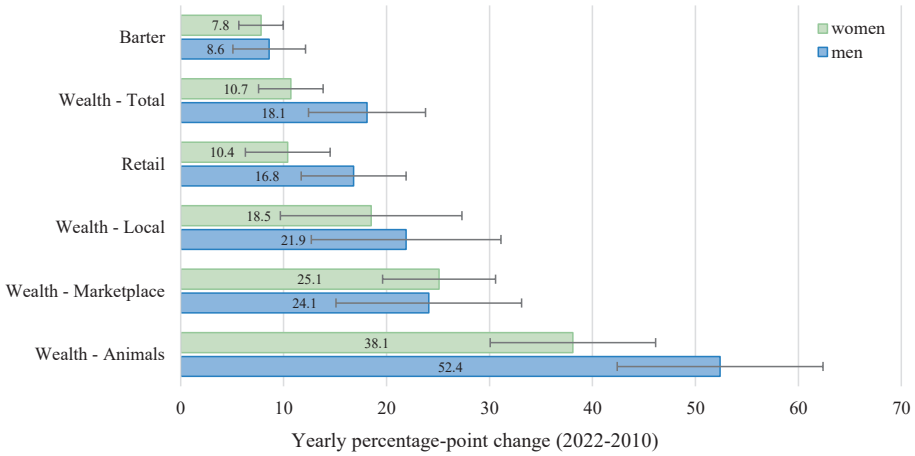

Fig. 3. Gender comparison of convergence rates (%/year, 2002–2010) of economic outcomes between adults in the bottom 20% of the distribution at baseline (2002) and the rest. Notes: Same notes as Fig. 1. Table S1, Supplementary Material, contains the regression results from which we extracted the growth rates shown in Fig. 2. For each outcomes, differences in convergence rates between the sexes were statistically significant at the 1% level (see footnote 4).

[4] We repeated the analysis of convergence using ordinary least squares (OLS) while controlling for age, the number of times an adult was surveyed, and a binary variable indicating if the adult was in the bottom quintile of the distribution in 2002 (Table S2, Supplementary Material). As the table and histogram of Table S2 show, the results were like the results of the fixed-effect regressions. In addition, we tested if the convergence rates between women and men were statistically significant in the OLS regressions of Table S2 by including a triple interaction term between the yearly level of the outcome, being in the bottom 20% of the distribution, and a variable for the adult's sex. Other than livestock wealth, all the results were statistically significant at the 1% level.

the same quintile of retail earning (women = 60 %; men = 44 %) or in the value of goods received in barter (women = 80 %; men = 68 %). In sum, immobility was higher with economic flows than with asset wealth and similar for women and men, except for flow indicators (retail earnings and barter) where women were more likely than men to remain in the same rank quintile.

Upward mobility. Fig. 5A shows greater upward mobility in stocks than in flows. Across all types of wealth and for both women and men, an adult had a 35 %–39 % probability of moving to a higher quintile in various types of asset wealth (Section AI, Table 4). However, they had a much lower probability of moving up in retail earnings (women = 18 %; men = 27 %) or in the value of articles received in barter (women = 1 %; men = 14 %) (sections AII-AIII, Table 4). Except for livestock wealth, men had a higher probability of moving up, sometimes by a large amount (Fig. 5B–C). For instance, men had a 52 %, 27 %, and 14 % probability of moving up in the quintile of wealth from marketplace assets, retail earnings, and value of goods obtained in barter, compared with women who had a 41 %, 18 %, and 1 % probability of upward mobility for these outcomes (sections AII-AIII, Table 4). Nonetheless, as Fig. 5B shows, women had a better chance of moving up in the quintile distribution of livestock wealth (women = 38 %; men = 30 %).

Downward mobility. The column "Down" in section A, Table 4, has the results of the analysis of downward mobility. The first notable finding is that, in the combined sample of women and men and across outcomes, the share of individuals who moved down was about the same for flows and stocks. In general, around 27 % of adults moved down the quintile distribution of asset wealth and retail earnings (bottom row, section AI, Table 4). Fig. 5A generally shows the same finding; that is, the share of people at the bottom did not differ too much by the economic outcome. Second, a comparison of Fig. 5B and 5C shows that, other than retail earnings and livestock wealth, women faced a higher probability of downward mobility than men. For instance, the likelihood

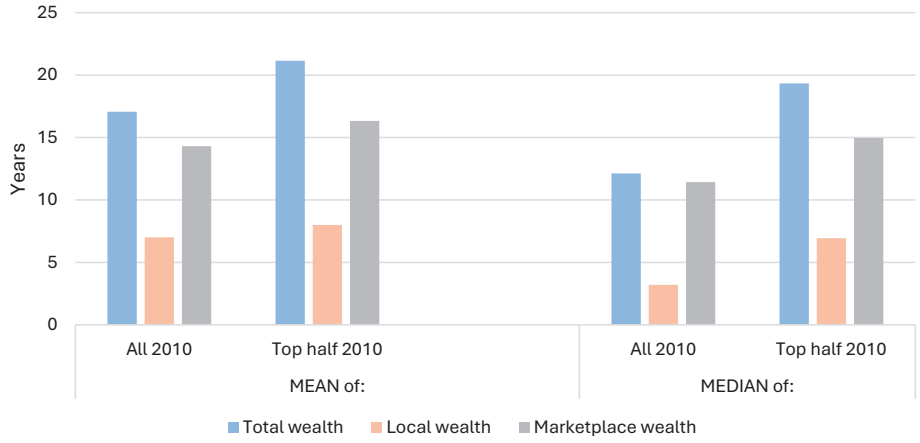

Fig. 4. Years for the bottom quintile to converge to the mean or median of all adults in 2010 or to the mean or median of adults in the top half of the distribution in 2010. Notes: The information for Fig. 4 is shown below. The convergence rate in the first column below comes from the parameters of the first row of Table S1 (Supplementary Material). Other than the column titled *Convergence rate*, the numbers in other columns are in real *bolivianos*.

