Aspirations and Investments in Rural Myanmar*

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Abstract

The aspirations gap is the distance between an individual's current and aspired standard of livelihood. A growing theoretical literature predicts that aspirations both "too close" and "too far" away from current standards lead to less investment in the future. These theories imply an inverted U-shaped relationship between the aspirations gap and investments. I test this hypothesis and extend existing empirical findings to rural Myanmar by examining the relationship between the income aspirations gap and real estate investment choices. I find that income aspirations that are ahead, but not too far ahead, of current income levels provide the best incentive for investment. Analysis of heterogeneity highlights that this relationship is strongest for those with relatively low income and those who hold fatalistic beliefs. These findings suggests the presence of psychological constraints to poverty alleviation and development in rural Myanmar.

Keywords: Aspirations, Investments, Inequality, Poverty, Psychology.

JEL Codes: D19, O18, R11, E71

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"[A] period of fast growth in a poor country can put significant stress on the system which it must cope with. Growth can also unleash powerful aspirations as well as frustrations..."

- Ghatak et al. (2014); quoted in Genicot and Ray (2017) "Aspirations and Inequality," *Econometrica*

1 Introduction

Economic inequality is growing within many countries around the world. This is particularly the case for lower income countries, many of whom enjoy fast-growing economies but have increasingly unequal populations (Page and Pande 2018). Myanmar represents a particular example of this phenomena. In 2015, Myanmar was the fastest growing economy in the world—with a projected growth rate of 8.6 percent—and would soon elect its first civilian president since 1962. At the same time, over 32 percent of Myanmar's population—roughly 17 million people—lived below the national poverty line (Asian Development Bank 2018).

The topic of inequality represents a classic literature in economics.[1] A subset of this literature considers potential psychological constraints to investment and asset accumulation that could generate poverty traps and widen within-country economic inequality (Appadurai 2004; Ray 2006; Banerjee and Mullainathan 2010; Mookherjee et al. 2010; Bogliacino and Ortoleva 2013; Bernheim et al. 2015; Besley 2016; Dalton et al. 2016; Genicot and Ray 2017; Janzen et al. 2017; Lybbert and Wydick 2018). Among these is a model of socially determined aspirations and individual incentives to invest in the future (Genicot and Ray 2017). The central idea of this model is that swift economic growth in a poor country can have competing consequences. It can either: (i) inspire powerful aspirations and incentives for investment or (ii) lead to frustration and despair.

A core concept in the model of Genicot and Ray (2017) is the "aspirations gap" or the distance between an individual's current standard of living and their aspired standard of living. According to this theory, the aspirations gap drives the relationship between aspirations and investments in the future. Too small of a gap and an individual has very little incentive to forgo present-day consumption to achieve their aspiration—leading to "aspiration failure." Too large of a gap and the necessary investment in the future takes away too much present-day consumption—leading to "aspiration frustration." This results in a theoretical prediction of an inverted U-shaped relationship between the aspirations gap and investment choices.

In this paper I aim to test this theory by examining the question: Do psychological constraints

[1] See, e.g., Becker and Tomes 1979; Loury 1982; Freeman 1996; Mookerjee and Ray 2003; and Piketty 2014.

limit investment in the future? Specifically, I test the hypothesis of an inverted U-shaped relationship between the income aspirations gap and investment choices (Ray 2006; Genicot and Ray 2017). Using data collected in rural Mon State, Myanmar—a coastal region with close proximity to Thailand—I find empirical evidence supporting theories predicting an inverted U-shaped relationship. Specifically, I find that income aspirations that are ahead, but not too far ahead, of the current level of income provide the best incentives for real estate investment—measured as expenditures of household construction materials and land.

A growing literature empirically tests the relationship between aspirations and future-oriented behavior in the context of poverty. Many of these studies examine the relationship between aspirations and the acquisition of human capital through education (Beaman et al. 2012; Dercon and Singh 2013; Bernard et al. 2014; Macours and Vakis 2014; Pasquier-Doumer and Brandon 2015; Janzen et al. 2017; Favara 2017; Garcia et al. 2019; Ross 2019; and Rizzica 2020). A subset also examine savings as an alternative form of future oriented behavior (Bernard et al. 2014; Janzen et al. 2017). Thus, a direct test of the relationship between income aspirations and investment choices is still relatively understudied in this literature to date.[2] Moreover, only a small number of studies explicitly test for an inverted U-shaped relationship between aspirations and future-oriented behavior and the evidence so far is mixed. Although initial investigations showed no such relationship (Pasquier-Doumer and Brandon 2015), more resent studies find evidence that supports theories predicting an inverted U-shaped relationship (Janzen et al. 2017; Ross 2019). Therefore, my results add to this literature in two important ways. First, I directly test the relationship between income aspirations and investment choices. Second, I aim to improve the credibility of the empirical estimation of the inverted U-shaped relationship.

Credibly identifying the relationship between aspirations and individual behavior presents a difficult empirical problem. Most fundamentally, socially determined aspirations are endogenous. Therefore, it may seem natural to consider an experimental study that exogenously influences an individual's aspirations (see, e.g., Bernard et al. 2014). Ethical issues, however, complicate the feasibility of such an empirical approach. If the theory of the inverted U-shaped relationship is taken seriously, then exogenously increasing an individual's aspirations via the use of experimental

[2]One exception is the work of Galiani et al. (2018), who examine the impact of a household improvement project in slums across multiple countries. In the experiment implemented by Galiani et al. (2018), slum-dwelling households are randomly selected to receive household improvements. The authors find that aspirations for non-beneficiary neighboring households increase, but that these increased aspirations did not lead to systematic investment in household improvements. One possible explanation of this finding is the presence of an inverted U-shaped relationship between aspirations and financial investments in real estate.

variation implemented by a researcher could make the individual worse off (La Ferrara 2019). If the experiment increased aspirations so that investment in the future or some other future-oriented behavior began to decrease, then the individual could be harmed due to their participation in the experiment. This being the case, the best way forward to understand the relationship between the aspirations gap and future-oriented behavior may be using econometric methods with observational data, despite the associated limitations.

I measure aspirations in two ways. In line with previous research on the measurement of aspirations, I ask respondents the following question: "What level of income would you *like to achieve in your life*?" (Bernard and Taffessee 2014). Despite widespread use of this approach in the literature, serious concern about the ability of this question to elicit legitimate measures of aspirations persists. After all, what would provoke anyone to answer any finite number? Therefore, I also ask an alternative question to measure aspirations: "What level of income do you *need to feel financially secure*?"[3] This study, therefore, is the first to have the benefit of two measures of income aspirations. Comparing results using each of these measures (i.e., "wants" vs. "needs") allows for a useful robustness check on the core results.

The primary contribution of this paper is implementing a test of the relationship between income aspirations and investment choices. I measure investments as expenditures of household construction materials and land. I support this measurement with two facts about economic life in rural Myanmar. First, in the context of rural Myanmar land ownership is a near necessary requirement for accessing formal forms of credit, which leads to increased income. Second, Mon State is a coastal region, which routinely suffers from exposure to extreme wind, rain, and flooding in the monsoon season. Many respondents expressed that building a household structure that can withstand exposure to extreme weather presents a positive long-run payoff in *net income*.

This measure of investment is, however, limited in a number of ways and I implement several robustness checks to test the sensitivity of the results. The first strategy is to control for relevant confounding covariates. This strategy incorporates factors included in analysis by Janzen et al. (2017), such as education, age, gender, income level, current migration status of household members, and the respondent's influence over household decisions. I find that the inverted U-shaped relationship is robust in specifications controlling for these observable characteristics. The second strategy is to use an alternative measure of aspirations and an alternative measure of expenditures in the regression analysis. While the alternative measure of aspirations serves as a robustness test,

[3]This is similar to the phrasing of questions measuring aspirations in Knight and Gunatilaka (2012).

the alternative measure of expenditures serves as a falsification test on the core findings. I find that the inverted U-shaped relationship is robust to the alternative measure of aspirations and does not persist in the falsification test using an alternative measure of expenditures. Finally, the third strategy uses the insights of Altonji et al. (2005) and methods of Oster (2017) to calculate how much greater the influence of unobservable factors would need to be, relative to observable factors, to completely explain away the inverted U-shaped relationship. I find that it is unlikely that the inverted U-shaped relationship can be fully attributed to unobserved heterogeneity.

Finally, I explore heterogeneity in the inverted U-shaped relationship. Heterogeneity is important in the context of the relationship between aspirations and future-oriented behavior for several reasons. First, and perhaps foremost, aspirations are inherently endogenous to a variety of social and economic factors. Therefore, it is possible that this relationship in general is driven by some factor of omitted heterogeneity. Second, comparative static analysis by Janzen et al. (2017) suggests that the "turning point," at which a larger aspirations gap no longer inspires more investment in the future, is increasing in wealth. I find evidence that supports this prediction. Specifically, I find that the inverted U-shaped relationship only persists among those with relatively low income. Third, an implication of the inverted U-shaped relationship between aspirations and future-oriented behavior is that aspirations by themselves may not always be sufficient in encouraging future-oriented behavior. Instead, aspirations must be accompanied by attitudes and beliefs in one's own ability to achieve a given aspiration (Lybbert and Wydick 2018; Wuepper and Lybbert 2016; Rizzica 2020). I find that the strength of the inverted U-shaped relationship may partly depend on fatalistic beliefs.

This paper continues, in the next section, with a brief discussion summarizing theoretical predictions about how the aspirations gap relates to investment choices. Section three presents the empirical framework of this analysis. This includes a discussion of the data, the study context, and the empirical strategies used to understand the relationship between income aspirations and investments. In the fourth section, I present and discuss the empirical results. Section five presents an investigation of heterogeneity in the inverted U-shaped relationship. Finally, section six concludes.

