Online Appendix for the Authors' Websites Only

Multinationals, Monopsony, and Local Development:
Evidence from the United Fruit Company

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Table of Contents

M Additional Robustness Checks

Our additional robustness checks presented in this section include: running our regressions at different distances from the boundary, changing the specifications of the latitude-longitude polynomial, and varying the control variables.

M.1 The River vs. the Boundary

In this subsection we present our average and yearly results restricting our observations to units on the "wrong side" of the river that closely follows our boundary. Our results hold even within these narrower neighborhoods.

Table M.1: Average UFCo Effect–River Test: Restricted 1 km

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.100	-0.014	-0.085	-0.084	-0.149	-0.284
	(0.034)	(0.030)	(0.030)	(0.024)	(0.046)	(0.074)
	[0.022]	[0.010]	[0.018]	[0.019]	[0.024]	[0.027]
Adjusted R^2	0.144	0.224	0.274	0.031	0.157	0.269
Observations	1,937	1,937	1,937	1,937	1,937	1,937
Clusters	44	44	44	44	44	44
Mean	0.176	0.060	0.235	0.200	0.481	0.670

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample is restricted to census block located within 1 km of the UFCo boundary. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Table M.2: Dynamics of the UFCo-Effect Across Years-River Test (Restricted 1 km)

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.140	-0.271	-0.090	-0.117	-0.202	-0.619
	(0.041)	(0.061)	(0.049)	(0.047)	(0.072)	(0.126)
	[0.031]	[0.065]	[0.064]	[0.046]	[0.093]	[0.148]
$UFCo_{1984}$	0.017	0.034	-0.126	-0.130	-0.123	-0.273
	(0.065)	(0.027)	(0.047)	(0.043)	(0.050)	(0.132)
	[0.060]	[0.018]	[0.048]	[0.045]	[0.044]	[0.133]
$UFCo_{2000}$	-0.083	0.010	-0.084	0.001	-0.104	-0.156
	(0.039)	(0.027)	(0.021)	(0.029)	(0.056)	(0.088)
	[0.044]	[0.028]	[0.018]	[0.039]	[0.069]	[0.112]
$UFCo_{2011}$	-0.073	-0.015	-0.104	-0.093	-0.181	-0.285
	(0.037)	(0.022)	(0.041)	(0.043)	(0.047)	(0.093)
	[0.026]	[0.015]	[0.050]	[0.039]	[0.110]	[0.061]
Adjusted R^2	0.146	0.239	0.273	0.025	0.156	0.267
Observations	1,937	1,937	1,937	1,937	1,937	1,937
Clusters	44	44	44	44	44	44
$Mean_{1973}$	0.491	0.396	0.455	0.252	0.829	1.595
$Mean_{1984}$	0.265	0.053	0.357	0.186	0.563	0.861
$Mean_{2000}$	0.150	0.037	0.255	0.208	0.497	0.650
$Mean_{2011}$	0.134	0.018	0.164	0.197	0.405	0.513

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample is restricted to census block located within 1 km of the UFCo boundary. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

M.2 Eliminating Observations Close to the Boundary

We present our main results after eliminating the top 5% and 10% of households that are closest to the border on each side.

Table M.3: Average UFCo Effect– Eliminating Observations Close to the Boundary

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
			Omitting the Top 5%			
UFCo	-0.105	-0.025	-0.049	-0.067	-0.131	-0.247
	(0.030)	(0.020)	(0.026)	(0.029)	(0.034)	(0.063)
	[0.039]	[0.018]	[0.017]	[0.027]	[0.028]	[0.064]
Adjusted R^2	0.105	0.181	0.240	0.015	0.117	0.205
Observations	8,654	8,654	8,654	8,654	8,654	8,654
Clusters	191	191	191	191	191	191
Mean	0.172	0.059	0.231	0.198	0.475	0.659
			Omitting the Top 10%			
UFCo	-0.101	-0.012	-0.052	-0.060	-0.122	-0.225
	(0.033)	(0.022)	(0.029)	(0.029)	(0.036)	(0.067)
	[0.039]	[0.024]	[0.0218]	[0.021]	[0.053]	[0.050]
Adjusted R^2	0.136	0.186	0.235	0.015	0.111	0.200
Observations	8,147	8,147	8,147	8,147	8,147	8,147
Clusters	181	181	181	181	181	181
Mean	0.170	0.059	0.231	0.199	0.476	0.660

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample omits the top 5% and 10% observations closest to the study boundary on each side, respectively. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

M.3 Varying Specifications for the Latitude-Longitude Polynomial

In our original results, we used a linear polynomial in latitude and longitude. In this section, we test the robustness of our results to different specifications for the RD polynomial. In particular, we use a quadratic polynomial and a linear polynomial in latitude, longitude, and distance to the boundary.

M.3.1 Quadratic Latitude-Longitude Polynomial

Table M.4: Average UFCo Effect-Quadratic Latitude-Longitude Polynomial

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.107	-0.022	-0.058	-0.070	-0.138	-0.257
	(0.027)	(0.018)	(0.022)	(0.026)	(0.030)	(0.057)
	[0.034]	[0.015]	[0.009]	[0.025]	[0.025]	[0.055]
Adjusted R^2	0.102	0.169	0.239	0.015	0.116	0.200
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.670

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a quadratic polynomial in latitude and longitude.

Table M.5: Dynamics Across Years-Quadratic Latitude-Longitude Polynomial

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.230	-0.292	-0.057	-0.139	-0.258	-0.718
	(0.065)	(0.077)	(0.042)	(0.046)	(0.068)	(0.154)
	[0.070]	[0.076]	[0.030]	[0.049]	[0.055]	[0.148]
$UFCo_{1984}$	-0.073	0.009	-0.088	-0.081	-0.101	-0.233
	(0.049)	(0.028)	(0.027)	(0.035)	(0.048)	(0.093)
	[0.035]	[0.012]	[0.019]	[0.029]	[0.032]	[0.061]
$UFCo_{2000}$	-0.097	0.017	-0.062	-0.152	-0.136	-0.239
	(0.032)	(0.018)	(0.022)	(0.028)	(0.038)	(0.061)
	[0.033]	[0.016]	[0.009]	[0.025]	[0.032]	[0.054]
$UFCo_{2011}$	-0.093	0.015	-0.040	-0.024	-0.108	-0.142
	(0.031)	(0.017)	(0.029)	(0.035)	(0.038)	(0.062)
	[0.034]	[0.018]	[0.025]	[0.051]	[0.049]	[0.087]
Adjusted R^2	0.104	0.199	0.239	0.017	0.117	0.207
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.462	0.353	0.393	0.208	0.777	1.416
$Mean_{1984}$	0.209	0.060	0.362	0.201	0.579	0.832
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a quadratic polynomial in latitude and longitude.

M.3.2 Linear Polynomial in Latitude, Longitude and Distance to the Boundary

Table M.6: Contemporary Household Outcomes: Average UFCo Effect-Linear Polynomial in Latitude, Longitude and Distance to the Boundary

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.101	-0.022	-0.053	-0.065	-0.132	-0.242
	(0.026)	(0.017)	(0.022)	(0.024)	(0.030)	(0.055)
	[0.031]	[0.015]	[0.016]	[0.025]	[0.026]	[0.053]
Adjusted R^2	0.102	0.169	0.238	0.015	0.115	0.199
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.658

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude, longitude, and distance to the UFCo boundary.