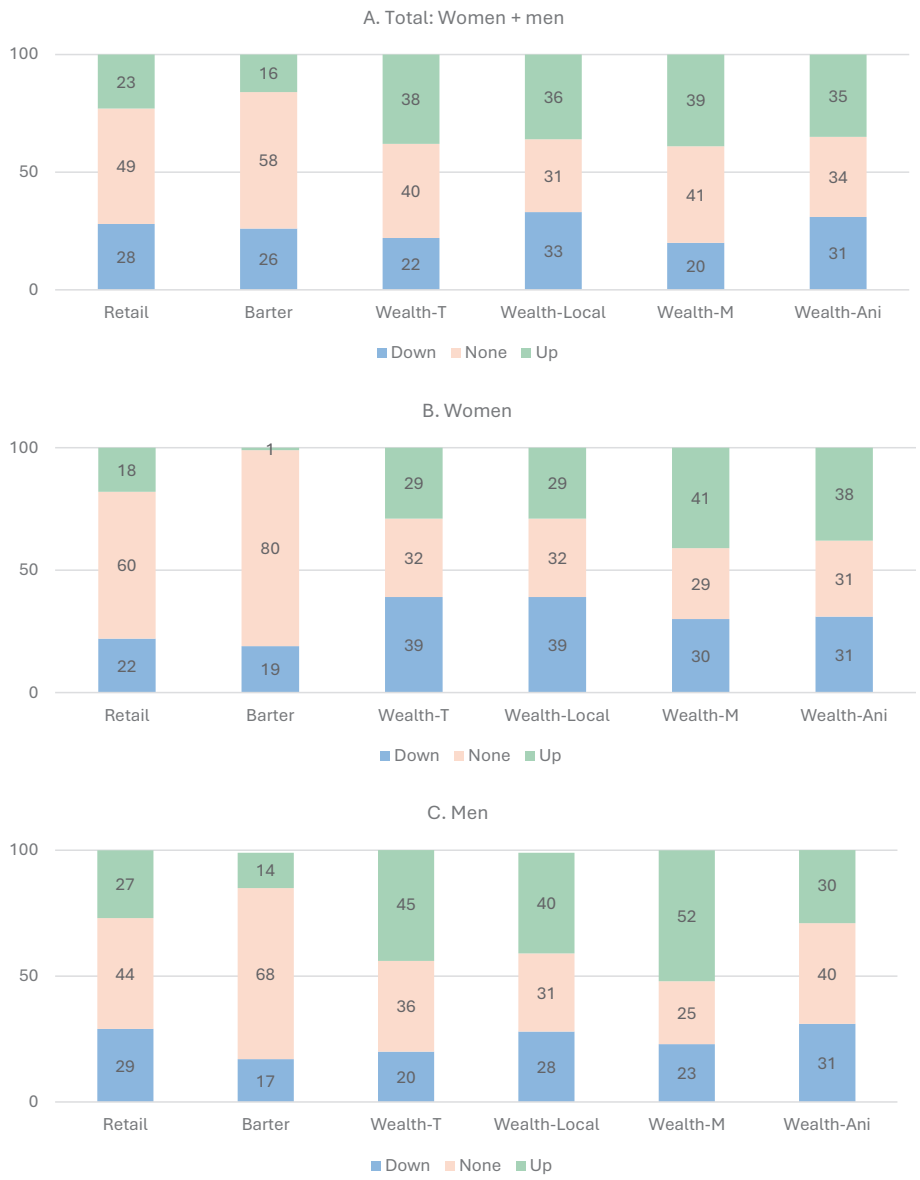

Fig. 5. Unconditional probability of change in adult economic quintile between baseline (2002) and endline (2010) for total sample, women, and men. Notes: Statistics for figures 5A-5C come from section [A], parts I-III, of Table 4: Figure A (Section I), Figure B (Section II), and Figure C (Section III).

a woman would drop at least one quintile in total asset wealth, marketplace wealth, or in the monetary value of goods received in barter was 39 %, 30 %, and 19 %; the comparable figures for men were 20 %, 23 %, and 17 % (Table 4).

Section I of Table 4 and Fig. 5C show there were reasons for pessimism and optimism about the chances of upward mobility. On the bleak side, people (especially women) were more likely to experience downward mobility in retail earnings and in the value of goods obtained in swaps. For these outcomes, the share of people who moved down was higher than the share of people who moved up; the gap was made up by the share of people who did not change rank. On the bright side, everyone was more likely to experience upward mobility with almost any type of asset wealth. In fact, averaged across all outcomes and both sexes, the probability of upward mobility (31 %) was larger than the probability of downward mobility (27 %) (last row, section AI, Table 4).

Extreme mobility between 2002 and 2010. Section B (Table 4) shows four results. First, averaged across outcomes and the combined sample of both sexes, extreme downward mobility was more common than extreme upward mobility; 23 % of the sample experienced extreme downward mobility compared with 9 % who experienced extreme upward mobility (last row, section BI, Table 4). Second, this result arose from the extreme downward mobility of economic flows. 38 % and 71 % of the sample dropped from the top to the bottom quintile in retail earnings and in the value of barter transactions between 2002 and 2010. Third, with asset wealth, extreme upward mobility was much more common than extreme downward mobility among women. Between 2002 and 2010, 12 %–19 % of women moved from the bottom to the top quintile in their stocks of total wealth, wealth in locally made articles, and in marketplace wealth compared with between 2 % to 9 % of women who dropped from the top to the bottom quintile between these two years for these outcomes. Fourth, compared with men, women saw greater upward mobility in all forms of asset wealth; on average, 15 % of women but only 6 % of men moved up from the bottom to the top quintile in asset wealth between 2002 and 2010. In sum, women were more likely to go from the very bottom to the very top in wealth, while both women and men were more likely to drop from the very top to the very bottom.

