Appendix: The Potential for Enhanced Targeting of Microfinance through Machine Learning

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Appendix

A Additional Tables

A.1 Basline Credit Access ITTs

Table A1: Baseline ITT - Credit Access (Replications)

Panel A: Bosnia

	Any Loan any source	Number of loans	Any Loan any MFI	Any Loan formal bank
Treatment	0.193***	0.429***	0.439***	−0.056***
	(0.026)	(0.065)	(0.029)	(0.017)
R^2	0.087	0.081	0.215	0.030
Num. obs.	994	994	994	994

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Panel B: Mexico

	Any Loan Any MFI	Any Loan Compartamos - Admin	Any Loan Compartamos - Survey
Treatment	0.060*	0.100***	0.067***
	(0.030)	(0.017)	(0.015)
R^2	0.007	0.045	0.025
Num. obs.	1740	1823	1733
N Clusters	33	33	33

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Panel C: Morocco

	Borrowed Al Amana (admin)	Borrowed Any source	Amount Al Amana (survey)	Amount Any source	Loan repayment
Treatment	0.138***	0.063***	633.471***	1002.516***	29.627***
	(0.011)	(0.017)	(88.352)	(277.566)	(8.511)
R^2	0.171	0.316	0.098	0.099	0.068
Num. obs.	3614	3614	3614	3614	3614
N Clusters	162	162	162	162	162

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Panel D: Mongolia

	Any Loan XacBank	Any Loan Other MFI	Any Loan Informal Bank	Any Loan Any Source
Treatment	0.475***	−0.105**	0.006	0.241***
	(0.046)	(0.043)	(0.005)	(0.040)
R^2	0.197	0.016	0.012	0.067
Num. obs.	961	961	961	961
N Clusters	40	40	40	40

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Panel E: Philippines

	Loans outstanding formal institutions	Loans outstanding informal sources
Treatment	0.094**	−0.011
	(0.045)	(0.042)
R^2	0.032	0.028
Num. obs.	1106	1106

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

A.2 Generic ML CLAN Tables

Table A2.1: Variables Contributing to Heterogeneity (CLAN Analysis)
Bosnia

variable	G1	G2	G3	G4	G4-G1	G4-G2	G4-G3	estimate.variable
assetvalue_stan_BL	4035422.35	2865099.91	2511103.75	3235523.09	-642101.52	400610.97	394238.99	assetvalue_stan_BL
avg yearly business profits	4235.73	154.14	206.32	4610.31	4209.28	4457.99	4332.11	biz_profits_stan_BL
avg yearly busines expenditures	99.64	66.05	104.58	4276.45	4105.25	394.33	285.61	biz_expenditures_stan_BL
b_y_max_stan	2145.13	1752.77	2054.50	3441.24	1343.42	1623.22	1355.18	b_y_max_stan
estimated value of savings	1104.55	962.24	1012.65	1881.82	754.55	985.63	864.59	b_savings_avg_stan
avg yearly business revenues	250.38	198.89	287.52	1025.54	823.56	810.40	671.54	biz_revenues_stan_BL
min expected income yearly	1154.45	961.45	1105.47	1701.66	546.98	758.17	665.16	b_y_min_stan
amount spent on durable consumption last year	1230.25	892.93	977.70	1539.08	278.05	628.28	554.36	b_durablec_stan
total yearly household income	658.08	629.23	695.25	999.00	332.95	367.58	307.55	b_y_tot_stan
total household income	658.08	629.23	695.25	999.00	332.95	367.58	307.55	total_hh_income_stan_BL
total household consumption	261.12	170.25	174.12	307.85	64.45	117.15	124.20	total_hh_consumption_stan_BL
total food consumption last week	46.08	47.69	52.73	74.65	28.58	27.33	21.35	b_foodc_stan
total consumption of temptation goods last week	20.12	19.78	21.71	36.02	18.42	15.75	13.40	hh_consumption_temptation_stan_BL
amt spend on food consumption outside of home last week	5.20	5.14	6.05	15.20	9.96	10.11	8.26	b_foodc_o_stan
Hours per-week respondent works on business	49.78	46.24	46.22	51.30	0.79	4.19	5.00	b_resp_hrswork
Educational attainment (highest grade level)	22.66	22.20	22.52	24.30	1.51	1.98	1.90	b_resp_hg
# employed hh members	0.95	1.03	1.16	1.40	0.44	0.38	0.27	b_hhmem_employed
# loans outstanding at baseline	0.71	0.73	0.79	0.91	0.18	0.15	0.10	b_loans
Respondent is employed	0.52	0.54	0.56	0.64	0.10	0.09	0.07	b_resp_es1
# kids aged <= 5	0.23	0.26	0.29	0.34	0.10	0.07	0.03	b_kids_05
business is in trade	0.21	0.25	0.29	0.32	0.12	0.07	0.04	b_bm_trade
business is in service	0.24	0.27	0.29	0.32	0.08	0.05	0.02	b_bm_service
Gender	1.33	1.41	1.46	1.44	0.11	0.02	-0.02	b_resp_gender
does household save for business expenses?	0.27	0.28	0.28	0.30	0.03	0.02	0.01	b_sav_busexp
=1 if primary dwelling is owned	0.87	0.87	0.88	0.88	0.01	0.01	0.00	b_dw_own
# elders aged > 64	0.16	0.15	0.16	0.15	-0.02	-0.00	-0.01	b_elders_64
business is in production	0.07	0.06	0.05	0.06	-0.01	-0.00	0.00	b_bm_prod
Respondent is divorced/separated	0.06	0.07	0.06	0.06	0.01	-0.00	-0.00	b_resp_ms4
# kids aged between 6-10	0.25	0.29	0.30	0.28	0.02	-0.00	-0.02	b_kids_610
# kids aged between 10-17	0.36	0.36	0.33	0.35	-0.02	-0.00	0.03	b_kids_1116
Respondent is married	0.61	0.62	0.61	0.59	-0.02	-0.00	-0.02	b_resp_ms2
business is in agriculture	0.46	0.42	0.37	0.29	-0.16	-0.12	-0.07	b_bm_agric
Age	39.97	38.48	37.02	35.57	-4.55	-2.92	-1.67	b_resp_age
# months business has existed	193.51	138.48	129.42	123.10	-72.89	-13.31	-3.81	b_bm_exist
loan amount taken	2070.45	1724.71	1607.22	1594.55	-518.27	-137.24	-31.93	loan_amount_any_stan