Table M.7: Contemporary Household Outcomes: Dynamics Across Years-Linear Polynomial in Latitude, Longitude and Distance to the Boundary

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.220	-0.279	-0.064	-0.134	-0.250	-0.670
	(0.065)	(0.078)	(0.045)	(0.048)	(0.068)	(0.159)
	[0.066]	[0.077]	[0.034]	[0.047]	[0.054]	[0.147]
$UFCo_{1984}$	-0.066	0.009	-0.084	-0.075	-0.093	-0.214
	(0.047)	(0.028)	(0.028)	(0.035)	(0.047)	(0.091)
	[0.031]	[0.014]	[0.022]	[0.031]	[0.032]	[0.064]
$UFCo_{2000}$	-0.090	0.017	-0.057	-0.090	-0.144	-0.219
	(0.031)	(0.017)	(0.058)	(0.027)	(0.036)	(0.058)
	[0.031]	[0.015]	[0.014]	[0.025]	[0.032]	[0.055]
$UFCo_{2011}$	-0.088	0.019	-0.038	-0.018	-0.102	-0.125
	(0.031)	(0.016)	(0.030)	(0.035)	(0.038)	(0.063)
	[0.031]	[0.019]	[0.029]	[0.052]	[0.050]	[0.091]
Adjusted R^2	0.104	0.198	0.238	0.017	0.117	0.206
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.462	0.353	0.393	0.208	0.777	1.416
$Mean_{1984}$	0.209	0.060	0.362	0.201	0.579	0.832
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude, longitude, and distance to the UFCo boundary.

M.4 Varying the Controls

M.4.1 No Demographic Controls

Table M.8: Average UFCo Effect-No Demographic Controls

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.108	-0.020	-0.082	-0.068	-0.150	-0.278
	(0.027)	(0.017)	(0.025)	(0.025)	(0.033)	(0.063)
	[0.033]	[0.014]	[0.010]	[0.023]	[0.025]	[0.056]
Adjusted R^2	0.071	0.162	0.044	0.003	0.058	0.111
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.658

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); census fixed effects, and a linear polynomial in latitude and longitude.

Table M.9: Contemporary Household Outcomes: Dynamics Across Years-No Demographic Controls

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.229	-0.286	-0.082	-0.136	-0.270	-0.732
	(0.064)	(0.079)	(0.058)	(0.049)	(0.069)	(0.166)
	[0.066]	[0.077]	[0.049]	[0.050]	[0.056]	[0.154]
$UFCo_{1984}$	-0.067	0.010	-0.086	-0.075	-0.095	-0.219
	(0.050)	(0.027)	(0.035)	(0.036)	(0.055)	(0.107)
	[0.040]	[0.015]	[0.025]	[0.031]	[0.037]	[0.077]
$UFCo_{2000}$	-0.098	0.020	-0.091	-0.092	-0.166	-0.262
	(0.030)	(0.017)	(0.027)	(0.027)	(0.039)	(0.062)
	[0.033]	[0.015]	[0.015]	[0.024]	[0.034]	[0.058]
$UFCo_{2011}$	-0.095	0.021	-0.072	-0.022	-0.124	-0.168
	(0.031)	(0.016)	(0.029)	(0.034)	(0.038)	(0.063)
	[0.032]	[0.018]	[0.019]	[0.050]	[0.044]	[0.078]
Adjusted R^2	0.073	0.192	0.044	0.005	0.059	0.118
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.462	0.353	0.393	0.208	0.777	1.416
$Mean_{1984}$	0.209	0.060	0.362	0.201	0.579	0.832
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); census fixed effects, and a linear polynomial in latitude and longitude.

M.4.2 No Geographic Controls

Table M.10: Average UFCo Effect-No Geographic Controls

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.105	-0.021	-0.054	-0.067	-0.137	-0.247
	(0.026)	(0.017)	(0.022)	(0.024)	(0.030)	(0.057)
	[0.031]	[0.016]	[0.018]	[0.023]	[0.025]	[0.052]
Adjusted R^2	0.101	0.169	0.238	0.015	0.115	0.199
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.658

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Table M.11: Contemporary Household Outcomes: Dynamics Across Years-No Geographic Controls

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.227	-0.289	-0.055	-0.136	-0.255	-0.708
	(0.062)	(0.079)	(0.045)	(0.046)	(0.067)	(0.158)
	[0.064]	[0.078]	[0.035]	[0.048]	[0.053]	[0.146]
$UFCo_{1984}$	-0.072	0.009	-0.084	-0.077	-0.098	-0.225
	(0.047)	(0.028)	(0.027)	(0.035)	(0.046)	(0.092)
	[0.036]	[0.016]	[0.023]	[0.031]	[0.034]	[0.069]
$UFCo_{2000}$	-0.094	0.017	-0.057	-0.089	-0.147	-0.224
	(0.031)	(0.017)	(0.023)	(0.026)	(0.037)	(0.059)
	[0.029]	[0.017]	[0.018]	[0.024]	[0.030]	[0.050]
$UFCo_{2011}$	-0.092	0.017	-0.037	-0.020	-0.110	-0.137
	(0.030)	(0.017)	(0.029)	(0.035)	(0.037)	(0.062)
	[0.029]	[0.019]	[0.030]	[0.046]	[0.047]	[0.085]
Adjusted R^2	0.103	0.199	0.238	0.017	0.117	0.206
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.462	0.353	0.393	0.208	0.777	1.416
$Mean_{1984}$	0.209	0.060	0.362	0.201	0.579	0.832
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

M.4.3 No Demographic or Geographic Controls

Table M.12: Average UFCo Effect-No Demographic or Geographic Controls

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.111	-0.019	-0.083	-0.069	-0.154	-0.281
	(0.027)	(0.017)	(0.025)	(0.025)	(0.034)	(0.064)
	[0.034]	[0.016]	[0.011]	[0.022]	[0.025]	[0.057]
Adjusted R^2	0.071	0.162	0.044	0.003	0.058	0.111
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.658

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include census fixed effects, and a linear polynomial in latitude and longitude.

Table M.13: Dynamics Across Years-No Demographic or Geographic Controls

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.232	-0.293	-0.055	-0.134	-0.251	-0.709
	(0.064)	(0.077)	(0.045)	(0.046)	(0.067)	(0.155)
	[0.066]	[0.076]	[0.034]	[0.049]	[0.054]	[0.145]
$UFCo_{1984}$	-0.071	0.009	-0.084	-0.076	-0.094	-0.218
	(0.050)	(0.027)	(0.028)	(0.035)	(0.047)	(0.092)
	[0.033]	[0.013]	[0.024]	[0.031]	[0.035]	[0.066]
$UFCo_{2000}$	-0.102	0.017	-0.055	-0.090	-0.143	-0.217
	(0.030)	(0.017)	(0.022)	(0.027)	(0.037)	(0.059)
	[0.031]	[0.016]	[0.014]	[0.026]	[0.032]	[0.054]
$UFCo_{2011}$	-0.099	0.017	-0.038	-0.019	-0.102	-0.128
	(0.030)	(0.017)	(0.029)	(0.035)	(0.038)	(0.064)
	[0.030]	[0.019]	[0.029]	[0.053]	[0.051]	[0.093]
Adjusted R^2	0.073	0.199	0.238	0.017	0.058	0.206
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.462	0.353	0.393	0.208	0.777	1.416
$Mean_{1984}$	0.209	0.060	0.362	0.201	0.579	0.832
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include census fixed effects, and a linear polynomial in latitude and longitude.

N Méndez & Trejos Index

In this section, we re-estimate equations (1) and (2) using the Unsatisfied Basic Needs (UBN) originally proposed by Méndez Fonseca and Trejos Solórzano (2004) for the 2000 and 2011 censuses. We find that our main message is unchanged.

