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GOTTA' HAVE MONEY TO MAKE MONEY?
BARGAINING BEHAVIOR AND FINANCIAL NEED OF MICROENTREPRENEURS

Morgan Hardy
New York University Abu Dhabi

Gisella Kagy
Vassar College

Lena Song
New York University

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Abstract

Bargaining over purchase prices with microenterprise owners in Ghana, we show that poorer sellers agree to significantly lower prices than wealthier peers. This relationship is robust both across firms and within firms over time, even after controlling for a plethora of time-varying observables. A computerized bargaining experiment on the same sample, with randomized initial endowment, corroborates the real-bargaining findings. This pattern can be explained by a simple application of classic bargaining theory to include endowments with nonlinear preferences. Pinpointing mechanisms behind this large and robust empirical relationship is a key frontier in understanding barriers to the profitability of microenterprises.

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1 Introduction

Micro-enterprises dominate the firm size distribution and make up the majority of employment in developing countries (Hsieh and Olken, 2014; Sandefur, 2010). For these firms, bargaining over the prices of the goods and services is often an integral part of operations. As a consequence, the resulting surplus allocation from this process has a direct, and potentially substantial, effect on the wealth and consumption of these entrepreneurs.

This paper empirically documents a quantitatively large and robust relationship between the existing wealth of a microentrepreneur and their bargaining behavior. Using a sample of garment makers in Ghana, we find that a one standard deviation increase in a firm owner’s personal liquidity is associated with a $\sim 5\%$ increase in the final price agreed upon during real bargaining exercises. This economically and statistically significant relationship is robust to the inclusion of firm owner fixed effects over a two-year panel as well as a myriad of time varying owner, owner household, and firm characteristic controls.

To further test for and understand this potentially causal relationship between wealth and bargaining behavior, we implement a field experiment during our second round of panel data collection. During the experiment, respondents bargain with a computer, programmed to “behave like a buyer, bargaining with [the firm owner] over the price of a garment.” During each bargaining round, respondents are prompted to suggest a “price” which they would keep for themselves as their allocation of a potential surplus, if the computer agrees. Before the experiment, respondents are randomized into higher and lower initial wealth categories.¹ Receiving the higher initial endowment causes a $\sim 7\%$ increase in the final surplus allocated to the firm owner during the experiment.

We discuss one possible intuition for this empirical relationship. Such a relationship can be predicted in an extension of the classic non-cooperative game developed in Rubinstein (1982) to include endowment and risk averse preferences for the seller. Specifically, this model predicts that for sellers with identical preferences, beliefs, and opportunity costs, those with a lower initial endowment will accept a lower final price from the buyer. Intuitively, this behavioral difference stems from the fact that poorer sellers have “more [utility] to lose” if bargaining breaks down.

¹Those in the higher wealth treatment group received an initial endowment of 25GHC, while those in the lower wealth treatment group received an initial endowment of 5GHC. This difference is equal to approximately a day’s income for the firm owners in our sample.

In addition to this example interpretation, we discuss other possible frameworks that may also explain our findings. These include, but are not limited to, differences in aspirations and subsistence consumption. Ultimately, we leave definitive discernment between these and other potential mechanisms to future research, with the contribution of this paper being the documentation of this economically and statistically significant empirical pattern and a resulting call for further research to understand its determinants and implications for the poor.

This paper contributes to the literature on barriers to microenterprise success. Previous studies have largely focused on capital and managerial constraints.² More recent studies have begun expanding this set of considerations.³ This paper is the first of this literature to focus on price setting behavior, a direct determinant of markups and microenterprise profitability. The findings of this paper compel a more serious consideration of how firm owners price their goods and services as a key potential barrier to microenterprise profitability and growth.

There is a vast and established literature from non-cooperative bargaining theory in which the division of surplus is modeled to be determined by bargaining protocols, players' preferences, beliefs and outside options.⁴ An equally vast lab experimental literature has empirically tested these theories, treating bargaining as a stand-alone activity and often abstracting away from personal and household characteristics of either player.⁵

Our paper contributes to the small empirical literature on bargaining in the field (Castillo et al., 2011; Balafoutas et al., 2013; Iyer and Schoar, 2015; Keniston, 2011; Ranganathan, 2018). These papers mostly focus on the relationship between seller-perceived buyer characteristics and bargaining outcomes.⁶ Unlike this previous work, our paper exploits data with a rich set of firm, personal, and household characteristics of the seller, and studies the role of seller characteristics (namely, wealth) in bargaining.

²Seminal examples include De Mel, McKenzie and Woodruff (2008) (capital), Banerjee, Karlan and Zinman (2015) (credit), and Karlan and Valdivia (2011) (management).

³The current list of considerations include lack of business knowledge (Drexler, Fischer and Schoar, 2014; Campos et al., 2017), regulatory burden (de Mel, McKenzie and Woodruff, 2013), lack of business networks (Fafchamps and Quinn, 2016; Cai and Szeidl, 2017; Brooks, Donovan and Johnson, 2018), lack or nature of demand (Hardy and Kagy, 2019), infrastructure unreliability (Hardy and McCasland, 2019), and labor constraints (de Mel, McKenzie and Woodruff (2019), Hardy and McCasland (2015)).

⁴See, for example, Muthoo (1999) for an overview.

⁵See Roth (1995) and, more recently, Guth and Kocher (2014) for a survey of this literature.

⁶For example, Castillo et al. (2011) focuses on the role between agreed price in bargaining and gender of passenger in the taxi market in Lima, Peru, and Balafoutas et al. (2013) looks at passenger presumed information on the local tariff system in the taxi market in Athens, Greece. Ranganathan (2018) studies sellers of handicrafts in India and finds that artisans, who identify with their work, set lower prices for discerning buyers in a bargaining routine.

This paper proceeds as follows: Section 2 introduces the context and sample; Section 3 describes data collection protocols and measurement; Section 4 present our main empirical results and discusses potential mechanisms; and Section 5 concludes.

2 Context and Sample

The empirical work in this paper focuses on Ghana’s garment-making industry. Garment-making microenterprises in Ghana are similar to other microenterprises in low-income countries. They are small, with typically the owner being the only employee. They are numerous, with all of the firms making similar products and using similar technologies.⁷

Garments are made to order. The main variable cost is cost of labor of making a garment.⁸ As with many other microenterprises in low-income countries, the price for a garment is determined through a bargaining process, where the buyer and seller go back and forth until they have either settled and agreed on a final transaction price or one of the parties has “walked away.” To study the bargaining behavior of micro-entrepreneurs, we bargain over the prices of potential child’s shirt orders with garment making microenterprises in Hohoe, Ghana.

The sample of garment making microenterprises from which a child’s shirt was ordered come from the Hohoe Garment Maker Study. The Hohoe Garment Maker Study has been collecting information on all garment making microenterprises in Hohoe since 2014, with the broader aim of providing an in-depth look into how microenterprises operate, struggle, and change over time.⁹ At the start of the study, a census was completed that identified all operational garment making firms in Hohoe town and surrounding areas and collected some baseline information on the firm and owner characteristics.

2.1 Attrition and Sample Characteristics

The main empirical work in this paper uses data collected in January of 2018 and 2019. There were 375 firms in operation during both January 2018 and January 2019. These rounds of data were

⁷In Ghana, a mixture of human and electrically powered sewing machines are used to sew garments.

⁸The buyer will bring fabric to the firm and choose and specify the style/cut for the garment to be sewn. If a price is agreed upon for the garment, the buyer will leave the fabric with the seller, but will not pay the agreed upon transaction price until the completed garment is picked up.

⁹Hohoe is the main town in Hohoe District, and residents are considered to be middle-income by Ghanaian standards.

collected as part of a class for New York University that taught students about data collection and analysis for development economics. Out of the possible 375 firms, 282 were surveyed in both 2018 and 2019.¹⁰

The child’s shirt orders were made within a 2-day short window for completion, as they needed to be collected prior to the survey team leaving the district. For this reason, some firm owners had immovable obligations (either personal or business related) during the short order period of 24 or 48 hours (depending on their survey day), and immediately refused the order without entering into a bargaining process. A few other firm owners began the bargaining process, but a final price agreement was not reached, as their final price offer was higher than our reservation price and we “walked away.” Ultimately, we successfully agreed on a price and received the child’s shirt from 229 of the firms that were surveyed in both years. This sample of 229 firms that delivered a garment in both years is our primary sample.

