The Smoothing Value of Microenterprise: Evidence from Coffee Price Shocks in Tanzania*

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Abstract

Studies of entrepreneurship in the developing world have largely focused on understanding barriers to the expansion of existing microenterprises. Using data from a unique panel of coffee-farming households in Tanzania, we show that intermittent, low-capital entrepreneurial activity in fact plays an important, and hitherto ignored, role as a smoothing mechanism in response to shocks to agricultural revenues, the primary source of income for many households in this context. We first verify that negative shocks to the global coffee price significantly decrease farmgate coffee prices, quantities sold, farm revenues and, consequently, household expenditures on food and non-food items. We then show that entrepreneurial entry and time spent in self-enterprise and off-farm employment move counter-cyclically with the global coffee price. Our results suggest that even in the absence of financial market failures, "subsistence" microenterprise may exist in equilibrium due to its value as a smoothing mechanism.

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1 Introduction

A growing literature in economics has sought to understand what barriers prevent microenterprises from expanding and how these barriers may be alleviated. The implied supposition of this literature is that even the smallest entrepreneurs have the desire to expand into larger-scale firms, but are constrained by lack of access to financial, human or managerial capital. In this view, interventions that make capital of various types more accessible could facilitate development through small business growth. Recent studies have tested these hypotheses, providing evidence on the effects–or lack thereof–of microcredit, capital infusions, and training in business skills such as management and bookkeeping on the profits and output growth of small and medium enterprises.

For instance, in a field experiment in Sri Lanka, de Mel, McKenzie, and Woodruff (2008) find that the return to randomly provided capital amongst microenterprises is higher than the market interest rate and that these returns are even larger for high-ability entrepreneurs. Similarly, Burgess and Pande (2005) find that improved access to banking institutions (which, in theory, provide both credit and savings accounts) in rural India increased output in non-agricultural production. However, Dupas and Robinson (2011) provide experimental evidence from Kenya that access to institutional savings accounts alone can increase productive investments, independent of access to credit. Finally, Karlan and Zinman (2010) conduct an experiment in Manila which finds weak average effects of access to microcredit on profits and scale of production of microenterprises. Other recent experimental interventions have begun to explore the effects of training programs on the growth and success of microenterprises. For example, Karlan and Valdivia (2011) explore the incremental benefits to adding business training to microfinance interventions in Peru. They find no evidence of effects of business training on growth or profits.

In a complementary literature, recent studies have found mixed evidence of the effects

of improved access to microcredit on entrepreneurial entry. Crepon et al. (2011) find in Morocco that improved access to credit increased the scale of existing farm and livestock enterprises, but had no effect on the creation of new enterprises. Additionally, amongst non-entrepreneurial households, improved access to credit increased food consumption and durable expenditures. Similarly, Banerjee et al. (2010) find positive effects of access to credit on durable expenditure of entrepreneurial households and non-durable expenditure of non-entrepreneurial households. However, in this context, the results indicate large effects on entrepreneurial entry in the short-run. In a non-experimental evaluation of one of the largest scale government microfinance initiatives in the world ("Million Baht Village Fund" program), Kaboski and Townsend (2012) find no impact of improved access to credit on business starts.

These results could imply that a large fraction of owners of microenterprises in developing contexts are not looking for opportunities to grow their businesses. Along these lines, Schoar (2009) posits that entrepreneurs in the developing world can be roughly divided into two categories: "transformational" and "subsistence." The first category is made up of precisely the types of individuals described above: those with the ability and skills necessary to lead large-scale businesses, but who may lack the labor pool or financial resources necessary to expand to their desired capacity. The second category, the "subsistence" entrepreneurs, is made up of individuals who "run tiny operations that do not grow into larger firms but merely provide an alternative employment opportunity to the entrepreneur and potentially their family members" (Schoar 2009).