Rank immobility. We estimate rank immobility in two ways: *(a)* the share of people who remained at the top or bottom quintile from 2002 until 2010 and *(b)* the within-person rank correlation between 2002 and

2010.

[a] Remains at the top or bottom. We estimated the share of people at the bottom (or top) quintile in 2002 who remained at the bottom (or top) quintile nine years later. Section CI (Table 4) shows one big finding. On average, 49 % of those at the bottom quintile were still at the bottom nine years later while 52 % of those at the top quintile were still at the top. There was some variation. People at the top were more likely to remain in the same place with wealth than with economic flows; the opposite was true for those at the bottom. Among those at the top quintile, 40 %–77 % remained at the top of the wealth distribution by 2010, but a smaller percentage (17 %–32 %) stayed at the top quintile of retail earnings or barter by 2010. Among adults originally at the bottom quintile of retail earnings or the value of goods received in barter transactions, between 67 % and 79 % were in the same bottom quintile at endline, but only 27 %–50 % remained in the same quintile of asset wealth by 2010. Sections CII-CIII show that men were more likely to stay in the same quintile of asset wealth (top = 57 %; bottom = 29 %) than women (top = 52 %; bottom = 26 %) while women were likely to stay in the same quintile of retail earnings and barter (top = 21 %–34 %; bottom = 69 %–85 %) than men (top = 20 %–32 %; bottom = 63 %–72 %).

[b] General rank immobility. Within-person correlations of rank between 2002 and 2010 show evidence of immobility and mobility (Table 5). People were not too tethered to baseline economic flows or to baseline livestock wealth. They moved up or down in rank, though

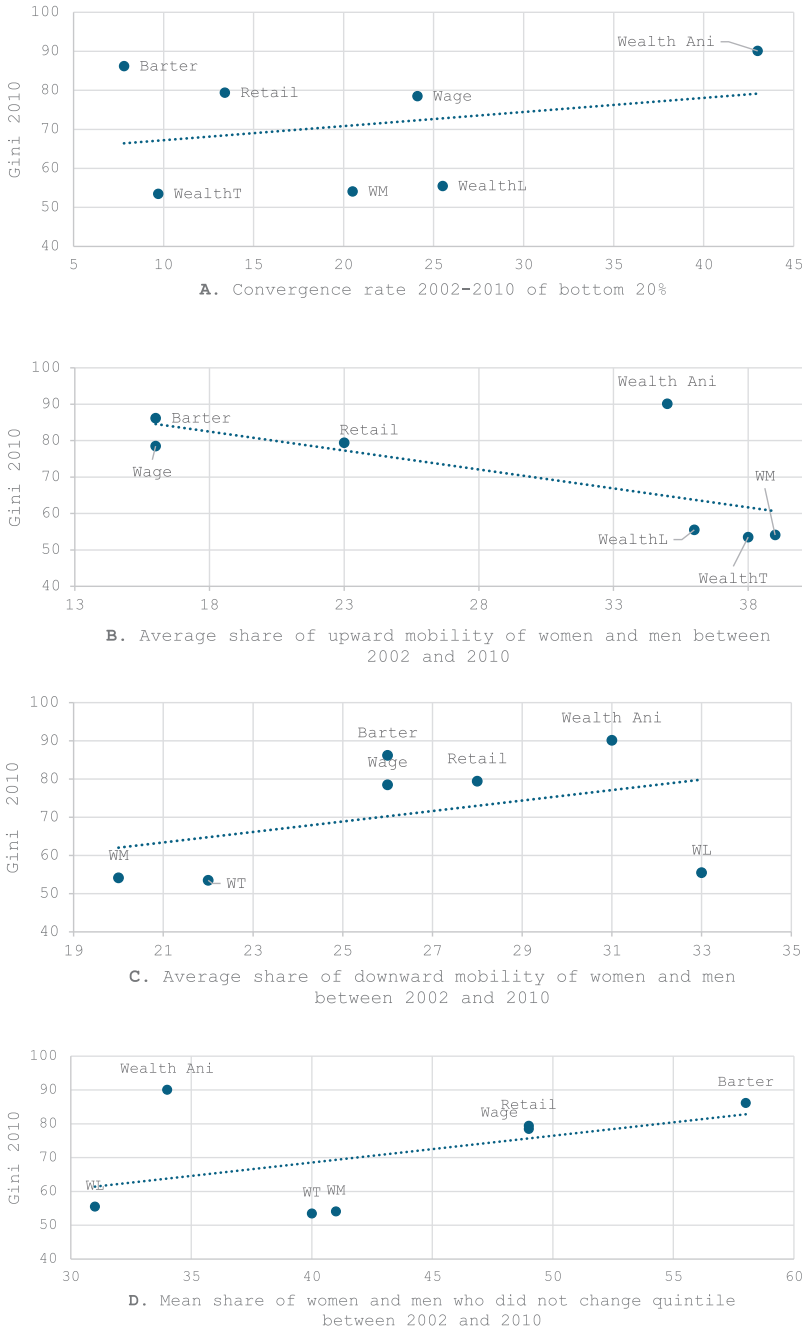

Fig. 6. Relation between Gini coefficient of inequality in 2010 and (A) converge rate 2002–2010, (B) share of the sample that moved up between 2002 and 2010, (C) share of sample that moved down between 2002 and 2010, and (D) share of the sample that did not move between 2002 and 2010. Notes: WT = Total wealth; WL = wealth in locally made goods; M = wealth in marketplace goods. Wealth Ani = wealth in livestock. Shares for figures 5B-5D come from section AI of Table 4. Convergence rates for Fig. 5A come from the first row of Table S1 (Supplementary Material).

correlations were never near zero or one, which would imply complete mobility or immobility. Correlations ranged from 0.10 for barter (men) to 0.22 for retail (both sexes) or about 0.25 for livestock wealth (both sexes). However, people (especially men) were more likely to be locked to their initial asset wealth (other than livestock wealth). Among men, initial rank in total asset wealth was highly correlated with endline rank. For men, the within-person rank correlation in total asset wealth was 0.51.