Appendix Table A.1 presents attrition analysis and sample characteristics for these three samples using firm and firm owner characteristics collected at the baseline in 2014. There are no significant differences between the sample of firms in operation during the panel (375), those surveyed in both years of data collection (282), and those who delivered a garment in both years of data collection (229). On average, in our main sample of 229, 75% of the firm owners are female, have approximately 9 years of education, and they are 36 years old with a business in operation for approximately 9 years as of 2014. Our sample, and all firms in this context, are unlikely to have any paid workers and only half have any apprentices (the majority labor type in this context). The average firm monthly profit for our sample was equivalent to 293 GHC or around 65 USD.¹¹

3 Data

Our data come from four sources: (1) a real bargaining exercise over a real child’s shirt conducted with each respondent in January of 2018 and 2019; (2) a short survey completed immediately after the bargaining exercises, in each year, collecting current information about the firm, firm owner,

¹⁰Because the data collection was paid largely by the New York University course budget, the survey team was funded to work in the district for only the 2 days required for the students’ experience. Although our enumerator team was large enough to cover all of the sample in this 2 day time frame, the short duration of our time in district meant that not all firm owners were available during both years. The majority of firm owners not surveyed were either travelling or ill.

¹¹Monetary values reported in this paper are inflation adjusted to 2018 currency value.

and firm owner’s household; (3) quality assessments of all garments collected during these two rounds; (4) and a bargaining game experiment, added for the 2019 round to be completed after the short survey, in which initial endowment was randomized and the firm owner bargained with the tablet over the division of a potential surplus.

3.1 Survey Logistics

A professional survey team of enumerators conducted the interviews for each round. Because these data were paid for as part of a New York University class, enumerators were sometimes randomly shadowed by a student. The students did not participate in the interviews or collect the data, but a student was present for a little less than half of all surveys.¹²

A stratified randomization procedure was implemented to encourage random survey timing (day 1 vs. day 2). This randomization determined the order in which the enumerators attempted to contact and locate garment makers. Although compliance on this design was imperfect given the short survey window, Appendix Table A.2 indicates observable balance on census characteristics between the two days of survey work.¹³

3.2 Bargaining Protocol

In both years, the survey began with an enumerator approaching a garment-making microenterprise and attempting to order a child’s shirt.¹⁴ If they were willing to make a shirt, the enumerator bargained with them over its price. The enumerators were trained to memorize the bargaining script¹⁵ and bargain in a natural way, only making note of the prices the garment maker suggested during each iteration of the bargaining process. The garment maker and enumerator went back and forth on the price, with the enumerator providing increasingly higher counter-offers in the case of disagreement. The maximum offer enumerators were able to make was 30GHC. In the case that 30GHC was offered and rejected, our enumerator would “walk away” from the order. If an

¹²The course enrolls up to 15 students and the enumerator team is set to be roughly double the class size, so that the students may estimate the impact of their own presence on respondent behavior as their final course assignment. Student presence is controlled for in all specifications indicating “YES” for survey controls.

¹³Survey day is controlled for in all specifications indicating “YES” for survey controls.

¹⁴All of the shirts ordered were of the same design and size.

¹⁵This script was written so that, for the same seller-proposed price in a given iteration of the bargaining process, every enumerator would respond identically with respect to the exact counter offer value, acceptance, or “walking away.” The exact ordering script used and memorized by the enumerators can be found in Appendix A.2

agreement was reached on the transaction price, in order to be paid, garment makers needed to produce the shirt the day after the data collection period ended, and thus had either one or two days to complete the order.¹⁶

Panel A of Table 1 reports average bargaining behavior indicators (final price, first price, and number of rounds) for both years pooled together and then 2018 and 2019 separately. Column 4 test the difference between the years. All three indicators increased significantly from 2018 to 2019.¹⁷

3.3 Survey Measures

After bargaining over a child’s shirt, regardless of the outcome of the bargaining activity, we collected information on current firm, firm owner, and firm owner’s household characteristics in both 2018 and 2019. The key explanatory variable of interest in this paper is collected at this point in the survey process. We use personal liquidity as a proxy to measure existing wealth of the microentrepreneur.

The measure of financial need comes from the survey question: *“If you urgently needed money for your family (e.g. your child’s education, someone becomes ill), how much cash can you collect in a week? Please include all sources, including your own savings, money you can get from other members of your household, money you can borrow from family, friends, and the bank or similar institutions.”* We focused on this measure, as individuals may be cash poor but have other safety nets that allow them to bargain more aggressively. We use per capita personal liquidity as a measure of financial need to avoid scale effects. Average personal liquidity per capita increased from 160GHC in 2018 to 175GHC in 2019.¹⁸

Panel B of Table 1 presents the summary statistics for time-varying controls included in our analysis.¹⁹ These controls include a myriad of proxies for firm owners’ personal financial situation, outside options, firm productivity, production costs, product quality, and price information.

¹⁶Although there are multiple dimensions on which bargaining may occur (namely time, quality, and price), we focus in this paper on one dimension of bargaining - price. We leave exploration of these other dimensions to future work.

¹⁷First and final price numbers adjust for inflation. As a reference, the GHC/USD conversion rate was approximately 4.52 in January of 2018 and 4.89 in January of 2019.

¹⁸Average personal liquidity level in 2019 is adjusted for inflation.

¹⁹Appendix Table A.3 reports these same characteristics on the sample of 282 firms that completed the survey in both years.

3.4 Garment Quality

In addition to the survey data collected from firm owners, we obtained independent quality ratings of each garment. Each shirt was evaluated for its overall quality by an expert in Accra, on a 0 - 10 scale with 10 being the highest quality. Quality was measured based on systematic considerations, including, but not limited to, how straight the lines of the garment were sewn, quality of button sewing, and symmetry from left to right.²⁰ Pooled and yearly means of garment quality are reported at the bottom of of Table 1.

3.5 Bargaining Game Experiment

In 2019, we administered a bargaining game in which the firm owner bargained with a tablet over the division of a possible surplus of 30GHC. The firm owners were told the tablet is set up to *"behave like a buyer, bargaining with you over the price of a garment."* If the firm owner and the tablet reach a mutually agreed upon "price", the firm owner receives that amount in cash.²¹

Immediately prior to this bargaining game, participants were given an amount of initial endowment that they would be able to keep in addition to anything from the game, regardless of what occurred during the game. This initial endowment was randomized to either be 5GHC or 25GHC (the difference of 20GHC is around a day of wage in our sample). This randomization was designed to create a random shock to the garment maker's wealth immediately before observing their bargaining behavior.²² To minimize reciprocity found in previous studies²³, enumerators are trained to make it explicit that the initial endowment is paid separately from the bargaining game, and the game is played against the computer instead of the enumerator.

The game was played through the use of two bins and 30 beans. One bin symbolized the "price" bin, with the beans inside indicating the amount the respondent would receive if an agreement were reached. Any beans inside the other bin symbolized what the tablet would receive if an agreement were reached. During the respondent's turn to propose a "price", they would indicate their choice

²⁰A rubric was used in all garment evaluations.

²¹Survey instrument for this bargaining game with the tablet can be found in A.2

²²Appendix Table A.4 shows balance in baseline characteristics across payment amount. The randomization appears balanced overall, but Raven's Score show significant differences, as is expected in small samples. As robustness, we include Appendix Table A.6, showing no difference in findings when Raven's Score is added as a control in our experiment analysis.

²³A summary of the empirical literature on reciprocity can be found in Fehr and Gächter (2000).

by placing beans between these two bins. In the case of a counter-offer from the tablet, the enumerator would move beans between bins to reflect the counter-offer.²⁴ Outcomes of interest from the experiment are the same as that of the panel analysis - the final “price” agreed upon, the first “price” offered, and the number of rounds that occurred during the bargaining game.