Table N.14: Average UFCo Effect-Méndez & Trejos Index

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.086	-0.023	-0.054	-0.020	-0.103	-0.184
	(0.030)	(0.050)	(0.026)	(0.018)	(0.043)	(0.077)
	[0.034]	[0.031]	[0.025]	[0.014]	[0.035]	[0.069]
Adjusted R^2	0.018	0.025	0.147	0.025	0.075	0.091
Observations	7,016	7,016	7,016	7,016	7,016	7,016
Clusters	166	166	166	166	166	166
Mean	0.129	0.023	0.188	0.197	0.420	0.536

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Table N.15: Dynamics Across Years-Méndez & Trejos Index

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{2000}$	-0.085	-0.012	-0.062	-0.038	-0.104	-0.196
	(0.036)	(0.066)	(0.023)	(0.019)	(0.052)	(0.102)
	[0.037]	[0.051]	[0.025]	[0.016]	[0.042]	[0.083]
$UFCo_{2011}$	-0.087	-0.032	-0.048	-0.006	-0.103	-0.104
	(0.033)	(0.049)	(0.031)	(0.020)	(0.045)	(0.075)
	[0.037]	[0.030]	[0.032]	[0.019]	[0.041]	[0.077]
Adjusted R^2	0.018	0.025	0.147	0.025	0.075	0.091
Observations	7,016	7,016	7,016	7,016	7,016	7,016
Clusters	166	166	166	166	166	166
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

O Distance to a Railroad

In this section, we include as a control variable the nearest distance of each census block centroid to a railroad. Our results suggest that the UFCo effect is not exclusively a product of the provision of railroads.

Table O.16: Average UFCo Effect-Distance to a Railroad

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.103	-0.023	-0.053	-0.065	-0.132	-0.244
	(0.026)	(0.017)	(0.022)	(0.025)	(0.030)	(0.057)
	[0.031]	[0.017]	[0.016]	[0.025]	[0.027]	[0.055]
Adjusted R^2	0.101	0.169	0.238	0.015	0.115	0.199
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.658

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include a control for distance to a railroad; geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Table O.17: Dynamics Across Years-Distance to a Railroad

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.228	-0.297	-0.055	-0.134	-0.252	-0.709
	(0.062)	(0.077)	(0.045)	(0.046)	(0.067)	(0.155)
	[0.066]	[0.076]	[0.034]	[0.049]	[0.054]	[0.145]
$UFCo_{1984}$	-0.068	0.009	-0.084	-0.076	-0.094	-0.218
	(0.048)	(0.027)	(0.028)	(0.035)	(0.047)	(0.092)
	[0.033]	[0.013]	[0.024]	[0.031]	[0.035]	[0.066]
$UFCo_{2000}$	-0.089	0.017	-0.055	-0.090	-0.143	-0.217
	(0.031)	(0.017)	(0.022)	(0.027)	(0.037)	(0.059)
	[0.031]	[0.016]	[0.014]	[0.026]	[0.032]	[0.054]
$UFCo_{2011}$	-0.090	0.018	-0.038	-0.019	-0.102	-0.128
	(0.031)	(0.017)	(0.029)	(0.035)	(0.038)	(0.064)
	[0.030]	[0.019]	[0.029]	[0.053]	[0.051]	[0.093]
Adjusted R^2	0.104	0.199	0.238	0.017	0.117	0.206
Observations	9,179	9,179	9,179	9,179	9,179	9,179
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.462	0.353	0.393	0.208	0.777	1.416
$Mean_{1984}$	0.209	0.060	0.362	0.201	0.579	0.832
$Mean_{2000}$	0.145	0.031	0.230	0.178	0.452	0.584
$Mean_{2011}$	0.118	0.016	0.156	0.211	0.396	0.501

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include a control for distance to a railroad; geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

P Assessing the Impact of Migration

In this section we run our regressions on subsamples of households where (i) nobody migrated, and (ii) the head of household did not migrate; both within 5 years of each census. Our results persist, indicating that migration is not driving our estimations. It is also worth noting that migration rates between UFCo and non-UFCo census-blocks are balanced; in particular, Table P.18 compares migration rates in UFCo and non-UFCo locations.

Table P.18: Difference in Migration Rates in UFCo and Non-UFCo Census-Blocks

	(1)
UFCo	-0.006
	(0.014)
Adjusted R^2	0.072
Observations	206
Clusters	206
Mean	0.092

Notes: Robust standard errors, adjusted for clustering by census block, are in parentheses. The regression includes census fixed effects.

P.0.1 No member migrated within 5 years of the census.

Table P.19: Average UFCo Effect-Any Migrant

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.114	-0.018	-0.066	-0.074	-0.151	-0.272
	(0.027)	(0.017)	(0.024)	(0.026)	(0.030)	(0.061)
	[0.034]	[0.017]	[0.015]	[0.020]	[0.021]	[0.044]
Adjusted R^2	0.091	0.171	0.232	0.012	0.109	0.188
Observations	6,855	6,855	6,855	6,855	6,855	6,855
Clusters	206	206	206	206	206	206
Mean	0.160	0.054	0.221	0.206	0.467	0.641

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample is restricted to households whose members are all non-migrants. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Table P.20: Dynamics of the UFCo-Effect Across Years-Any Migrant

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.273	-0.271	-0.096	-0.189	-0.292	-0.829
	(0.055)	(0.077)	(0.049)	(0.040)	(0.073)	(0.169)
	[0.062]	[0.078]	[0.030]	[0.041]	[0.065]	[0.156]
$UFCo_{1984}$	-0.087	-0.000	-0.107	-0.093	-0.139	-0.288
	(0.046)	(0.028)	(0.033)	(0.042)	(0.049)	(0.092)
	[0.043]	[0.016]	[0.024]	[0.038]	[0.032]	[0.067]
$UFCo_{2000}$	-0.090	0.011	-0.051	-0.105	-0.150	-0.235
	(0.030)	(0.017)	(0.026)	(0.031)	(0.036)	(0.059)
	[0.029]	[0.018]	[0.020]	[0.029]	[0.027]	[0.046]
$UFCo_{2011}$	-0.103	0.018	-0.055	0.013	-0.119	-0.153
	(0.031)	(0.016)	(0.033)	(0.035)	(0.036)	(0.061)
	[0.032]	[0.018]	[0.029]	[0.044]	[0.041]	[0.072]
Adjusted R^2	0.094	0.193	0.232	0.016	0.110	0.197
Observations	6,855	6,855	6,855	6,855	6,855	6,855
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.457	0.376	0.371	0.227	0.777	1.431
$Mean_{1984}$	0.212	0.061	0.369	0.232	0.604	0.875
$Mean_{2000}$	0.135	0.033	0.224	0.179	0.446	0.571
$Mean_{2011}$	0.116	0.017	0.154	0.213	0.395	0.500

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample is restricted to households whose members are all non-migrants. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

P.0.2 Head-of-household did not migrate within 5 years of the census

Table P.21: Average UFCo Effect-Head Migrant

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
UFCo	-0.115	-0.018	-0.070	-0.080	-0.157	-0.282
	(0.026)	(0.015)	(0.025)	(0.025)	(0.029)	(0.056)
	[0.031]	[0.015]	[0.018]	[0.023]	[0.023]	[0.045]
Adjusted R^2	0.096	0.174	0.230	0.013	0.112	0.188
Observations	7,555	7,555	7,555	7,555	7,555	7,555
Clusters	206	206	206	206	206	206
Mean	0.165	0.054	0.229	0.201	0.473	0.649

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample is restricted to households whose head of household is non-migrant. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Table P.22: Dynamics of the UFCo-Effect Across Years-Head Migrant