Attrition. Recall from the earlier discussion that in 2005–2006 ten households from two villages of the panel moved permanently to Undumo, a rural area in the department of La Paz, about seven hours by road from the town of San Borja. Emigrants said they left because they could extract and sell more forest thatch palm, receive a higher price for thatch palm, and eat more game meat. Tsimane' felt appreciated by town people in their new home. Government officials in Undumo gave Tsimane' land in the town to build an office and were more solicitous about the welfare of Tsimane' than government officials in the town of San Borja. To assess attrition, we used the complete sample, a binary variable for these attritors, a regression with individual and year fixed effects, and, as dependent variables, a change in quantile rank of total wealth or retail earnings as dependent variables. Attrition did not affect rank in statistically significant ways. These attritors went up 0.48 quintiles in wealth rank (standard error [SE] = 0.47; p = 0.312; n = 4258) and went down 0.02 quintiles in retail rank (SE = 0.42; p = 0.95; n = 4289). If these attritors resembled all the attritors who had been present in 2002 but absent in 2010, they would enlarge the share of people who did not experience mobility, including the people tethered to the bottom or to the top rank quintile. Put differently, the share of adults who did not change rank that we presented might underestimate the true share of all adults who remained in the same rank.

6.4. The association between (a) convergence and mobility and (b) economic inequality

We next examine associations between the Gini coefficients of inequality for economic outcomes at endline in 2010 used as dependent variables and, as predictors, the *(a)* rates of convergence during 2002–2010 for the bottom 20 % or *(b)* mobility in rank between 2002 and 2010 (Fig. 6A–D).

Fig. 6A shows no relation between the 2002–2010 convergence rate of the bottom 20 % of the sample and the Gini coefficient of the outcome at end line. The upward sloping line of Fig. 6A is somewhat misleading because it stems from the influence of the outlying value at the top right-hand corner of the graph. The outlier, asset wealth in livestock, had an extremely high Gini coefficient (0.9) in 2010 and a high yearly convergence rate for the bottom 20 % (43 percentage points). Although the bottom converged, the amount of convergence was not enough to make a dent on the Gini coefficient.

Figs. 6B-6C show that the shares of the sample that experienced upward or downward mobility between 2002 and 2010 were associated with less inequality. Fig. 6B illustrates that as the share of people experiencing upward mobility in an economic outcome (e.g., total wealth) rose, the Gini coefficient declined. Fig. 6C shows that the share of people who experienced downward mobility in an economic outcome was associated with a higher Gini coefficient for the outcome, suggesting that upward and downward mobility affected inequality in opposite ways. Nonetheless, immobility was associated with more inequality (Fig. 6D). As the share of the sample that remained in the same quintile rose, inequality increased.

Additional analysis. In Tables S4 and S5 (Supplementary Material), we show the results of additional analyses to test if mobility rose during the years of prime working age and if proximity to town (a proxy of exposure to the marketplace) correlated with mobility. We found that propinquities to town had a modest effect on mobility, but age did not bear a significant association with rank mobility.

7. Discussion

Summary. Convergence*:* adults (especially men) who were most disadvantaged in economic resources at baseline were fast approaching the better-off. The time to converge was realistic, especially for young adults. Mobility*:* There was a mixture of considerable mobility and immobility. Men moved up in asset wealth while women experienced the opposite. We found evidence of people moving from the very bottom to the very top, and the opposite. However, there were sizable pockets of people who remained at the top or at the bottom quintile of the distribution through the study period.

Comparison with developed economies. We compare similarities and differences between developed economies and Tsimane' because the second goal of the article was to assess the external validity of findings from developed economies. Results should be read with care because of differences in the scale of the two economies, sample sizes, and measurement errors. Information about rank mobility in developed economies comes from nationally representative samples and often comes from official tax records, whereas information about convergence and mobility in economic rank among Tsimane' comes from self-reported answers to survey questions.

Similarities. ***[a]*** In both developed economies and among the Tsimane' there is a glass ceiling for those at the very bottom and a glass floor for those at the very top of the distribution. One could find 49 %–52 % of Tsimane' adults who were in the baseline bottom or top quintile in the same quintile by 2010. In the USA, from 1987 to 2007, about half of those in the bottom wealth quintile remained there, while about 60 % of those in the top quintile also stayed there (Auten et al. 2013). The share of those who remained at the top or at the bottom in these two different economies are similar. ***[b]*** In developed economies (Fisher & Johnson, 2020) and among Tsimane', intragenerational mobility correlates negatively with economic inequality.

Differences. ***[a]*** There was far more mobility among Tsimane' adults than among their peers in developed economies. For instance, as noted in Table 5, among Tsimane', within-person rank correlation coefficients for economic flows (mean = 0.18) and economic stocks (mean = 0.35) were much lower than in the USA, where, depending on the years studied and age bracket considered, within-person rank correlations ranged from 0.5 to (often) over 0.8 (Berman, 2022a; Fisher & Johnson, 2020). ***[c]*** Unlike intragenerational mobility in developed economies, intragenerational mobility among Tsimane' did not correlate with age (Table S4, Supplementary Material). ***[c]*** In the USA, there was more income mobility than wealth mobility (Fisher & Johnson, 2020); among Tsimane' the opposite happened (Section AI, Table 4 and Fig. 5A). Flows are more variable and changing that stocks, which are just accumulated flows. So where did the mobility in stocks among Tsimane' come from? A possible explanation is the expansion of governmental transfers that happened during the study. Individuals who received them – pensioners, pregnant women, new mothers, households with school-age children – may have used them to acquire wealth, fueling mobility in stock. Since

Table 5
Within-person correlations between baseline (2002) and end line (2010) quintile rank of economic outcomes.