4 Results

4.1 Panel Data Findings

Figure 1a visually depicts the cross-sectional relationship between per capita personal liquidity and the final transaction price, pooled across both years of data collection.²⁵ The figure shows a strong relationship between final transaction price and personal liquidity per capita. As the garment makers personal liquidity per capita rises, so does the final price that is agreed upon in the bargaining exercise. Figure 1b looks at within variations. An increase in personal liquidity from 2018 to 2019 is strongly associated with an increase in final transaction price.

Table 2 shows how per capita personal liquidity relates to bargaining outcomes in a regression framework. Pooling our 2018 and 2019 data, we use the following specification:

$$Y_{i,t} = \alpha + \beta \cdot L_{i,t} + \delta \cdot S'_{i,t} + \mu \cdot X'_{i,t} + \theta_i + \epsilon_{i,t}$$

where $Y_{i,t}$ is the bargaining behavior outcome of interest and $L_{i,t}$ is the z-score for personal liquidity for respondent i in year t . The vectors of controls, $S'_{i,t}$ (survey characteristics)²⁶, θ_i (firm fixed effect), $X'_{i,t}$ (time varying characteristics), are stepped in progressively moving from left to right in the table. $X'_{i,t}$ includes the following: if the garment business is the firm owners primary income source, firm owner’s percent contribution to the household income, ratio of wage earners within the household, household income per capita, firm profits last month, number of orders possible in next 7 days, firm profits expected next week, number of orders in the last 7 days, total expenses in the

²⁴To help respondents better internalize the value of each bean, we handed them their initial randomized endowment first in beans that they then handed back to the enumerator in exchange for cash prior to commencing the game.

²⁵The upper tail of per capita personal liquidity is winsorized at the 1% level, to alleviate concerns of outliers driving the results. Results are similar if per capita personal liquidity is winsorized at the 5% level.

²⁶ $S'_{i,t}$ is a vector of survey characteristics that includes the day of the survey and whether a student was present for the survey of respondent i in year t , as well as a fixed effect for year t .

last 7 days, firm owner beliefs about prices paid to other sellers, and delivered garment quality.²⁷ Standard errors are clustered at the firm level.

Column 1 of Table 2 shows that, when only survey characteristics are included, a one standard deviation increase in per capita personal liquidity is associated with a 0.78GHC increase in final transaction price, significant at the 1% level. As the average price for a child’s shirt is 15.80 GHC in our sample, this represents an $\sim 5\%$ increase in final price with one standard deviation increase in personal liquidity. A similar result holds for other bargaining outcomes - those with higher personal liquidity asked for higher first price and bargained for a larger number of rounds.²⁸

A 5% difference in prices may add up to larger inequalities in firm growth trajectory. One might suppose that a difference of 5% markup per product yields a 5% difference in all markups. With average monthly profits in our sample being 336GHC, that could translate into an average difference of around ~ 20 GHC in owner income per month. To put 20GHC in perspective, the cost of an extra apprentice’s monthly wages, for example, is ~ 40 GHC.²⁹

One potential concern is that the relationship observed between personal liquidity and bargaining behavior is driven by time-invariant unobservables. For example, a seller who is a good negotiator will receive higher prices in the bargaining exercise, as well as reaping higher profits in past transactions leading to a higher level of savings.³⁰ To address this, Table 2 Column 2 reports our main coefficient of interest after including firm owner fixed effects to isolate within firm variation. Even with these fixed effects, a one standard deviation increase in personal liquidity per-capita is associated with a 0.81 GHC increase in final price, significant at the 1% level. The number of rounds during the bargaining exercise is also significantly associated with personal liquidity per capita, however the first price offered by the firm owner is not.³¹ Taken together, these results show reasonably strong evidence that a change in an individual’s personal liquidity over the course of a year influences how that individual bargains and the ultimate surplus enjoyed.

²⁷Household income per capita, firm profits and the z-score for personal liquidity are winsorized at the top one percent.

²⁸Since the enumerators followed a bargaining script that included fixed price thresholds, final price and number of rounds are highly correlated.

²⁹Hardy and McCasland (2015) find that the average apprentice wage in 2015 was 20GHC. Inflated to 2018 exchange rates that is estimated to be ~ 40 GHC.

³⁰This explanation is consistent with results found in Fiala (2015): in a bargaining experiment over an imaginary good, rents participants reaped as buyers are positively correlated with long-term individual wealth.

³¹It is unsurprising that sellers may not change how they start their negotiation from year-to-year, as buyers do not usually walk away after just an initial price in this context.

Another concern lies in the potential for time-varying characteristics of the firm owner, household, or firm to drive both variation in bargaining behavior as well as variation in personal liquidity per capita. For example, a garment maker could have accumulated more savings over the past year because they have significantly improved the quality of their work. This also allows them to charge a higher price. Column 3 includes time-varying proxies for firm owner’s personal financial situation, outside options, firm productivity, production costs, price information, and garment quality. When all covariates are included, a one standard deviation increase in personal liquidity per-capita is associated with a 0.69GHC increase in final price, significant at the 1% level. This robust relationship indicates that, even when controlling for a plethora of potential confounding time-varying characteristics, the level of financial need of the seller is strongly and significantly associated with the final price agreed upon for the transaction.³²

It is still possible that we might observe the results in Table 2 due to some time varying firm or owner characteristic that remains unobserved. A key unobservable of interest is the firm owners opportunity cost. Although column 3 includes a myriad of potential proximate measures, this is an abstract concept that is difficult to pin down with a specific measurable characteristic. The desire to rule out opportunity cost as a confounding mechanisms is a key motivation for the bargaining experiment described above. Our experimental findings in the next section corroborate our panel results on the relationship between wealth and bargaining behavior.

4.2 Experimental Findings

Recall that we randomized payments to participants and therefore generated random small variations in endowment prior to having the firm owner bargain with a tablet. This abstracts away from opportunity cost and other individual and firm characteristics related to garment making. Instead, the experiment arguably focuses more directly on just the act of negotiation over division of surplus.

Table 3 reports the estimated causal impact of a 20GHC increase in a respondents wealth immediately prior to the bargaining game on the final price agreed upon with the tablet. As shown in column 1, this increase in wealth is associated with a 0.92GHC increase in final price, significant

³²Our results are not driven by selection into the sample. Appendix Table A.5 shows that per-capita personal liquidity is not significantly associated with whether or not the garment maker delivered the final product. This lack of association also holds when reason for refusal to bargain is delineated.

at the 10% level. We interpret this finding as causal evidence of a direct relationship between the amount of money a microentrepreneur has and how they bargain.

Note that this pooled impact estimate obscures a large difference in impact between day 1 and day 2. As shown in Column 2, this increase in wealth is associated with a 1.48GHC increase in final price on Day 1, significant at the 5% level. As shown in Column 3, this positive and significant relationship disappears after the first day of data collection. This disappearance of the effect is unlikely to be explained by sample differences across the two days, as intended survey timing was randomized and baseline characteristics appear balanced across the two days.³³ This, instead, could be a result of contamination of the control group between day 1 and day 2 of the experiment.³⁴

Figure 2 provides empirical evidence for this spillover hypothesis. On day 1 of the survey, the higher endowment group negotiates an average price of 13.79GHC, while the lower endowment group negotiates a price of 12.31GHC. By day 2, both groups have increased their final price, with the higher endowment group now negotiating an average price of 14.87GHC and the lower endowment group having completely “caught-up” at an average final price of 14.80GHC. This pattern is consistent with the spread of information about the tablet’s reservation price and contamination of treatment groups.

4.3 Potential Mechanisms

Why do we observe such a strong and robust relationship between wealth and bargaining behavior? A natural initial intuition for our empirical findings is an application of the canonical non-cooperative bargaining framework to include non-risk-neutral preferences along with a variable initial endowment of the seller. Even though firms are often modelled as profit-maximizing and risk-neutral, and households as risk-averse, this extension is natural as microenterprises in a developing country often employ only one person (the owner herself/himself). In this way, these businesses are closely tied with the individual entrepreneurs.³⁵

If preferences are risk neutral, then sellers of all levels of liquidity will transact at the same price.