	Probability of UBN in				Probability	Total number
	Housing	Health	Education	Consumption	of being poor	of UBN
	(1)	(2)	(3)	(4)	(5)	(6)
$UFCo_{1973}$	-0.253	-0.277	-0.101	-0.178	-0.307	-0.809
	(0.061)	(0.078)	(0.047)	(0.036)	(0.069)	(0.158)
	[0.067]	[0.081]	[0.031]	[0.040]	[0.060]	[0.149]
$UFCo_{1984}$	-0.091	-0.000	-0.106	-0.105	-0.143	-0.302
	(0.047)	(0.026)	(0.033)	(0.040)	(0.045)	(0.089)
	[0.037]	[0.014]	[0.021]	[0.039]	[0.033]	[0.065]
$UFCo_{2000}$	-0.094	0.014	-0.058	-0.113	-0.157	-0.251
	(0.030)	(0.017)	(0.024)	(0.029)	(0.035)	(0.056)
	[0.028]	[0.019]	[0.020]	[0.027]	[0.028]	[0.052]
$UFCo_{2011}$	-0.104	0.019	-0.056	-0.019	-0.123	-0.159
	(0.031)	(0.015)	(0.032)	(0.033)	(0.036)	(0.061)
	[0.029]	[0.018]	[0.032]	[0.048]	[0.046]	[0.081]
Adjusted R^2	0.099	0.199	0.230	0.016	0.114	0.198
Observations	7,555	7,555	7,555	7,555	7,555	7,555
Clusters	206	206	206	206	206	206
$Mean_{1973}$	0.464	0.367	0.377	0.210	0.787	1.418
$Mean_{1984}$	0.213	0.057	0.379	0.219	0.603	0.868
$Mean_{2000}$	0.141	0.031	0.231	0.176	0.451	0.579
$Mean_{2011}$	0.118	0.017	0.159	0.212	0.398	0.505

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. The sample is restricted to households whose head of household is non-migrant. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

Q Verifying that Results are not Driven by Persistence of Better Agricultural Abilities

A concern might be that the higher productivity and better infrastructure in the UFCo attracted people who were ex-ante better at growing crops; and that what we are capturing is the persistence of these abilities across generations. Therefore, in this section, we compare the UFCo effect in households that worked in agricultural activities with the effect on households devoted to other non-agricultural enterprises, and find no significant difference in the UFCo effect.

Table Q.23 compares our results for households where a member is employed in agricultural activities against all other households. Table Q.24 shows how households whose head works in agricultural activities deliver equivalent estimates to households where the head is employed in other activities.

Table Q.23: Average UFCo Effect-Comparison of Households Where Any Member is Engaged in the Agriculture Sector Versus Other Economic Sectors

		Probability of UBN in				Probability	Total number
		Housing	Health	Education	Consumption	of being poor	of UBN
		(1)	(2)	(3)	(4)	(5)	(6)
Agricultural Sector	UFCo	-0.102	-0.030	-0.046	-0.063	-0.134	-0.242
		(0.027)	(0.178)	(0.024)	(0.026)	(0.032)	(0.057)
		[0.027]	[0.014]	[0.0203]	[0.023]	[0.020]	[0.045]
	Adjusted R^2	0.123	0.187	0.246	0.044	0.152	0.245
	Observations	6,449	6,449	6,449	6,449	6,449	6,449
	Clusters	206	206	206	206	206	206
	Mean	0.180	0.067	0.263	0.187	0.489	0.697
Non-Agricultural Sector	UFCo	-0.093	0.002	-0.077	-0.061	-0.118	-0.230
		(0.039)	(0.024)	(0.032)	(0.049)	(0.051)	(0.094)
		[0.047]	[0.025]	[0.025]	[0.025]	[0.039]	[0.080]
	Adjusted R^2	0.048	0.089	0.169	0.018	0.045	0.068
	Observations	2,730	2,730	2,730	2,730	2,730	2,730
	Clusters	199	199	199	199	199	199
	Mean	0.148	0.035	0.157	0.226	0.442	0.567
P-value for difference		0.798	0.170	0.376	0.971	0.774	0.899

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude. The p-values in the last row are for the test of the hypothesis that the UFCo coefficient is the same between the two groups, and are clustered at the census-block level.

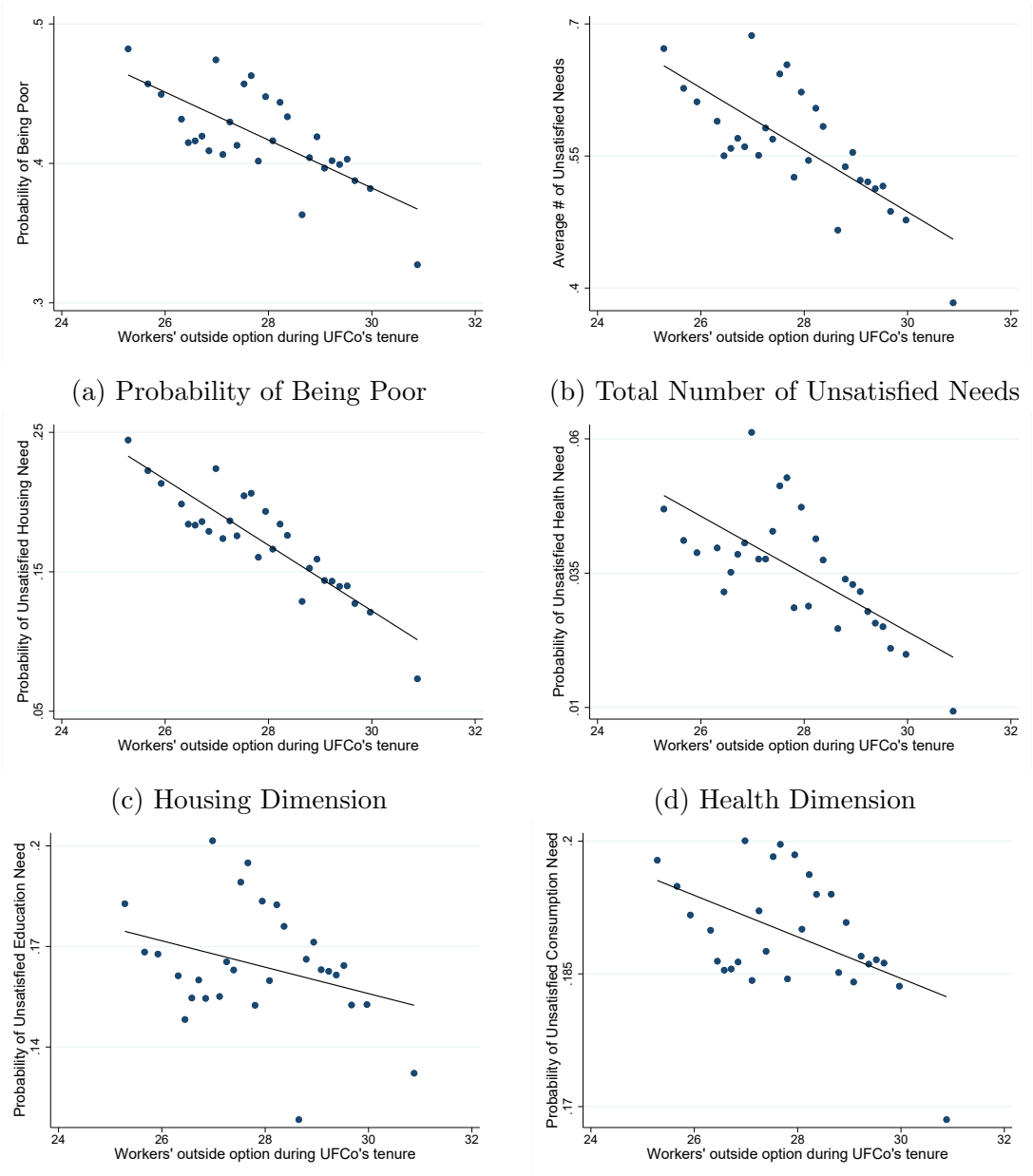
Table Q.24: Average UFCo Effect-Comparison of Households Where Head of Household is Engaged in the Agriculture Sector Versus Other Economic Sectors