Economic outcome	Men	Women
Flows:		
Wages (men)	0.204	Not applicable
Retail	0.227	0.227
Barter	0.102	0.175
Stocks (wealth):		
Total	0.518	0.349
Local	0.405	0.321
Marketplace	0.428	0.344
Animal	0.244	0.258

Notes: Sample sizes are in the column "People" of Table 4.

we did not measure income from governmental transfers, we cannot test this explanation.

Conclusion. We draw one overall conclusion on substance and one on methods. The well-documented limited intragenerational mobility of developed economies is not universal. It pays off to examine a range of economic flows and stocks when studying intragenerational mobility because convergence rates and mobility patterns differed by the economic outcome analyzed.

Future studies on intragenerational mobility in small-scale societies. We see three promising areas for future research on intragenerational mobility in small-scale societies.

Testing theories about the effects of mobility on wellbeing. Mobility matters because it affects the quality of life of individuals. At least four theories from the behavioral sciences and public health have been developed over the past century to explain the effects of intragenerational adult mobility on adults' well-being (especially subjective well-being) (Breen & Ermisch, 2024; Houle, 2011; Jonsson et al., 2017). All the theories have been tested with data from developed economies; testing the theories in small-scale societies would enable assessing the external validity of prior findings from developed economies.

Explore a new link between intragenerational and intergenerational mobility. Intergenerational and intragenerational mobility tend to be analyzed separately and correlate positively (Bradbury, 2022), but not entirely, because the economic status of offspring also depends on their effort (Cheng & Song, 2019; Corak, 2013) and luck (Frank, 2016). The standard approach examines the one-way flow of resources and opportunities bestowed by parents on offspring (Björklund & Jäntti, 2020; Jantti & Jenkins, 2015; Jarvis & Song, 2017; Passaretta et al., 2018). Cross-cultural studies in small-scale societies cited earlier (*What is known about the topics, [b]*) likewise analyzed the parent-to-offspring transmission of resources. To our knowledge, what remains under explored is the generational transfers of economic resources in the other direction — from adult offspring to aging parents (Smythe, 2022) — to assess if the transfers safeguard parents from downward mobility, limit the upward mobility of adult offspring, and thus reduce the generational gap in material resources between parents and offspring.

Mixed methods. With few exceptions (e.g., Carpentieri et al., 2024; Friedman, 2016; Vaid, 2024), intragenerational studies are either qualitative or quantitative (Bertaux & Thompson, 2017; Morgan et al., 2006) yet they are both needed to obtain a firmer understanding of mobility. Statistics (including the ones presented in this article) lack an ethnographic narrative to make the numbers speak. Nothing is known about how Tsimane' experience mobility or their perceptions of mobility, or tolerance for inequality. For instance, does remaining in the bottom quintile among Tsimane' engender hopelessness and malicious envy as it does in developed economies (Bak & Yi, 2024) or does it not because people choose a rank and are comfortable with it even if they could have moved up? Is a change in rank a straight path from origin to destination or is it a path with zigzags, ups, and downs (Baulch & Davis, 2008)? Qualitative methods could build upon statistical results to provide a richer understanding of mobility.

Credit authorship contribution statement

Ricardo Godoy: Writing – review & editing, Writing – original draft, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Jonathan Bauchet:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Formal analysis. **Victoria Reyes-García:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Eduardo A. Undurraga:** Writing – review & editing, Visualization, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.worlddev.2025.107237.

Data availability

The data is available at several web places; thus, the only other additional data are the Stata do files.

The processed and coarse panel data are available at several public repositories (Godoy, 2025; Appendix A) and the computer codes that generated the statistical results for this article are available as an online supplement.

References

Arseneault, L. (2023). *Landscaping international longitudinal datasets: Full report.* Retrieved from London:.

Asadullah, M. N. (2012). Intergenerational wealth mobility in rural Bangladesh. *The Journal of Development Studies, 48*(9), 1193–1208. https://doi.org/10.1080/00220388.2011.646988

Auten, G., Gee, G., & Turner, N. (2013). Income inequality, mobility, and turnover at the top in the US, 1987-2010. *American Economic Review, 103*(3), 168–172. https://doi.org/10.1257/aer.103.3.168

Bak, H., & Yi, Y. (2024). Brand envy in economic disparity: Understanding and mitigating malicious envy towards brands among consumers perceiving limited economic mobility. *Journal of Business Research, 184*, Article 114896. https://doi.org/10.1016/j.jbusres.2024.114896

Bartley, M., & Plewis, I. (2007). Increasing social mobility: An effective policy to reduce health inequalities. *Journal of the Royal Statistical Society, 170*(2), 469–481. https://doi.org/10.1111/j.1467-985X.2006.00464.x

Bauchet, J., Undurraga, E., Reyes-García, V., Behrman, J. R., & Godoy, R. (2018). Conditional cash transfers for primary education: Which children are left out? *World Development, 105*, 1–12.

Bauchet, J., Undurraga, E., Zycherman, A., Behrman, J. R., Leonard, W. R., & Godoy, R. (2021). The effect of gender targeting of food transfers on child nutritional status: Experimental evidence from the Bolivian Amazon. *Journal of Development Effectiveness, 13*(1), 276–291.