Schoar points to evidence that the subsistence category–specifically, small, low-growth, family-owned businesses–makes up the overwhelming majority of entrepreneurs in most developing country contexts. Moreover, she argues that very few firms transition successfully from subsistence to transformational enterprise. Given the recent, mixed evidence on the effects of capital infusions and management consulting on small-scale enterprise outcomes, it

is thus possible that the observed lack of growth beyond subsistence levels in certain types of microenterprises is not the result of market failures necessarily, but rather may be optimal. For example, it is likely that in addition to access to productive capital, entrepreneurs vary substantially in ability, preferences, and outside employment options. This variation may generate heterogeneity in business owners' objectives and, ultimately, their economic decisions and outcomes.

Given the prevalence and persistence of subsistence entrepreneurship, it is important to understand how, when and why these small-scale household businesses arise. In this study, we contribute to that understanding by showing that in primarily agricultural households, participation in microenterprise constitutes an important way to smooth negative shocks to profitability in the default (farm) sector. The smoothing value of low-capital enterprises may help to explain their existence, as well as the observed unwillingness of households to grow them into larger-scale businesses. Note many of the microfinance interventions discussed above, despite having found weak or confounding effects on business outcomes, have found strong, consistent effects on consumption, suggesting these households are in need of a consumption smoothing mechanism.

Specifically, we find that ownership and time spent in microenterprise in a sample of coffee farmers in Tanzania is strongly countercyclically related to global coffee prices. Agricultural commodity producers are important to study in this context for several reasons. First, the majority of the global supply of agricultural commodities is from small-holder farming households in low-income countries. Second, these farm households face substantial revenue uncertainty due to fluctuations in global commodity prices, and thus agricultural profitability shocks are salient for them. Third, in developing contexts in which labor markets are thin or nonexistent, off-farm wage employment is not a viable option when faced with low output prices. For all these reasons, microenterprise could play an important smoothing role for these households.

We match survey responses of prices, revenues, expenditures, and the labor activities of coffee farming households in a region of northwest Tanzania to the global coffee prices they faced in the last harvest. We begin by showing that the global price and the imputed farmgate price are strongly positively correlated, as are global prices and revenues from the sale of harvested coffee. We show that these revenue shifts generate substantial changes in household food and non-food expenditures.

Next, we study how global coffee prices affect household entry into the microenterprise sector, measured by ownership of businesses. We find that drops in the global coffee price significantly increase the probability of owning a business, but do not increase the number of businesses conditional on owning at least one. These results suggest that entry, the extensive margin of participation, is the salient margin.

We then corroborate the household-level results using individual-level data on participation in self-enterprise and other productive activities, as well as detailed time use data. We find that individuals are significantly more likely to be engaged in microenterprise both on the intensive and extensive margins. Dividing self-enterprise into types of businesses, we find that individuals are most likely to switch into merchant businesses, which are precisely the type of low capital enterprises described as falling in the "subsistence" category by Schoar (2009).

Finally, we emphasize the features of coffee farming that make it appealing in terms of unbiased identification of the effects of agricultural profitability on entrepreneurship. Our main worry in this panel data setting is that households react to coffee prices by changing their area under coffee or, in the extreme, make entry and exit decisions into and out of coffee farming based on the global price. We argue that for coffee farming, entry and exit are not salient issues, since coffee trees take at least three years to produce fruit, and by government regulation, cannot easily be uprooted. Moreover, we then verify in our data that global coffee price fluctuations did not change selection into the coffee grower sample, or affect the area

under coffee within the sample.

The remainder of the paper is organized as follows. Section **??** describes our data set and construction of important variables. Section **??** presents our empirical strategy and discusses its validity. Section **??** presents results from the empirical tests of the main predictions of the model. Finally, section **??** concludes.