2 Theoretical Framework

For the purpose of motivating the subsequent empirical analysis I discuss the core concepts and mechanics of the model presented in Genicot and Ray (2017), and summarized in Janzen et al. (2017). This model provides a testable prediction: an inverted U-shaped relationship between

aspirations for income and investment. In this section, I make minor adaptations to this model and comment on the context of rural Myanmar. Interested readers should consult the work of Genicot and Ray (2017) and Janzen et al. (2017) for additional detail and explanation of this model.

Genicot and Ray (2017) begin by defining an inter-temporal utility function that models aspirations as a reference point (Kahneman and Tversky 1979). When an aspiration is achieved or when an individual's outcomes reach some reference point, the individual realizes "bonus" utility. Janzen et al. (2017) summarize this aspirations-based utility function as follows. An individual maximizes utility over two time periods and is endowed with wealth (y_1), which can be either consumed (c) or invested in the future (k) with a positive return (ρ).

In rural Mon State, Myanmar, one of the most salient ways to invest in the future is by purchasing land or making improvements to a household structure.[4] This is supported by two facts. First, land—and more specifically a land title ("Form 7")—is a near necessary requirement to access formal forms of credit in Myanmar. Therefore it follows that expenditures in land can be realistically modeled with a positive return ρ. Second, Mon State is a coastal region which routinely suffers from exposure to extreme wind, rain, and flooding in the monsoon season. In qualitative focus group interviews, many respondents expressed that building a household structure strong enough to withstand exposure to extreme weather presents a positive long-run payoff. This long-run payoff is captured in the model through ρ.

In the first period, the individual derives utility solely from consumption. In the second period, the individual derives utility from income net of any costs of repair (r). These costs of repair should be understood as necessary costs associated with living in an area that is annually affected by extreme weather events. Therefore, in the second period, the individual has $y_2 = \rho(k - r)$ in wealth. Utility in the second period is derived by whether net income falls short, meets, or exceeds aspirations. If the level of net income is higher than the individual's aspirations, the individual experiences "bonus" utility, denoted as w. The individual then maximizes the following utility function, where β serves as a discount factor between periods:

$$u(c, k) = v_1[c] + \beta\Big[v_2[\rho(k - r)] + w \times I[\rho(k - r) \geq a]\Big] \tag{1}$$

Following both Genicot and Ray (2017) and Janzen et al. (2017), I assume that v_1 and v_2 are both smooth, increasing, and strictly concave. The cost of investment is defined in terms of

[4]This detail is discussed in more detail and qualitatively validated in Section 3.1.2.

the opportunity cost of present consumption. Following Genicot and Ray (2017) and Janzen et al. (2017), I assume that the cost function is both concave and invariant to the amount by which outcomes exceed or fall short of aspirations. Therefore, the cost function is defined as follows:

$$C(k) = v_1[y_1] - v_1[y_1 - (k - r)] \tag{2}$$

With this inter-temporal utility function and cost function, the individual decides how much to consume now (c) and how much to invest in the future (k). Due to the "bonus" utility the benefits of investing in the future are defined by the following piece-wise function:

$$B(k) = \begin{cases} \beta\Big[v_2[\rho(k-r)]\Big] & \text{if} \quad \rho(k-r) = y_2 < a \\ \beta\Big[v_2[\rho(k-r)] + w\Big] & \text{if} \quad \rho(k-r) = y_2 \geq a \end{cases} \tag{3}$$

Equation (3) suggests that there is a discontinuity in the benefits the individual receives from investment in the future. On either side of some level of the aspirations gap (a) there is at most one local solution that maximizes the benefits. When the aspirations gap (a) is close to zero, then the chosen level of investment and corresponding net income ($k - r$) likely exceeds the aspirations gap. In this case, aspirations are "satisfied" and their is a positive relationship between the aspirations gap and investment. When the aspirations gap (a) is relatively high, then the aspirations gap likely exceeds net income ($k - r$). In this case, aspirations are "frustrated," there is a sudden decrease in the level of investment, and any further increase in the aspirations gap (a) will not influence investment choices. The point at which aspirations switch from being "satisfied" to being "frustrated" is the turning point ($\hat{a}$) in an individual's aspirations gap.

Janzen et al. (2017) go on to show that if every individual within some population had the same turning point value in their aspirations gap, then an empirical investigation of the relationship between the aspirations gap and investment choices would show an upward sloping relationship for aspiration gap values below $\hat{a}$, a discontinuous drop at $\hat{a}$, and a flat relationship for aspiration gap values above $\hat{a}$. Given heterogeneity in the turning point value in the aspirations gap ($\hat{a}$), however, an inverted U-shaped relationship will form between the aspirations gap and investment choices. As the aspirations gap (a) increases so does the level of investment. At some point, however, an increasing share of the population exceeds their turning point values ($\hat{a}$) and as the aspirations gap increases investment on average across the population decreases.

An individual's turning point value ($\hat{a}$) depends on their initial endowment, their discount rate,

the rate of return on their investment, and idiosyncratic characteristics in their utility function. Comparative static analysis by Janzen et al. (2017) suggests that individuals who are more patient, initially better off, and have a higher rate of return on their investment will have a higher value of $\hat{a}$. A higher value of $\hat{a}$ implies the point at which a larger aspirations gap discourages investment occurs at a larger aspirations gap than an individual with a lower value of $\hat{a}$. In essence, the higher the value of $\hat{a}$ the less likely the individual experiences aspirations frustration. In Section five I test these predictions by examining observed heterogeneity in the inverted U-shaped relationship between the aspirations gap and investment.

3 Empirical Framework

The empirical analysis in this paper tests the predictions of the model developed by Genicot and Ray (2017) and summarized in the previous section. As the aspirations gap increases so do investments in the future up until some point, whereafter as the aspirations gap grows investment decreases. This theory is tested in the context of rural Mon State, Myanmar.

3.1 Data and Context

Modern-day rural Myanmar presents a relevant setting to study the relationship between aspirations and investment choices. After almost 50 years of violent civil wars and economic mismanagement, Myanmar is now transitioning into a period of swift economic growth associated with far-reaching political and economic reforms. At the same time, a relatively large share of the population live in poverty and economic inequality is growing. This study takes place in Mon State, a region in the south-east of Myanmar, with close proximity to Thailand. Mon State is primarily comprised of the Mon people who have their own unique history of political oppression and marginalization. Considering this history, this context represents a near ideal setting to test for the existence of psychological constraints in the presence of economic inequality.

The data for this empirical analysis were collected in two waves. The first wave is the Mon State Rural Household Survey (MSRHS). This survey was implemented between May and June 2015 and collected information on agricultural production and household livelihoods. The MSRHS consists of 1,637 households within 143 enumeration areas and is representative of rural Mon State (Hein et al. 2016). The second wave is the Hope Survey. This survey was implemented in March of 2016 and collected information on aspirations and other psychological characteristics. This survey consists

Table 1: Summary Statistics

	Hope Survey			MSRHS		
	Mean	Standard Deviation	Obs.	Mean	Standard Deviation	Obs.
IHS land and materials expenditure[a]	3.53	6.12	482	3.93	6.38	1,637
Binary land and materials expenditure	0.26	0.44	482	0.29	0.45	1,637
IHS ceremonies and banquets expenditure[a]	5.25	6.78	482	5.35	6.81	1,637
Binary ceremonies and banquets expenditure	0.39	0.49	482	0.39	0.49	1,637
Income aspirations	663,937	1,249,137	491			
Income aspirations gap	0.55	0.28	482			
Squared income aspirations gap	0.37	0.29	482			
Alt. Income aspirations[b]	547,229	4,509,522	498			
Alt. Income aspirations gap[b]	0.39	0.37	488			
Alt. squared income aspirations gap[b]	0.28	0.37	488			
Current monthly income	403,951	3,399,548	490			
Years of education (respondent)	4.60	3.43	503	4.32	2.65	1,059
Age (respondent)	46.07	14.10	465	51.64	14.83	1,625
Household has migrant	0.47	0.50	482	0.45	0.50	1,637
Respondent controls spending	0.57	0.50	482	0.62	0.49	1,637

Notes: [a] IHS refers to the inverse hyperbolic sine, a function that is "log-like" but is able to handle zeros (Burbidge, Magee, and Robb (1988). [b] The alternative income aspirations refers to income aspirations measured in terms of "needs" rather than "wants".

of a random subset of 48 enumeration areas from the first wave and includes of 503 households (Bloem et al. 2018).[5] Table 1 shows descriptive statistics of the key variables used in this paper.

3.1.1 Measuring Aspirations and the Aspirations Gap

Before describing the specific details of the measurement of aspirations, it is helpful to carefully define "aspirations" as a concept. Aspirations have three distinctive features (Bernard and Taffesse 2014). They are (i) *future oriented* in the sense that they cannot be achieved without current or future effort, (ii) *motivators* in that they are goals that require present-day effort or sacrifices to achieve, and (iii) *specific* but contribute to a multi-dimensional life outcome. Additionally, aspirations are distinct from expectations. An expectation, even subjectively measured, is defined as an outcome an individual considers to be relatively likely. An individual living in poverty may not expect to escape poverty due to the observed experiences of most others within their social network, nevertheless this person may aspire to escape poverty. It is the relationship between this aspiration, more specifically the gap between this aspiration and current level of livelihood, and real estate investment choices that I investigate in this paper.

[5]Both of these surveys were implemented through the Feed the Future Innovation Lab for Food Security Policy with collaboration from Michigan State University and the International Food Policy Research Institute (IFPRI) with funding from the United States Agency for International Development (USAID). Local implementation assistance was provided by the Centre for Economic and Social Development, a think-tank and research organization based in Yangon, Myanmar.

In the present study, income aspirations—and the associated income aspiration gap—are measured using a method closely related to that described by Bernard and Taffesse (2014). That is, respondents are asked the following questions:

(1) What level of income do you currently earn each month?