		Probability of UBN in				Probability	Total number
		Housing	Health	Education	Consumption	of being poor	of UBN
		(1)	(2)	(3)	(4)	(5)	(6)
Agricultural Sector	UFCo	-0.092	-0.033	-0.038	-0.048	-0.115	-0.212
		(0.029)	(0.020)	(0.026)	(0.028)	(0.035)	(0.063)
		[0.025]	[0.014]	[0.026]	[0.022]	[0.026]	[0.057]
	Adjusted R^2	0.128	0.195	0.252	0.044	0.155	0.253
	Observations	5,574	5,574	5,574	5,574	5,574	5,574
	Clusters	206	206	206	206	206	206
	Mean	0.177	0.071	0.254	0.194	0.484	0.695
Non-Agricultural Sector	UFCo	-0.118	0.002	-0.085	-0.090	-0.160	-0.296
		(0.033)	(0.017)	(0.030)	(0.039)	(0.039)	(0.066)
		[0.045]	[0.021]	[0.020]	[0.027]	[0.025]	[0.062]
	Adjusted R^2	0.064	0.089	0.209	0.012	0.067	0.103
	Observations	3,605	3,605	3,605	3,605	5,574	3,605
	Clusters	203	203	203	203	203	203
	Mean	0.166	0.039	0.200	0.208	0.467	0.612
P-value for difference		0.473	0.098	0.188	0.366	0.334	0.248

Notes: UBN= Unsatisfied Basic Need. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude. The p-values in the last row are for the test of the hypothesis that the UFCo coefficient is the same between the two groups, and are clustered at the census-block level.

R Outside Options in 1973 and Current Outcomes

Figure R.1: Outside Options during UFCo's Tenure and Current Outcomes



(a) Probability of Being Poor

(b) Total Number of Unsatisfied Needs

(c) Housing Dimension

(d) Health Dimension

(e) Education Dimension

(f) Consumption Dimension

Notes: Figure R.1 shows results from Table 4 graphically. In every case, higher outside options in 1973 within the UFCo are associated with better current outcomes.

S Historical Details to Support the Assumptions in the General Equilibrium Model

Monopsony in the UFCo Region: Between 1912 and 1976, the UFCo employed, on average, 7% of the Costa Rican total agricultural labor force. The UFCo was also the only employer within its landholdings. To measure the degree of monopsony of the UFCo, we analyze how changes in the company's employment correlate with changes in world banana prices during the period 1912 to 1976. Namely, we consider the following regression

$$\ln(\textit{UFCo employment}_t) = \alpha + \beta \ln(P_{Bt}^W) + \varepsilon_t, \tag{1}$$

where P_{Bt}^W stands for the world banana price at year t. The coefficient β measures the degree of monopsony. Assuming decreasing returns to scale, under perfect competition $\beta > 1$, while under monopsony $\beta < 1$.[1]

We estimate $\beta = 0.397$ with a robust standard error of 0.089 (thus, the coefficient is significant at the 1% level). The result implies that the company indeed faced an upward-sloping labor supply, i.e., the firm could influence the price of labor. Therefore, it provides support to the assumption that the UFCo was a monopolist, the sole employer within its concession.

Perfect Competition in the Rest of the Country: Aside from bananas, most of the agricultural production during the 20th century in Costa Rica consisted of coffee. Coffee was produced predominantly in small farms, owned by many producers. According to the 1935 Coffee Census, there were 25,477 farms producing coffee and 21,731 producers, on average, 1.17 farms per owner. The coffee plantations were mostly small: 93.81% had an extension below five hectares. We use the Herfindahl-Hirschman Index (HHI) to measure coffee production concentration. The HHI is 39.03, suggesting a competitive industry (HHI below 100). Moreover, the 1935 Coffee Census reported 25,472 persons permanently employed in coffee production (on average, one worker per farm), approximately 23% of the Costa Rican total agricultural labor force. This historical evidence supports our assumption of perfect competition in the rest of the country.

Local Government Budget Constraints: The Costa Rican government during the first half of the 20th century had very limited access to capital markets. In the 1870s, the government entered into $15 million of external debt with an 18% interest rate (sovereign bonds sold in England and France). At the time, the service of this external debt represented between 20% and 50% of the value of exports (Marichal, 1988). This burden proved to be too large, and in 1874 the first default on payments

[1]For the intuition behind this result, consider the case of an increase in the price of the final product. The increase in the price of the final product increases the value of the marginal product of labor. Therefore, the optimal response for the firm is to adjust by increasing employment. Under perfect competition, the firm cannot influence wages, and because of the decreasing returns to scale, the change in employment must be more than proportional to the change in the price of the final product. Under monopsony, the firm influences wages, then the increase in labor demand will increase wages, which offsets the initial increase in prices. Therefore, the change in labor is less than proportional to the change in price. The result holds regardless if the firm has market power in the final product market or does not.

occurred. At this time, debt was restructured with a longer maturity and a higher interest rate. A similar story repeated itself in 1901 and 1933. By this time, the debt had increased to $21 million of external debt, as new debt emitted to cover delayed interest payments. The country then entered a moratorium that lasted more than a decade (1935-1946), with payments being defaulted throughout the period. Therefore, the very high loan in the late 1800s and the local inability to serve the interest of this debt, incurred a penalty on the interest rates and borrowing ability.

According to data from Reinhart and Rogoff (2009), between 1899 and 1984 (UFCo tenure), Costa Rica had four episodes of external and domestic debt default or restructuring.[2] The country was in a state of default or restructuring during 37 of the 86 years that cover the period. In particular, for the period that we calibrate our model (1950 to 1973), the country went through two episodes of default, being in a state of default during four of the 24 years. Therefore, we assume that the government has to finance local amenities using collected taxes and is intertemporally constrained.

T Small Area Estimation Methodology

In this section, we use the small area estimation methodology of Elbers et al. (2003) as an alternative to compute household income and poverty status. The methodology imputes income or consumption for each household in the population census, using a prediction model obtained from a household survey. A series of studies employ the method to generate measures of consumption, income, or poverty when is not directly surveyed at a more disaggregated level (e.g., Baird et al. 2013; Enamorado et al. 2016; Asher and Novosad 2020).

To apply the small area estimation methodology, we use the 2000 and 2011 censuses, the 2000 Multipurpose Household Survey (*Encuesta de Hogares de Propósitos Múltiples (EHPM)*), and the 2011 National Household Survey (*Encuesta Nacional de Hogares (ENAHO)*). The EHPM and the ENAHO are nationally representative surveys that share some questions with the corresponding population census and, in addition, contain information on household per capita income. We cannot apply the small area estimation methodology for all the census waves used through the paper because the household survey program began in 1976, and information that might be relevant to predict income, such as dwelling characteristics or asset ownership, was not collected before 1989.

As a first step to implement the methodology, we identified the set of explanatory variables in the EHPM and the ENAHO that are also found in, and strictly comparable to, the corresponding population census. Through a lasso regression, we selected the variables that improved the accuracy of the model. We then use the obtained coefficients to predict household-level real per capita net income (in 2015 Costa Rican Colones) in the census microdata. We iterate the model 1000 times and take the median value for income for each household. A household is considered poor if its median imputed income falls below the poverty line defined by the National Institute

[2]The year when each episode began is 1901, 1932, 1962, and 1981.

of Statistics and Census (*Instituto Nacional de Estadística y Censos*).[3]

Then, using as dependent variables the values for real income and poverty generated by the small area estimation method, we estimate equation (1). Although we use imputed variables, their use as a dependent variable does not require additional regression adjustments (Elbers et al., 2005). For the case of real income, we use its logarithm. All regressions include geographic and demographic controls, census fixed effects, and a linear polynomial in latitude and longitude.