2 Data

This study uses survey data from the Kagera region of Tanzania, an area west of Lake Victoria, and bordering Rwanda, Burundi and Uganda. Kagera is mostly rural and primarily engaged in producing bananas and coffee in the north, and rain-fed annual crops (maize, sorghum, and cotton) in the south. The Kagera Health and Development Survey (KHDS) was conducted by the World Bank and Muhimbili University College of Health Sciences. The sample consists of 816 households from 51 clusters (or communities) located in 49 villages covering all five districts of Kagera, interviewed up to four times, from Fall 1991 to January 1994, at 6 to 7 month intervals. The randomized sampling frame was based on the 1988 Tanzanian Census.A two-stage, randomized stratified sampling procedure was employed. In the first stage, Census clusters (or communities) were stratified based on agro-climactic zone and mortality rates and then were randomly sampled. In the second stage, households within the clusters were stratified into "high-risk" and "low-risk" groups based on illness and death of household members in the 12 months before enumeration, and then were randomly sampled. There was moderate attrition from the longitudinal sample. 9.6% of households sampled in wave 1 were lost by wave 4. However, to preserve balancing across health profiles in the sample, lost households were replaced with randomly selected households from a sample of predetermined replacement households stratified by sickness. KHDS is a socio-economic survey following the model of previous World Bank Living Standards Measurement Surveys. The

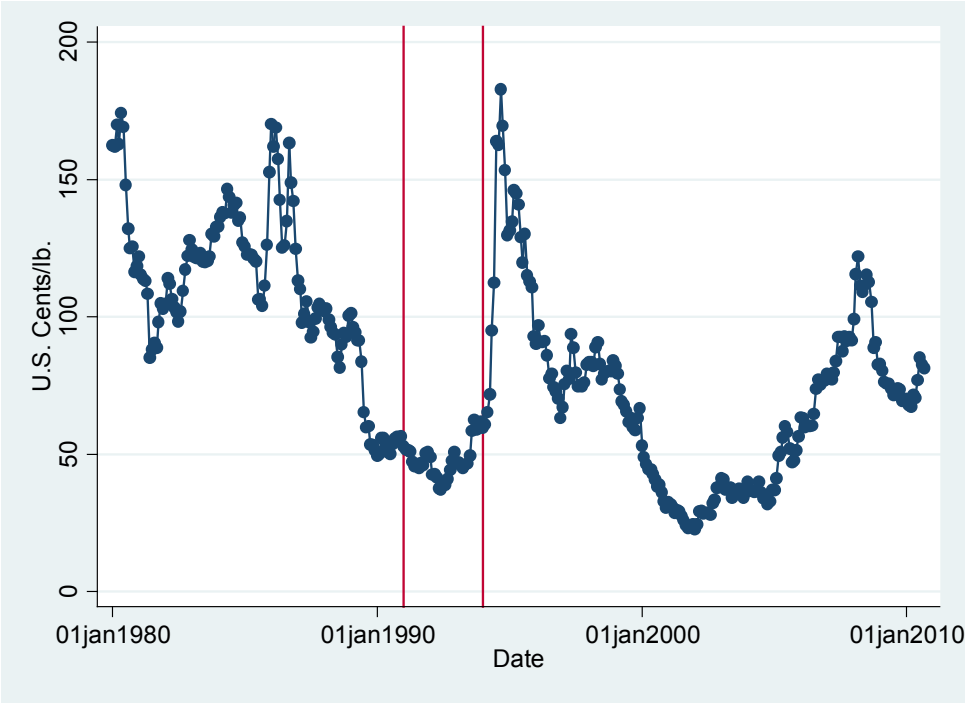
survey covers individual-, household-, and cluster-level data related to the economic livelihoods and health of individuals, and the characteristics of households and communities.Our sample is confined to households who reported harvesting coffee at least once in the survey period (1991-1994), which includes over 80% of the households in the entire sample.

We combine the Kagera household survey with data on monthly international coffee prices available with the International Coffee Association. The monthly prices are robusta coffee prices, which is primarily the variety of coffee grown in the Kagera region. Figure 1 shows the graph of monthly prices from 1980-2010, and indicates the prices during the survey period. Prices during the entire survey period (1991-1994) were relatively low compared to the historical average. In the following paragraphs, we outline the variables we use in our analyses.