(2) What level of monthly income would you like to achieve in your life?

While preparing to implement the Hope Survey, concerns emerged that the local population may be reluctant to report information about "wants" for fear of looking "wealth-hungry." The population of Mon State is almost entirely Buddhist and appearing "power-hungry" or "wealth-hungry" can be seen as particularly un-Buddhist. Several rounds of pre-testing suggested that asking a question about "needs" may attenuate some of this concern. Additionally, some raise the point that answering any finite number to a question asking about the level of income one would like to achieve in life is bizarre. If more income is always better than less income, then why would the answer to this question be anything other than infinity? Due to these concerns, the Hope Survey included the following question to elicit an alternative measure of income aspiration:

(3) What level of monthly income do you need to feel financially secure?

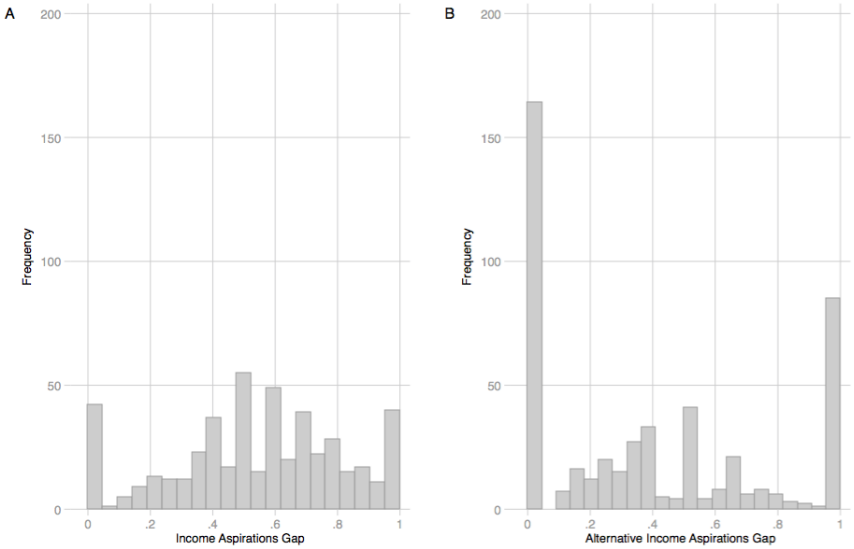
Following Janzen et al. (2017) the aspirations gap is constructed by calculating the difference between answers to either question (2) or (3) and question (1). The ratio of this difference and the value of an individual's aspiration, again the response to either questions (2) or (3), completes the construction of the aspirations gap. Formally the aspirations gap is defined as follows—with $q = 2$ or 3 corresponding to responses to questions (2) or (3):

$$Income\ aspirations\ gap_q = \frac{aspiration_q - current}{aspiration_q} \tag{4}$$

This method for constructing the income aspirations gap bounds the values to be between zero and one. This is a useful feature in that it allows for more meaningful comparisons of the aspirations gap across individuals. The aspirations gap will be equal to one if a respondent reports zero current income and has a non-zero aspiration for income.[6] Figure 1 plots histograms that

[6] Janzen et al. (2017) convert all zero values of aspirations and current income to one in order to distinguish between individuals with no current income and high income aspirations, and individuals with no current income and low income aspirations. In the Hope Survey, although many respondents have relatively little current income, none of the respondents report zero income. Thus, the concern about a mechanical relationship between current income and the income aspirations gap is absent from this study.

Figure 1: Histogram of Primary and Alternative Income Aspirations Gap Measures



Notes: Panel A plots a histogram for the values of the primary income aspirations gap measure. Panel B plots a histogram for the values of the alternative income aspirations gap measure.

show the distribution of the values for both the primary and alternative income aspirations gap measures.

It is important to note that this alternative method departs from the typical method used by much of the empirical literature on aspirations (Bernard and Taffesse 2014). One exception in the literature is Knight and Gunatilaka (2012) who use a proxy measure of income aspirations measured as the reported minimum income needed by a household. If this alternative measure of aspirations meets each of the three distinctive features of aspirations as defined by Bernard and Taffesse (2014)—e.g., (i) future oriented, (ii) motivator, (iii) and specific—then it may serve as a valid alternative measure. Panel B of Figure 1 shows that in the context of rural Mon State, a relatively large share of the population (e.g., roughly 70 percent) report having enough income to feel financially secure. This compares to roughly 20 percent, in Panel A of Figure 1, who have achieved the income they would like to earn at some time in their life and highlights that the alternative measure of aspirations (in terms of "needs") may not be as future oriented as traditionally measured aspirations (in terms of "wants"). However, in the present context this alternative measure of aspirations may be more specific, and thus motivating, than traditionally measured aspirations. Additionally, although these two measures of aspirations are positively correlated, with a raw correlation coefficient of 0.511, they are not identical and sufficient variation persists in both measures (see Figure 1). Therefore, given the existing concern about the validity of the traditional method

used to measure aspirations, this alternative measure of aspirations will serve as a robustness check on the main results using the traditional measure of aspirations.

3.1.2 Measuring Household Expenditures

In rural Myanmar, and specifically in the context of Mon State, purchases of land or household construction materials is a common investment mechanism. Describing the data used in this paper, Hein et al. (2016) note several important observations. First, the percentage of loans taken from formal sources is much greater in land-owning households (51 percent) than in landless households (22 percent). This disparity reflects the fact that land ownership, expressed via a land title ("Form 7"), is a popular form of collateral and facilitates to access formal forms of credit in Myanmar. Second, access to formal credit is important because of the relative cost of informal credit. Again describing the data used in this paper, Hein et al. (2016) highlight that the median annualized interest rate for informal credit in Mon State is roughly six times that of formal credit. Third, Mon State's climate is characterized by seasonal exposure to monsoons with heavy rains, wind, and storms associated with the early to peak monsoon months of May through August. Only about 57 percent of households dwellings have roofs made with improved materials, defined as corrugated sheet metal, tile, or concrete (Hein et al. 2016). Alternative materials for roofs include thatch, leaves, or palm which are easily destroyed during the monsoon season. Therefore, in qualitative focus group interviews, many respondents expressed that building a household structure with improved materials strong enough to withstand exposure to extreme weather presents a positive long-run payoff with reduced expenses and increased net income.

The measures of household expenditures collected in the MSRHS account for spending in various dimensions over the previous five years. This aims to capture overall trends in household investment, rather than short-term fluctuations. In the following empirical analysis I use two measures of household spending: One accounting for spending in land acquisition or household construction materials, and the other accounting for spending on ceremonies or banquets. Importantly, while the former is likely understood as an investment by households in Mon State, the latter is likely not considered an investment. Comparing results between these two measures of household expenditures allows for a falsification test of the theory of the relationship between aspirations and investment expenditures, rather than any expenditure.[7]

[7]Although it is possible that spending on ceremonies or banquets could be viewed as a form of conspicuous consumption, it is difficult to conceptualize how this conspicuousness would lead to increased income.

These measures of household expenditures are expressed by two distinct representations throughout this empirical analysis. The first representation is by the inverse hyperbolic sine (IHS) transformation (Burbidge et al. 1988; MacKinnon and Magee 1990; Pence 2006; Bellemare and Wichman 2019). The IHS transformation is similar to the natural log transformation, but is mathematically capable of handling zeros. This allows for the measures of household expenditures, which are non-Gaussian with a long right tail on their distributions, to be expressed in a more manageable way. The second representation is as a binary indicator of any expenditure. As reported in Table 1, about a quarter to a third of all respondents report having no expenditures in the two measures of household expenditures. In the following empirical analysis, specifications using the IHS of expenditures approximate effects on the intensive margin and specifications using the binary measure of any expenditures approximate effects on the extensive margin.

Although these measures of household expenditures are useful, they do come with several limitations. First, the survey asks about both expenditures of household construction materials and land together in one question. Therefore, although it would be interesting to disaggregate this measure of investment spending, the data do not allow for this sort of disaggregation. Second, these measures of expenditures are inherently backward-looking and aspirations are inherently forward-looking. With the exception of Ross (2019), who has the benefit of aspirations data collected years before the outcome data, this is a complicating issue in all cross-sectional observational analysis on aspirations and behavior. Specifically if past investment choices influence aspirations then this leads to an endogeneity problem, which I aim to address with a number of robustness and sensitivity checks. As articulated by Janzen et al. (2017), however, although this endogeneity problem is indeed serious, it is difficult to imagine how endogeneity would lead to an inverted U-shaped relationship between aspirations and investments.

3.2 Estimation Strategies

In this subsection, I describe the details for each of the estimation strategies used to examine the relationship between the income aspirations gap and investment choices. It is important to note that each of these estimation strategies rely on critical but distinct identification assumptions. Although each of these strategies by themselves may lead to limited empirical findings, taken together these strategies provided a rigorous investigation of the inverted U-shaped relationship.

3.2.1 OLS and Semi-Parametric Regressions

The baseline estimation strategy largely follows that used by Janzen et al. (2017). In general, this baseline strategy estimates two equations. One that imposes a quadratic functional form on the aspirations gap variable, and another that allows the aspirations gap variable to enter non-parametrically. The first method estimates the following equation:

$$y_{ie} = \alpha_0 + \alpha_1 g_{ie} + \alpha_2 g_{ie}^2 + \alpha_3 s_{ie} + X_{ie}'\Gamma + \theta_e + \epsilon_{ie} \tag{5}$$

In this equation y_{ie} is the outcome variable of interest and represents household expenditures in land or construction materials, expressed as either the IHS transformation of expenditures or a binary variable representing any expenditures.[8] The g_{ie} variable represents the income aspirations gap and g_{ie}^2 represents the squared income aspirations gap. The variable, s_{ie}, controls for the current level of income.[9] The vector X_{ie} represents a set of control variables. These control variables include the respondent's years of education, age, gender, a dummy variable indicating if the household has a migrant, and a dummy variable indicating if the respondent makes decisions about spending. Finally, θ_e are enumeration area fixed effects and ϵ_{ie} is the error term. Formally—as discussed by Lind and Mehlum (2010)—the presence of an inverted U-shape relationship exists if, given an interval of values of $g \in [g_l, g_h]$, $\alpha_1 + 2\alpha_2 g_l > 0$ and $\alpha_1 + 2\alpha_2 g_h < 0$.