Table A2.2: Variables Contributing to Heterogeneity (CLAN Analysis)
Mexico

variable	G1	G2	G3	G4	G4-G1	G4-G2	G4-G3	estimate.variable
Bi-weekly business profits	14.75	-2.54	17.71	35.58	26.07	38.81	8.37	biz_profits_stan_BL
Bi-weekly business revenues	42.36	54.60	126.90	90.35	43.40	36.35	-39.47	biz_revenues_stan_BL
Bi-weekly business expenditures	34.37	59.36	110.37	72.32	35.36	-12.29	-52.09	biz_expenditures_stan_BL
Bi-weekly hh income from business	38.78	43.39	59.92	53.48	12.25	7.39	-6.56	hh_biz_income_stan_BL
Monthly food expenditure	146.92	137.33	140.72	138.37	-9.99	2.73	-0.06	foodconsumption_stan_BL
Number of businesses	0.21	0.21	0.26	0.39	0.17	0.10	0.08	BE_Q10_1
Depression index	-0.28	-0.09	0.08	0.09	0.33	0.18	0.04	BE_Q22_mean
Num fam members empl by fam business	0.08	0.14	0.20	0.31	0.23	0.11	0.08	BE_Q10_4_tot_family
Formal credit experience	0.29	0.25	0.30	0.40	0.09	0.15	0.11	base_formalexper_dum
Has a business	0.18	0.20	0.25	0.33	0.14	0.10	0.06	BE_Q10_any
Has owned a business	0.46	0.43	0.43	0.54	0.09	0.13	0.07	business_before
Started business in last year	0.03	0.07	0.09	0.16	0.12	0.10	0.07	BE_bizstart12mo
High risk aversion	0.66	0.71	0.71	0.75	0.10	0.04	0.04	base_riskpref
Has credit account	0.19	0.19	0.18	0.21	0.00	0.00	0.04	base_account
Fraction children 4-17 working	0.09	0.08	0.08	0.11	0.01	0.02	0.03	BE_Q5_frac_working
Fraction children 4-17 in school	0.65	0.63	0.63	0.64	-0.02	0.01	0.02	BE_Q5_fraction
Bi-weekly hh income per adult last month	0.07	0.07	0.08	0.07	-0.00	-0.00	-0.01	total_hh_income_stan_BL
Closed business in last year	0.22	0.18	0.13	0.16	-0.05	-0.02	-0.02	BE_bizclose
Has outstanding debt	0.21	0.18	0.16	0.17	-0.08	-0.02	-0.03	BE_Q21_anyloan
Member of a savings group	0.31	0.23	0.22	0.21	-0.11	-0.01	-0.04	BE_Q20_2
Member of informal lending group	0.31	0.23	0.22	0.21	-0.11	-0.01	-0.04	base_cundina
Has had a loan (any informal entity)	0.09	0.06	0.04	0.03	-0.09	-0.03	-0.01	BE_Q21_3_informal2
Good health status	0.73	0.79	0.74	0.71	-0.05	-0.09	-0.04	BE_Q3_1_sat
Age	37.89	37.66	36.77	37.21	-0.86	-0.57	0.09	BF5
Monthly income from gov't aid	5.51	3.06	2.78	2.03	-3.71	-1.03	-0.73	hh_aid_income_stan_BL
Loan amount from Compartamos	19.71	27.29	34.49	16.70	-8.76	-14.15	-8.48	loan_amount_comp_stan
Loan amount (any informal entity)	209.70	195.71	174.87	163.32	-85.68	-296.70	-221.11	BE_Q21_5_informal2
Loan amount from any MFI	107.84	178.80	176.48	144.46	22.28	-67.35	-51.46	loan_amount_any_stan
Total debt in last 2 years	169.35	216.43	280.27	109.58	-130.93	-142.90	-173.58	total_debt_stan_BL

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Table A2.3: Variables Contributing to Heterogeneity (CLAN Analysis)
Morocco

variable	G1	G2	G3	G4	G4-G1	G4-G2	G4-G3	estimate.variable
Total livestock	600.33	1105.42	2473.62	5443.69	4811.29	4378.19	2938.00	savings_livestock_bl_stan
Total agriculture assets	102.21	133.39	256.06	651.19	533.27	497.11	371.46	savings_agri_bl_stan
Total output last year - any business	44.18	72.67	186.33	406.40	370.82	333.73	228.21	output_total_bl_stan
Business expenditures	32.14	45.41	100.97	288.38	256.23	236.88	170.18	biz_expenditures_stan_BL
Total consumption	156.15	183.52	244.45	395.47	237.37	209.77	150.42	total_hh_consumption_stan_BL
Monthly consumption of nondurables	154.17	180.79	240.63	383.82	229.05	203.17	141.86	cons_nondurables_bl_stan
Agriculture output last year	17.97	27.47	104.03	216.10	198.25	182.43	105.90	prod_agri_bl_stan
Sales from agriculture business last year	14.10	23.51	94.57	195.14	178.95	173.93	103.69	sale_agri_bl_stan
Debt outstanding informal (MAD)	15.51	19.31	30.56	125.24	102.71	105.93	93.55	aloansamt_informal_bl_stan
Business revenues	13.75	26.54	77.21	111.08	100.89	79.80	31.16	biz_revenues_stan_BL
Husbandry expenses last year	7.35	12.20	28.99	96.51	90.46	84.36	69.76	expense_livestock_bl_stan
Sales from anim. husb. business last year	6.17	10.52	26.95	82.32	76.15	72.42	55.52	sale_livestock_bl_stan
Business profits	12.09	27.15	78.82	95.64	80.42	59.65	7.13	biz_profits_stan_BL
Agriculture expenses last year	7.25	10.09	26.18	78.48	71.07	68.59	53.53	expense_agri_bl_stan
Loan amount	2393.27	2377.08	2376.99	2426.91	26.20	50.12	44.19	admin_amount_stan
Debt outstanding Al Amana (MAD)	0.00	0.00	1.67	20.06	20.06	20.06	18.52	aloansamt_alamana_bl_stan
Income from wages or salary last year	73.76	90.48	105.67	109.76	37.51	15.20	0.26	income_dep_bl_stan
Monthly consumption of durables	1.97	2.74	3.82	12.38	10.75	9.64	8.45	cons_durables_bl_stan
Livestock asset purchases in last year	0.45	0.91	2.10	8.99	8.32	7.94	6.93	inv_livestock_bl_stan
Number of household members	3.36	4.16	5.84	7.14	3.82	2.85	1.31	members_resid_bl
Number of adults 16+ in household	2.24	2.54	3.84	5.10	2.90	2.55	1.25	nadults_resid_bl
Number of self-employment activities	0.98	1.18	1.77	2.16	1.10	0.92	0.40	act_number_bl
Share of income from self-employment	0.25	0.30	0.41	0.83	0.57	0.54	0.43	share_inc_self_bl
Has agriculture self-employment activity	0.40	0.43	0.67	0.84	0.42	0.40	0.19	act_agri_bl
Number of children < 16 in household	1.10	1.63	1.93	2.04	0.90	0.35	0.10	nchildren_resid_bl
Has animal husbandry self-employment activity	0.28	0.40	0.65	0.78	0.49	0.36	0.14	act_livestock_bl
Lost livestock in past year	0.12	0.13	0.20	0.36	0.23	0.23	0.15	hadlost_livestockanim_bl
Agriculture asset purchases in last year	0.02	0.04	0.13	0.24	0.22	0.20	0.10	inv_agri_bl_stan
Has ever borrowed	0.26	0.18	0.28	0.36	0.10	0.16	0.06	borrowed_total_bl
Low educational attainment	0.69	0.48	0.56	0.61	-0.10	0.11	0.04	head_educ_1_bl
Has non-agriculture self-employment activity	0.19	0.15	0.20	0.24	0.05	0.09	0.04	act_business_bl
Share of income going to consumption	0.13	0.16	0.01	0.25	0.18	-0.02	0.06	share_cons_income_bl
Has borrowed from Al Amana	0.00	0.00	0.00	0.02	0.02	0.02	0.01	borrowed_alamana_bl
Has borrowed informally	0.07	0.06	0.08	0.07	0.01	0.01	-0.01	borrowed_informal_bl
Is identified as poor	0.24	0.24	0.31	0.18	-0.05	-0.06	-0.14	poor_bl