Baulch, B., & Davis, P. (2008). Poverty dynamics and life trajectories in rural Bangladesh. *International Journal of Multiple Research Approaches: Hybrid, Synergistic, Integrated and Cultural, 2*(2), 176–190. https://doi.org/10.5172/mra.455.2.2.176

Becchetti, L., Colcerasa, F., & Pisani, F. (2022). When income differences hurt or excite: The nonlinear effect of regional inequality on subjective well-being. *Review of Income and Wealth, 69*(4), 1114–1135. https://doi.org/10.1111/roiw.12608

Berman, Y. (2022a). Absolute intragenerational mobility in the United States, 1962–2014. *The Journal of Economic Inequality, 20*(3), 587–609. https://doi.org/10.1007/s10888-022-09529-7

Berman, Y. (2022b). The long-run evolution of absolute intergenerational mobility. *American Economic Journal: Applied Economics, 14*(3), 61–83. https://doi.org/10.1257/app.20200631

Bertaux, D., & Thompson, P. (Eds.). (2017). *Pathways to social class: A qualitative approach to social mobility*. Oxford and New York: Clarendon Press.

Bevis, L. E. M., & Barrett, C. B. (2015). Decomposing intergenerational income elasticity: The gender-differentiated contribution of capital transmission in rural Philippines. *World development, 74*, 233–252. https://doi.org/10.1016/j.worlddev.2015.04.010

Billingsley, S. (2012). Intragenerational mobility and mortality in Russia: Short and longer-term effects. *Social Science & Medicine, 75*(12), 2326–2336. https://doi.org/10.1016/j.socscimed.2012.09.003

Björklund, A., & Jäntti, M. (2020). Intergenerational mobility, intergenerational effects, sibling correlations, and equality of opportunity: A comparison of four approaches. *Research in Social Stratification and Mobility, 70*, Article 100455. https://doi.org/10.1016/j.rssm.2019.100455

Borgerhoff Mulder, M., Bowles, S., Hertz, T., Bell, A., Beise, J., Clark, G., & Wiessner, P. (2009). Intergenerational wealth transmission and the dynamics of inequality in small-scale societies. *Science, 326*(5953), 682–688. Retrieved from <Go to ISi>://000271233200026.

Bowles, S., Smith, E., & Borgerhoff Mulder, M. (2010). The emergence and persistence of inequality in premodern societies. *Current Anthropology, 51*(1), 7–17.

Bradbury, K. (2022). Family characteristics in U.S. intragenerational family income mobility, 1978–2014. *The Journal of Economic Inequality, 21*(1), 1–23. https://doi.org/10.1007/s10888-022-09544-8

Breen, R., & Ermisch, J. (2024). The Effects of Social Mobility. *Sociological science, 11*, 467–488. https://doi.org/10.15195/V11.A17

Burkhauser, R. V., Nolan, B., & Couch, K. A. (2012). Intragenerational Inequality and Intertemporal Mobility. In R. V. Burkhauser, B. Nolan, & K. A. Couch (Eds.), *The Oxford Handbook of Economic Inequality* (pp. 522–546). Oxford, UK: Oxford University Press.

Carpentieri, J. D., Carter, L., & Jeppesen, C. (2024). Between life course research and social history: New approaches to qualitative data in the british birth cohort studies. *International Journal Of Social Research Methodology, 27*(5), 517–544. https://doi.org/10.1080/13645579.2023.2218234

Cheng, S., & Song, X. (2019). Linked lives, linked trajectories: intergenerational association of intragenerational income mobility. *American sociological review, 84*(6), 1037–1068. https://doi.org/10.1177/0003122419884497

Cheng, Y., Goodin, A. J., Pahor, M., Manini, T., & Brown, J. D. (2020). Healthcare utilization and physical functioning in older adults in the United States. *Journal of the American Geriatrics Society, 68*(2), 266–271. https://doi.org/10.1111/jgs.16260

Chetty, R., Hendren, N., Kline, P., & Saez, E. (2014). Where is the land of opportunity? The geography of intergenerational mobility in the United States. *The Quarterly Journal of Economics, 129*(4), 1553–1623. https://doi.org/10.1093/qje/qju022

Claussen, B., Smits, J., Naess, O., & Davey Smith, G. (2005). Intragenerational mobility and mortality in Oslo: Social selection versus social causation. *Social Science & Medicine, 61*(12), 2513–2520. https://doi.org/10.1016/j.socscimed.2005.04.045

Corak, M. (2013). Income Inequality, Equality of Opportunity, and Intergenerational Mobility. *Journal of Economic Perspectives, 27*(3), 79–102. https://doi.org/10.1257/jep.27.3.79

Davidai, S., & Gilovich, T. (2018). How should we think about Americans' beliefs about economic mobility? *Judgment and decision making, 13*(3), 297–304. https://doi.org/10.1017/s1930297500007737

Davis, P., & Baulch, B. (2011). Parallel realities: Exploring poverty dynamics using mixed methods in rural Bangladesh. *The journal of development studies, 47*(1), 118–142. https://doi.org/10.1080/00220388.2010.492860

Durongkaveroj, W. (2018). Tolerance for inequality: Hirschman's tunnel effect revisited. *Journal of international development, 30*(7), 1240–1247. https://doi.org/10.1002/jid.3389

Federman, S., Sarid, A., & Yaish, M. (2023). The intragenerational mobility of the top income earners during financial crises, a story of a cohort. *Advances in Life Course Research, 58*, Article 100565. https://doi.org/10.1016/j.alcr.2023.100565

Fisher, J. D., & Johnson, D. S. (2020). Inequality and mobility over the past half-century using income, consumption, and wealth. In R. Chetty, J. N. Friedman, J. C. Gornick, B. Johnson, & A. Kennickell (Eds.), *Measuring distribution and mobility of income and wealth* (pp. 437–455). Chicago: The University of Chicago Press.