³³See appendix table A.2.

³⁴As suggested by previous work in this same sampling context, Hardy and McCasland (2016), word could spread quickly about what was arguably a large deviation from normal life of a garment maker (the negotiation of a surplus with a tablet).

³⁵From anecdotal evidence (for example, see Karlan, Knight and Udry (2015)), microenterprises in developing countries act more as an individual than the broadly defined firm.

However, with higher levels of risk-aversion, all sellers receive lower prices and sellers with lower endowment receive relatively lower prices. The insight here is that financial need and bargaining behavior will be linked if the sellers have preferences with a sufficient degree of prudence. Kimball (1990) first coined this term studying precautionary savings. The concept is related to the third derivative of a seller's utility function. A concave function f exhibiting prudence has the property that $f'''(x) > 0$. This is satisfied, for example, by CRRA preferences with its property of decreasing absolute risk aversion.

Intuitively, sellers with less cash on hand and therefore lack of financial means sell at lower prices because a bargaining breakdown is more costly for them than wealthier sellers. Therefore, poorer sellers are willing to accept lower price offers from buyers to secure the sale. This, in turn, forces the sellers to offer and accept lower prices in the bargaining game equilibrium. A similar concept applies to consumption-saving and investment decisions, and here we can use it to understand the strategic decision when the seller interacts with a potential customer. We formalize this intuition in Appendix A.

There are other potential mechanisms that could drive a relationship between initial endowment and final price. One possible mechanism is through aspirations. Financial need and wealth have direct psychological effects on choices. Genicot and Ray (2017), for example, provides a theoretical framework for the link between poverty and aspirations. If poorer sellers have lower reference price than rich sellers, possibly due to different past experiences and/or peer groups, the same relationship between personal liquidity and final price would hold.

Subsistence consumption is another mechanism through which non-homothetic preferences and heterogeneity in financial need lead to different bargaining behavior among sellers. This need for a minimum level of consumption \underline{c} with borrowing constraint could generate similar result even for a risk-neutral seller: a seller who is desperate in meeting \underline{c} will reap lower surplus in order to secure the transaction.

These mechanisms could work simultaneously to lead to the same relationship. All of these results highlight the relevance of individual and household characteristics in price-setting of microenterprises.

5 Conclusion

Bargaining is a daily necessity in the lives of the world’s poor. In developing countries, where socio-economic status of individuals is a key focus of researchers and policy makers, the initial endowment of buyers and sellers may be, through an impact on bargaining behavior, a key determinant of one’s wages, consumption, and overall livelihood. This variation in initial endowment may be equally important in explaining firm behavior in the context of microenterprises in developing countries, where the firm and the individual are closely linked.

This paper provides a first set of empirical evidence that the personal wealth of a microentrepreneur predicts that microentrepreneur’s bargaining behavior in an economically meaningful and statistically significant way. Namely, better endowed sellers negotiate higher final prices, both during real price-bargaining exercises and during a computer-bargaining experiment. Not only is this empirical relationship robust to a multitude of controls and research designs, it is economically significant.

Our work documents the existence of a potential poverty multiplier in strategic interactions. We know from the vast literature in occupational choice and employment³⁶ that poor people have to choose working for others over becoming entrepreneurs and are at higher risk of becoming involuntarily unemployed. Furthermore, even after securing employment, being poor may also affect productivity.³⁷ Our findings suggest that, even conditional on owning a business, lower wealth individuals may be bargaining their way into a lower surplus.

Our paper focuses on bargaining as it is the method of transactions for microentrepreneurs in most markets in developing countries. However, the insights are not limited to this particular pricing mechanism. In other markets where prices are set by sellers beforehand, poor sellers could be similarly disadvantaged as they face a similar trade-off. This implies that an exogenously-determined fixed price imposed by market or government regulations (such as a fixed taxi fare) will have distributional consequences and may benefit poorer sellers more. Further research is needed in both theory and empirical work to better untangle the various mechanisms leading to this potentially meaningful contributor to the profits of microenterpreneurs. This lower surplus

³⁶See, for example, Banerjee and Newman (1993) and Dasgupta and Ray (1986).

³⁷For example, Kaur et al. (2020) find that workers with more cash on hand are more productive under a piece-rate setting.

may leave poorer bargainers relatively poorer than richer bargainers, a cycle likely to perpetuate inequality in the developing country context. Understanding how this bargaining gap can be closed may be key to mitigating inequality in the developing world.

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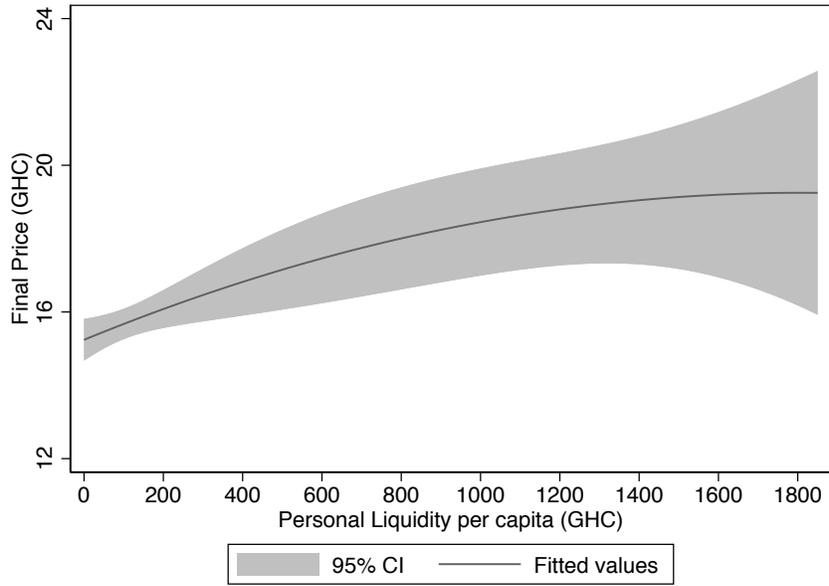
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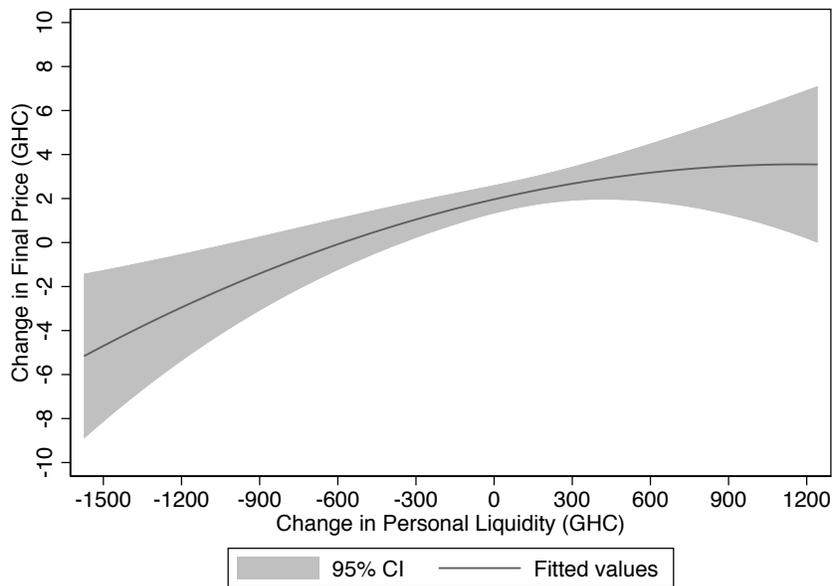
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Figure 1: Relationship between final price and personal liquidity