Table A2.4: Variables Contributing to Heterogeneity (CLAN Analysis)
Philippines

variable	G1	G2	G3	G4	G4-G1	G4-G2	G4-G3	estimate.variable
value of non-stock assets	3167.52	2795.83	2970.78	5852.11	2699.52	2793.48	2553.43	nonstock_assets_value_stan_BL
value of stock assets	1933.83	1806.19	2153.02	4827.27	3054.49	2863.51	2372.69	stock_assets_value_stan_BL
value of reported property	3081.94	3077.48	3288.17	4316.96	1073.97	1252.17	876.64	total_property_value_stan_BL
loan amount received from FMB	381.27	484.95	571.48	853.58	478.09	368.42	272.03	loan_amount_any_stan
bi-weekly business expenditures	26.54	26.97	41.34	172.04	143.62	147.21	122.92	biz_expenditures_stan_BL
bi-weekly business revenues	6.19	2.46	2.74	5.13	-0.42	3.32	3.80	biz_revenues_stan_BL
bi-weekly business income	6.19	2.46	2.74	5.13	-0.42	3.32	3.80	business_income_stan_BL
Business 1: number of full time employees	0.09	0.14	0.28	1.58	1.48	1.46	1.27	css_regularcount1
Business 1: years in business	5.87	6.32	6.64	7.43	1.49	1.10	0.85	css_yearsinbusiness1
final credit score	51.17	51.28	51.39	51.81	0.52	0.44	0.35	css_creditscorefinal
Business 1: type 1	0.13	0.17	0.25	0.35	0.23	0.18	0.08	css_businesstype1_1
educational attainment level 1	0.29	0.30	0.34	0.46	0.17	0.16	0.11	css_educattainment_1
number of dependents	2.19	2.24	2.25	2.36	0.19	0.13	0.07	css_dependents
spouse occupation category 2	0.64	0.65	0.67	0.74	0.10	0.10	0.08	css_spousejob_2
homeownership status 4	0.09	0.09	0.12	0.18	0.09	0.08	0.05	css_homeownership_4
Business 1: type 4	0.14	0.09	0.10	0.15	0.01	0.05	0.05	css_businesstype1_4
number of businesses	1.15	1.12	1.13	1.18	0.01	0.04	0.04	css_noofbusiness
Business 1: type 6	0.07	0.08	0.09	0.12	0.04	0.04	0.03	css_businesstype1_6
Business 1: type 5	0.01	0.01	0.01	0.04	0.03	0.03	0.03	css_businesstype1_5
total loans outstanding	0.02	0.01	0.01	0.02	0.00	0.00	0.00	total_loans_outstanding_stan_BL
homeownership status 3	0.03	0.03	0.02	0.02	-0.01	-0.00	-0.00	css_homeownership_3
educational attainment level 5	0.02	0.02	0.02	0.01	-0.01	-0.01	-0.01	css_educattainment_5
pays electric bill on time	1.95	1.96	1.97	1.95	-0.00	-0.01	-0.02	css_paidtag_electric
homeownership status 2	0.12	0.12	0.10	0.11	-0.01	-0.01	0.01	css_homeownership_2
educational attainment level 4	0.03	0.04	0.04	0.03	-0.01	-0.01	-0.01	css_educattainment_4
spouse occupation category 3	0.06	0.07	0.06	0.04	-0.02	-0.03	-0.02	css_spousejob_3
gender	1.84	1.87	1.87	1.83	-0.01	-0.04	-0.04	css_gender
spouse occupation category 1	0.26	0.26	0.25	0.20	-0.07	-0.05	-0.05	css_spousejob_1
educational attainment level 2	0.27	0.25	0.23	0.20	-0.07	-0.06	-0.04	css_educattainment_2
homeownership status 1	0.75	0.76	0.74	0.68	-0.08	-0.09	-0.07	css_homeownership_1
educational attainment level 3	0.35	0.38	0.35	0.28	-0.06	-0.09	-0.07	css_educattainment_3
Business 1: type 2	0.60	0.60	0.49	0.21	-0.39	-0.38	-0.26	css_businesstype1_2
age	42.34	42.49	42.10	41.36	-1.15	-1.23	-0.75	css_age
bi-weekly household income	96.18	85.05	84.52	75.51	-19.76	-9.33	-2.55	total_hh_income_stan_BL
bi-weekly household income	96.18	85.05	84.52	75.51	-19.76	-9.33	-2.55	total_hh_income_stan_BL
amount of remittances received	64.13	70.33	64.86	52.14	-8.99	-17.88	-15.30	remittances_stan_BL

A.3 VIF Tables

Table A3.1: Mean Variable Importance Factors (VIF)
Bosnia

	Covariate	Profit	Revenue	Expenditures	Income	Consumption
1	value of all assets	0.02	0.03	0.04	0.03	0.03
2	business is in agriculture	0.00	0.00	0.00	0.00	0.01
3	# months business has existed	0.08	0.06	0.04	0.03	0.12
4	does household own business?	0.00	0.00	0.00	0.00	0.00
5	business is in production	0.00	0.00	0.00	0.00	0.01
6	business is in service	0.01	0.01	0.01	0.00	0.00
7	business is in trade	0.01	0.01	0.01	0.00	0.00
8	total consumption of temptation goods last week	0.01	0.02	0.03	0.03	0.02
9	amount spent on durable consumption last year	0.08	0.09	0.09	0.05	0.07
10	=1 if primary dwelling is owned	0.00	0.00	0.00	0.00	0.00
11	# elders aged > 64	0.00	0.00	0.00	0.00	0.00
12	total food consumption last week	0.05	0.04	0.04	0.04	0.03
13	amt spend on food consumption outside of home last week	0.01	0.01	0.02	0.03	0.08
14	# employed hh members	0.00	0.01	0.01	0.01	0.01
15	# kids aged <= 5	0.01	0.01	0.01	0.01	0.01
16	# kids aged between 10-17	0.00	0.00	0.00	0.01	0.00
17	# kids aged between 6-10	0.00	0.00	0.00	0.00	0.00
18	# loans outstanding at baseline	0.01	0.00	0.00	0.01	0.00
19	Age	0.02	0.02	0.02	0.06	0.03
20	Respondent is employed	0.00	0.00	0.00	0.00	0.00
21	Gender	0.00	0.00	0.00	0.00	0.00
22	Educational attainment (highest grade level)	0.01	0.02	0.02	0.03	0.09
23	Hours per-week respondent works on business	0.02	0.02	0.02	0.03	0.03
24	Respondent is married	0.00	0.00	0.00	0.00	0.00
25	Respondent is divorced/separated	0.00	0.00	0.00	0.00	0.00
26	does household save for business expenses?	0.04	0.03	0.02	0.01	0.01
27	estimated value of savings	0.07	0.06	0.05	0.02	0.02
28	max expected income yearly	0.10	0.06	0.03	0.07	0.04
29	min expected income yearly	0.10	0.07	0.04	0.10	0.04
30	total yearly household income	0.05	0.08	0.08	0.13	0.06
31	avg yearly busines expenditures	0.02	0.03	0.05	0.01	0.02
32	avg yearly business profits	0.06	0.07	0.08	0.04	0.02
33	avg yearly business revenues	0.04	0.05	0.05	0.03	0.01
34	loan amount taken	0.05	0.04	0.07	0.03	0.05
35	total household consumption	0.06	0.06	0.08	0.05	0.13
36	total household income	0.05	0.08	0.08	0.13	0.06

Table A3.2: Mean Variable Importance Factors (VIF)
Mexico

	Covariate	Profit	Revenue	Expenditures	Income	Consumption
1	Has credit account	0.01	0.00	0.00	0.01	0.01
2	Member of informal lending group	0.01	0.04	0.03	0.00	0.01
3	Formal credt experience	0.03	0.04	0.03	0.06	0.01
4	Monthly income per adult last month	0.23	0.15	0.08	0.07	0.26
5	High risk aversion	0.00	0.01	0.00	0.01	0.00
6	Closed business in last year	0.00	0.00	0.00	0.00	0.00
7	Started business in last year	0.00	0.00	0.00	0.00	0.00
8	Monthly food expenditure	0.05	0.02	0.08	0.05	0.11
9	Number of businesses	0.00	0.00	0.01	0.00	0.00
10	Num fam members empl by fam business	0.00	0.00	0.00	0.00	0.00
11	Expenditures last 2 weeks	0.03	0.04	0.05	0.03	0.06
12	Profits last 2 weeks	0.01	0.01	0.00	0.01	0.00
13	Revenues last 2 weeks	0.07	0.14	0.13	0.06	0.08
14	Has a business	0.00	0.00	0.01	0.00	0.00
15	Monthly business income	0.02	0.02	0.09	0.01	0.01
16	Monthly income from gov't aid	0.00	0.00	0.00	0.00	0.00
17	Member of a savings group	0.01	0.04	0.03	0.00	0.01
18	Has had a loan (any informal entity)	0.00	0.00	0.00	0.00	0.00
19	BE_Q21_3_oth	0.00	0.00	0.00	0.00	0.00
20	Total debt in last 2 years	0.01	0.01	0.03	0.04	0.02
21	Loan amount (any informal entity)	0.00	0.00	0.00	0.00	0.00
22	BE_Q21_5_oth	0.00	0.00	0.00	0.00	0.00
23	Has outstanding debt	0.01	0.00	0.02	0.01	0.02
24	Depression index	0.26	0.23	0.14	0.39	0.13
25	Good health status	0.00	0.00	0.00	0.00	0.00
26	Fraction children 4-17 working	0.00	0.00	0.00	0.00	0.00
27	Fraction children 4-17 in school	0.01	0.01	0.02	0.02	0.01
28	Age	0.21	0.18	0.14	0.18	0.19
29	Has owned a business	0.02	0.03	0.08	0.01	0.02
30	Loan amount from any MFI	0.00	0.00	0.00	0.00	0.00