Table T.25 reports the results for all border segments where the characteristics balance, while Table T.26 presents the results for the census blocks in the land that was randomly assigned to the company. Overall, the results obtained through the small area estimation methodology reinforce our main message: in the households located within the former UFCo plantations, the real per capita net income is higher, and the probability of being poor measured using the poverty line is lower.

Table T.25: Average UFCo Effect-Small Area Estimation Methodology Along All Border Segments where Characteristics Balance

	ln Household Real per Capita Net Income	Probability of being poor
	(1)	(2)
UFCo	0.044	-0.099
	(0.028)	(0.021)
	[0.038]	[0.020]
Adjusted R^2	0.444	0.173
Observations	10,220	10,220
Clusters	274	274
Mean	11.537	0.226

Notes: The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

[3]The National Institute of Statistics and Census constructs the poverty line as the cost of a basic food basket and expands it to non-food components using the Orshansky coefficient. In constant 2015 Costa Rican Colones (CRC), for 2000, the poverty line for urban and rural areas per person per month was 67,188 CRC and 46,251 CRC, respectively. On the other hand, for 2011, the poverty line for urban and rural areas per person per month was 106,697 CRC and 82,198 CRC, respectively.

Table T.26: Average UFCo Effect-Small Area Estimation Methodology

	ln Household Real per Capita Net Income (1)	Probability of being poor (2)
UFCo	0.096	-0.107
	(0.037)	(0.032)
	[0.043]	[0.019]
Adjusted R^2	0.471	0.186
Observations	7,016	7,016
Clusters	166	166
Mean	11.531	0.208

Notes: The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

U Persistence of the UFCo Effect and Education

Table U.27: Average UFCo Effect Across Time for Individuals Who Were Born during UFCo Times, and Were Old Enough to Attend an UFCo School

	Years of Schooling	Primary School
	(1)	(2)
UFCo_{1973}	0.495	0.092
	(0.133)	(0.017)
	[0.067]	[0.027]
UFCo_{1984}	0.654	0.088
	(0.099)	(0.011)
	[0.206]	[0.022]
UFCo_{2000}	0.771	0.096
	(0.089)	(0.008)
	[0.253]	[0.020]
UFCo_{2011}	0.615	0.075
	(0.085)	(0.007)
	[0.314]	[0.018]
Adjusted R^2	0.172	0.174
Observations	281,363	281,363
Clusters	9,570	9,570
Mean_{1973}	4.236	0.375
Mean_{1984}	5.366	0.554
Mean_{2000}	5.959	0.618
Mean_{2011}	6.635	0.664

Notes: The unit of observation is the individual. The sample is restricted to individuals who were at least 12 years old at the time of UFCo's closure, such that they might have been directly exposed to UFCo schools. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include include geographic and individual controls, census fixed effects, and a linear polynomial in latitude and longitude.

V Model's Framework and Estimation

V.1 Theoretical Framework

There are $j \in \{1, ..., N\}$ locations, and time is discrete. Throughout, we use a prime to denote next-period values. Each individual lives for one period. First, each agent is born in the location where her parent lives. Then, she chooses whether to live and work in this location, or to move to a different location. Once the location is chosen, the individual supplies a unit of labor inelastically to produce a differentiated variety in the location she lives, and she consumes. The period ends with the agent having one offspring.[4] The total number of workers is normalized in each period and the initial population is exogenous.

[4]This OLG structure, which follows Allen and Donaldson (2018), will allow us to compute steady states which are independent of the initial allocation of individuals across space. This will matter for our counterfactual analysis.

Household Preferences and Consumption After endogenously choosing their location, agents consume and derive utility. In particular, workers living in region j have constant elasticity of substitution (CES) preference with elasticity σ across differentiated domestic goods (c). Additionally, they derive utility from the per capita local amenities of the region where they live. The deterministic component of welfare—defined as welfare up to an idiosyncratic shock that we will introduce below—of a worker residing in location j is given by $\mathcal{U}(c_{jk},\, \tilde{a}_j) = \tilde{a}_j[\sum_{k=1}^{N} c_{jk}^{\frac{\sigma-1}{\sigma}}]^{\frac{\alpha\sigma}{\sigma-1}}$, where $\tilde{a}_j = (A_j/L_j)^{1-\alpha}$ captures the utility derived from per capita local amenities.[5] Each worker supplies one unit of labor inelastically and earns a nominal wage (w_j). Let P_j be the CES price index.[6] The *equilibrium* deterministic utility of a worker in location j can be expressed as $W_j = \tilde{a}_j \left(\frac{w_j}{P_j}\right)^{\alpha}$.

Migration, Shocks and Location Choice As previously stated, the utility of a worker in region j has a deterministic component given by W_j in equilibrium. Further, we allow for bilateral moving costs $\lambda_{jk} \geq 1$, where any value larger than one implies there are migration frictions. Thus, the deterministic utility of a worker who migrates from location j to location k is given by $\frac{W_k}{\lambda_{jk}}$.

Finally, the last component of the utility function is given by idiosyncratic taste differences, denoted by vector $\vec{\omega}$. Therefore, the ultimate utility of a worker living in location j who is *not moving* will depend on the idiosyncratic shock ω_k, and is given by $W_j\omega_j$, while the utility of a resident of location j *moving* to location k is denoted as $W_{jk}(\vec{\omega}) = \frac{W_k\omega_k}{\lambda_{jk}}$. Thus, each period, a worker in location j chooses his location solving $\max_k \left\{ W_{jk}(\vec{\omega}) \right\} = \max_k \left\{ \frac{W_k\omega_k}{\lambda_{jk}} \right\}$.

We further assume that the idiosyncratic utility shifter, $\vec{\omega}$, follows a Frechet extreme value distribution with shape parameter θ. Letting L_j denote the number of workers who live in location j at time t, it follows that the outflow of individuals born in region j who will choose to work in region k (L'_{jk}) can be described as $\frac{L'_{jk}}{L_j} = \frac{\left(\frac{W'_k}{\lambda'_{jk}}\right)^{\theta}}{\sum_{n=1}^{N}\left(\frac{W'_n}{\lambda'_{jn}}\right)^{\theta}}$. Finally, we can derive the gravity equation describing bilateral migration flows from location j as a function of its current population, expected utility in j and utility in other locations, as follows:

$$L'_{jk} = (\lambda'_{jk}\Omega'_j)^{-\theta}(W'_k)^{\theta}L_j, \tag{2}$$

[5] We assume there is perfect congestion in local amenities (i.e., $\tilde{a}_i = \bar{a_j}(A_j/L_j^{\rho})^{1-\alpha}$ with $\rho = 1$). As will become clear in the next subsection, a model with imperfect congestion ($\rho < 1$), would lead to larger investments in local amenities from the UFCo (given the increasing returns to investment) and stronger welfare effects. However, to abstract from this additional agglomeration force and focus on mobility frictions and productivity spillovers, we set $\rho = 1$ and, in this sense, take the effects we find as a lower bound.

[6] As is standard, the CES price index is given by $P_j = \left(\sum_{n=1}^{N-1}(\tau_{nj}p_n)^{1-\sigma}\right)^{1/(1+\sigma)}$, where p_n denotes the price of the variety produced in region $n \neq U$ and τ_{nj} represents bilateral iceberg trade costs (as described below).

where $\Omega'_j = \left[\sum_{n=1}^{N} \left(\frac{W'_n}{\lambda'_{jn}}\right)^{\theta}\right]^{\frac{1}{\theta}}$ denotes the expected utility of an individual born in location j.