(a) Final Price by personal liquidity per capita

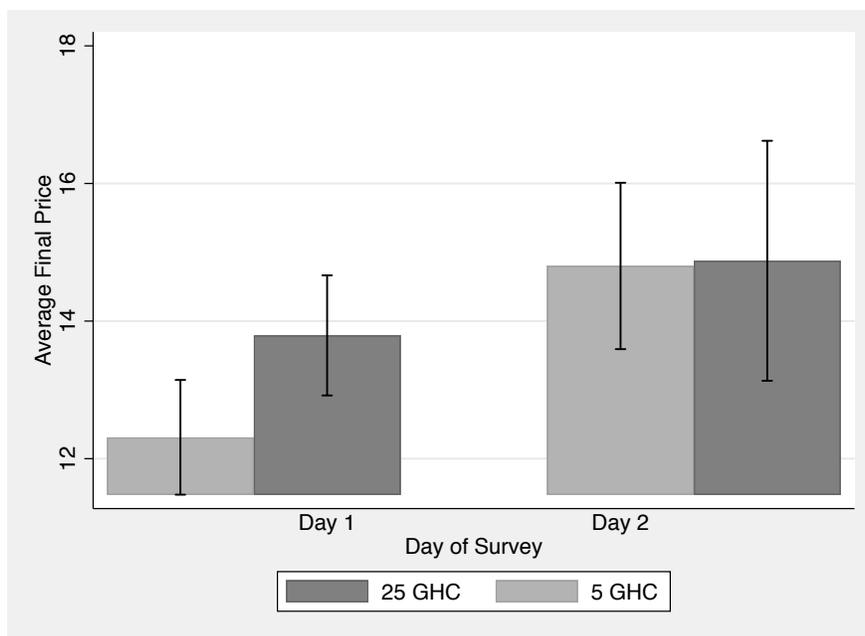
This figure shows the relationship between personal liquidity per capita and final price. Personal liquidity per capita is winsorized at the 1% level.



(b) Change in Final Price by Change in personal liquidity per capita

This figure shows the relationship between change in personal liquidity per capita and the change in final price across two years. Personal liquidity per capita is winsorized at the 1% level.

Figure 2: Final Price in Bargaining Game by Survey Day and Random Endowment



This figure graphs the average final price in the experimental game played by the firm owner and tablet by day of the survey and randomized initial endowment amount.

Table 1: Summary Statistics

This table reports the mean and standard deviation of bargaining behavior outcomes and time varying controls of each microenterprise in the final sample that was surveyed and delivered a garment both years. Column 1 pools together both years, Column 2 and 3 are for 2018 and 2019. Column 4 shows the difference between the two years with the associated standard error clustered at the firm owner level.

	(1)	(2)	(3)	(4)
	Pooled	2018	2019	Diff
<i>Panel (a): Bargaining Outcomes</i>				
Final Price	15.84 (4.46)	14.92 (4.22)	16.76 (4.50)	1.85 (0.32)
First Price	20.00 (7.21)	18.79 (6.74)	21.20 (7.47)	2.41 (0.52)
Number of Rounds	2.64 (1.17)	2.42 (1.02)	2.85 (1.28)	0.43 (0.09)
<i>Panel (b): Time Varying Controls</i>				
Garment business is primary income	1.00 (0.07)	1.00 (0.00)	0.99 (0.09)	-0.01 (0.01)
Pct. contribution to HH income	0.54 (0.33)	0.55 (0.32)	0.54 (0.34)	-0.00 (0.03)
Ratio of wage earners within HH	0.38 (0.49)	0.37 (0.48)	0.40 (0.49)	0.03 (0.04)
HH income per capita	132.85 (145.17)	131.24 (156.34)	134.45 (133.40)	3.21 (11.38)
Number orders possible next 7 days	14.60 (13.49)	16.32 (15.19)	12.89 (11.31)	-3.43 (0.92)
Firm profits expected next week	90.50 (138.16)	80.22 (147.20)	100.78 (127.97)	20.56 (11.25)
Firm profits last month	336.59 (315.53)	350.49 (325.36)	322.70 (305.46)	-27.80 (20.67)
Number orders in last 7 days	5.07 (6.57)	4.90 (6.29)	5.25 (6.84)	0.36 (0.44)
Total expenses last 7 days	43.43 (70.90)	45.27 (78.03)	41.59 (63.09)	-3.69 (6.47)
Price you think others charge	19.05 (5.44)	17.99 (5.78)	20.11 (4.88)	2.11 (0.45)
Quality of garment (1-10)	5.32 (0.90)	5.19 (0.83)	5.45 (0.95)	0.25 (0.07)
Observations	458	229	229	458

Table 2: Relationship Between Real Bargaining Behavior and Personal Liquidity

This table reports the estimated relationship between personal liquidity and real bargaining behavior outcomes across our two years of data collection. Personal liquidity per capita is winsorized at the 1% level and is included as a z-score. All standard errors are clustered at the firm-level. Survey controls include whether or not a student from NYU Abu Dhabi was present, the day the survey was completed, and year of survey. Time varying controls include the following: whether firm profit is his/her primary source of income, if firm owner earns over 50% of household income, wage earners ratio within the household, per capita household income winsorized at the top 1%, number of orders firm has had in last 7 days, firm profits in the last month, the number of orders the firm could handle in the next 7 days, and estimated profits in the next 7 days, total expenses for the firm in the last 7 days winsorized at the top 1%, garment quality on a scale from 0-10, and price that the firm owner thinks other firms are charging for the same garment. The average final price agreed upon was 15.8GHC, the average first price given by the firm owner was 20GHC, and the average number of rounds was 2.6.

	(1)	(2)	(3)
		<u>Final Price</u>	
Z-score of personal liquidity per capita	0.783 (0.170)	0.813 (0.233)	0.689 (0.237)
		<u>First Price</u>	
Z-score of personal liquidity per capita	0.850 (0.284)	0.571 (0.395)	0.347 (0.404)
		<u>Number of Rounds</u>	
Z-score of personal liquidity per capita	0.195 (0.0414)	0.181 (0.0632)	0.153 (0.0645)
Survey Controls	YES	YES	YES
Firm Fixed Effects	NO	YES	YES
Time Varying Controls	NO	NO	YES
Number of Observations	458	458	458

Standard errors in parentheses

Table 3: Impact of Randomized Endowment on Experiment Bargaining Behavior

This table reports the estimated impact of receiving a higher random endowment amount on experiment bargaining behavior outcomes. Column 1 reports average estimated impacts across all days of data collection. Columns 2 and 3 report within day impacts. All standard errors are clustered at the firm-level.

	(1)	(2)	(3)
	All Days	Day 1	Day 2
	<u>Final Price</u>		
25 GHC Payment	0.92 (0.55)	1.48 (0.61)	0.08 (1.05)
Constant	13.26 (0.36)	12.31 (0.42)	14.80 (0.60)
	<u>First Price</u>		
25 GHC Payment	1.19 (0.67)	1.95 (0.81)	-0.00 (1.15)
Constant	17.45 (0.46)	16.56 (0.55)	18.91 (0.79)
	<u>Number of Rounds</u>		
25 GHC Payment	0.21 (0.14)	0.28 (0.14)	0.11 (0.28)
Constant	2.02 (0.09)	1.81 (0.09)	2.38 (0.16)
Observations	229	144	85

Standard errors in parentheses

A Theoretical Framework Appendix

This section outlines one possible mechanism through which we could observe a relationship between a seller's personal liquidity and final price from bargaining.

A.1 Set-up

Suppose sellers and buyers bargain over the price of a good after being matched randomly. Let p be the transaction price, $v > 0$ the buyer's valuation, and w the level of seller's personal liquidity, i.e. the seller's initial endowment.

If the buyer and seller reach an agreement, the seller receives price p from the transaction and achieves consumption $c = w + p$. If they cannot agree to a price, the seller consumes her initial endowment $c = w$. The buyer's disagreement payoff is normalized to be 0. We assume that the seller has utility function $u(c)$, concave in consumption c and exhibit prudence, with $u'(c) \geq 0$, $u''(c) \leq 0$ and $u'''(c) \geq 0$. An example of such a utility function is CRRA, which has the property that as c increases, agent's absolute risk aversion decreases.

The timing of the game is as follows:

- At time 1, seller proposes price p_1 . If buyer accepts, then buyer's payoff is $v - p_1$ and seller's payoff is $u(p_1 + w) - u(w)$.
- If no agreement is reached at time 0, there is a cost of delay: the game ends with probability $1 - \delta$.³⁸ With probability δ , the buyer gets to make an offer of price p_2 , to which seller can respond.
- The game continues, with buyers and sellers make alternating offers, until either an offer is accepted or bargaining breaks down exogenously.