The second method estimates the following equation using semi-parametric techniques:

$$y_{ie} = \beta_0 + f(g_{ie}) + \beta_1 s_{ie} + X_{ie}'\Xi + \rho_e + \nu_{ie} \tag{6}$$

This estimation equation is essentially similar to equation (5) except that the g_{ie} variable enters into the equation non-parametrically. This allows for a more flexible relationship between g_{ie} and y_{ie}. Again s_{ie} indicates the current level of income, X_{ie} is the same vector of control variables, θ_e is enumeration area fixed effects, and ϵ_{ie} is the error term.

I estimate this semi-parametric regression using two distinct strategies. In the first strategy, I implement Robinson's (1988) double residual semi-parametric estimator. This strategy first partials out the non-parametric part of the regression by removing conditional expectations of the paramet-

[8] Regressions with a binary outcome variable are estimated as a linear probability model.

[9] Janzen et al. (2017) make the point that it is necessary to control for current level of income for two reasons: (i) since the current status is likely correlated with investments in the future through non-aspirational channels and (ii) since the turning point in which a larger aspiration gap decreases investment in the future is likely increasing in current income level.

ric part of the regression. Next a local polynomial smoothing function characterizes the residualized non-parametric relationship between g_{ie} and y_{ie}. As discussed by Verardi and Debarsy (2012) this strategy for semi-parametric regression estimation leads to smaller biases than Yatchew's (1988) differencing estimator. In the second strategy, I implement a binned scatterplot of the relationship between g_{ie} and y_{ie} conditional on s_{ie}, the vector X_{ie}, and enumeration area fixed effects ρ_e. This approach is closely related to Robinson's (1988) double residual semi-parametric estimator but ultimately requires fewer assumptions and presents a more intuitive strategy for visualizing the nonparametric relationship between income aspirations and investment choices.

3.2.2 Unobservable Selection and Coefficient Stability

The relationship between the aspirations gap and investment choices may be endogenous due to multiple sources of unobserved heterogeneity. Most generally, issues relating to omitted variable bias and measurement error may result in problems for credible identification from equations (5) and (6). For example, if those who hold more extreme risk preferences (e.g., extreme risk loving or extreme risk averse) invest relatively little in the future and if these preferences are correlated with aspirations, then it may be the case that the observed correlations estimated in equations (5) and (6) are spurious. Additionally, measurement error is a concern particularly for the results in equation (5). Although it is commonly understood that classical measurement error leads to attenuated coefficient estimates, Griliches and Ringstad (1970) show that in a regression specification imposing quadratic structure the attenuation bias will be larger on the coefficient of the quadratic term. This suggests that the estimated turning point will suffer from "expansion bias," implying the turning point is biased away from zero.

To examine the robustness of the core results to potential unobserved heterogeneity I use the method developed by Oster (2017) and Altonji et al. (2005) for assessing unobservable selection bias and coefficient stability. This method generates bounds on the effect by estimating a "short" regression without controls and a "long" regression with controls and recording the change in the coefficient estimate and the change in the R^2 between these regressions. Specifically, the estimator is formally defined as follows:

$$\hat{\tilde{\pi}} = \pi^* - (\pi - \pi^*) \times \frac{R_{Max} - R^*}{R^* - R} \tag{7}$$

In equation (7), π^* and R^* are the coefficient estimate and R^2 from the "long" regression and

π and R are the coefficient estimate and R^2 from a "short" regression without controls. The value of R_{Max} is an unknown parameter and represents the assumed maximum possible R^2 of the specification. The best strategy is to place plausible bounds on the value of R_{Max}. It is clear that the lower bound on R_{Max} is simply R^* and the highest possible upper bound is 1. In the present setting using household survey data to measure financial investments, it is well-known that such variables are measured with considerable error (McKenzie 2012). In this case assuming an upper bound on R_{Max} of 1 is likely to be overly conservative. Therefore, following Gonzalez and Miguel (2015), when presenting the coefficient stability results, I show the sensitivity of these results to different assumptions about the plausible bounds on R_{Max}.

4 Results: Aspirations Failure and Frustration

The results follow three iterations. First, I estimate these equations with a measure of the household's expenditure in land or household materials as the dependent variable and the primary income aspirations (i.e., in terms of "wants"). These results serve as the core findings of the paper. Second, I re-estimate these equations, but instead use the alternative income aspirations measure (i.e., in terms of "needs"). These results serve as a robustness test on the core findings. Finally, I again re-estimate these equations, using the primary income aspirations measure, but instead use a measure of the household's expenditure on ceremonies and banquets. These results serve as a falsification test on the core findings.

4.1 OLS and Semi-Parametric Estimation Results

In this sub-section, I present and discuss the results from estimating equations (5) and (6). Table 2 presents results from estimating equation (5) on the relationship between the income aspirations gap and the household's expenditure in land or household construction materials. The dependent variable in columns (1), (3), and (5) in Table 2 are the IHS of the household expenditure value. The dependent variable in columns (2), (4), and (6) in Table 2 are binary indicators of any household expenditure. As previously discussed, these two definitions of the dependent variable allow for tests of the inverted U-shaped relationship with investments on both the intensive and extensive margins.

In columns (1) and (2) in Table 2 the sign on the income aspirations gap is positive and the sign on the squared income aspirations gap is negative, and both coefficient estimates are statistically

Table 2: OLS Estimates of the Relationship between the Aspirations Gap and Expenditures

	(1) IHS Investment	(2) Binary Investment	(3) IHS Investment	(4) Binary Investment	(5) IHS Banquets	(6) Binary Banquets
Income	13.657***	0.997***			-5.476	-0.345
aspirations gap	(2.511)	(0.182)			(3.534)	(0.257)
Squared income	-11.087***	-0.850***			3.940	0.189
aspirations gap	(2.403)	(0.166)			(3.335)	(0.229)
Alt. income			9.339***	0.635***		
aspirations gap			(3.253)	(0.216)		
Squared alt. income			-9.809***	-0.702***		
aspirations gap			(3.022)	(0.202)		
Observations	445	445	445	445	445	445
R-squared	0.371	0.379	0.362	0.373	0.355	0.356
EA fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls?	Yes	Yes	Yes	Yes	Yes	Yes
U-test results:						
Turning point	0.616	0.587	0.476	0.452	0.695	0.914
Fieller 95% C.I.	[0.497; 0.814]	[0.477; 0.738]	[0.322; 0.582]	[0.299; 0.547]	$[-\infty;\infty]$	$[-\infty;\infty]$
Sasabuchi p-value	0.003	0.001	0.003	0.003	0.255	0.446
Slope at Min	13.657	0.997	9.339	0.635	-5.476	-0.345
Slope at Max	-8.516	-0.702	-10.278	-0.769	2.404	0.033

Notes: Columns (1), (3), and (5) report the dependent variable is the inverse hyperbolic sine (IHS) of household expenditures. Columns (2), (4), and (6) report the dependent variable as a binary indicator of whether or not the household had any expenditures of a given type. As expressed in each column, expenditures are either on land and household construction materials or on banquets and ceremonies. Additional controls include current monthly income, years of education, age, gender, a dummy variable indicating if the individual controls spending, and a dummy variable indicating of the household has a migrant. Missing observations are coded as zeros, and a dummy variable included in the regression indicates these missing observations. Standard errors clustered at the enumeration area level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

significant. This is consistent with theoretical predictions. U-test results reinforce the finding of a strong inverted U-shaped relationship between the income aspirations gap and expenditures in land or household construction materials.[10] At both the intensive and extensive margins, the null hypothesis of no inverted U-shaped relationship is rejected at the 1 percent level.

These core results use a measure of income aspirations elicited using conventional techniques (Bernard and Taffesse 2014). Using this technique, aspirations are measured by asking respondents about the income level they would like to achieve in their life. That is, these measures of income aspirations correspond to "wants." As previously noted, discussions while preparing for data collection led to a concern that this method for eliciting aspirations may not be appropriate in the context of rural Mon State, Myanmar. In particular, several enumerators raised the concern that some respondents may be uncomfortable with this question as to avoid coming off as "wealth-

[10]This U-test empirically tests for a non-monotonic relationship by rejecting the null hypothesis of a monotonic relationship at a given level of statistical significance if both H_0^L and H_0^H are rejected at a given level of statistical significance. Where H_0^L tests if $\alpha_1 + 2\alpha_2 g_l \leq 0$ vs. $\alpha_1 + 2\alpha_2 g_l > 0$ and H_0^H tests if $\alpha_1 + 2\alpha_2 g_h \geq 0$ vs. $\alpha_1 + 2\alpha_2 g_h < 0$. See Lind and Mehlum (2010) and Sasabuchi (1980) for additional details.