Trade Local bilateral trade flows from region j to region k incur an iceberg trade cost, $\tau_{jk} \geq 1$, where $\tau_{jk} = 1$ corresponds to frictionless trade. Thus, the bilateral trade flows of domestic goods are governed by a standard gravity equation: $X_{jk} = \tau_{jk}^{1-\sigma} \left(\frac{w_j}{A_j^{\chi}}\right)^{1-\sigma} \frac{w_k L_k}{P_k^{1-\sigma}}$.

Producers The country has N regions: one producing "bananas," where only the UFCo operates (denoted 'U'), and other $N-1$ locations ($j \in \{1, 2, ..., N-1\}$) which produce a domestic homogeneous good. We assume bananas are a pure export good, while domestic goods are consumed locally. We proceed by describing these regions and their production schemes.

The UFCo's Region (U) The UFCo is a profit maximizer and the sole employer within its location, departing from standard spatial models where firms are price-takers. Besides wage, the firm may also provide local amenities as part of the worker's compensation bundle, and solves the following problem

$$\max_{\{A_U, L_U\}} \Pi_U = \max_{\{A_U, L_U\}} P_U \left(\frac{A_U}{L_U}\right)^{\chi} L_U^{\phi} - w_U(L_U) L_U - P_A A_U$$

such that

$$L_U = L_{U,-1} - \sum_{j=1}^{N-1} L_{Uj} + \sum_{j=1}^{N-1} L_{jU} \tag{3}$$

where L_{Uj} and L_{jU} satisfy equation (2), and χ measures the strength with which the level of amenities (like hospitals or schools) increases productivity.[7]

This means that the firm will provide workers with utility as compared with their "outside option" to attract enough people to meet their optimal labor demand, given bilateral migration flows. *In this sense, the firm is a local monopsonist, whose degree of monopsony power will depend on workers' mobility, which is governed by θ.* High values of θ imply higher worker mobility and less monopsony power for the firm; thus, attracting the same number of workers (L'_U) would be more costly: The firm would have to provide workers with a higher utility level, either through higher wages or more local amenities. Conversely, in a hypothetic case where workers are immobile ($L' = L = L_{-1}$) would lead to a perfectly inelastic labor supply and a case of pure monopsony within this region.[8]

[7] Costa Rican banana production represented, on average, less than two percent of the total world banana production from 1956-1984 (sample used in our calibration), which is why we are not considering p_U—the world banana price—as a function of q_U—bananas produced in Costa Rica. This also allows us to focus on monopsony forces that seemed to have been key, as explained in our empirical analysis.

[8] The curvature of workers' utility function, which is concave in amenities and consumption will guarantee that the compensation bundle chosen by the company will be a combination of both amenities and wages. A previous version of the model was dynamic, in that amenities did not fully

Firms in the Rest of the Country Each of the $N-1$ regions in the rest of the country produce domestic tradable goods.[9] Producers in location $j \in \{1, ..., N-1\}$ maximize profits in a competitive market and pay taxes to the government, solving

$$\max_{\{L_j\}} \Pi_j(L_j) = \max_{\{L_j\}} p_j \left(\frac{A_j}{L_j}\right)^{\chi} L_j^{\gamma} - w_j L_j - T_j.$$

Local Amenities For simplicity, we assume that local amenities can be purchased at an exogenous price P_A in all regions.

Government The government collects taxes T from firms in the "Rest of the Country," and provides local amenities to this region so that $P_A A_j = \frac{L_j}{\bar{L}-L_U} \sum_{j=1}^{N-1} T_j = \frac{L_j}{\bar{L}-L_U} \sum_{j=1}^{N-1} t P_j (A_j)^{\chi} L_j^{\gamma}$, where $\bar{L}$ is the total adult population in the country. As shown, we assume the government has no access to borrowing in foreign capital markets, and is therefore its provision of amenities is constrained at every point in time by $\sum_{j=1}^{N-1} T_j$, where each T_j is a fixed proportion t of the sales in region j, which is consistent with severe historical borrowing constraints. We also assume that revenue is spent on local amenities according to the labor share in each region, which is consistent with the observed public spending shares in our data: From 1955 to 1984, public spending on local amenities per capita across cantons was very similar, so much so that the dispersion index of this data is only 0.008.[10]

Equilibrium A competitive equilibrium in this economy consists of prices $\{w_j, p_j\}_{j=1}^{N}$, and $\{P_A\}$; company decisions $\{A_U, L_U\}$; and labor supply $\{L_j\}_{j=1}^{N}$ such that: All firms and households optimize; trade is balanced; labor flows are consistent across regions $L'_j = \sum_k L'_{kj}$ and $L_j = \sum_k L'_{jk}$; and the labor, domestic good, and UFCo fruit market clear. The solution of the system of equations implied by this equilibrium, and the proof of its uniqueness closely follows Allen and Donaldson (2018), who in turn use techniques derived from Allen et al. (2015).

V.2 Estimation

We calibrate the model to the historical reference equilibrium corresponding to the observed annual levels of economic activity at the canton-level, with 59 locations in total, for years 1950-1973, in which all the data required for the estimation is available. Our strategy to recover the parameters in the model has several steps. Our first step

depreciating from one period to the next. This more complicated version, available upon request, delivered qualitatively similar results, but could explain why there is persistence after UFCo's exit. In particular, a depreciation rate of amenities of 3% allowed us to match the observed rate of convergence across UFCo and non-UFCo regions.

[9] Note that these goods are homogeneous in the sense that they have the same production function, however, they will be traded given the CES structure of the utility function.

[10] The dispersion index is a normalized measure of the dispersion of a probability distribution, and it is defined as the ratio of the variance to the mean. A constant random variable would have a dispersion index of zero. An under-dispersed random variable would have dispersion between zero and 1 (for example, points spread uniformly), while if the dispersion index is larger than 1, a dataset is considered over-dispersed.

assumes migration costs of the standard form $\ln(\lambda_{jk}) = \mu \ln(dist_{jk})$.[11] We substitute these into equation (2), and obtain

$$\ln(L_{jkt}) = -\theta\mu \ln(dist_{jk}) + \theta\alpha \ln(w_{jt}) + \theta(1-\alpha) \ln\left(\frac{A_{jt}}{L_{jt}}\right) + \rho_j + \pi_k + \varepsilon_{jkt}, \quad (4)$$

where $j \in R$, $k \in U$ and ρ_j, π_k are origin and destination fixed-effects. We can then estimate θ, μ, and α using data on distances and migration of individuals working in the agricultural sector across locations using PPML.[12] Moreover, as endogeneity is a concern, we use an IV strategy, where we focus on agricultural workers who migrate from any region to a non-UFCo location. For them, their main outside option at the time was working in coffee plantations. Thus, as in Section 5.1.4, we use the suitability to grow coffee in a location to instrument for wages. For amenities, while still focusing on migration to non-UFCo locations only, we use a "Bartik"-type instrument (Bartik, 1991). Along the lines of Nakamura and Steinsson (2014), the instrument is constructed using national changes in population interacted with the population share in each location according to the 1927 Population Census (more than two decades before the data to calibrate our model begins).[13] Table V.28 shows both stages of this estimation.

We find that $\{\mu, \alpha, \theta\} = \{0.17, 0.75, 5.49\}$. These values are reassuring. While μ is in line with standard elasticities found in the literature (Redding and Rossi-Hansberg, 2017), α aligns with values of the income share spent on consumption goods obtained after collecting data from household income and expenditure surveys conducted in Costa Rica between 1949 and 1961, which imply a value of $\alpha = 0.8$.[14] Finally, our migration elasticity for agricultural workers of mid-20th century Costa Rica, θ, is in line with findings from Allen and Donaldson (2018), who estimate a migration elasticity of 8.45 for the United States in 1850, which decreased consistently over time (5.58 in 1950) until reaching a value of 4.5 in 2000.[15] Given the importance of this elasticity, in the next section, we show how our results change for a wide range of values of θ.