Table A3.3: Mean Variable Importance Factors (VIF)
Morocco

	Covariate	Profit	Revenue	Expenditures	Income	Consumption
1	Has agriculture self-employment activity	0.00	0.00	0.00	0.00	0.00
2	Has non-agriculture self-employment activity	0.00	0.00	0.00	0.00	0.00
3	Has animal husbandry self-employment activity	0.00	0.00	0.00	0.00	0.00
4	Number of self-employment activities	0.01	0.01	0.00	0.00	0.07
5	Debt outstanding Al Amana (MAD)	0.00	0.00	0.00	0.00	0.00
6	Debt outstanding informal (MAD)	0.00	0.01	0.01	0.00	0.01
7	Business expenditures	0.15	0.07	0.09	0.13	0.04
8	Business profits	0.06	0.07	0.07	0.05	0.03
9	Business revenues	0.01	0.01	0.01	0.01	0.00
10	Has borrowed from Al Amana	0.00	0.00	0.00	0.00	0.00
11	Has borrowed informally	0.00	0.00	0.00	0.00	0.00
12	Has ever borrowed	0.00	0.00	0.00	0.00	0.00
13	Was an Al Amana client at baseline	0.00	0.00	0.00	0.00	0.00
14	Monthly consumption of durables	0.01	0.02	0.01	0.01	0.00
15	Monthly consumption of nondurables	0.03	0.04	0.05	0.03	0.10
16	Agriculture expenses last year	0.07	0.06	0.14	0.07	0.05
17	Husbandry expenses last year	0.11	0.10	0.12	0.10	0.09
18	Lost livestock in past year	0.00	0.00	0.00	0.00	0.00
19	Low educational attainment	0.00	0.00	0.00	0.00	0.00
20	Income from wages or salary last year	0.01	0.01	0.01	0.02	0.05
21	Agriculture asset purchases in last year	0.01	0.01	0.02	0.01	0.00
22	Livestock asset purchases in last year	0.13	0.11	0.06	0.15	0.03
23	Number of household members	0.02	0.04	0.03	0.03	0.08
24	Number of adults 16+ in household	0.01	0.01	0.01	0.01	0.02
25	Number of children < 16 in household	0.01	0.00	0.01	0.01	0.03
26	Total output last year - any business	0.04	0.04	0.03	0.03	0.03
27	Is identified as poor	0.00	0.00	0.00	0.00	0.00
28	Agriculture output last year	0.04	0.04	0.05	0.04	0.02
29	Sales from agriculture business last year	0.06	0.04	0.13	0.06	0.03
30	Sales from anim. husb. business last year	0.08	0.11	0.02	0.07	0.07
31	Total agriculture assets	0.02	0.04	0.00	0.02	0.01
32	Total livestock	0.08	0.06	0.05	0.08	0.06
33	Share of income going to consumption	0.02	0.03	0.02	0.03	0.08
34	Share of income from self-employment	0.02	0.03	0.03	0.01	0.02
35	Total consumption	0.02	0.04	0.03	0.02	0.07

Table A3.4: Mean Variable Importance Factors (VIF)
Philippines

	Covariate	Profit	Revenue	Expenditures	Income
1	age	0.08	0.09	0.12	0.09
2	Business 1: type 1	0.02	0.03	0.03	0.02
3	Business 1: type 2	0.01	0.01	0.01	0.01
4	Business 1: type 3	0.00	0.00	0.00	0.00
5	Business 1: type 4	0.03	0.00	0.00	0.00
6	Business 1: type 5	0.00	0.00	0.00	0.00
7	Business 1: type 6	0.00	0.00	0.02	0.00
8	final credit score	0.06	0.07	0.09	0.11
9	number of dependents	0.03	0.05	0.06	0.03
10	educational attainment level 1	0.00	0.00	0.00	0.01
11	educational attainment level 2	0.00	0.01	0.01	0.01
12	educational attainment level 3	0.00	0.01	0.01	0.01
13	educational attainment level 4	0.00	0.00	0.00	0.00
14	educational attainment level 5	0.00	0.00	0.00	0.00
15	gender	0.01	0.02	0.01	0.02
16	homeownership status 1	0.01	0.01	0.01	0.01
17	homeownership status 2	0.01	0.01	0.01	0.01
18	homeownership status 3	0.00	0.00	0.00	0.00
19	homeownership status 4	0.02	0.02	0.02	0.02
20	new (0) or repeat (1) borrower	0.00	0.00	0.00	0.00
21	total monthly business expenses	0.10	0.12	0.09	0.09
22	total monthly business income	0.00	0.00	0.00	0.00
23	monthly household income	0.05	0.02	0.02	0.04
24	number of businesses	0.00	0.01	0.00	0.00
25	pays credit bill on time	0.00	0.01	0.00	0.00
26	pays electric bill on time	0.00	0.00	0.00	0.00
27	Business 1: number of full time employees	0.08	0.06	0.03	0.04
28	amount of remittances received	0.02	0.02	0.01	0.09
29	spouse occupation category 1	0.01	0.01	0.01	0.01
30	spouse occupation category 2	0.03	0.01	0.01	0.01
31	spouse occupation category 3	0.04	0.00	0.00	0.00
32	spouse occupation category 4	0.01	0.00	0.00	0.00
33	value of stock assets	0.12	0.11	0.09	0.09
34	Business 1: years in business	0.05	0.07	0.05	0.06
35	loan amount received from FMB	0.05	0.08	0.09	0.06
36	total loans outstanding	0.02	0.01	0.01	0.01
37	value of reported property	0.11	0.10	0.14	0.10
38	total household savings	0.03	0.05	0.03	0.04

A.4 Confusion Matrices for Propensity Score Models

A.4.1 Logit Models

Table A4: Logit Confusion Matrices

Panel A: Mexico

	0	1
0	1649	2
1	73	0

Panel B: Morocco

	0	1
0	1329	212
1	212	39

Panel C: Mongolia

	0	1
0	103	220
1	112	261

Notes: These are the confusion matrices for the logit models. This helps assess the accuracy of the propensity scores generated by the logit and compare to the random forest. I utilize only the treatment sample for model training and evaluation as including the control individuals in either will throw off the model parameters and lead to misleading fit statistics. The columns correspond to the number of individuals predicted to take a loan (1) vs. reject a loan (0) if we follow the classification rule that Loan = 1 if the Propensity Score is within the quantile which matches the take up rate observed in the data. In this case, 16.3% of the treatment sample took a loan, so in this case I assign predicted loan take-up = 1 if an individual is in the top 16.3% of the propensity score distribution generated by the logit. The rows correspond to the actual dispersion of loans in the data. Thus, the top left value corresponds to the number of correct negatives generated by the logit and the bottom-right cell correponds to the number of correct positives. The "Accuracy" of the model is generally calculated to be the share of correct predictions $A = \frac{truePos+trueNeg}{N}$. "Precision" in classification analysis is defined as $P = \frac{truePos}{truePos+falsePos}$ and represents how likely a prediction of 1 (i.e. a person will take a loan) is to be correct (i.e if the model predicts they will get a loan, how likely is this prediction to be correct). Finally, "Recall" asks what share of actual positives are identified correctly by the model: $R = \frac{truePos}{truePos+falseNeg}$. In this case the logit model generates an accuracy score of (76%), precision score of (16%), and recall score of (16%).