A.2 Subgame Perfect Equilibrium

With a direct application of results in Rubinstein (1982) and the analysis with risk aversion in Roth (1989), we have the buyer's indifference condition Equation 1 and the seller's indifference condition

³⁸Under our setting, price offers are made quickly and it is hard to justify impatience as the cost of delay. Instead, the cost of delay can be interpreted as arising from exogenous breakdown in each round, following Binmore, Rubinstein and Wolinsky (1986).

Equation 2:

$$v - p_1 = \delta(v - p_2) \quad (1)$$

$$u(p_2 + w) - u(w) = \delta(u(p_1 + w) - u(w)) \quad (2)$$

These conditions ensure that the seller (buyer) is indifferent between accepting the equilibrium offer from the buyer (seller) or receiving their own equilibrium offer in the next period.

Combining equations 1 and 2, the subgame perfect equilibrium can be characterized by price p^* that satisfies:

$$u(v - (v - p^*)/\delta + w) - u(w) = \delta(u(p^* + w) - u(w)) \quad (3)$$

In other words, the unique subgame perfect equilibrium is such that the seller offers $p_1 = p^*$ and buyer would make an offer of $p_2 = v - (v - p_1)/\delta$, but accepts the seller's offer immediately.

A.3 Sellers with Constant Relative Risk Aversion

For a clear example, we assume sellers have CRRA preferences, $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$, equation (3) now becomes:

$$(v - (v - p^*)/\delta + w)^{1-\sigma} - w^{1-\sigma} = \delta((p^* + w)^{1-\sigma} - w^{1-\sigma}) \quad (4)$$

The value of σ is a measure of relative risk aversion. For $\sigma = 0$, the agent is risk-neutral. For all values of $\sigma > 0$, the agent is risk-averse, with higher values representing greater relative risk aversion.

Implicitly differentiating (3) and re-arranging, we get:

$$\frac{dp^*}{dw} = \frac{\delta u'(p^* + w) + (1 - \delta)u'(w) - u'(v - (v - p^*)/\delta + w)}{u'(v - (v - p^*)/\delta + w) - \delta u'(p^* + w)} \quad (5)$$

Because $v - (v - p^*)/\delta \leq p^*$ for $\delta \leq 1$ and u is concave, we have a positive denominator.

With CRRA preferences, the numerator of (5) is:

$$\delta(p^* + w)^{-\sigma} + (1 - \delta)w^{-\sigma} - (v - (v - p^*)/\delta + w)^{-\sigma} \quad (6)$$

Combining (4) and (6), and noting that $x^{-\sigma}$ is more convex³⁹ than $x^{1-\sigma}$, we have $\frac{dp}{dw} \geq 0$.

We plot 4 values of RRA in Figure A.1. If the seller is risk-neutral, then financial need is not relevant and sellers at all levels of liquidity will transact at the same price. With higher levels of risk-aversion, sellers receive lower price and low w sellers receive relatively lower prices.

A.4 Discussion

Intuitively, the expression $u(p + w) - u(w)$ represents the difference between the seller payoff and outside option, where we take into consideration financial need explicitly through the parameter w for liquidity. This parameter enters in both the bargaining outcome and the outside option, different from just an outside option.

The buyer's utility function is represented as the difference between valuation and price. This simplifying assumption that buyers are risk-neutral is made to focus on seller business and household characteristics and understand their implications for microenterprise owners.⁴⁰ We could extend the model to risk-averse buyers, buyers with non-zero disagreement payoff, or introduce buyer heterogeneity. These extensions do not change our main theoretical prediction about the bargaining behavior of sellers under full information.⁴¹

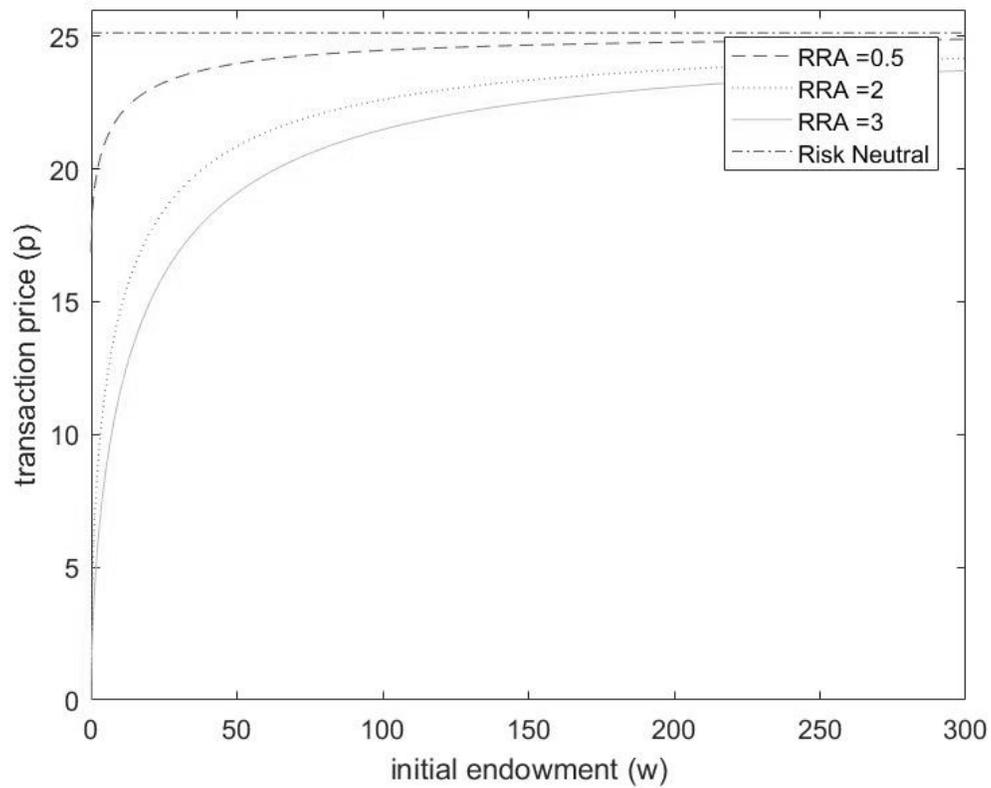
Note that we can also derive a similar relationship between financial need and bargaining behavior from a static model with Nash bargaining solution. This axiomatic approach would allow us to abstract from the particular details of the bargaining protocol, but the non-cooperative bargaining model above better highlights the trade-offs faced by sellers of different financial needs and the strategic interaction between the players.

³⁹Another way to think about this is to consider certainty equivalent: the convex combination of $(p^* + w)^{-\sigma}$ and $w^{-\sigma}$ is equal to the value of $x^{-\sigma}$ at the certainty equivalent, let's say, z . By equation (4), if $v - (v - p)/\delta + w$ is the certainty equivalent of a less convex function $x^{1-\sigma}$, it must be larger than z . So we have $\delta(p^* + w)^{-\sigma} + (1 - \delta)w^{-\sigma} - (z + w)^{-\sigma} = 0$. Since the function $x^{-\sigma}$ is decreasing in x , it must be that $\delta(p^* + w)^{-\sigma} + (1 - \delta)w^{-\sigma} - (v - (v - p^*)/\delta + w)^{-\sigma} \geq 0$.

⁴⁰It is well-established in the literature that risk aversion is disadvantageous for bargaining with riskless outcomes (see Kihlstrom and Schmeidler (1981) and Kannai (1977)). However our results compare among sellers, not between seller and buyer.

⁴¹Our model predicts that there is no delay in bargaining. Extensions that include incomplete information could potentially lead to delay. See Kennan and Wilson (1990) and Kennan and Wilson (1993) for much more thorough discussions.

Figure A.1: Price and Liquidity for Different Relative Risk Aversion



This figure graphs the relationship between liquidity and transaction price according to our bargaining model, varying the levels of Relative Risk Aversion.

