Supplemental Material

New measures for richer theories:

some thoughts and an example

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December 2025

A Additional references

In this section, we cite and briefly discuss some relevant papers that were omitted from the main text for space restrictions.

Innovative surveys. In the paper, we discussed how the approach of the profession to the use of data on subjective beliefs, expectations and intentions has been changing in recent years. Much work has been devoted to the elicitation of subjective expectations, as reviewed, for example, in Hurd and McGarry (1995, 2002). These papers focus on validation of these novel measures, for example by exploring to which extent respondents adapt to new information and the predictive power of reported subjective probabilities for realized future outcomes. The authors exploit the information in the Health and Retirement Study, a biennial panel survey of individuals first collected in 1992 which elicits information on subjective survival probabilities.

Many institutions collect and maintain surveys that collect data on subjective beliefs and expectations. A relevant example is the New York Fed's Survey of Consumer Expectations (SCE), a nationally representative survey that elicits expectations about a number of macroeconomic and household-level variables (such as inflation or house price expectations), labor market outcomes (such as job loss and job finding probabilities) and expected changes to respondents' own future income and spending. The SCE started in 2013 and consists of a rotating panel of about 1,300 household heads that are surveyed on a monthly basis. A detailed description of the survey can be found in Armantier, Topa, Van der Klaauw, and Zafar (2017).

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Evaluating social programs: RCTs vs non-experimental variation. Classic impact evaluation papers include Robins (1985); Burtless and Greenberg (1982) on the labor supply effects of negative tax experiments and Heckman and Hotz (1989) on the effects of training programs. Recent contributions, such as Heckman and Vytlacil (2007) and Imbens and Rubin (2015) have discussed the combination of experimental and non-experimental data in this context.

More recent contributions have emphasized the combination of experimental and non-experimental data; see, for instance, Heckman and Vytlacil (2007), Abadie, Diamond, and Hainmueller (2010) and Athey, Chetty, and Imbens (2020).

Choices within the household. Some recent empirical contributions to which we allude in the main text include Dunbar, Lewbel, and Pendakur (2013) and Lechene, Pendakur, and Wolf (2022), which estimate resource shares — the fraction of resources allocated to different household members — using only household expenditure data.

On top of this, two interesting studies that introduce innovative measures when studying the allocation of resources within the household are Giannola (2023) and Andrew and Adams (2022), as highlighted in the text. When allocating limited resources among several children, different motives are at play in such contexts: parents might want to maximize the average outcome their children achieve, but might also have a desire to minimize inequality among children. Giannola (2023) designs modules that allow them to obtain data on parental beliefs, as well as their taste for equality and efficiency.

On a similar vein, Andrew and Adams (2022) use a cleverly designed survey based on vignettes about hypothetical situations, to obtain data on what they label "revealed beliefs". Interestingly, the authors obtain information on perceived probabilistic beliefs without directly eliciting questions about probabilities.

The determinants of parenting behavior. The literature on child developments has recently received considerable attention. A partial list of papers include Cunha and Heckman (2008) and Cunha, Heckman, and Schennach (2010); see also Attanasio, Cattan, and Meghir (2023) for a survey.

A strand of this literature focuses on the role of parental beliefs. A relevant reference is Cunha, Elo, and Culhane (2022), which we also refer to in the main text and investigates the relevance of maternal subjective expectations regarding skill formation in the first few months of life. An earlier version of that paper (Cunha, Elo, and Culhane, 2013) contains additional details. Other papers have looked at parental beliefs regarding the impact of different types of parental investment later in the life cycle. Examples include Attanasio, Boneva, and Rauh (2019) and Boneva and Rauh (2018), which look at beliefs of English parents of children in middle and high school.

Education choices. Several studies have considered the role of subjective expectations in education choices. Both Attanasio and Kaufmann (2014) and Wiswall and Zafar (2015) use rich probabilistic subjective expectations data on future earnings to study the determinants of senior high school and college major choice. Attanasio and Kaufmann (2014) study schooling choices by Mexican students, considering both the decision to enroll in high-school or college and how these decisions are influenced by subjective expectations of earnings under different counterfactual scenarios. Furthermore, they consider several angles of the problem: whether the youths' expectations or their parents' matter, whether these correlations change with gender, and whether both expected variance and risk influence these choices. Additional details are provided in an earlier working paper version in Attanasio and Kaufmann (2009).