Figure I

Historical Price Trend (1980 – 2010)

FIGURE 1: ROBUSTA COFFEE PRICE TIME SERIES



2.1 Price Lag Variable

The first wave of the survey asked households about their economic and labor activities in the 12 months preceding the survey. The second, third and four waves of the survey however, asked households about their economic and labor activities in the last 6 months. This is because the time lag between waves was about 6-7 months, and the questions were changed to avoid questions about overlapping time periods. In order to estimate the impact of international coffee price fluctuations on the household, we need to match the outcome variables to the appropriate international price faced by the household at the time when it made decisions regarding labor allocations and microenterprise ownership.Since we have information on the month and year in which household's were surveyed, we matched the average international price for the time period about which the survey asked. In the first wave, this was

the average price for the last 12 months preceding the survey month of the households, and for the subsequent waves, it was the average price for the last 6 months. Thus, if a household was interviewed in wave 1 in September 1991, the price faced by the household is the average international robusta coffee price from September 1990-August 1991.If it was interviewed in any wave other than the first, for instance in September 1993, the price faced by the household is the average international robusta coffee price from March 1993-August 1993. The average price computed in this manner is about 46 cents/lb, with a standard deviation of about 3.9 cents/lb.

We use two transformations of this average price as the independent variable of interest. For binary and count outcomes, we use the price divided by its standard deviation over the survey period. The coefficient on this variable is the marginal effect of a one standard deviation in the price . For continuous outcomes, we use the log of the price.

2.2 Household-Level Variables

At the household-level, we examine the impact on revenues from coffee, consumption expenditure and microenterprise ownership. Table 1 presents the summary statistics. Area harvested for coffee is on average only about 10% of area harvested by households, but annual revenues from coffee sales comprise about 43% of agricultural revenues for the sample (67% if only households' reporting non-zero coffee revenues are included). Thus, it is a significant component of household income.

Regarding microenterprise ownership, 40% of the households reported owning an enterprise, and about 12% report owning more than one, the maximum being 7.

2.3 Individual-Level Variables

The individual level variables regarding labor allocation and micro-enterprise ownership are available for individuals who are age 7 or older. At the individual-level, we examine hours allocated weekly [1] in the labor market in the farming and non-farming sectors, as well as hours in domestic activities. Within non-farming, we examine hours in microenterprise and wage employment. Total hours worked are about 30 hours on average, of which about half are in domestic activities. We also examine participation in the three main labor market sectors - farming, microenterprise and wage employment, defined as working in the sector in the last 12 months for the individuals in the first wave and last 6 months for the subsequent waves.

At the individual level, we have information on which kind of enterprise the individual worked in, in the week preceding the survey. We thus examine microenterprise ownership variables at the individual level, including the category of enterprise. We categorized enterprises into 6 main categories - farming, merchant, skilled, high-skilled and high capital. Merchant enterprises are by far the most common, followed by skilled and high-skilled enterprises.

3 Empirical Strategy

This section develops the empirical strategy to estimate the effects of fluctuations in households' agricultural profitability on microenterprise ownership at the household and individual-level. Directly correlating agricultural profitability and the households' microenterprise ownership decisions would produce biased estimates of the effects of agricultural profitability, since the two are likely to be determined jointly. Similarly, farm-gate prices received by the household are unsuitable proxies for agricultural profitability, since they are very likely en-

[1] defined as hours worked in the 7 days prior to the survey

dogenous.

Fluctuations in international coffee prices, in absence of stringent price control policies, cause exogenous changes in agricultural profitability for coffee-growing households. We hypothesize that in absence of perfect consumption smoothing mechanisms, households may own and operate microenterprises to allow consumption-smoothing when the default sector (agriculture) is faced with a negative productivity shock, given by a negative shock to international coffee prices. Analogously, they would be less likely to own microenterprises when there is a positive productivity shock to the agricultural sector.