B Supplementary Tables and Figures Appendix

Figure A.2: Survey Protocols

This figure depicts the paper training materials for surveyors. Subfigure (a) was memorized by surveyors in order to hit various price points in response to seller offers while bargaining naturally. Sub-figure (b) was used as a training mechanism for surveyors to understand the tablet bargaining system. However, in practice, the tablet would determine responses to seller offers and the surveyor was responsible only for game introduction and then facilitation of tablet and seller interactions.

OE. ORDER EXERCISE	
<p>Now, I would like to discuss the possibility of making a purchase from you today. New York University is interested in purchasing some children's clothing. Specifically, we would like you to sew for us a child's shirt. I would need this garment made by no later than Friday morning. I leave town on Friday morning and cannot collect the shirt and make the payment after this time.</p>	
<p>Bargaining worksheet:</p> <p>A. <input type="checkbox"/> <input type="checkbox"/> GHC (First price: "At what price would you be willing to sew a shirt for us?")</p> <p>B. <input type="checkbox"/> <input type="checkbox"/> GHC (If > 10GHC: "Would you be willing to sew the shirt for 10 GHC?")</p> <p>C. <input type="checkbox"/> <input type="checkbox"/> GHC (If > 15GHC: "Would you be willing to sew the shirt for 15 GHC?")</p> <p>D. <input type="checkbox"/> <input type="checkbox"/> GHC (If > 20GHC: "Would you be willing to sew the shirt for 20 GHC?")</p> <p>E. <input type="checkbox"/> <input type="checkbox"/> GHC (If > 22GHC: "Would you be willing to sew the shirt for 22 GHC?")</p> <p>F. <input type="checkbox"/> <input type="checkbox"/> GHC (If > 25GHC: "Would you be willing to sew the shirt for 25 GHC?")</p> <p>G. <input type="checkbox"/> <input type="checkbox"/> GHC (If > 30GHC: "Would you be willing to sew the shirt for 30 GHC?")</p> <p>Did you agree upon a price?</p> <p>H.</p> <p>I. <input type="checkbox"/> <input type="checkbox"/> GHC (Final price: Write the final price agreed upon. It must be <=30GHC.)</p>	<p>AN. If no first price, why not?:</p> <p>1. <input type="checkbox"/> Business too busy</p> <p>2. <input type="checkbox"/> Personal Reason</p> <p>3. <input type="checkbox"/> Other</p> <p>1. <input type="checkbox"/> YES</p> <p>2. <input type="checkbox"/> NO</p>
<p>SURVEYOR: If firm owner has agreed to sew the garment before Friday morning, deposit the fabric and measurements.</p>	

(a) Ordering Exercise

BG. Bargaining Game	
<p>Now we are going to play our first game. In this game, you need to bargain with the computer over a "price", which determines how 30GHC will be divided between you and the computer. The "price" you offer indicates how much of the 30GHC you are proposing to keep for yourself. The computer has been programmed to behave like a buyer, bargaining with you over the price of a garment. Just like a real customer bargaining, the computer tries to minimize the "price" to be paid and has a fixed value (between 1 and 30), under which the computer will never accept your offer. It is always possible that the game ends before you reach an agreement, in which case neither you nor the computer will receive any of the 30GHC. This game is being played for real money, if you and the computer are able to agree on a "price", we will give you that money.</p> <p>SURVEYOR - USE THE BEANS AND BOWLS TO SHOW THE RESPONDENT HOW MUCH MONEY THEY WOULD BE GETTING AND HOW MUCH COMPUTER WOULD GET.</p>	
<p>A. Do you understand the instructions for the game? Surveyor: If 'No,' answer any questions</p> <p>B. What initial amount would you like to offer the computer? If amount to computer >=20, then computer accepts Congratulations your price offer was accepted. You will receive (Price in A). End Game. If amount to computer <20, then computer rejects offer The computer rejects your offer. But they are counter-offering 10GHC to you, and 20 GHC to the computer. Do you accept this offer?</p> <p>C. If you do not accept, what is your counter offer? If amount to computer >=15, then computer accepts Congratulations your price offer was accepted. You will receive (Price in C). End Game. If amount to computer <15, then computer rejects offer The computer rejects your price. But they are counter-offering 15 GHC to you, and 15 GHC to the computer. Do you accept this offer?</p> <p>D. If you do not accept, what is your counter offer? If amount to computer >=10, then computer accepts Congratulations your price offer was accepted. You will receive (Price in D). End Game. If amount to computer <10, then computer rejects offer The computer rejects your price. But they are counter-offering 20 GHC to you, and 10 GHC to the computer. Do you accept this offer?</p> <p>E. If you do not accept, what is your counter offer? If amount to computer >=8, then computer accepts Congratulations your price offer was accepted. You will receive (Price in E). End Game. If amount to computer <8, then computer rejects offer The computer rejects your price. But they are counter-offering 22 GHC to you, and 8 GHC to the computer. Do you accept this offer?</p> <p>F. If you do not accept, what is your counter offer? If amount to computer >=5, then computer accepts Congratulations your price offer was accepted. You will receive (Price in F). End Game. If amount to computer <5, then computer rejects offer The computer rejects your price. But they are counter-offering 25 GHC to you, and 5 GHC to the computer. Do you accept this offer?</p> <p>G. If you do not accept, what is your counter offer? If amount to computer >=0, then computer accepts Congratulations your price offer was accepted. You will receive (Price in G). End Game.</p>	<p>1. <input type="checkbox"/> YES</p> <p>2. <input type="checkbox"/> NO</p> <p><input type="checkbox"/> GHC to Seller <input type="checkbox"/> GHC to Computer</p> <p>1. <input type="checkbox"/> YES</p> <p>2. <input type="checkbox"/> NO</p> <p><input type="checkbox"/> GHC to Seller <input type="checkbox"/> GHC to Computer</p> <p>1. <input type="checkbox"/> YES</p> <p>2. <input type="checkbox"/> NO</p> <p><input type="checkbox"/> GHC to Seller <input type="checkbox"/> GHC to Computer</p> <p>1. <input type="checkbox"/> YES</p> <p>2. <input type="checkbox"/> NO</p> <p><input type="checkbox"/> GHC to Seller <input type="checkbox"/> GHC to Computer</p> <p>1. <input type="checkbox"/> YES</p> <p>2. <input type="checkbox"/> NO</p> <p><input type="checkbox"/> GHC to Seller <input type="checkbox"/> GHC to Computer</p>

(b) Bargaining Game with Computer

Table A.1: Attrition

This table reports baseline characteristics collected in 2014 for the three samples of interest. The mean is reported followed by the standard deviation in parentheses. Profits are adjusted to their January 2018 value. Column one includes all firms in operation during both years of data collection 2018 and 2019, Column two includes all firms surveyed in both years of data collection, and Column three includes only those firms surveyed in both years who also delivered a child's shirt in both years. Columns 4 and 5 display the differences between the samples.

	(1)	(2)	(3)	(4)	(5)
	Firm in Operation during Panel	Firm Surveyed Both Years	Delivered Garment Both Years	Diff (1) - (2)	Diff (2) - (3)
Male	0.23 (0.42)	0.25 (0.43)	0.25 (0.44)	-0.02 (0.03)	0.00 (0.04)
Age of garment maker	35.80 (9.09)	35.87 (8.67)	35.53 (8.13)	-0.07 (0.70)	-0.33 (0.75)
Years of schooling	8.85 (2.30)	8.86 (2.24)	8.89 (2.24)	-0.01 (0.18)	0.03 (0.20)
Ravens Score (correct out of 12)	5.66 (2.69)	5.55 (2.66)	5.56 (2.74)	0.11 (0.21)	0.01 (0.24)
Ethnic group is Ewe	0.75 (0.43)	0.76 (0.43)	0.77 (0.42)	-0.01 (0.03)	0.01 (0.04)
Married or living with partner	0.73 (0.45)	0.73 (0.45)	0.76 (0.43)	0.00 (0.04)	0.03 (0.04)
Had a least one child	0.85 (0.36)	0.85 (0.36)	0.86 (0.35)	-0.01 (0.03)	0.01 (0.03)
Age of business	9.68 (7.92)	9.71 (7.72)	9.20 (6.73)	-0.02 (0.62)	-0.51 (0.64)
Profits last month	274.81 (301.81)	288.68 (319.80)	293.94 (333.68)	-13.87 (24.61)	5.25 (29.13)
Firm has paid workers	0.04 (0.20)	0.03 (0.18)	0.03 (0.16)	0.01 (0.01)	-0.01 (0.01)
Number of baseline contacts	4.84 (4.04)	5.21 (4.18)	5.11 (4.02)	-0.38 (0.32)	-0.10 (0.36)
Observations	375	282	229		

Table A.2: Experimental Bargaining Game Balance by Survey Day

This table reports baseline characteristics collected in 2014 by Day 1 or Day 2 of the survey. The mean is reported followed by the standard deviation in parentheses. Profits are adjusted to their January 2018 value.