A.4.2   Random Forest Models

Table A5: Random Forest Confusion Matrices

Panel A: Mexico

	0	1
0	1703	2
1	73	0

Panel B: Morocco

	0	1
0	1376	165
1	189	62

Panel C: Mongolia

	0	1
0	119	207
1	139	236

Notes: These are the confusion matrices for the random forest models. This helps assess the accuracy of the propensity scores generated by the logit and compare to the random forest. I utilize only the treatment sample for model training and evaluation as including the control individuals in either will throw off the model parameters and lead to misleading fit statistics. The columns correspond to the number of individuals predicted to take a loan (1) vs. reject a loan (0) if we follow the classification rule that Loan = 1 if the Propensity Score is within the quantile which matches the take up rate observed in the data. In this case, 16.3% of the treatment sample took a loan, so in this case I assign predicted loan take-up = 1 if an individual is in the top 16.3% of the propensity score distribution generated by the logit. The rows correspond to the actual dispersion of loans in the data. Thus, the top left value corresponds to the number of correct negatives generated by the logit and the bottom-right cell correponds to the number of correct positives. The "Accuracy" of the model is generally calculated to be the share of correct predictions $A = \frac{truePos + trueNeg}{N}$. "Precision" in classification analysis is defined as $P = \frac{truePos}{truePos + falsePos}$ and represents how likely a prediction of 1 (i.e. a person will take a loan) is to be correct (i.e if the model predicts they will get a loan, how likely is this prediction to be correct). Finally, "Recall" asks what share of actual positives are identified correctly by the model: $R = \frac{truePos}{truePos + falseNeg}$. In this case the logit model generates an accuracy score of (76%), precision score of (16%), and recall score of (16%).

A.5   Overlaps Across Targeting Algorithms

Table A6.1: Selection Overlaps Across Targeting Algorithms
Bosnia

	CATE Profit	CATE Revenue	CATE Expenditure	CATE Income	CATE Consumption
CATE Profit	0.25	0.61	0.29	0.38	0.22
CATE Revenue	0.61	0.25	0.59	0.36	0.31
CATE Expenditure	0.29	0.59	0.25	0.31	0.37
CATE Income	0.38	0.36	0.31	0.25	0.18
CATE Consumption	0.22	0.31	0.37	0.18	0.25

Table A6.2: Selection Overlaps Across Targeting Algorithms
Mexico

	CATE Profit	CATE Revenue	CATE Expenditure	CATE Income	CATE Consumption
CATE Profit	0.50	0.32	0.18	0.41	0.89
CATE Revenue	0.64	0.25	0.57	0.22	0.74
CATE Expenditure	0.37	0.57	0.25	0.09	0.63
CATE Income	0.82	0.22	0.09	0.25	0.85
CATE Consumption	0.59	0.25	0.21	0.28	0.75

Table A6.3: Selection Overlaps Across Targeting Algorithms
Morocco

	CATE Profit	CATE Revenue	CATE Expenditure	CATE Income	CATE Consumption
CATE Profit	0.75	0.93	0.83	0.33	0.19
CATE Revenue	0.93	0.75	0.84	0.33	0.15
CATE Expenditure	0.83	0.84	0.75	0.32	0.16
CATE Income	1.00	1.00	0.95	0.25	0.06
CATE Consumption	0.58	0.45	0.48	0.06	0.25

Table A6.4: Selection Overlaps Across Targeting Algorithms
Philippines

	CATE Profit	CATE Revenue	CATE Expenditure	CATE Income
CATE Profit	0.75	0.50	0.74	0.28
CATE Revenue	0.75	0.50	0.89	0.34
CATE Expenditure	0.74	0.59	0.75	0.31
CATE Income	0.84	0.69	0.93	0.25

A.6 Balance Tests

Table A7.1: Balance Test Post-ML Filtering
Bosnia

	Mean Treated	Mean Untreated	Difference	p-value
Number male HH members	1.99	1.90	0.09	0.44
Number adults >= 16 years old	2.70	2.69	0.01	0.91
Number children < 16 years old	0.96	0.92	0.05	0.70
Number of outstanding loans	0.93	0.95	-0.03	0.80
Percent w/ loan from an MFI	0.49	0.59	-0.10	0.15
Total outstanding debt (USD)	4335.23	5515.62	-1180.39	0.42
Avg amount borrowed from an MFI (USD)	1035.73	1356.26	-320.53	0.17
Avg amount borrowed from a bank (USD)	3319.38	4169.71	-850.33	0.54
Total HH income last year (USD)	20061.97	20454.78	-392.81	0.83
Income from self-employment (USD)	8707.49	6607.56	2099.93	0.04
Income from agriculture (USD)	475.33	445.04	30.29	0.93
# HH members unemployed	0.69	0.67	0.02	0.83
# HH members retired	0.26	0.30	-0.04	0.51
Hours worked by respondent last week	52.94	49.54	3.40	0.23
Food consumption (USD)	104.86	100.26	4.61	0.62
Nondurables consumption (USD)	424.45	332.79	91.66	0.56
Durables consumption (USD)	4356.08	4685.73	-329.65	0.67

Table A7.2: Balance Test Post-ML Filtering
Mexico

	Mean Treated	Mean Untreated	Difference	p-value
Age	39.66	39.60	0.06	0.95
Primary school or none	0.38	0.37	0.01	0.81
Middle school	0.37	0.40	-0.03	0.39
High school	0.17	0.18	-0.01	0.62
Prior business owner	0.48	0.51	-0.03	0.49

Table A7.3: Balance Test Post-ML Filtering
Mongolia

	Mean Treated	Mean Untreated	Difference	p-value
Household size	4.90	4.88	0.02	0.73
Age	39.27	40.23	-0.96	0.37
Completed 8th grade	0.11	0.14	-0.02	0.51
Buddhist	0.71	0.72	-0.01	0.92
Outstanding debt (USD)	995.89	420.52	575.37	0.01
Household owns business	0.57	0.54	0.03	0.33
Respondent owns business	0.33	0.30	0.03	0.25
Business revenues (USD)	7.15	5.48	1.67	0.30
Business expenditures (USD)	11.20	12.56	-1.36	0.75
Business profits (USD)	-5.40	-7.08	1.67	0.55

Table A7.4: Balance Test Post-ML Filtering
Morocco

	Mean Treated	Mean Untreated	Difference	p-value
Number HH members	5.12	4.90	0.22	0.08
Number adults >= 16 years old	3.42	3.25	0.17	0.10
Number children < 16 years old	1.68	1.64	0.05	0.40
Borrowed from Al Amana	0.01	0.01	-0.00	0.46
Borrowed from other formal source	0.08	0.06	0.02	0.07
Borrowed informally	0.09	0.07	0.02	0.00
Amount borrowed from Al Amana	6.08	8.87	-2.79	0.43
Amount borrowed informally	51.95	61.83	-9.88	0.78
# of self employmen tactivities	1.78	1.71	0.07	0.06
Has agricultural business	0.68	0.64	0.05	0.02
Purchases of agri. assets last year	0.11	0.12	-0.01	0.29
Sales from agri. last year	92.59	86.40	6.20	0.92
Total agri. bus. expenses last year	39.36	33.19	6.17	0.14
Has animal husbandry business	0.63	0.58	0.06	0.01
Purchases of livestock last year	4.91	4.21	0.70	0.19
Sales from animal husbandry business	42.35	39.23	3.12	0.52
Has non-agriculture business	0.22	0.27	-0.05	0.03
# business managed by women	0.25	0.25	-0.00	0.88
Has business	0.82	0.83	-0.01	0.17
Lost livestock last year	0.26	0.21	0.05	0.00
Total hh consumption (MAD) monthly	250.25	236.64	13.61	0.01
Total hh consumption of nondurables monthly	244.01	231.59	12.42	0.02
Total hh cons. of durables monthly	6.24	5.05	1.19	0.24
HH is poor	0.26	0.26	-0.00	0.74