Instead, Wiswall and Zafar (2015) collect longitudinal data on subjective beliefs held by undergraduate students at New York University on future earnings implied by different major choices. The expectations data used in the article are extremely rich, as they include information on the expected earnings of different major choices, the risk associated with these choices, and the probability of graduating in each major. Furthermore, between subsequent waves of data collection, respondents were provided with accurate information on the earnings distributions associated with each major. This framework allows the authors to observe how individual beliefs change with information. Moreover, the availability of a longitudinal dimension and changes in subjective beliefs allows to difference out fixed effects due to preferences and, under some assumptions, to separately identify the impact of beliefs about future earnings on major choice from that of preferences.

Another relevant study is Giustinelli and Pavoni (2017), which focuses on middle schoolers' knowledge and on how it evolves over the process of high school track choice. The authors construct measures of perceived awareness, subjective beliefs, and belief ambiguity among middle school students in Italy. Students show only partial awareness of the available paths and report low confidence in their beliefs, particularly with regard to their likelihood of following a regular high school path. At the start of 8th grade, students have more information about their preferred options and focus their search more intensely as pre-enrollment approaches. However, children from less advantaged backgrounds start with lower perceived knowledge and acquire information more slowly, particularly regarding college-preparatory schools.

Firm behavior: managerial ability and subjective expectations. A new research agenda has grown out the seminal work by Bloom and Van Reenen (2007), which introduced innovative measures of management quality that have been collected in many surveys. Some subsequent work includes Bloom and Van Reenen (2010), Bloom, Lemos, Sadun, Scur, and Van Reenen (2014), Bloom, Sadun, and Van Reenen (2016) and Scur, Sadun, Van Reenen, Lemos, and Bloom (2021).

B Risk sharing: a theoretical framework

In this setting, a planner maximizes the expected utility of a risk-sharing group v, assigning to each individual i a Pareto weight λ_i^v, which may reflect factors such as wealth or social status. Although frictions such as imperfect contract enforcement can influence these weights, they are taken as given for the time being. The planner's only constraint is the availability of aggregate resources in the group, leading to the following optimization problem (assuming that there are no aggregate savings for simplicity).

$$W^v = \sum_{i=1}^{I_v} \lambda_i^v E_0 \sum_{t=0}^{\infty} \beta^t u(c_{i,t}^v)$$
$$\text{subject to} \quad \sum_i c_{i,t}^v \leq \sum_i y_{i,t}^v, \quad \forall t.$$

The corresponding Lagrangian is:

$$L^v = \sum_{t=0}^{\infty} E_0 \left\{ \sum_{i=1}^{I_v} \lambda_i^v \beta^t u(c_{i,t}^v) + \theta_t^v \sum_{i=1}^{I_v} [y_{i,t}^v - c_{i,t}^v] \right\},$$

where θ_t^v are time-t Lagrange multipliers associated with the feasibility constraint. The first-order condition with respect to $c_{i,t}^v$ is:

$$\beta^t u'(c_{i,t}^v) \lambda_i^v = \theta_t^v \quad \forall i, t.$$

Since this condition must hold in all states of the world, no expectation operator is needed. The term λ_i^v represents the individual's Pareto weight, which remains constant over time, while θ_t^v captures the shadow price of resources in each period and state. [1]

Assuming power utility and taking logs of the marginal utility expression, we obtain the following:

$$\ln c_{i,t}^v = \frac{1}{\gamma}(t \ln \beta - \ln \theta_t^v + \ln \lambda_i^v) \quad \forall i, t.$$

Taking first difference (or differences across different time periods) of this equation, and taking into account that the Pareto weight is constant over time, we get:

$$\Delta \ln c_{i,t}^v = \frac{1}{\gamma}(\ln \beta - \Delta \ln \theta_t^v) \quad \forall i, t.$$

[1] For notational simplicity, we absorb the probability of each state into θ_t^v.

We notice that the right hand side of this equation does not depend on the individual subscript i, implying that this equation should hold for all individuals. In other words, perfect risk sharing implies that consumption growth depends only on the *group aggregate multiplier* $\Delta \ln \theta_t^v$, that is, by changes in the multiplier associated to the resource constraints for group v.

These implications of perfect risk sharing have been tested in the literature by considering regressions such as:

$$\Delta \ln c_{i,t}^v = \pi_0 + \delta_t^v + \pi_1 \Delta \ln y_{i,t}^v + \varepsilon_{i,t}^v \tag{B.1}$$

where δ_t^v are group and time dummies interacted and perfect risk sharing implies that $\pi_1 = 0$. The π_1 coefficient measures how idiosyncratic income shocks are reflected into consumption changes, given group level aggregate income shocks. The size of this coefficient, therefore, can be interpreted as the extent of the deviation from first best allocations.