We include year-level fixed effects to capture the effects of trends in coffee prices, and month-level fixed effects to capture the effects of seasonality and ensure that they do not affect our estimates. We also include household fixed effects for regressions at the household-level and individual fixed effects for regressions are the individual-level to ensure that unobservable heterogeneity amongst households or individuals does not affect our results.

3.1 Household Level

At the household level, we estimate the following regression:

$$O_{hmy} = \alpha + \beta P_{my} + H_h + \delta_y + \theta_m + \epsilon_{hmy} \tag{1}$$

where O_{hmy} is the outcome variable for household h surveyed in month m in year y , P is the transformation variable of the average price faced by households surveyed in month m in year y, and H_h, δ and θ are fixed effects for the household, year and month respectively. As mentioned in the previous section, P_{my} is the price divided by its standard deviation when O_{ihmy} is a binary or count variable and is the log of the price when O_{ihmy} is a continuous variable. Thus, this regression specification examines the impacts of shocks to agricultural profitability within a household on its decision to own a microenterprise.

3.2 Individual Level

At the individual level, we estimate the following regression:

$$O_{ihmy} = \alpha + \beta P_{my} + I_i + \delta_y + \theta_m + \ _{ihmy} \tag{2}$$

where O_{ihmy} is the outcome variable for individual i in household h surveyed in month m in year y , P is the transformation variable of the average price faced by individuals in households surveyed in month m in year y, and I, δ and θ are fixed effects for the individual, year and month respectively. Analogous to the household-level specification, this regression specification examines the impacts of shocks to agricultural profitability on an individual's on its decision to own a microenterprise.

4 Results

This section presents the results of the regression specifications in equations (1) and (2). We begin by showing that international coffee prices do affect the agricultural profitability households in the Kagera region, which is reflected in the farm-gate coffee prices received by the households, sale quantities and coffee revenues. We show that negative shocks to the international prices affect the consumption expenditure of households, and thus indicates that households smooth consumption incompletely when faced with agricultural profitability shocks. We then show that microenterprise ownership probability rises when international prices fall, indicating that a negative shock to agricultural profitability increases participation in the enterprise sector (and to the wage employment sector as well). We finally show that this pattern is reflected in the hours worked in the three labor market sectors - farming, enterprise and wage employment, and in participation in non-farming sectors at the individual level. We also present checks for selection bias, to show that fluctuations in coffee prices

do not affect whether a household grows or harvests coffee during the length of our survey period.

4.1 Importance of international prices to household agricultural profitability and expenditure

We first estimate equation (1) for determinants of agricultural profitability - farm-gate prices, sales quantities and coffee revenues. Sales quantities were reported in several units, only 2 of which (kilos and debe[2]) were easily convertible to uniform units. Thus, sales quantities and household farmgate prices[3] are restricted to households that reported sales in these 2 units. Farmgate prices are further restricted to households that reported positive sales revenues. Table II presents the results. A 1% increase in international coffee prices causes a 2.8% increase in farm-gate prices, a 3.9% increase in sales quantities and a nearly 6% increase in coffee revenues. Thus, international coffee prices have fairly large, statistically significant and exogenous effects on the profitability of the default sector, agriculture for coffee-growing households. The impacts on productivity affect household income, and the effects on household consumption is sizeable as well - a 1% increase in prices has a 2.5% increase in total annualized household food expenditure, and a 1.7% increase for non-food expenditure. Thus, households smooth consumption incompletely when faced with these income shocks.