Table A7.5: Balance Test Post-ML Filtering
Philippines

	Mean Treated	Mean Untreated	Difference	p-value
Credit score	52.30	50.73	1.57	0.03
Loan amount	467.55	535.78	-68.23	0.25
Gender	1.92	1.93	-0.01	0.73
Age	44.70	46.66	-1.95	0.24
Educational attainment cat 1	0.31	0.17	0.14	0.05
Educational attainment cat 2	0.27	0.22	0.05	0.42
No. dependents	1.88	1.95	-0.07	0.96
Total stock assets	1532.71	1432.38	100.32	0.56
Total remittances	75.75	159.98	-84.23	0.06
Total non-stock assets	2463.54	1706.20	757.34	0.18
Years in business	4.46	5.83	-1.37	0.11
No. full time employees	0.16	0.12	0.04	0.62
Total household income	98.71	176.11	-77.39	0.20
Bi-weekly business expenditures	27.72	23.78	3.94	0.66
Monthly household income	3687.20	6578.05	-2890.85	0.20
No. of businesses	1.11	1.27	-0.15	0.13
Pays electric bill on time	1.97	1.98	-0.01	0.82
Total property value	3475.62	3275.60	200.02	0.18
Total outstanding debt	0.01	0.01	-0.01	0.69

Table A8.1: Counterfactual ITTs - Drop Bottom 25% (Causal Forest)

Panel A: Bosnia

	Business profits (USD 2009 PPP)	Business revenues (USD 2009 PPP)	Business expenditures (USD 2009 PPP)	Household income (USD 2009 PPP)	Household consumption (USD 2009 PPP)
Treatment	125.47**	195.12**	164.06**	158.64**	−5.39
	(54.04)	(95.85)	(78.33)	(74.90)	(26.53)
Control Mean	132.58	198.06	73.4	687.55	196.42
R^2	0.13	0.12	0.14	0.14	0.04
Num. obs.	249	249	248	249	248

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel B: Mexico

	Business profits (USD PPP 2009)	Business revenues (USD PPP 2009)	Business expenditures (USD PPP 2009)	Household income (USD PPP 2009)	Household consumption (USD PPP 2009)
Treatment	9.53	33.84	37.60*	−5.25	−18.65
	(14.65)	(26.11)	(19.12)	(19.54)	(15.79)
Control Mean	21.7	45.92	18.76	278.97	294.13
R^2	0.00	0.02	0.04	0.00	0.00
Num. obs.	1367	1367	1367	1267	1214

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel C: Morocco

	Business profits (USD 2009 PPP)	Business revenues (USD 2009 PPP)	Business expenditures (USD 2009 PPP)	Household income (USD 2009 PPP)	Household consumption (USD 2009 PPP)
Treatment	14.67	17.06**	41.96*	70.38	−3.42
	(12.89)	(8.33)	(22.79)	(176.17)	(5.72)
Control Mean	86.33	61.26	232.92	2619.8	301.96
R^2	0.09	0.07	0.11	0.09	0.21
Num. obs.	2710	2710	2710	2710	2704
N Clusters	160	160	160	160	160

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel D: Mongolia

	Business profits (USD 2009 PPP)	Business revenues (USD 2009 PPP)	Business expenditures (USD 2009 PPP)	Household income (USD 2009 PPP)	Household consumption (USD 2009 PPP)
Treatment	−0.52	0.36	0.97**	−15.05	68.94
	(0.31)	(0.23)	(0.36)	(17.71)	(47.09)
Control Mean	-1.1	1.17	3.11	58.88	327.64
R^2	0.04	0.11	0.06	0.01	0.26
Num. obs.	720	480	720	718	480
N Clusters	40	40	40	40	40

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel E: Philippines

	Profit (USD 2009 PPP)	Revenue (USD 2009 PPP)	Expenditures (USD 2009 PPP)	Household Income (USD 2009 PPP)
Treatment	125.283**	88.000	21.456	79.390
	(49.089)	(175.783)	(164.677)	(202.425)
Control Mean	380.11	1525.29	1110.94	1778.12
R^2	0.047	0.037	0.032	0.047
Num. obs.	834	834	834	811

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Notes: Counterfactual ITTs are estimated using the ML-approved sample of treatment and control individuals. The regression specifications otherwise exactly match those from the benchmark equations in Table 2.

Panel A: Bosnia

	Business profits (USD 2009 PPP)	Business revenues (USD 2009 PPP)	Business expenditures (USD 2009 PPP)	Household income (USD 2009 PPP)	Household consumption (USD 2009 PPP)
Treatment	58.51**	88.47*	52.83**	48.89	−24.11
	(25.54)	(46.91)	(25.93)	(35.74)	(18.93)
Control Mean	132.58	198.06	73.4	687.55	196.42
R^2	0.04	0.03	0.03	0.10	0.04
Num. obs.	745	745	745	745	745

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel B: Mexico

	Business profits (USD PPP 2009)	Business revenues (USD PPP 2009)	Business expenditures (USD PPP 2009)	Household income (USD PPP 2009)	Household consumption (USD PPP 2009)
Treatment	23.21	89.66	86.58	−4.71	−25.20
	(39.05)	(75.86)	(57.14)	(17.61)	(17.61)
Control Mean	26.8	62.72	18.46	249.07	297.78
R^2	0.00	0.02	0.01	0.00	0.01
Num. obs.	456	456	456	427	403

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel C: Morocco

	Business profits (USD 2009 PPP)	Business revenues (USD 2009 PPP)	Business expenditures (USD 2009 PPP)	Household income (USD 2009 PPP)	Household consumption (USD 2009 PPP)
Treatment	−12.21	−11.03	85.89*	232.43	−0.54
	(30.32)	(20.07)	(50.01)	(373.75)	(8.26)
Control Mean	86.33	61.26	232.92	2619.8	301.96
R^2	0.16	0.13	0.15	0.16	0.32
Num. obs.	904	904	904	904	904
N Clusters	152	154	153	153	148

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel D: Mongolia

	Business profits (USD 2009 PPP)	Business revenues (USD 2009 PPP)	Business expenditures (USD 2009 PPP)	Household income (USD 2009 PPP)	Household consumption (USD 2009 PPP)
Treatment	−0.52	0.36	0.97**	−15.05	68.94
	(0.31)	(0.23)	(0.36)	(17.71)	(47.09)
Control Mean	-1.1	1.17	3.11	58.88	327.64
R^2	0.04	0.11	0.06	0.01	0.26
Num. obs.	720	480	720	718	480
N Clusters	40	40	40	40	40

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel E: Philippines

	Profit (USD 2009 PPP)	Revenue (USD 2009 PPP)	Expenditures (USD 2009 PPP)	Household Income (USD 2009 PPP)
Treatment	79.543	699.724*	248.275	604.685**
	(88.866)	(365.016)	(279.842)	(241.335)
Control Mean	380.11	1525.29	1110.94	1778.12
R^2	0.144	0.113	0.080	0.134
Num. obs.	278	278	278	272

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Notes: Counterfactual ITTs are estimated using the ML-approved sample of treatment and control individuals. The regression specifications otherwise exactly match those from the benchmark equations in Table 2.

B   Additional Figures

B.1   Generic ML Figures

B.1.1   BLP Grids

Figure B1.1:
Best Linear Predictor (BLP) Analysis
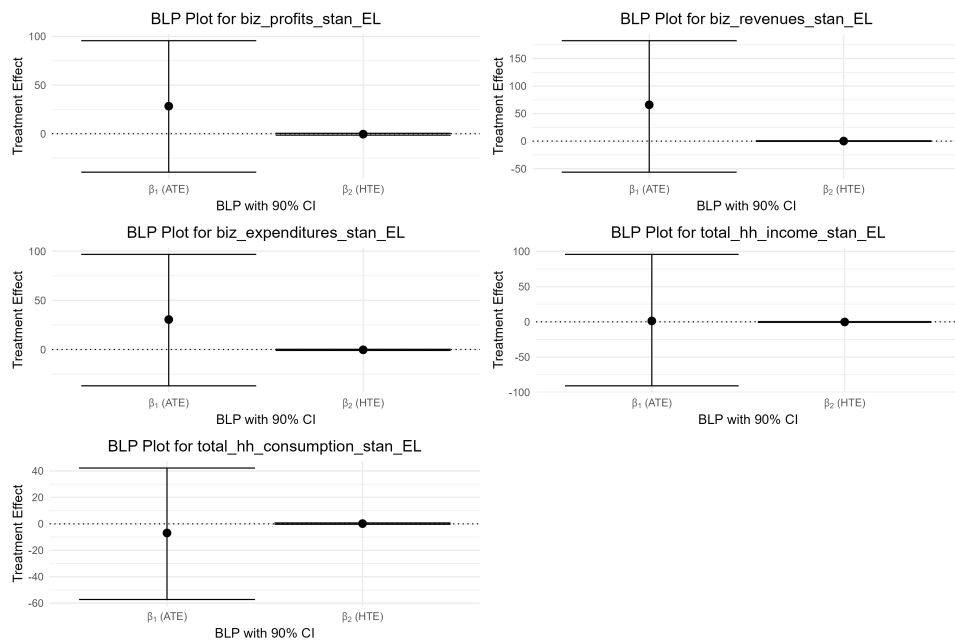Bonsia