Foster, Z., Byron, E., Reyes-García, V., Huanca, T., Vadez, V., Apaza, L., & Leonard, W. R. (2005). Physical growth and nutritional status of Tsimane' Amerindian children of lowland Bolivia. *American Journal of Physical Anthropology, 126*, 343–351.

Frank, R. H. (2016). *Success and luck : Good fortune and the myth of meritocracy*. Princeton: Princeton University Press.

Friedman, S. (2016). Habitus Clivé and the emotional imprint of social mobility. *The sociological review, 64*(1), 129–147. https://doi.org/10.1111/1467-954X.12280

Fuwa, N. (2011). Should we track migrant households when collecting household panel data? household relocation, economic mobility, and attrition biases in the rural Philippines. *American Journal of Agricultural Economics, 93*(1), 56–82. https://doi.org/10.1093/ajae/aaq114

Germano, F. (2022). Entropy, directionality theory and the evolution of income inequality. *Journal of Economic Behavior & Organization, 198*, 15–43. https://doi.org/10.1016/j.jebo.2022.03.017

Godoy, R. (2025). *Researching well-being in an indigenous Amazon community: A detailed survey of the Tsimane' over time*. New York and Oxford: Routledge.

Godoy, R., Bauchet, J., Behrman, J. R., Huanca, T., Leonard, W., Reyes-García, V., & Zycherman, A. (2024). Changes in adult well-being and economic inequalities: An exploratory observational longitudinal study (2002-2010) of micro-level trends among Tsimane', a small-scale rural society of Indigenous People in the Bolivian Amazon. *World Development, 176*, Article 106518.

Godoy, R., Gurven, M., Byron, E., Reyes-García, V., Keough, J., Vadez, V., & Pérez, E. (2004). Do markets worsen economic inequalities? Kuznets in the bush. *Human Ecology, 32*(3), 339–364.

Godoy, R. A., Patel, A., Reyes-García, V., Seyfried, C. F., Leonard, W. R., McDade, T., & Vadez, V. (2006). Nutritional status and spousal empowerment among native Amazonians. *Social Science & Medicine, 63*(6), 1517–1530. https://doi.org/10.1016/j.socscimed.2006.03.048

Gurven, M., Kaplan, H., & Supa, A. Z. (2007). Mortality experience of Tsimane Amerindians of Bolivia: Regional variation and temporal trends. *American Journal of Human Biology : The Official Journal of the Human Biology Council, 19*(3), 376–398. https://doi.org/10.1002/ajhb.20600

Gurven, M., Mulder, M. B., Hooper, P. L., Kaplan, H., Quinlan, R., Sear, R., & Bell, A. (2010). Domestication alone does not lead to inequality intergenerational wealth transmission among horticulturalists. *Current Anthropology, 51*(1), 49–64. https://doi.org/10.1086/648587

Gurven, M., Zanolini, A., & Schniter, E. (2008). Culture sometimes matters: Intra-cultural variation in pro-social behavior among Tsimane Amerindians. *Journal of Economic Behavior & Organization, 67*(3–4), 587–607. https://doi.org/10.1016/j.jebo.2007.09.005

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., & Tracer, D. (2005). "Economic man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies. *Behavioral and Brain Sciences, 28*(6), 795–815. https://doi.org/10.1017/S0140525X05000142

Hirschman, A. O., & Rothschild, M. (1973). The changing tolerance for income inequality in the course of economic development. *The Quarterly Journal of Economics, 87*(4), 544–566. https://doi.org/10.2307/1882024

Houle, J. N. (2011). The psychological impact of intragenerational social class mobility. *Social Science Research, 40*(3), 757–772. https://doi.org/10.1016/j.ssresearch.2010.11.008

IMF. (2023). World Economic Outlook (WEO). Frequently asked questions. Retrieved from https://www.imf.org/en/Publications/WEO/frequently-asked-questions#:~:text=The%20main%20criteria%20used%20by,of%20its%20exports%20are%20oil%2C.

INE. (2015). *Censo de población y vivienda 2012, Bolivia. Características de la población*. La Paz, Bolivia: Instituto Nacional de Estadísticas INE.

Jantti, M., & Jenkins, S. P. (2015). Income mobility. In A. Atkinson (Ed.), *Handbook of Income Distribution* (Vol. 2, pp. 807–935). Amsterdam, Netherlands: North-Holland.

Jarvis, B. F., & Song, X. (2017). Rising intragenerational occupational mobility in the United States, 1969 to 2011. *American sociological review, 82*(3), 568–599. https://doi.org/10.1177/0003122417706391

Jenkins, S. P. (2011). *Changing fortunes: Income mobility and poverty dynamics in Britain*. Oxford, UK: Oxford University Press.

Jonsson, F., Sebastian, M. S., Hammarström, A., & Gustafsson, P. E. (2017). Intragenerational social mobility and functional somatic symptoms in a northern Swedish context: Analyses of diagonal reference models. *International Journal for Equity in Health, 16*(1), 1. https://doi.org/10.1186/s12939-016-0499-1

Kanyangarara, M., Douillot, L., Pison, G., Ndiaye, C. T., Delaunay, V., & Helleringer, S. (2020). Tracing long- and short-term migrants for participation in demographic and epidemiological studies: Evidence from Senegal. *Field Methods, 32*(1), 38–57. https://doi.org/10.1177/1525822X19879892

Kempf, D., & Kempf, E. (2017). *Journey to Chimane land*. Maitland, Florida: Xulon Press.

Khairuddin, A., Bernebé, E., & Delgado-Angulo, E. (2021). Intragenerational social mobility and self-rated oral health in the british cohort study. *Health and Quality of Life Outcomes, 19*(1). https://doi.org/10.1186/s12955-021-01757-1

Mattison, S., MacLaren, N., Sum, C., Mattison, P., Liu, R., Shenk, M., & Wander, K. (2023). Market integration, income inequality, and kinship system among the Mosuo of China. *Evolutionary Human Sciences, 5*, e4.