Based on data we collected from the Annual Report of the Ministry of Economy and Finance (*Memoria Anual del Ministerio de Economía y Hacienda*), we set the

[11] We approximate intra-unit trade costs based on the average distance traveled to the center of a circular unit of the same area from evenly-distributed points within it (e.g., Redding and Venables (2004)).

[12] Results using OLS and a gamma are statistically equal to those using PPML.

[13] Note that, given the historical setting, both of these instruments only make sense when the destination of a migrant is *outside* the UFCo.

[14] These are the "Family Income and Expenditure for San José. Survey 1949" (*"Ingresos y gastos de las familias de la ciudad de San José. Encuesta 1949"*) and the "Survey of Family Income and Expenditures 1961" (*"Encuesta de ingresos y gastos familiares 1961"*). The surveys asked a representative sample of Costa Rican households about the share of their income spent on different goods and services, including food, clothes, housing, education, and healthcare. The data record the goods and services with a high level of detail, consisting of 144 categories in 1949 and 153 in 1961. We classify each good and service as an amenity if, according to the company's reports, the UFCo provided them to its workers at no extra cost. With this, we can calculate the share of income spent on amenities and "consumption" and found that the share of income spent in non-UFCo provided goods and services had a value of 0.80.

[15] This elasticity might have been larger for agricultural workers in Costa Rica, as compared with modern-day estimates, due to the aggressive expansion of the agricultural frontier at the time.

share of tax revenues over non-UFCo-related GDP, T, equal to 0.1318. We assume costless trade and set $\sigma = 5$ as in Allen and Donaldson (2018), while conducting a sensitivity analysis. We recover other parameters using a simulated method of moments (SMM). The targets for the SMM mainly exploit variation between the UFCo region and the rest of the country. Table V.29 reports the results of our SMM and its targets. We proceed by explaining these targets and data sources in more detail.

Table V.28: Estimation of Model Elasticities

First Stage		
	ln Wages	ln Amenities per Capita
	(1)	(2)
Coffee Intensity	0.227	
	(0.089)	
ln Population share		1.114
		(0.104)
Adjusted R^2	0.580	0.600
F-statistic (excluded instruments)	21.197	113.777
Second Stage (Dependent variable: L_{kj})		
	Coefficient	Standard Error
ln Distance between Locations k and j	-0.925	(0.054)
ln Wages in Location j	4.139	(0.679)
ln Amenities per Capita in Location j	1.352	(0.354)

Notes: First Stage: the unit of observation is the individual in column (1) and the canton in column (2). Robust standard errors, adjusted for clustering by canton, are in parentheses. Second Stage: the unit of observation is the migration flow between location k (origin) and j (destiny). We consider only flows of agricultural workers from any location to agriculture-intensive locations, as our instruments are only valid for this type of flows. Estimation is performed using PPML. Robust standard errors, adjusted for clustering by each k and j pair, are in parentheses.

We hand-collected data on the number of employees hired by the UFCo from company reports. The number of workers in coffee production comes from the 1950 and 1963 Agricultural Censuses. We digitized data on coffee and banana prices from Costa Rican Statistic Yearbooks, while data on spending per capita on amenities by the UFCo and the government corresponds with the one described in Section 5.1.3. Finally, we create a model-based version of the RD design we conducted empirically. To obtain the RD estimate, we first construct a projection of the probability of being poor—an index that does not have a model-equivalent—on real wages and investments in amenities per capita in each location—which are observable both in the data and in the model. To do so, we use real wages of agricultural workers from the 1973 Population Census and data we collected on government spending per municipality, while controlling for the geographic and demographic characteristics of each location.[16]

[16]In particular, we restrict attention to households with at least one member in the agricultural sector and estimate the following specification:

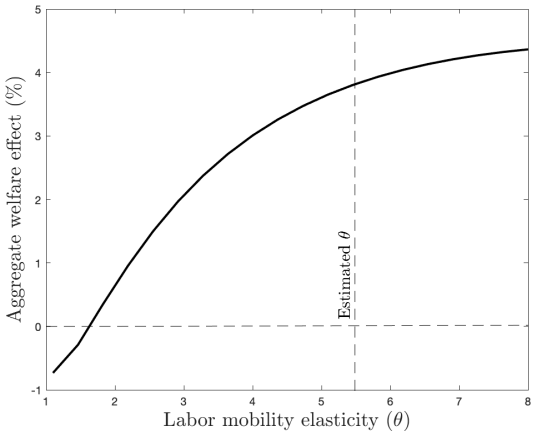
$$P(poor_j) = \beta_1 \ln(w_j) + \beta_2 \ln\left(\frac{P_A A_j}{L_j}\right) + \mathbf{X}_j\Gamma + \varepsilon_j,$$

where $P(poor_j)$ is the probability of being poor in location j, $\ln(w_j)$ is the logarithm of the average

Table V.29: Jointly Calibrated Values in Steady State (SMM)

Target	Data	Model
Local effect (RD)	-0.06	-0.06
Agricultural labor share UFCo	0.09	0.09
Price per ton UFCo/RoC	0.13	0.13
Investment per cap UFCo/government	1.27	1.27

Figure V.2: Aggregate Welfare and Labor Mobility



Notes: The figure shows how the aggregate welfare of the UFCo changes as labor mobility changes. The company's aggregate welfare effect is computed by comparing the scenario with UFCo with a one where the UFCo's location has exactly the same characteristics as the rest of the country.

We estimate that the average fitted probability of being poor for the UFCo region (U) is $P(\widehat{poor_{UFCo}}) = 0.721$, and for the rest of the country (R) is $P(\widehat{poor_R})$=0.776. Therefore, $\gamma = P(\widehat{poor_{UFCo}}) - P(\widehat{poor_R})$=-0.056 (robust standard error adjusted for clustering by location: 0.015). We then run the SMM to minimize the difference between the empirical and model-based γ.

The SMM targeted moments from the model closely match the data. Our calibrated parameters are, first, the price of amenities (P_A) with a value of 5.91, then, we obtain a value of χ, which measures the effect of amenities in productivity, of 0.06. In general, it is extremely difficult to measure the effect that amenities like schools have on productivity, as the decision to provide them is disconnected from the decisions of firms. In our case, the UFCo was, in some sense, a "profit-maximizing public goods producer," which internalized the effect of amenities on productivity. Thus, the setting provides a rare opportunity to estimate a value of χ from the levels of investment that the company chose. The SMM results in a value of 0.18 and 0.07 for the labor share of output in the UFCo (ϕ) and the rest of the country (γ), respectively.[17]

wage for members in households working in the agricultural sector in location j, $\ln\left(\frac{P_A A_j}{L_n}\right)$ is the logarithm of the government spending per capita in location j. We find that β_1=-0.077, and β_2=-0.055, with standard errors of 0.033 and 0.024, respectively.

[17]Historically, the coffee plantations suffered from low productivity (León Sáenz, 2012).

V.3 Counterfactual

Figure V.2 displays a counterfactual exercise where we change the value of the labor mobility elasticity (θ). The UFCo's effect is sensitive to the value of the labor mobility elasticity, and low values of this elasticity can flip the sign of the UFCo's effect, such that the firm's presence might harm locals.[18]

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[18] This would be impossible in a case with perfect mobility across regions, where the country's labor market would feature perfect competition. However, with low labor mobility, workers within the UFCo region can be negatively affected by the firm's market power.

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