Of course, an expression such as that in equation (B.1) can be enriched to take into account a variety of other factors. First, one could consider other observable variables that appear related to changes in consumption and that could be explained by the theory as determinants of the marginal utility of consumption. Second, variables other than changes in (log) income could be considered as proxying for idiosyncratic shocks. Third, as has been done in the literature, one could consider heterogeneity in preferences and attitudes towards risk, such as Schulhofer-Wohl (2011), and Asdrubali, Tedeschi, and Ventura (2019). Finally, and important for our discussion, one could consider models of specific frictions that could rationalize and mediate the observed deviations from perfect risk sharing. In particular, we consider measures on social cohesion, on the quality of information, and on the properties of income processes. The first two sets of measures were collected using lab-in-the-field experiments; the ones related to the properties of the income process are recovered from probabilistic subjective expectations data on future earnings.

B.1 Failures of perfect risk sharing

Heterogeneity in risk attitudes. Measures of discount factors and risk tolerance that were not uncommon in experimental economics (Andersen, Harrison, Lau, and Rutström, 2008) are now becoming more and more common in household surveys (Falk, Becker, Dohmen, Huffman, and Sunde, 2016; Falk and Hermle, 2018). Some papers have started to use them within the context of risk-sharing models. For example, Chiappori, Samphantharak, Schulhofer-Wohl, and Townsend (2014) use risk aversion measures collected among participants in a survey in rural villages in Thailand to study risk sharing, while allowing for this form of preference heterogeneity. This feature can be important, as more risk-tolerant households might be willing to absorb shocks and be compensated in terms of mean consumption. In fact Chiappori et al. (2014) do not reject perfect risk sharing when allowing heterogeneous risk aversion, an exercise that they can perform due to the availability of the relevant data.

Social capital and cohesion. Risk sharing presupposes the existence of institutions and norms that might allow its implementation. These considerations could be particularly relevant in developing countries. Platteau (2000) explores how community-based networks and shared norms act as informal insurance mechanisms, which can even substitute for formal/market-based insurance. A growing literature on the importance of social capital includes Alesina and La Ferrara (2002), Guiso, Sapienza, and Zingales (2004) and Field, Pande, Rigol, Schaner, and Troyer Moore (2021). These developments make the need for reliable measures of these norms clear.

Imperfect information. Models of perfect risk sharing rely on the assumption that all members of a risk-sharing group have complete information about each other's incomes and the factors influencing them. In reality, of course, information is far from perfect; many theoretical contributions have analyzed the impact of adverse selection, moral hazard, or simply the absence of full information about individual income. However, empirical work on this topic has been limited by the lack of empirical measures of the quality and nature of information. Several papers, including Udry (1994), Ligon (1998), and Attanasio and Pavoni (2011) have considered the implications of imperfect information, but they do so indirectly, looking at some of the properties of observed income and consumption allocations.

An exception to the lack of empirical work on models with imperfect information that use direct measures on the *quality of information* is Attanasio and Krutikova (2020). They use such empirical measures in extended family networks in Tanzania. In the Kagera Health and Development Survey (KHDS) data set, described in Beegle, Dehejia, and Gatti (2006), the members of each extended family were asked a number of questions about their own assets and the assets owned by the other members. Attanasio and Krutikova (2020) use these data to construct the quality of the information each member has about other members' assets and then use this measure to construct an adjacency matrix. They show that this quality measure is positively related to the amount of risk shared observed in the data.

Imperfect enforceability of insurance. Risk sharing and the transfers that are implied by it, need to be implemented. Therefore, risk-sharing groups and networks need enforcement mechanisms. When institutions are not strong enough or not developed enough, risk-sharing agreements might need to rely on self-enforcement, which might be achieved by the threat of exclusion from future agreements. A rich theoretical literature has been developed that looks at this type of frictions, including papers such as Ligon, Thomas, and Worrall (2002), Ambrus, Gao, and Milan (2020), Ábrahám and Laczó (2018), and others. Some of these studies, such as Ligon et al. (2002), have an empirical analysis based on a full structural estimation of the model at hand (albeit with some approximation).