4.2 Entrepreneurship

We now examine whether the productivity shocks to the agricultural sector imply that households use participation in microenterprises as a consumption smoothing mechanism. At the household-level, we use two dependent variables - i) a dummy variable that is 1 if the household reported to owning a microenterprise, and ii) conditional on the household owning an

[2] 1 debe=20kg

[3] calculated as total coffee revenues/sales quantity

enterprise, a count variable for the number of enterprises owned, that ranges from 1 to 7. Thus, we estimate equation (1) with these dependent variables. The transformation of the price variable used is the price divided by its standard deviation. Table III(A) presents the results for the impacts on household enterprise ownership. A one standard deviation increase in international coffee prices decreases the probability household owns an enterprise by -0.055, and the effect is statistically significant. There is also a negative impact on the number of businesses owned, though this is not statistically significant, which implies that the intensive margin of microenterprise activity (i.e., ownership) may be most salient, while increasing the number of businesses for those who already own a microenterprise may not be a significant margin of adjustment.

At the individual level, we examine both ownership and the type of businesses that individuals operate, classified into five categories: merchant, skilled, high-skilled, high capital and other. Labor activities, including participation in microenterprises were reported for all individuals age 7 and older. The regression specification is given by equation (2). The results are presented in Table III(B). The coefficients for ownership at the individual level are smaller than at the household-level, possibly since the survey covers individuals 7 or older, and individual ownership at young ages is close to zero. Most individuals working in self-enterprise are merchants – consequently, we only find significant effects for merchant businesses, and see no significant movement for other types of businesses.

4.3 Labor Allocation

In the previous section, we showed that negative productivity shocks to the agricultural sector are associated with increase in microenterprise ownership, particularly merchant microenterprises. These shocks should then also impact allocation of labor hours amongst individuals, as households increase labor allocated to non-farm sectors in order to equate marginal productivity across sectors. We study hours allocated to all the labor market sectors

- farming, microenterprise and wage employment - as well as total labor market hours and hours spent in domestic activities. Table V presents the results. We find that a 1% increase in international coffee prices decreases the hours spend in the microenterprise by about 2% , with similar effects for wage employment. Hours in farming decrease as well, though the effect is not statistically significant.

4.4 Sector Participation

We now analyze the impact of international coffee prices on the individual's choice to participate in the two non-farming labor market sectors, viz. entrepreneurship and wage employment . The dependent variable for participation in a sector is a dummy variable that is 1 if the individual reported working in that sector in the last 12 months if they were interviewed in the first wave, and in the lat 6 months if they were interviewed during the following waves. Table VI presents these estimates. Labor participation in both the non-farm sectors decreases with a one standard deviation increase in the international coffee prices.

4.5 Selection Bias Checks

In this section, we present evidence that selection bias does not drive our results. The coffee tree when first planted takes about 2-3 years to produce its first coffee, and reaches full yield levels only after 5 years. Thus, the choice to be coffee-growing household is fixed in the short run, as households cannot plant and take advantage of transitory increases in international coffee prices. Furthermore, amongst coffee-growing households, the decisions regarding harvesting are purely seasonal and not driven by prices.

We estimate equation (1) using the following as dependent variables: i) a dummy variable that is 1 if the household reported a positive harvest area under coffee in any wave, ii) Within the households that reported a positive harvest area under coffee in any wave, a dummy vari-

able that is 1 if the household reported positive area under coffee harvested in that particular wave, and iii) harvest area under coffee. If our hypothesis is correct, none of these variables should be impacted by changes in the coffee prices. Table IV ascertains that this is indeed the case - none of the coefficients are statistically significant, and all are quite small in magnitude.

5 Conclusion

Recent literature on drivers of entrepreneurial entry and growth have produced confounded results. The effects of business skills training on growth of existing enterprises appear small and insignificant. Returns to capital among microenterprises appear high in some contexts, but microfinance interventions have produced inconsistent results on entrepreneurial entry and growth of existing enterprises. On the other hand, studies consistently find large effects of improved access to credit on household consumption.

We propose that many developing households are subject to income shocks, particularly in agricultural activities, and that they often use microenterprise as a mechanism for smoothing consumption against these shocks. If, for at least a subset of entrepreneurial households, income-smoothing is the primary motivation of the microenterprise, the aforementioned results of microfinance and business training interventions are less surprising. These households seem to treat microfinance and microenterprise as substitutable mechanisms for smoothing productivity shocks in their ex ante optimal sector of production, largely agriculture.