Mattison, S. M., Smith, E. A., Shenk, M. K., & Cochrane, E. E. (2016). The evolution of inequality. *Evolutionary Anthropology : Issues, News, And Reviews, 25*(4), 184–199. https://doi.org/10.1002/evan.21491

Mayer, K. U. (2008). Retrospective longitudinal research: The German life history Study. In S. Menard (Ed.), *Handbook of longitudinal research: Design, measurement, and analysis* (1st ed., pp. 85–106). Chantilly: Elsevier Science and Technology Ltd.

McAllister, L., Gurven, M., Kaplan, H., & Stieglitz, J. (2012). Why do women have more children than they want? Understanding differences in women's ideal and actual family size in a natural fertility population. *American Journal of Human Biology, 24*(6), 786–799.

Meschede, T., Thomas, H., Mann, A., Stagg, A., & Shapiro, T. (2016). Wealth mobility of families raising children in the twenty-first century. *Race and social problems, 8*(1), 77–92. https://doi.org/10.1007/s12552-016-9161-1

Morgan, S. L., Grusky, D. B., & Fields, G. S. (Eds.). (2006). *Mobility and inequality : frontiers of research in sociology and economics*. Stanford, Calif: Stanford University Press.

Muthitacharoen, A., & Burong, T. (2023). Climbing the economic ladder: Earnings inequality and intragenerational mobility among Thai formal workers. *Journal of Asian Economics, 89*, Article 101665. https://doi.org/10.1016/j.asieco.2023.101665

Naschold, F., & Barrett, C. B. (2011). Do short-term observed income changes overstate structural economic mobility? *Oxford Bulletin Of Economics and Statistics, 73*(5), 705–717. https://doi.org/10.1111/j.1468-0084.2011.00640.x

Oh, H., & Choi, Y. J. (2018). Limited income mobility: Empirical evidence from Korea. *Social Indicators Research, 138*(2), 665–687. https://doi.org/10.1007/s11205-017-1670-9

Passaretta, G., Barbieri, P., Wolbers, M. H. J., & Visser, M. (2018). The direct effect of social origin on men's occupational attainment over the early life course: An Italian–Dutch comparison. *Research in Social Stratification and Mobility, 56*, 1–11. https://doi.org/10.1016/j.rssm.2018.04.002

Reyes-Garcia, V. (2001). *Indigenous people, ethnobotanical knowledge, and market economy. a case study of the Tsimane' Amerindians in lowland Bolivia*. Miami: University of Florida. PhD.

Reyes-García, V., Ledezma, J., Paneque-Galvez, J., Orta, M., Gueze, M., Lobo, A., & T.S. Team. (2011). Presence and purpose of non-indigenous peoples on indigenous lands. A descriptive account from the Bolivian Lowlands. *Society & Natural Resources*. In Press.

Rozensweig, M. (2003). Payoffs from panels in low-income countries: Economic development and economic mobility. *The American Economic Review, 93*(2), 112–117. https://doi.org/10.1257/000282803321946903

Schoeni, R. F., & Wiemers, E. E. (2015). The implications of selective attrition for estimates of intergenerational elasticity of family income. *The Journal of Economic Inequality, 13*(3), 351–372. https://doi.org/10.1007/s10888-015-9297-z

Smythe, A. (2022). Child-to-parent intergenerational transfers, social security, and child wealth building. *American Economic Review Papers and Proceedings, 112*, 53–57. https://doi.org/10.1257/pandp.20221018

Song, X. I., & Mare, R. D. (2015). prospective versus retrospective approaches to the study of intergenerational social mobility. *Sociological Methods & Research, 44*(4), 555–584. https://doi.org/10.1177/0049124114554460

Steckel, R. H. (1990). Poverty and Prosperity: A Longitudinal Study of Wealth Accumulation, 1850-1860. *The review of economics and statistics, 72*(2), 275–285. https://doi.org/10.2307/2109717

Tucker, B., Lill, E., Tsiazonera, T. J., Lahiniriko, R., Rasoanomenjanahary, L., & Tsikengo, J. (2015). Inequalities beyond the Gini: Subsistence, social structure, gender, and markets in southwestern Madagascar. *Economic Anthropology, 2*, 326–342. https://doi.org/10.1002/sea2.12034

Undurraga, E., Zycherman, A., Yiu, J., TAPS, & Godoy, R. (2014). Savings at the periphery of markets: Evidence from forager-farmers in the Bolivian Amazon. *The Journal of Development Studies, 50*(2), 288–301.

Vaid, D. (2021). Ethnography and social mobility: A review. In V. Iversen, A. Krishna, & K. Sen (Eds.), *Social Mobility in Developing Countries: Concepts, Methods, and Determinants* (pp. 247–270). Oxford: Oxford University Press.

Vaid, D. (2024). "If not work, then what?": Work, ambition, and satisfaction among young women in urban India. *South Asian history and culture, 15*(2), 264–281. https://doi.org/10.1080/19472498.2024.2346866

Varghese, J. S., Patel, S. A., Martorell, R., Ramirez-Zea, M., & Stein, A. D. (2021). Relative and absolute wealth mobility since birth in relation to health and human capital in middle adulthood: An analysis of a Guatemalan birth cohort. *SSM - Population Health, 15*, Article 100852. https://doi.org/10.1016/j.ssmph.2021.100852

Witoelar, F. (2013). Risk Sharing within the extended family: evidence from the indonesia family life survey. *Economic Development and Cultural Change, 62*(1), 65–94. https://doi.org/10.1086/671715

World-Bank. (2022). Poverty Data. Retrieved from https://povertydata.worldbank.org/poverty/country/BOL.