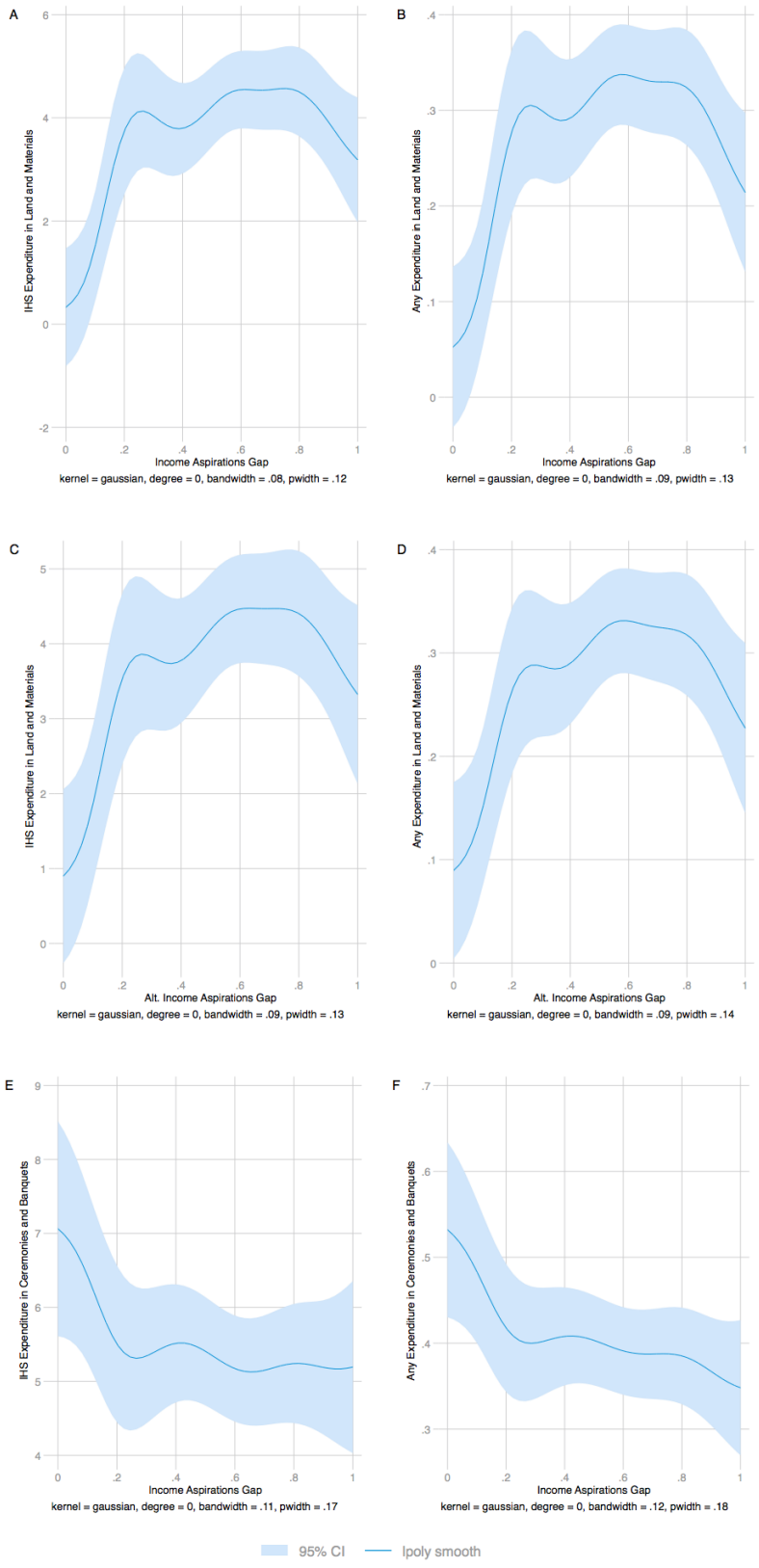
hungry," a rather un-Buddhist character trait. Therefore, the data collection team agreed upon an alternative method for eliciting a measure of income aspirations. This method asked respondents about the income level they would need to feel financially secure. That is, this measure of income aspirations correspond to "needs," rather than "wants."

Columns (3) and (4) in Table 2 report results from estimating equation (5) on the relationship between the alternative measure of income aspirations and the household's expenditure in land or household construction materials. Similar to columns (1) and (2), the sign on the alternative income aspirations gap is positive and the sign on the squared income aspirations gap is negative, and both coefficient estimates are statistically significant. The similarity between columns (1) and (3) and columns (2) and (4) suggest that results are not sensitive to the use of either the primary or alternative measure of the aspirations gap. That is, despite valid concern about the method used to measure aspirations, empirical results are largely invariant between income aspirations measured in terms of "wants" or "needs."

Lastly, columns (5) and (6) in Table 2 report results from estimating equation (5) on the relationship between the primary measure of the income aspirations gap and the household's expenditure in banquets and ceremonies. These results act as a falsification test on the core results. It could be the case that the inverted U-shaped relationship persists not only between the aspirations gap and investments, but also with any household expenditure. That is, rather than testing a theory about aspirations and future-oriented behavior this empirical relationship shows up for any expenditure. The results in columns (5) and (6) do not support this alternative explanation. In both columns, the sign on the income aspirations gap is negative and the sign on the squared income aspirations gap is positive. This is the opposite of existing theoretical predictions. Additionally, these coefficient estimates are not statistically significant.

The results so far come from estimating equation (5) which imposes a specific functional form on the relationship between income aspirations and investment choices. An alternative method for estimating this relationship is to allow the income aspirations gap to enter into the estimation equation non-parametrically. As explained in the Section 3.2, equation (6) allows for this by estimating a semi-parametric regression. Figure 2 shows the non-parametric fit of the relationship between income aspirations and expenditure in land or household construction materials using Robinson's (1988) double residual estimator. Panel A shows the non-parametric fit when the dependent variable is the inverse hyperbolic sine (IHS) of expenditures in land or household construction materials. Panel B shows this same non-parametric fit when the dependent variable is a binary indicator of

Figure 2: Nonparametric Fit of the Relationship between the Aspirations Gap and Expenditures



Notes: Semiparametric specification including control variables and enumeration area fixed effects.

any expenditures in land or household construction materials. In both of these cases, equation (6) includes all control variables and enumeration area fixed effects. Both panels A and B in Figure 2 illustrate an inverted U-shaped relationship even when such a functional form is not directly imposed.

Panel C in Figure 2 shows the non-parametric fit when the dependent variable is the inverse hyperbolic sine (IHS) of expenditures and panel D shows this same non-parametric fit when the dependent variable is a binary indicator of any expenditure in land or household construction material. Similar with panels A and B, the results illustrate an inverted U-shaped relationship between the alternative aspirations gap measure and financial investments when such a functional form is not directly imposed. These results support the validity of the results presented in Table 2. In particular, these results suggest the presence of an inverted U-shaped relationship between income aspirations and financial investments in rural Mon State, Myanmar.

Finally, panels E and F illustrate the non-parametric relationship between the primary aspirations gap measure and expenditures in ceremonies and banquets. These results again serve as a falsification test on the core results. Similar to the conclusions drawn from Table 2, the relationship between the aspirations gap and expenditures in ceremonies and banquets does not follow an inverted U-shape. In fact, these figures suggest a negative relationship between the income aspirations gap and expenditures in ceremonies and banquets. This supports the core results in the sense that there is something different about expenditures in land and household construction materials that generates an inverted U-shaped relationship with the aspirations gap.[11]

So far the estimation specifications detailed in equations (5) and (6) and the results reported in Table 2 and Figures 2 and 3 essentially mirror those estimated by Janzen et al. (2017) and Ross (2019). This should lend credence to the results from both previous studies. That is, the finding of an inverted U-shaped relationship between the income aspirations gap and future-oriented behavior persists across multiple contexts. That being said, it could likely be the case that the relevant factor of unobserved heterogeneity is present in each context. This motivates a more rigorous investigation of the relationship between the income aspirations gap and investment choices. This is the focus of the next subsection.

[11]Figure A1, in the appendix, shows binned scatterplots of the relationship between the income aspirations gap and expenditures. These figures provide an alternative, and perhaps more intuitive, method for visualizing the relationship between the income aspirations gap and investment choices. The results are qualitatively similar to those illustrated in Figure 2

4.2 Coefficient Stability Results

As previously discussed, these core results could be biased due to various forms of unobserved heterogeneity (e.g., omitted variable bias, measurement error, etc.). The potential for this bias motivates the use of a more careful method using OLS regression analysis to define a plausible range for the estimated relationship between the income aspirations gap and real estate investments.

For structure, I follow the approach developed by Altonji et al. (2005) and Oster (2015) for assessing the importance of omitted variable bias. As previously noted in Section 3.2.2, the inherent difficulty with this approach is to establish a plausible range of valid values for R_{Max}, or the assumed maximum R^2 in the "long" regression specification. In Table 4, I present four different methods for setting R_{Max}. Column (3) uses the method suggested by Oster (2017), which sets R_{Max} equal to $1.3 \times R^*$. Where R^* is the R^2 from the "long" regression. In this context, this is the least conservative approach. Column (4) uses the method used by Bellows and Miguel (2009), which sets R_{Max} equal to $R^* + (R^* - R)$. Where R is the R^2 from the "short" regression without controls. Column (5) uses the method used by Gonzalez and Miguel (2015), which sets R_{Max} equal to $2.2 \times R^*$. Finally, column (6) is the most conservative approach and simply sets R_{Max} equal to 1, which implicitly assumes there is no measurement error in the outcome variable.

Each panel in Table 3 represents a different core regression specification. Panel A shows results using the IHS transformation of household expenditures in land and household construction materials and the primary measure of the income aspirations gap. Panel B also uses the primary measure of the income aspirations gap, but uses the binary indicator of any expenditures in land and household construction materials. Panel D shows results using the IHS transformation of the household expenditures in land and household construction materials and the alternate measure of the income aspirations gap. Finally, panel D uses the alternative measure of the income aspirations gap, but uses the binary indicator of any expenditures in land and household construction materials.