Furthermore, these households are less likely to avail themselves of growth opportunities in the entrepreneurial sector as these businesses do not represent their primary source of income in equilibrium. In particular, the "subsistence" entrepreneur might be constrained in terms of growth by ability more than credit. That is, the households who switch frequently in and out of the entrepreneurial sector or allocate on average a small fraction of the time and re-

sources towards their microenterprises do not likely represent the high ability entrepreneurs.

Indeed, allocating public resources toward improving access to credit for high ability, growth-oriented entrepreneurs might be a high return endeavor, both in terms of growth of these enterprises and from a general welfare-enhancing perspective. However, identifying this high return subset of entrepreneurs is, then, of the utmost importance. Finally, though recent business training interventions have produced little in the way of measurable success, they could be quite valuable in converting the marginal "subsistence" entrepreneur into a "transformational" entrepreneur with growth potential. Both identifying this subset of the population and testing this hypothesis are important endeavors for future studies.

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Table Ia: Summary Statistics

Summary Statistics of Sample Households

Household

	Mean	SD
Importance of Coffee in Agricultural Revenues		
Annual Coffee Revenues (USD)	30.310	578.430
Proportion of coffee revenues to total agricultural revenues	0.420	0.410
Harvest Area Under Coffee (acres)	0.649	1.070
Proportion of harvest area under coffee revenes to total harvest area	0.103	0.107
Expenditure (USD)		
Food Expenditure	42.758	69.087
Non-Food Expenditure	89.982	203.829
Business Ownership		
Whether Business Owned	0.402	0.490
Number of Businesses Owned (conditional on owning at least 1)	1.408	0.745

Table Ib: Summary Statistics

Summary Statistics of Sample Individuals

Individual

	Mean	SD
Weekly Labor Hours		
i) Farming	9.711	10.552
ii) Enterprise	1.422	7.098
iii) Wage/Salary Employment	2.671	10.515
iv) Total Hours in the Labor Market (i+ii+iii)	13.804	15.488
v) Hours in Domestic Activities	15.302	15.806
Sectoral Participation		
i) Farming	0.831	0.375
ii) Enterprise	0.136	0.343
iii) Wage/Salary Employment	0.135	0.340
Business Ownership		
Whether Business Owned	0.075	0.264
Business Ownership - Type of Business		
Farming	0.000	0.017
Merchant	0.051	0.220
Skilled	0.010	0.100
High Skilled	0.011	0.105
High Capital	0.006	0.077
Other	0.004	0.059

Table Ic: Summary Statistics

Number of Households and Individuals Included in the Sample

Wave	Number of Households Included in the Sample	Total Number of Survey Households	Number of Individuals Included in the Sample	Total Number of Survey Individuals
1	743	888	3,544	4,186
2	733	861	3,401	3,966
3	699	819	3,226	3,723
4	648	752	2,968	3,428
Total	2,823	3,320	13,139	15,303

Notes: Households included in the sample are those that reported harvesting coffee at least once in the survey period (1991-94). Individuals included in the sample belong to sample households and are age 7 or older

Table II: Sale Price, Sales Quantity Revenues and Consumption

Effects of Coffee Price on Sale Price, Coffee Revenues and Consumption Expenditure

	Log(Price received by households)	Log(1+Quantity Sold)	Log(1+Coffee Revenues)	Log(1+Food Expenditure)	Log(1+Non Food Expenditure)
Log(Price)	2.807**	3.395**	5.760**	2.521***	1.737***
	(1.299)	(1.331)	(2.194)	(0.381)	(0.333)
Fixed Effects			Household, Year, & Month		
Observations	668	1,795	2,822	2,822	2,822
Number of Households	486	714	753	753	753
(Exponentiated) Mean of Dependent Variable	0.457	63.520	25.576	45.304	86.461

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Log(Price received by housheolds) and the Quantity Sold sample includes households who reported sales in kilos or debe only. Price received by the households is further restricted to households with non-zero coffee revenues (and thus positive per unit sales price) . Quantity sold is in kilos. Price is in USD/kg. Revenues and expenditures are reported in USD.