Albarrán and Attanasio (2003) take a different approach, exploiting the introduction (in a random set of villages in Mexico) of a transfer program, the celebrated PROGRESA Conditional

Cash Transfer Program. The idea is that the presence of these transfers reduces the variance of individual income and therefore reduces the enforceability of private insurance arrangements. Albarrán and Attanasio (2003) document that the introduction of the CCT led to a reduction of private transfers.

In models with informal insurance contracts having to be self-enforceable, the properties of (perceived) income processes are relevant for the amount of risk sharing that can be implemented. In these models, where the punishment for deviations from an insurance contract depends on the cost of being excluded from risk sharing, an increase in the variance of income decreases the value of autarky, therefore making punishment from exclusion harsher. In such a situation, intuition would suggest that it should be easier to implement risk sharing. Another way to see this is that an increase in income risk should increase the demand for insurance. Although in standard models of imperfect enforceability, the relationship between variance and insurability is not necessarily monotonic, the existence of such a relationship is an interesting empirical question.

Analogous considerations apply to persistence. When persistence is high, individuals receiving positive shocks would be more tempted to leave the insurance contract than in situations where the shocks are of a transitory nature. Again, it is an interesting empirical question to characterize the relationship between persistence and risk sharing.

In Section 4.1, we discuss how we estimate the properties of the perceived income process in the Colombian data that we use, and we relate empirically these novel measures to deviations from perfect risk sharing in Section 5.

C The Colombian Survey data

All the data used in this paper are from three waves of a survey collected in Colombia to evaluate a conditional cash transfer.

A first set of 57 villages was selected among its relatively small and semi-urban towns where the Colombian government started *Familias en Acción* early. The remaining 65 villages, which were used as controls, were selected among those where the program started late and were *similar* to the first batch on a number of observable characteristics, including population and level of poverty. In each of these villages, around 100 households eligible for *Familias en Acción* were sampled. In the baseline survey, administered in 2002, 11,462 households were interviewed, while in two follow-up surveys, in 2003 and in 2005-2006, 10,743 and 9,463 households were re-interviewed; our main sample consists of an unbalanced panel on 11,914 unique households.[2] Detailed information on the survey design is available in Attanasio, Battistin, and Mesnard (2012) and Arellano et al. (2024).

[2]To keep probabilities that are reported to be zero or one, we apply the modified logit transformation of Cox and Snell (1970, p. 32), see Arellano, Attanasio, Crossman, and Sancibrián (2024, Appendices A.3 and D) for additional details.

There are only minor variations in our final sample with respect to that in Arellano, Attanasio, Crossman, and Sancibrián (2024), due to, for instance, keeping some observations with missing covariates that were dropped otherwise. We drop extreme observations where consumption exceeds 20 times household income. We report robustness checks below in Section D.

D Additional results and robustness checks

Table D.1 reports the OLS coefficients of the augmented version of equation (7) in levels. This is the counterpart to Table 4 in the main text.

	(1) $\ln c_{it}^v$	(2) $\ln c_{it}^v$	(3) $\ln c_{it}^v$	(4) $\ln c_{it}^v$
$\ln y_{it}^v$	0.150***	0.152***	0.149***	0.153***
	(0.017)	(0.018)	(0.020)	(0.011)
$\text{VCM}_v(1) \times \ln y_{it}^v$	0.022			
	(0.036)			
$\text{VCM}_v(2) \times \ln y_{it}^v$		0.014		
		(0.027)		
$\overline{VCM}_v \times \ln y_{it}^v$			0.023	
			(0.038)	
$\overline{size}_v \times \ln y_{it}^v$				0.001
				(0.001)
Household FE	Yes	Yes	Yes	Yes
Village × time FE	Yes	Yes	Yes	Yes
Adj. R^2	0.560	0.560	0.560	0.560
Observations	17879	17879	17879	17879

TABLE D.1. Townsend (1994) tests augmented with interactions with measures of social cohesion. In column (1), social cohesion is measured using the share of individuals in each village contributing to the first round of the public goods game. In column (2), the share of individuals contributing to round 2 of the public goods game is used. Column (3) includes an average between the two measures. Lastly, column (4) includes the average risk-sharing group size as a measure for social cohesion. Time refers to survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

Table D.2 uses a latent social cohesion factor, predicted using the three social cohesion measures described in Section 4. The social cohesion factor is then interacted with income to estimate deviations from perfect risk sharing, using a modified version of equations (7) and (8). Table D.3 reports the same results shown in Table 5, using income and consumption levels instead of first differences.