The first detail to note from the results presented in Table 3 is that the bounds on the income aspirations gap coefficients—for both the primary and alternative measures—are positive for each of the different methods for setting R_{Max}. Additionally, the bounds on the squared income aspirations gap coefficients—for both the primary and alternative measures—are negative for each of the different methods for setting R_{Max}. When only considering the sign of the income aspirations gap and squared income aspirations gap coefficients, these findings suggest that the inverted U-shaped

Table 3: Coefficient Stability and Effect Bounds

	(1) Short regression	(2) Long regression	(3) $R_{Max} = 1.3R^*$	(4) $R_{Max} = R^* + (R^* - R)$	(5) $R_{Max} = 2.2R^*$	(6) $R_{Max} = 1$
Panel A: IHS Investments						
Income	7.756**	13.657***	[13.66; 15.85]	[13.66; 21.80]	[13.66; 24.03]	[13.66; 30.11]
aspirations gap	(3.095)	(2.511)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
Squared income	-6.449**	-11.087***	[-12.88; -11.09]	[-17.96; -11.09]	[-19.95; -11.09]	[-25.62; -11.09]
aspirations gap	(3.175)	(2.403)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
R^2	0.01	0.37				
R_{Max}			0.48	0.73	0.81	1.00
Panel B: Binary Investments						
Income	0.589**	0.997***	[0.997; 1.15]	[0.997; 1.57]	[0.997; 1.743]	[0.997; 2.092]
aspirations gap	(0.233)	(0.182)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
Squared income	-0.517*	-0.850***	[-0.978; -0.850]	[-1.350; -0.850]	[-1.509; -0.850]	[-1.842; -0.850]
aspirations gap	(0.229)	(0.166)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
R^2	0.01	0.38				
R_{Max}			0.49	0.75	0.84	1.00
Panel C: IHS Investments with Alt. Aspirations Gap						
Alt. Income	5.082	9.339***	[9.34; 11.04]	[9.34; 15.79]	[9.34; 17.75]	[9.34; 24.16]
aspirations gap	(3.305)	(3.253)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
Squared alt. income	-5.951*	-9.809***	[-11.35; -9.81]	[-15.65; -9.81]	[-17.44; -9.81]	[-23.30; -9.81]
aspirations gap	(3.137)	(3.022)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
R^2	0.01	0.36				
R_{Max}			0.47	0.71	0.79	1.00
Panel D: Binary Investments with Alt. Aspirations Gap						
Alt. Income	0.297	0.635***	[0.635; 0.765]	[0.635; 1.125]	[0.635; 1.292]	[0.635; 1.718]
aspirations gap	(0.224)	(0.216)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
Squared alt. income	-0.392	-0.702***	[-0.821; -0.702]	[-1.152; -0.702]	[-1.305; -0.702]	[-1.700; -0.702]
aspirations gap	(0.213)	(0.202)	$\delta < 0$	$\delta < 0$	$\delta < 0$	$\delta < 0$
R^2	0.01	0.37				
R_{Max}			0.48	0.72	0.81	1.00
Observations	445	445				
EA fixed effects?	No	Yes				
Additional controls?	No	Yes				

Notes: Columns (1) and (2) show regression coefficients from the "short" and "long" regressions, respectively. Columns (3) through (6) show bounds on the effect and the δ parameter representing the proportional selection coefficient using the methods described by Altonji et al. (2005) and Oster (2017). Moving from left to right, each column uses a progressively more conservative approach for setting the value of R_{Max}. Additional controls include current monthly income, years of education, age, a dummy variable indicating if the individual controls spending, and a dummy variable indicating of the household has a migrant. Standard errors clustered at the enumeration area level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

relationship is unlikely to be driven by unobservable confounding factors. More specifically, in each specification the coefficient always moves away from zero when including additional controls variables in the regression. As noted by Oster (2017), this observation suggests that results are qualitatively robust to the inclusion of omitted variables. This detail is formalized through the calculation of the δ parameter, the proportional selection coefficient, which is negative in all cases. A negative proportional selection coefficient indicates that adding additional control variables or fixed effects to the regression only moves the coefficient estimate away from zero. This implies that these results are highly robust to potential unobserved heterogeneity.

5 Heterogeneity in the Inverted U-Shaped Relationship

Comparative static analysis on the model detailed by Janzen et al. (2017) suggests that individuals who are more patient, initially better off, and have a higher rate of return on investment are likely to have a higher turning point in their aspirations gap. Additionally, a theoretical model of the "economics of hope" indicates that fatalistic beliefs may critically interact with aspirations to inspire or discourage investment choices (Lybbert and Wydick 2018). To test these ideas, I examine the relationship between the aspirations gap and investment choices between various sub-groups of the sample. I first directly test the theoretical prediction that individuals who are initially better off, in terms of income, have a higher turning point in their aspirations gap. Next I investigate heterogeneity driven by fatalistic beliefs about the future. Specifically, I estimate an augmented version of the baseline estimation strategy, which is similar in spirit to the methodology used by Bandiera and Rasul (2006).

$$y_{ie} = \sigma_0 + [\sigma_1 g_{ie} \times A_{ie}] + [\sigma_2 g_{ie}^2 \times A_{ie}] + [\sigma_3 g_{ie} \times B_{ie}] + [\sigma_4 g_{ie}^2 \times B_{ie}] + \sigma_5 s_{ie} + X_{ie}'\Delta + \phi_e + \psi_{ie} \quad (8)$$

In equation (8) A and B indicate sub-groups of the sample. These sub-groups are defined by income level and belief in the role of destiny in life.[12] Low income is defined as having a natural log of monthly income less than 12, the median value in the data. This cutoff roughly translates to a monthly income of less than 20,000 kyat or 13 US dollars per month. Belief in destiny is both measured on a zero through ten ordinal scale indicating how much an individual agrees with the statement: "What one achieves is primarily determined by destiny or luck."[13] I define individuals

[12]Results shown in the appendix investigate heterogeneity by age, gender, and a feeling of being successful. These additional results are purely exploratory and are less well motivated by existing theory.

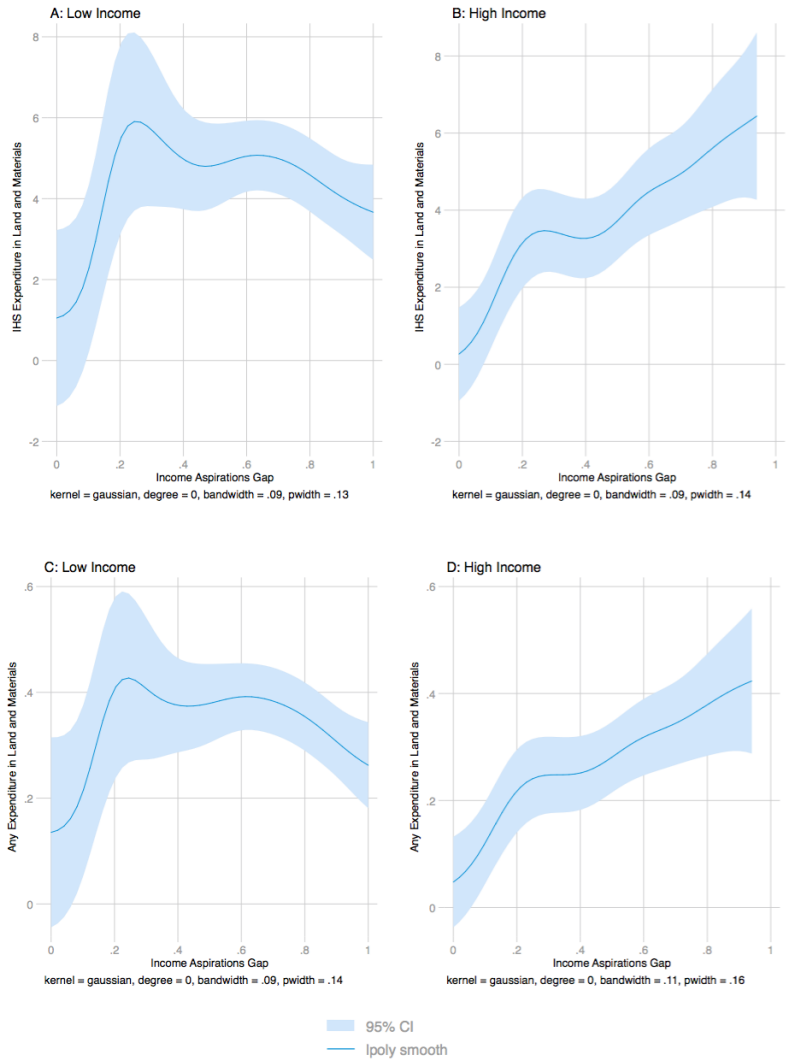
[13]See Bloem et al. 2018 for a discussion of these questions.

as agreeing with this statement if they report a score greater than five on the zero through ten scale, and disagreeing otherwise.

Figure 3 illustrates heterogeneity by income by estimating equation (8) using the same nonparametric estimation technique discussed above. Panels A and B show results using the IHS of expenditures in land and household materials. Panel A restricts the sample to relatively low income individuals and shows a clear inverted U-shaped relationship between the aspirations gap and investments. Panel B restricts the sample to relatively high income individuals and shows no inverted U-shaped relationship. In fact, the relationship for high income individuals is roughly linear with a relatively consistent upward slope. Panels C and D show a similar finding when using a binary outcome variable indicating any expenditure in land or household materials. These results are reported in tabular form, with more information, in the Appendix. Column (1) of Table A1 confirms the estimated turning point is higher for those with more income. Specifically, the turning point for those with relatively low income is estimated to be at 0.563, at about the midpoint of the aspirations gap measure. This estimate is statistically significant according to the Sasabuchi p-value. The turning point for those with relatively high income is estimated to be outside of the domain for the aspirations gap variable, which leads to a trivial failure to reject the null hypothesis of no inverted U-shaped relationship for those with relatively high income. In addition, coefficients estimates of the relationship between the aspirations gap and investments are statistically different at conventional levels according to a test of equality between $A(g + g^2)$ and $B(g + g^2)$. Qualitatively similar findings persist in Table A2 when using a binary outcome variable measuring any expenditure in land or household materials. These results confirm the predictions from comparative static analysis by Janzen et al. (2017) that individuals who are initially better off will have a higher turning point in the relationship between aspirations gap and investments.