Table IIIa: Household Entrepreneurship

Effects of Coffee Price on Entrepreneurship

	Business Ownership	Number of Businesses
Price/SD(Price)	-0.0558***	-0.030
	(0.0115)	(0.0270)
Fixed Effects	Household, Year, & Month	
Observations	2,822	1,135
Number of Households	753	753
Mean of Dependent Variable	0.402	0.563

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Number of Businesses is conditional on owning at least one business.

Table IIIb: Individual Entrepreneurship

Effects of Coffee Price on Entrepreneurship

	Business Ownership	Business Ownership by Type of Business				
		Merchant	Skilled	High-Skilled	High Capital	Other
Price/SD(Price)	-0.009**	-0.009***	-0.001	-0.001	-0.001	0.001
	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Fixed Effects				Individual, Year, & Month		
Observations	13,137	13,137	13,137	13,137	13,137	13,137
Number of Individuals	4,288	4,288	4,288	4,288	4,288	4,288
Mean of Dependent Variable	0.0753	0.051	0.010	0.011	0.005	0.003

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). High capital businesses include transport, construction, factory or bar/hotel businesses. High-skilled businesses include education, health and skilled businesses.

Table IV: Selection into Coffee Growing

Effects of Coffee Price on Coffee Growing and Harvest Acreage

	Coffee Sample	Coffee Grower	Log(1+ Harvest Area Under Coffee)
Price/SD(Price)	-0.005	-0.009	
	(0.0150)	-0.005	
Log(Price)			0.0967
			(0.153)
Fixed Effects	Year & Month	Household, Year & Month	
Observations	3,320	2,822	2,822
Number of Households		753	753
Mean of Dependent Variable	0.850	0.952	0.649

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Coffee grower is a dummy variable that is 1 if a household reported harvesting coffee in that wave. Coffee sample is a dummy variable that is 1 if a household reported harvesting coffee in any one of the 4 waves, and 0 otherwise. Harvest area under coffee is the number of acres harvested in the last 12 months if the household is surveyed in the first wave, and the number of acres harvested in the last 6 months if the household is surveyed in any subsequent wave. Harvest area is reported in acres.

Table V: Individual Labor Hours by Sector

Effects of Coffee Price on Labor Activity in Last 7 days

	Total Hours in the Labor Market			Log(1+Total Hours in the Labor Market)	Log(1+Hours in Domestic Activities)
	Log (1 +Hours in Enterprise)	Log(1+Hours in Farm Labor)	Log (1 + Hours in Wage/Salaried Work)		
Log(Price)	-0.198**	-0.044	-0.248**	-0.304	0.031
	(0.0931)	(0.294)	(0.121)	(0.320)	(0.214)
Fixed Effects	Individual, Year, & Month				
Observations	13,137	13,137	13,137	13,137	13,137
Number of Individuals	4,288	4,288	4,288	4,288	4,288
Mean of Dependent Variable	1.422	9.711	2.671	13.804	15.302

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Total hours in the Labor Market is the sum of hours worked in enterprise, farming and wage/salaried employment.

Table VI: Individual Labor Participation by Sector

Effects of Coffee Price on Labor Activity in Last Year

	Participation in Non-farm Sectors	
	Enterprise	Wage or Salary
Price/SD(Price)	-0.016***	-0.010*
	(0.005)	(0.005)
Fixed Effects	Individual, Year and Month	
Observations	13,137	13,137
Number of Individuals	4,288	4,288
Mean of Dependent Variable	0.136	0.135

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Participation in a sector is a dummy variable that is 1 if the individual reported working in that sector in the last 12 months for the individuals in the first wave and the last 6 months for the subsequent waves.