Tables D.4 and D.5 report robustness checks using alternative sample selection decisions to those in Section 4 that might affect the way income and consumption are computed in the data and the way village-level subjective risk and persistence parameters are recovered. Table D.5

	(1) $\ln c_{it}^v$	(2) $\ln c_{it}^v$
$\ln y_{it}^v$	0.173***	
	(0.013)	
Social cohesion factor $\times \ln y_{it}^v$	-0.001	
	(0.019)	
$\Delta \ln y_{it}^v$		0.174***
		(0.013)
Social cohesion factor $\times \Delta \ln y_{it}^v$		-0.001
		(0.019)
Household FE	Yes	No
Village $\times$ time FE	Yes	Yes
Adj. R^2	0.556	0.152
Observations	5373	3164

TABLE D.2. Factor model where *Social cohesion factor* is the estimated latent social cohesion using $VCM_v(1)$, $VCM_v(2)$, and $\overline{size}_v$ as predictors. Time refers to survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

explores the sensitivity of results to different ways of calculating household-level income based on the survey data. In particular, it considers both results excluding the *Familias en Acción* subsidy payment, which is difficult to include in the second round follow-up of the survey, and including instead reports of occasional non-labor income, which is otherwise left out of the calculation. The relevant counterpart in the main text is Table 3 in Section 5.

Tables D.6 and D.7 explore the relationship among the different measures used in Section 5. The estimated model is an augmented Townsend model using both centrality measures and beliefs about persistence and dispersion of income processes as predictors of the extent of deviations from perfect risk sharing.

	(1) $\ln c_{it}^v$	(2) $\ln c_{it}^v$	(3) $\ln c_{it}^v$	(4) $\ln c_{it}^v$	(5) $\ln c_{it}^v$
$\ln y_{it}^v$	0.208***	0.217***	0.140***	0.252***	0.232***
	(0.019)	(0.021)	(0.016)	(0.031)	(0.027)
$\text{IC}_i \times \ln y_{it}^v$	-0.014**				
	(0.006)				
$\text{OC}_i \times \ln y_{it}^v$		-0.016**			
		(0.006)			
$\rho_v \times \ln y_{it}^v$			0.042		0.092***
			(0.031)		(0.029)
$\sigma_v \times \ln y_{it}^v$				-0.159***	-0.208***
				(0.054)	(0.051)
Household FE	Yes	Yes	Yes	Yes	Yes
Village × time FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.558	0.558	0.558	0.558	0.559
Observations	5887	5887	22958	22958	22958

TABLE D.3. Townsend (1994) tests augmented with interactions with centrality measures and interactions with village-level measures of subjective risk and persistence. IC_i is calculated as the weighted number of individuals that recognized individual i as a family/friend/acquaintance. OC_i is calculated as the weighted number of individuals recognized by individual i as a family/friend/acquaintance. Time are survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

	(1) $\ln c_{it}^v$	(2) $\Delta\ln c_{it}^v$	(3) $\ln c_{it}^v$	(4) $\Delta\ln c_{it}^v$	(5) $\ln c_{it}^v$	(6) $\Delta\ln c_{it}^v$
$\ln y_{it}^v$	0.187***	0.234***			0.225***	
	(0.007)	(0.027)			(0.026)	
$\Delta\ln y_{it}^v$			0.182***	0.225***		0.212***
			(0.008)	(0.035)		(0.033)
$\rho_v \times \ln y_{it}^v$		0.090***			0.083***	
		(0.030)			(0.025)	
$\rho_v \times \Delta\ln y_{it}^v$				0.091**		0.087***
				(0.034)		(0.028)
$\sigma_v \times \ln y_{it}^v$		-0.159***			-0.191***	
		(0.048)			(0.047)	
$\sigma_v \times \Delta\ln y_{it}^v$				-0.150**		-0.175***
				(0.061)		(0.060)
Household FE	Yes	Yes	No	No	Yes	No
Village × time FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.575	0.569	0.155	0.156	0.566	0.146
Observations	24862	22472	14377	13054	24820	14460

TABLE D.4. Baseline Townsend (1994) tests and tests augmented with interactions with village-level measures of subjective risk and persistence. Columns (1)-(4) use a modified rule for nonsensical consumption observations that drops those exceeding 10 times household income (rather than 20), while columns (5)-(6) drop villages with fewer than 10 households per village (rather than 20). Time refers to survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