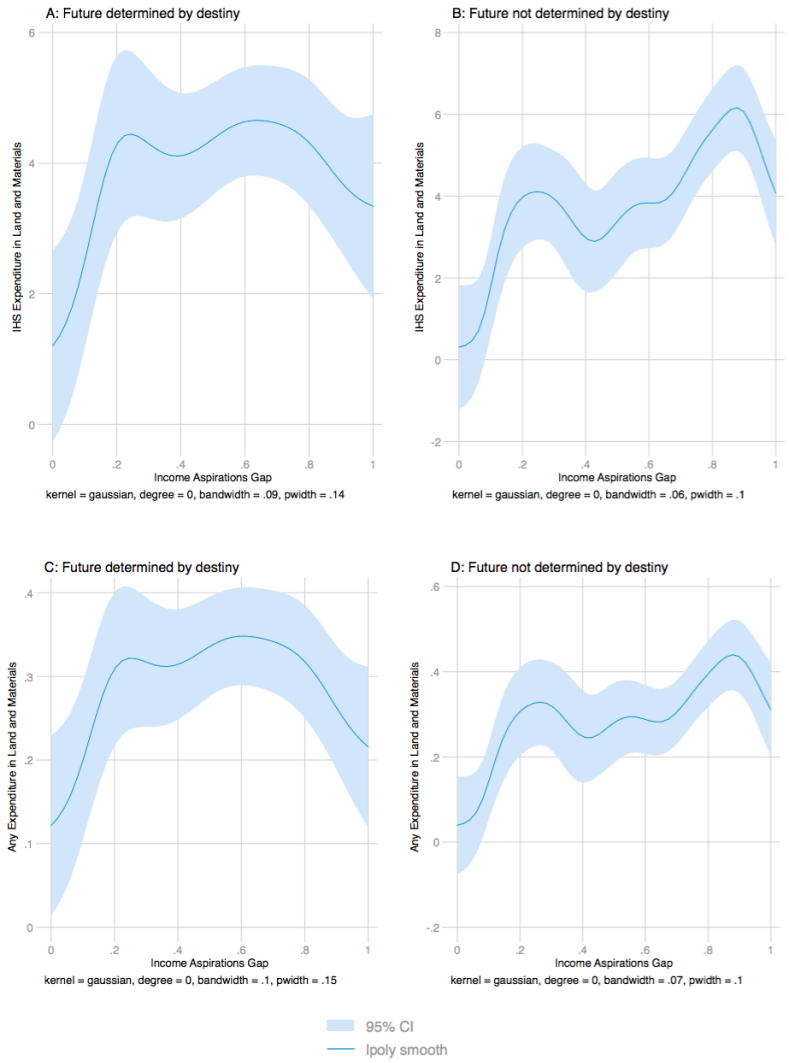
Figure 4 illustrates heterogeneity by belief in the primacy of destiny, again by estimating equation (8) and using nonparametric estimation. Similar to Figure 3, Panels A and B show results using the IHS of expenditure in land and household materials. Panel A restricts the sample to those who believe that what one achieves is primarily determined by destiny and shows an inverted U-shaped relationship between the aspirations gap and investments. Panel B restricts the sample to those who do not believe that what one achieves is primarily determined by destiny and shows less clear evidence of an inverted U-shaped relationship between the aspirations gap and investments. Similar to Figure 3, Panels C and D show similar findings using a binary outcome variable indicating any expenditure in land or household materials. These results are again reported in

Figure 3: Heterogeneity by Income



Notes: Semiparametric specification including control variables and enumeration area fixed effects.

Figure 4: Heterogeneity by Belief in Destiny



Notes: Semiparametric specification including control variables and enumeration area fixed effects.

tabular form, with more information, in the Appendix. Column (4) of Table A1 shows that the estimated turning point is higher for those who do not believe that what one achieves is primarily determined by destiny. Specifically, the turning point for those who do believe that what one achieves is primarily determined by destiny is estimated to be at 0.595. This estimate is statistically significant according to the Sasabuchi p-value. The turning point for those who do not believe that what one achieves is primarily determined by destiny is estimated to be at 0.738, but is statistically insignificant according to the Sasabuchi p-value. I find no statistical difference, however, between coefficient estimates of the relationship between the aspirations gap and investments according to a test of equality between $A(g + g^2)$ and $B(g + g^2)$. These results are consistent with a model developed by Lybbert and Wydick (2018) who point out that aspirations, by themselves, may not be sufficient for encouraging future-oriented behavior.[14] Along with aspirations that are beyond one's current standard of living an individual must believe that they are able to achieve a given aspiration. Without this belief in oneself, increased aspirations may fail to influence any change in behavior.

Taken together I find that the inverted U-shaped relationship is strongest for relatively low income individuals and for individuals holding fatalistic beliefs. This type of heterogeneity highlights the possibility that aspirations may give rise to poverty trap dynamics via a behavioral mechanism. These dynamics can, in part, explain widening economic inequality within relatively low income but fast growing countries. Inequality is a general consequence of fast growth in a relatively poor country. Some individuals realize quick growth in either income or wealth while others remain relatively poor. The findings documented in this paper highlight the potential for a poverty trap, whereby relatively low income individuals experience aspirations frustration and therefore make fewer investments and therefore remain poor. This, in turn, perpetuates persistent poverty and increased within-country economic inequality.

Finally, and on a more technical note, the finding that the inverted U-shaped relationship between aspirations and future-oriented behavior is subjected to important heterogeneity indicates that estimates of this relationship that are not carefully identified may be spurious due to omitted variable bias. This further supports the primary objective of this paper in aiming to provide more rigorous evidence of the inverted U-shaped relationship between the aspirations gap and investments. Future research should take care to consider important sources of endogeneity and

[14] It is also consistent with emerging empirical results showing that policies that uniquely leverage aspirations are ineffective in changing behavior (Rizzica 2020).

heterogeneity in extending this result to alternative contexts.

6 Conclusion

Although the topic of inequality is classic in the economics literature, emerging work focuses on the potential psychological causes and consequences of poverty traps and widening within-country economic inequality (Ray 2006; Besley 2016; Genicot and Ray 2017; Lybbert and Wydick 2018). In particular, theory developed by Genicot and Ray (2017) suggests that swift economic growth in a poor country can have competing consequences. On the one hand, rapid economic growth can encourage investment. On the other hand, this same rapid economic growth can lead to frustration and despair. If these dynamics persist, then this is one potential mechanism through which within-country inequality may persist and grow.

The study context of rural Mon State, Myanmar presents a well-suited environment to test the theory of Genicot and Ray (2017). Nationally, Myanmar is home to both high rates of economic growth and relatively large rates of poverty. Mon State in particular, is a region with a history of marginalization. Therefore, the dynamics of psychological constraints within this population may play an particularly important role in economic development and poverty alleviation. Indeed, I find evidence of the existence of an inverted U-shaped relationship between the income aspirations gap and real estate investments. This finding suggests several core insights.

First, simply focusing on relieving external constraints (e.g., providing access to credit, insurance, etc.) may prove ineffective, since those with a relatively small aspirations gap do not invest as much as those with a slightly larger aspirations gap. This insight may help explain persistent puzzles in development economics of individuals or households refraining from making profitable investments (Ashraf et al. 2006; Duflo et al. 2011; Suri 2011; and Bryan et al. 2014). Second, and consistent with the findings of Galiani et al. (2018) and Rizzica (2020), simply focusing on psychological constraints may also not be sufficient in encouraging investment, since those with a relatively large aspirations gap do not invest as much as those with a relatively small aspirations gap. Aspirations, by themselves, may not be sufficient in inspiring investment in the future. This is an important finding for policy-makers that aim to improve aspirations within a population for the purpose of improving economic outcomes (see, e.g., Beaman et al. 2012; and Bernard et al. 2014). Third, the strength of the inverted U-shaped relationship may be influenced by a number of important factors. Those who are already economically better off, who believe they themselves can

generally influence future outcomes, and who believe that they are currently successfully achieving their goals may have a higher turning point in their aspirations gap. This final insight is consistent with a model aspirations and future-oriented behavior that is dependent on personal agency and external constraints (Lybbert and Wydick 2018).

Similar to any other empirical analysis, the results presented in this paper are not without their limitations. In this paper I aim support the credibility of the estimated inverted U-shaped relationship using different estimation techniques. Importantly, each of these results support the theoretical predictions of Genicot and Ray (2017). Future work could focus on further improving the estimation of the inverted U-shaped relationship by using plausibly exogenous shocks to aspirations. Finally, although it is plausible that these results translate well to other relatively low income contexts experiencing fast economic growth, given that the present study only focuses on one region in one country, future work could add to the external validity of these results.