Figure B1.2:
Best Linear Predictor (BLP) Analysis
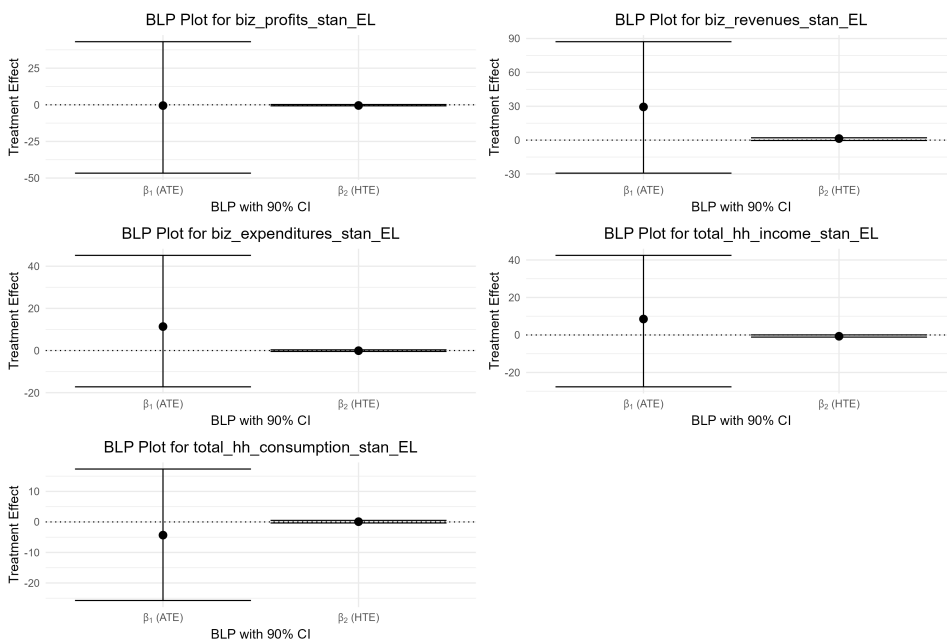## Mexico

BLP Plot for biz_profits_stan_EL

BLP Plot for biz_revenues_stan_EL

BLP Plot for biz_expenditures_stan_EL

BLP Plot for total_hh_income_stan_EL

BLP Plot for total_hh_consumption_stan_EL

Figure B1.3:
Best Linear Predictor (BLP) Analysis
Morocco

BLP Plot for biz_profits_stan_EL

BLP Plot for biz_revenues_stan_EL

BLP Plot for biz_expenditures_stan_EL

BLP Plot for total_hh_income_stan_EL

BLP Plot for total_hh_consumption_stan_EL
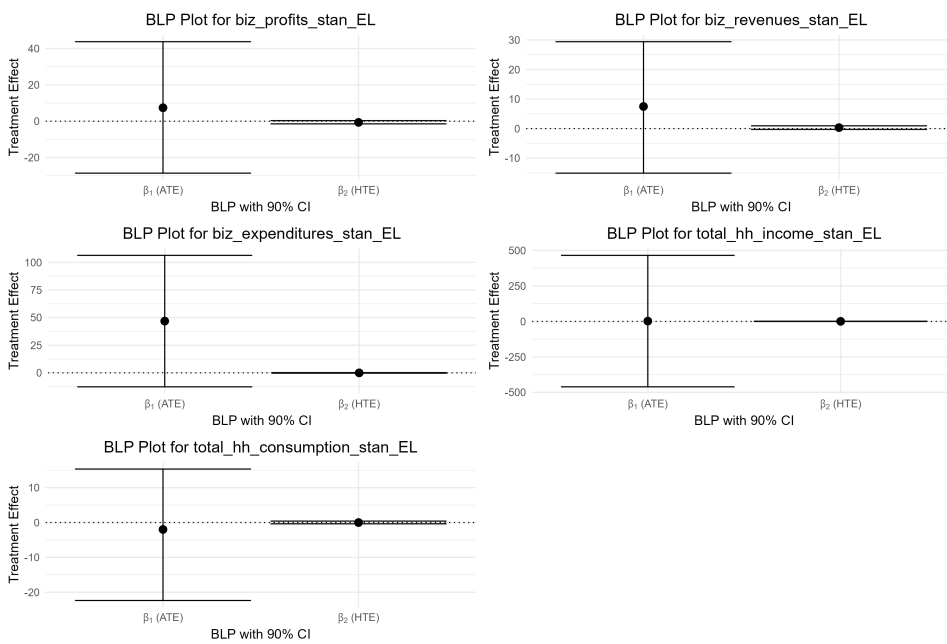
Figure B1.4:
Best Linear Predictor (BLP) Analysis
Philippines

BLP Plot for biz_profits_stan_EL

BLP Plot for biz_revenues_stan_EL

BLP Plot for biz_expenditures_stan_EL

BLP Plot for total_hh_income_stan_EL
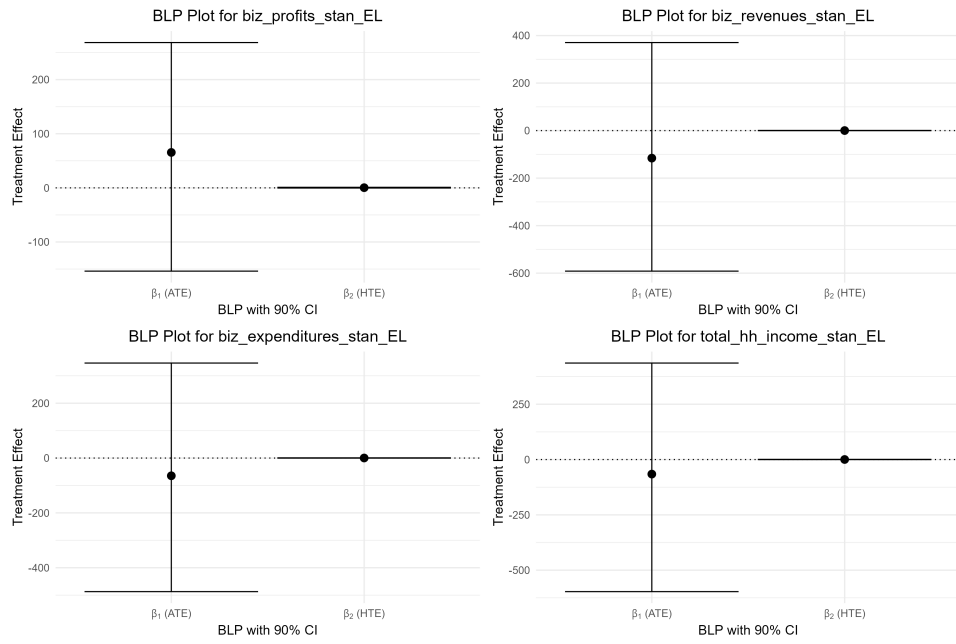
B.1.2   GATES Grids