	(1) $\ln c_{it}^v$	(2) $\ln c_{it}^v$	(3) $\ln c_{it}^v$	(4) $\ln c_{it}^v$
$\Delta\ln y_{it}^v$	0.157***	0.205***	0.155***	0.204***
	(0.008)	(0.030)	(0.008)	(0.034)
$\rho_v \times \Delta\ln y_{it}^v$		0.038		0.050
		(0.034)		(0.034)
$\sigma_v \times \Delta\ln y_{it}^v$		-0.113**		-0.128**
		(0.055)		(0.059)
Household FE	No	No	No	No
Village × time FE	Yes	Yes	Yes	Yes
Adj. R^2	0.146	0.147	0.144	0.144
Observations	14686	13323	14483	13140

TABLE D.5. Townsend (1994) tests augmented with interactions with village-level measures of subjective risk and persistence. Columns (1)-(2) include occasional non-labor income and columns (3)-(4) exclude the *Familias en Acción* subsidy payment from household income. Time refers to survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

	(1) $\ln c_{it}^v$	(2) $\ln c_{it}^v$	(3) $\ln c_{it}^v$	(4) $\ln c_{it}^v$
$\ln y_{it}^v$	0.250***	0.211***	0.256***	0.138*
	(0.040)	(0.078)	(0.041)	(0.073)
$\text{IC}_i \times \ln y_{it}^v$	-0.013**	0.002		
	(0.006)	(0.022)		
$\rho_v \times \ln y_{it}^v$	0.074	0.170*	0.077	0.189*
	(0.050)	(0.085)	(0.047)	(0.101)
$\sigma_v \times \ln y_{it}^v$	-0.137*	-0.147	-0.132*	-0.019
	(0.073)	(0.155)	(0.074)	(0.154)
$\rho_v \times \text{IC}_i \times \ln y_{it}^v$		-0.035		
		(0.029)		
$\sigma_v \times \text{IC}_i \times \ln y_{it}^v$		0.003		
		(0.047)		
$\text{OC}_i \times \ln y_{it}^v$			-0.016**	0.025
			(0.006)	(0.020)
$\rho_v \times \text{OC}_i \times \ln y_{it}^v$				-0.038
				(0.033)
$\sigma_v \times \text{OC}_i \times \ln y_{it}^v$				-0.037
				(0.041)
Household FE	Yes	Yes	Yes	Yes
Village × time FE	Yes	Yes	Yes	Yes
Adj. R^2	0.552	0.552	0.552	0.552
Observations	5414	5414	5414	5414

TABLE D.6. Townsend (1994) tests augmented with interactions with measures of centrality, subjective risk and persistence. Time refers to survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

	(1) $\Delta \ln c_{it}^v$	(2) $\Delta \ln c_{it}^v$	(3) $\Delta \ln c_{it}^v$	(4) $\Delta \ln c_{it}^v$
$\Delta \ln y_{it}^v$	0.231***	0.228***	0.241***	0.194**
	(0.042)	(0.080)	(0.044)	(0.092)
$\text{IC}_i \times \Delta \ln y_{it}^v$	-0.013*	-0.011		
	(0.007)	(0.027)		
$\rho_v \times \Delta \ln y_{it}^v$	0.043	0.111	0.045	0.100
	(0.054)	(0.100)	(0.053)	(0.123)
$\sigma_v \times \Delta \ln y_{it}^v$	-0.075	-0.126	-0.079	-0.045
	(0.087)	(0.175)	(0.089)	(0.200)
$\rho_v \times \text{IC}_i \times \Delta \ln y_{it}^v$		-0.026		
		(0.032)		
$\sigma_v \times \text{IC}_i \times \Delta \ln y_{it}^v$		0.020		
		(0.052)		
$\text{OC}_i \times \Delta \ln y_{it}^v$			-0.015**	0.002
			(0.007)	(0.025)
$\rho_v \times \text{OC}_i \times \Delta \ln y_{it}^v$				-0.019
				(0.039)
$\sigma_v \times \text{OC}_i \times \Delta \ln y_{it}^v$				-0.012
				(0.049)
Household FE	No	No	No	No
Village × time FE	Yes	Yes	Yes	Yes
Adj. R^2	0.167	0.167	0.167	0.167
Observations	3201	3201	3201	3201

TABLE D.7. Townsend (1994) tests augmented with interactions with village-level measures of centrality, subjective risk and persistence. Time refers to survey rounds. Standard errors clustered at the village level. *10%, ** 5%, ***1%.

Data availability

Code replicating the tables in this article can be found in Attanasio, Sancibrián, and Ambrosio (2025) in the Harvard Dataverse, https://doi.org/10.7910/DVN/SQ4XNB.

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