	Day 1	Day 2	Diff
Male	0.24 (0.43)	0.27 (0.45)	-0.03 (0.06)
Age of garment maker	35.61 (7.81)	35.39 (8.69)	0.22 (1.14)
Years of schooling	8.98 (2.21)	8.72 (2.28)	0.26 (0.31)
Ravens Score (correct out of 12)	5.76 (2.76)	5.22 (2.69)	0.53 (0.37)
Ethnic group is Ewe	0.81 (0.40)	0.72 (0.45)	0.09 (0.06)
Married or living with partner	0.74 (0.44)	0.78 (0.42)	-0.03 (0.06)
Had a least one child	0.87 (0.34)	0.85 (0.36)	0.02 (0.05)
Age of business	8.73 (6.11)	9.98 (7.64)	-1.25 (0.97)
Profits last month	278.31 (295.98)	320.40 (389.81)	-42.09 (48.90)
Firm has paid workers	0.03 (0.16)	0.02 (0.15)	0.00 (0.02)
Number of baseline contacts	5.00 (3.55)	5.29 (4.73)	-0.28 (0.59)
Observations	144	85	229

Table A.3: Summary Statistics on Sample of Firms Surveyed in Both Years

This table reports the mean and standard deviation of bargaining behavior outcomes and time varying controls of each microenterprise in the sample that was surveyed both years. Column 1 pools together both years, Column 2 and 3 are for 2018 and 2019. Column 4 shows the difference between the two years with the associated standard error clustered at the firm owner level. Note that quality of garment is missing for those who did not deliver a garment.

	(1)	(2)	(3)	(4)
	Pooled	2018	2019	Diff
<i>Panel (a): Bargaining Outcomes</i>				
Final Price	15.88 (4.31)	15.07 (4.09)	16.69 (4.38)	1.62 (0.28)
First Price	20.18 (7.53)	18.90 (7.23)	21.43 (7.61)	2.53 (0.54)
Number of Rounds	2.51 (1.26)	2.40 (1.02)	2.62 (1.46)	0.22 (0.09)
<i>Panel (b): Time Varying Controls</i>				
Garment business is primary income	0.99 (0.07)	1.00 (0.06)	0.99 (0.08)	-0.00 (0.01)
Pct. contribution to HH income	0.56 (0.34)	0.56 (0.32)	0.56 (0.35)	-0.00 (0.03)
Ratio of wage earners within HH	0.37 (0.48)	0.37 (0.48)	0.37 (0.48)	0.00 (0.04)
HH income per capita	133.73 (142.79)	134.53 (155.19)	132.94 (129.48)	-1.59 (10.13)
Number orders possible next 7 days	14.27 (13.13)	15.89 (14.38)	12.65 (11.55)	-3.24 (0.83)
Firm profits expected next week	85.42 (135.55)	76.42 (137.93)	94.42 (132.75)	18.00 (9.96)
Firm profits last month	327.94 (321.88)	344.80 (333.73)	311.09 (309.25)	-33.71 (18.67)
Number orders in last 7 days	4.77 (6.71)	4.59 (6.07)	4.96 (7.29)	0.38 (0.42)
Total expenses last 7 days	40.49 (66.61)	42.40 (72.24)	38.58 (60.52)	-3.82 (5.39)
Price you think others charge	18.93 (5.50)	17.79 (5.76)	20.07 (4.99)	2.28 (0.41)
Quality of garment (1-10)	5.32 (0.90)	5.17 (0.85)	5.46 (0.94)	0.28 (0.07)
Observations	564	282	282	564

Table A.4: Experimental Bargaining Game Balance by Random Endowment

This table reports baseline characteristics collected in 2014 by the two random endowment amounts received in the experimental bargaining game. The mean is reported followed by the standard deviation in parentheses. Profits are adjusted to their January 2018 value.

	5 GHC	25 GHC	Diff
Male	0.24 (0.43)	0.27 (0.44)	0.03 (0.06)
Age of garment maker	34.73 (7.61)	36.31 (8.57)	1.58 (1.07)
Years of schooling	8.79 (2.24)	8.98 (2.24)	0.20 (0.30)
Ravens Score (correct out of 12)	5.25 (2.72)	5.86 (2.73)	0.61 (0.36)
Ethnic group is Ewe	0.80 (0.40)	0.75 (0.43)	-0.05 (0.06)
Married or living with partner in 2014	0.74 (0.44)	0.77 (0.42)	0.02 (0.06)
Had a least one child in 2014	0.85 (0.36)	0.87 (0.34)	0.02 (0.05)
Age of business	9.28 (6.94)	9.11 (6.54)	-0.17 (0.89)
Profits last month	307.48 (375.71)	280.74 (287.94)	-26.74 (44.32)
Firm has paid workers	0.03 (0.16)	0.03 (0.16)	-0.00 (0.02)
Number of baseline contacts	5.19 (4.22)	5.03 (3.83)	-0.16 (0.53)
Observations	113	116	229

Table A.5: Relationship Between Personal Liquidity and Garment Completion

This table reports the estimated relationship between personal liquidity and garment completion across our two years of data collection for the sample of firms that were surveyed in both years. Personal liquidity per capita is winsorized at the 1% level and is included as a z-score. All standard errors are clustered at the firm-level. Survey controls include whether or not a student from NYU Abu Dhabi was present, the day the survey was completed, and year of survey. Time varying controls include the following: whether firm profit is his/her primary source of income, if firm owner earns over 50% of household income, wage earners ratio within the household, per capita household income winsorized at the top 1%, number of orders firm has had in last 7 days, firm profits in the last month, the number of orders the firm could handle in the next 7 days, and estimated profits in the next 7 days, total expenses for the firm in the last 7 days winsorized at the top 1%, and price that the firm owner thinks other firms are charging for the same garment. 89 percent of firm owners completed a garment.

	(1)	(2)	(3)
Z-score of personal liquidity per capita	0.00140 (0.00916)	0.00488 (0.0150)	-0.00220 (0.0157)
Survey Controls	YES	YES	YES
Firm Fixed Effects	NO	YES	YES
Time Varying Controls	NO	NO	YES
Observations	564	564	564

Standard errors in parentheses

Table A.6: Impact of Randomized Endowment on Experiment Bargaining Behavior with Controls

This table reports the estimated impact of receiving a higher random endowment amount on experiment bargaining behavior outcomes with the inclusion of in-balanced controls. Column 1 reports average estimated impacts across all days of data collection. Columns 2 and 3 report within day impacts. All standard errors are clustered at the firm-level.

	(1)	(2)	(3)
	All Days	Day 1	Day 2
	<u>Final Price</u>		
25 GHC Payment	1.00 (0.55)	1.49 (0.60)	0.40 (1.04)
Constant	12.50 (0.61)	12.20 (0.68)	12.46 (1.08)
	<u>First Price</u>		
25 GHC Payment	1.26 (0.68)	1.94 (0.82)	0.32 (1.14)
Constant	16.76 (0.84)	16.62 (1.03)	16.57 (1.37)
	<u>Number of Rounds</u>		
25 GHC Payment	0.23 (0.14)	0.28 (0.14)	0.19 (0.28)
Constant	1.86 (0.15)	1.79 (0.17)	1.82 (0.28)
Observations	229	144	85

Standard errors in parentheses