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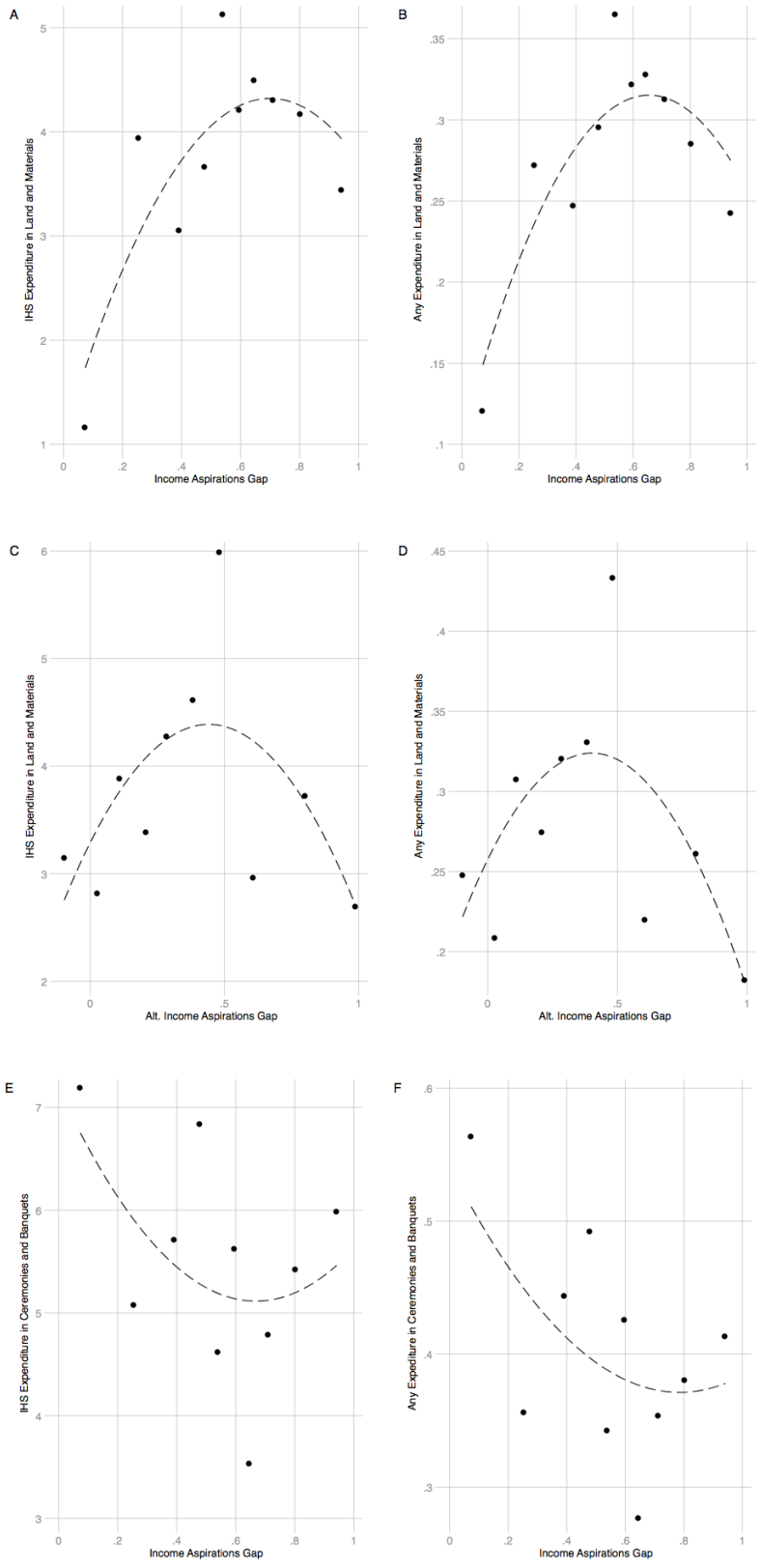
Appendix: Additional Tables and Figures

Included in the appendix are additional tables and figures supporting the results reported in the main manuscript. Figure 3 shows a non-parametric estimates of the relationship between aspirations and expenditures using binned scatterplots. Table 6 shows heterogeneity results when using a binary indicator of any investment.

Figure A1: Binned Scatterplots of the Relationship between the Aspirations Gap and Expenditures



Notes: Binned scatterplots are conditional on all control variables and enumeration area fixed effects as specified in equation (6).

Table A1: Heterogeneity with IHS of Investments

Dependent variable: Inverse hyperbolic sine (IHS) of investments					
	(1)	(2)	(3)	(4)	(5)
	Income	Age	gender	Destiny	Successful
	A = Lower	A = Younger	A = Male	A = Agree	A = Agree
	B = Higher	B = Older	B = Female	B = Disagree	B = Disagree
A × income	14.26***	16.29***	14.47**	15.08***	11.76***
aspirations gap	(2.708)	(3.643)	(5.981)	(2.746)	(4.341)
A × squared income	-12.66***	-13.26**	-12.68***	-12.68***	-8.712*
aspirations gap	(2.730)	(3.349)	(5.317)	(2.884)	(4.825)
B × income	7.717**	11.83***	13.36***	9.655***	14.36***
aspirations gap	(3.674)	(2.771)	(2.873)	(3.441)	(2.626)
B × squared income	-1.732	-9.829***	-10.13***	-6.542*	-12.04***
aspirations gap	(4.742)	(3.106)	(3.254)	(3.641)	(2.883)
A(g + g^2)= B(g + g^2) test	0.021	0.466	0.300	0.670	0.677
Observations	445	445	445	445	445
R-squared	0.378	0.374	0.373	0.374	0.372
EA fixed effects?	Yes	Yes	Yes	Yes	Yes
Additional controls?	Yes	Yes	Yes	Yes	Yes
U-test results for A:					
Turning point	0.563	0.621	0.546	0.595	0.675
Fieller 95% C.I.	[0.462; 0.722]	[0.497; 0.840]	[0.325; 0.808]	[0.491; 0.790]	$[-\infty; \infty]$
Sasabuchi p-value	0.001	0.006	0.014	0.003	0.159
Slope at Min	14.26	16.30	14.47	15.08	11.76
Slope at Max	-11.07	-9.957	-12.05	-10.27	-5.666
U-test results for B:					
Turning point	2.227	0.602	0.659	0.738	0.597
Fieller 95% C.I.	$[-\infty; \infty]$	[0.465; 1.025]	[0.515; 1.178]	$[-\infty; \infty]$	[0.467; 0.857]
Sasabuchi p-value	1.000	0.037	0.050	0.234	0.008
Slope at Min	7.717	11.829	13.36	9.655	14.36
Slope at Max	4.460	-7.829	-6.902	-3.429	-9.711

Notes: The dependent variable in all columns is the IHS of investment spending on land and household construction. Column (1) defines low income as having a natural log of income less than 10, and high income otherwise. This is a natural break in the income distribution in this sample. Column (2) defines low age as being less than 40 years old, and high age otherwise. Columns (3) through (5) define low as scoring less than 5 on a zero through ten ordinal scale measuring agency, pathways, and locus of control, respectively. Additional controls include current monthly income, years of education, age, gender, a dummy variable indicating if the individual controls spending, and a dummy variable indicating of the household has a migrant. The test of equality between A(g + g^2) and B(g + g^2) reports a p-value of the null hypothesis that these coefficients are equal. Standard errors clustered at the enumeration area level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A2: Heterogeneity with Binary Indicator of Any Investments

Dependent variable: Binary indicator of any investments					
	(1)	(2)	(3)	(4)	(5)
	Income	Age	gender	Destiny	Successful
	A = Lower	A = Younger	A = Male	A = Agree	A = Agree
	B = Higher	B = Older	B = Female	B = Disagree	B = Disagree
A × income	1.058***	1.256***	1.177***	1.101***	0.777**
aspirations gap	(0.202)	(0.269)	(0.422)	(0.202)	(0.292)
A × squared income	-0.977***	-1.074***	-1.102***	-0.968***	-0.588*
aspirations gap	(0.193)	(0.246)	(0.381)	(0.200)	(0.321)
B × income	0.591**	0.803***	0.916***	0.707***	1.076***
aspirations gap	(0.280)	(0.178)	(0.204)	(0.250)	(0.194)
B × squared income	-0.226	-0.685***	-0.734***	-0.513*	-0.950***
aspirations gap	(0.353)	(0.190)	(0.221)	(0.274)	(0.199)
A(g + g^2)= B(g + g^2) test	0.045	0.566	0.452	0.607	0.587
Observations	445	445	445	445	445
R-squared	0.385	0.385	0.381	0.383	0.381
EA fixed effects?	Yes	Yes	Yes	Yes	Yes
Additional controls?	Yes	Yes	Yes	Yes	Yes
U-test results for A:					
Turning point	0.542	0.584	0.534	0.569	0.660
Fieller 95% C.I.	[0.444; 0.670]	[0.481; 0.734]	[0.365; 0.725]	[0.473; 0.724]	$[-\infty; \infty]$
Sasabuchi p-value	0.001	0.001	0.006	0.001	0.146
Slope at Min	1.058	1.256	1.177	1.101	0.777
Slope at Max	-0.895	-0.893	-1.028	-0.835	-0.399
U-test results for B:					
Turning point	1.306	0.586	0.624	0.688	0.566
Fieller 95% C.I.	$[-\infty; \infty]$	[0.445; 0.898]	[0.493; 0.997]	$[-\infty, \infty]$	[0.453; 0.748]
Sasabuchi p-value	1.000	0.013	0.025	0.184	0.001
Slope at Min	0.591	0.803	0.916	0.707	1.076
Slope at Max	-0.166	-0.567	-0.552	-0.320	-0.825

Notes: The dependent variable in all columns is a binary indicator of any expenditure on land and household construction. Column (1) defines low income as having a natural log of income less than 10, and high income otherwise. This is a natural break in the income distribution in this sample. Column (2) defines low age as being less than 40 years old, and high age otherwise. Columns (3) through (5) define low as scoring less than 5 on a zero through ten ordinal scale measuring agency, pathways, and locus of control, respectively. Additional controls include current monthly income, years of education, age, a dummy variable indicating if the individual controls spending, and a dummy variable indicating of the household has a migrant. The test of equality between A(g + g^2) and B(g + g^2) reports a p-value of the null hypothesis that these coefficients are equal. Standard errors clustered at the enumeration area level in parentheses. *** p<0.01, ** p<0.05, * p<0.1