Figure B2.1:
Group Average Treatment Effects (GATES) Analysis
Bosnia
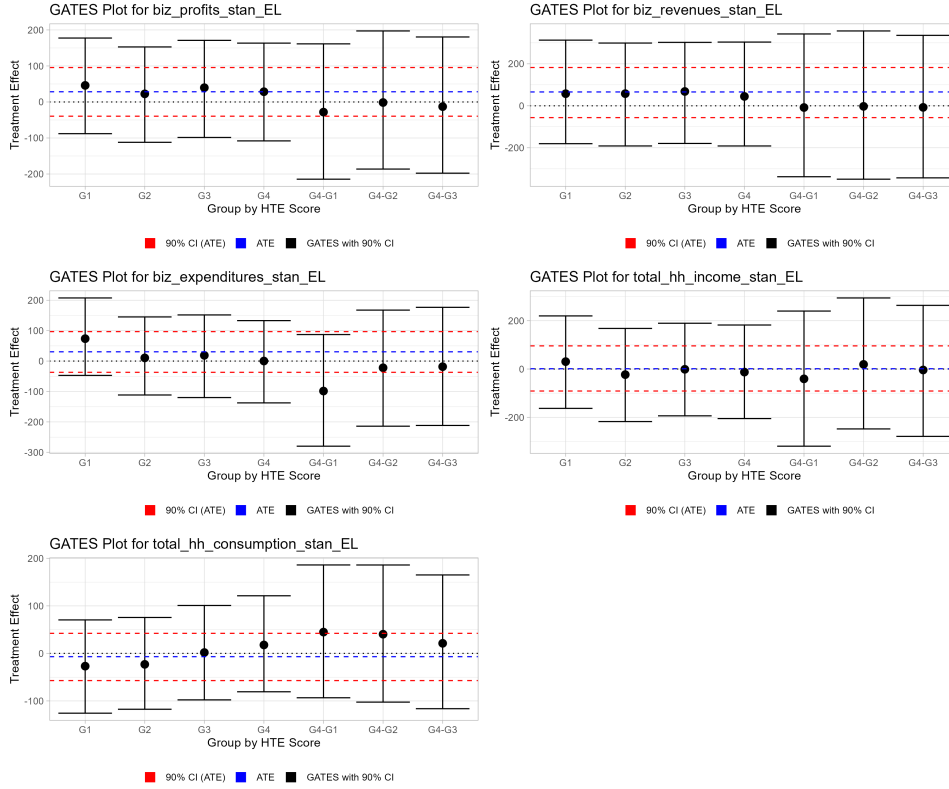
Figure B2.2:
Group Average Treatment Effects (GATES) Analysis
Mexico

GATES Plot for biz_profits_stan_EL

GATES Plot for biz_revenues_stan_EL

GATES Plot for biz_expenditures_stan_EL

GATES Plot for total_hh_income_stan_EL

GATES Plot for total_hh_consumption_stan_EL
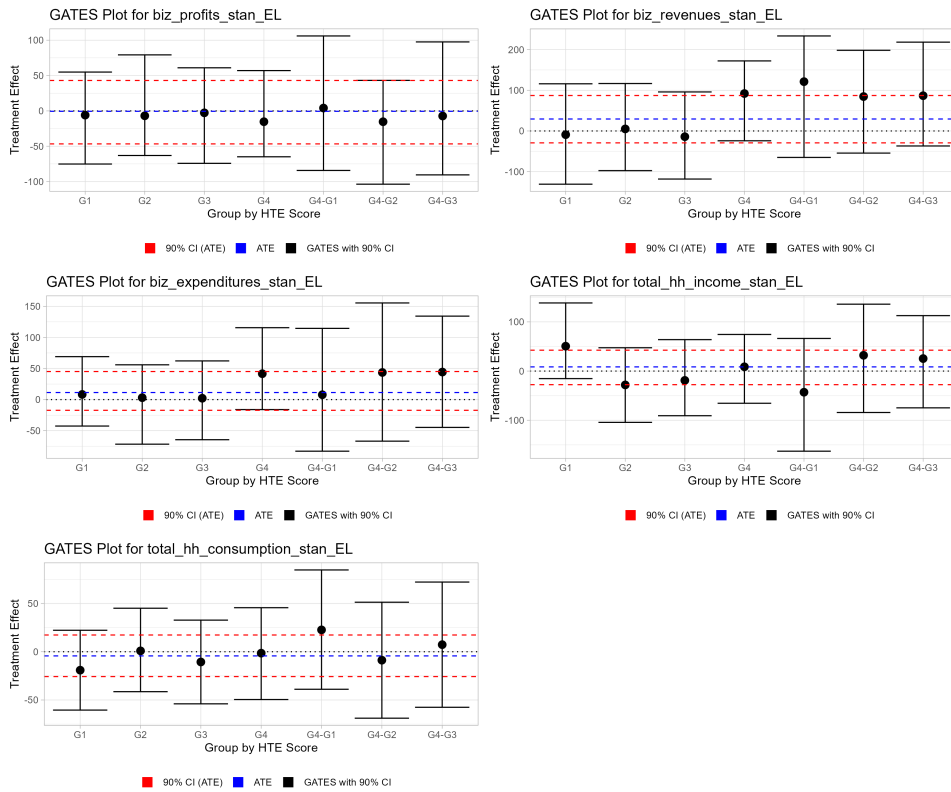
Figure B2.3:
Group Average Treatment Effects (GATES) Analysis
Morocco

GATES Plot for biz_profits_stan_EL

GATES Plot for biz_revenues_stan_EL

GATES Plot for biz_expenditures_stan_EL

GATES Plot for total_hh_income_stan_EL

GATES Plot for total_hh_consumption_stan_EL
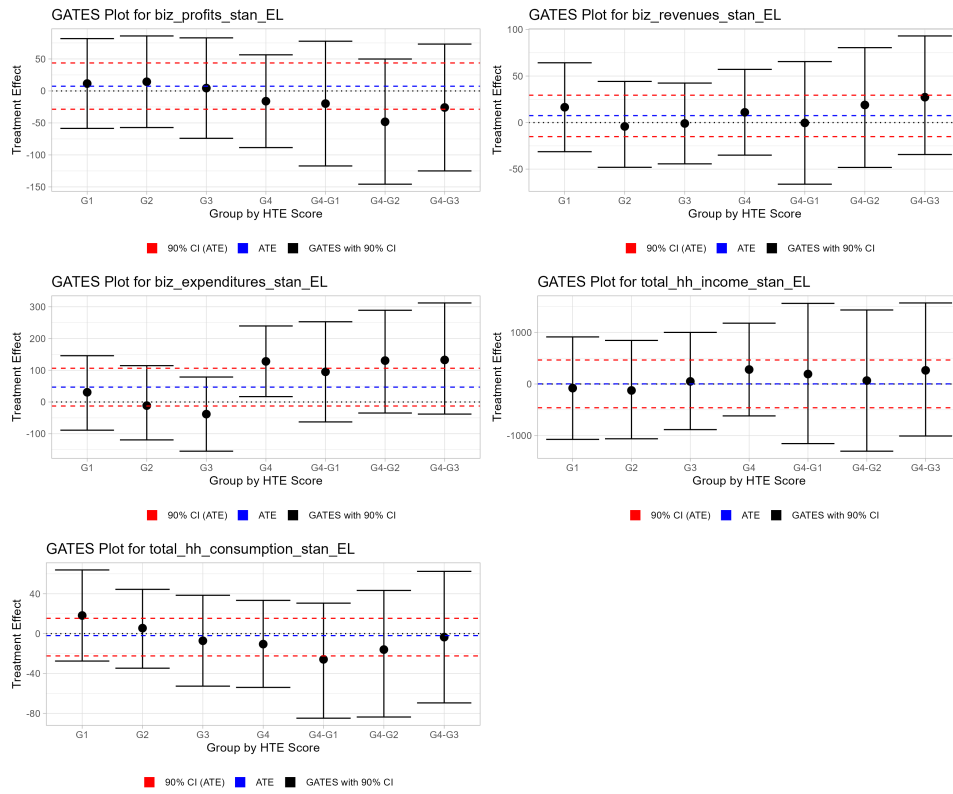
Figure B2.4:
Group Average Treatment Effects (GATES) Analysis
Philippines

GATES Plot for biz_profits_stan_EL

90% CI (ATE) ATE GATES with 90% CI

GATES Plot for biz_revenues_stan_EL

90% CI (ATE) ATE GATES with 90% CI

GATES Plot for biz_expenditures_stan_EL

90% CI (ATE) ATE GATES with 90% CI

GATES Plot for total_hh_income_stan_EL

90% CI (ATE) ATE GATES with 90% CI
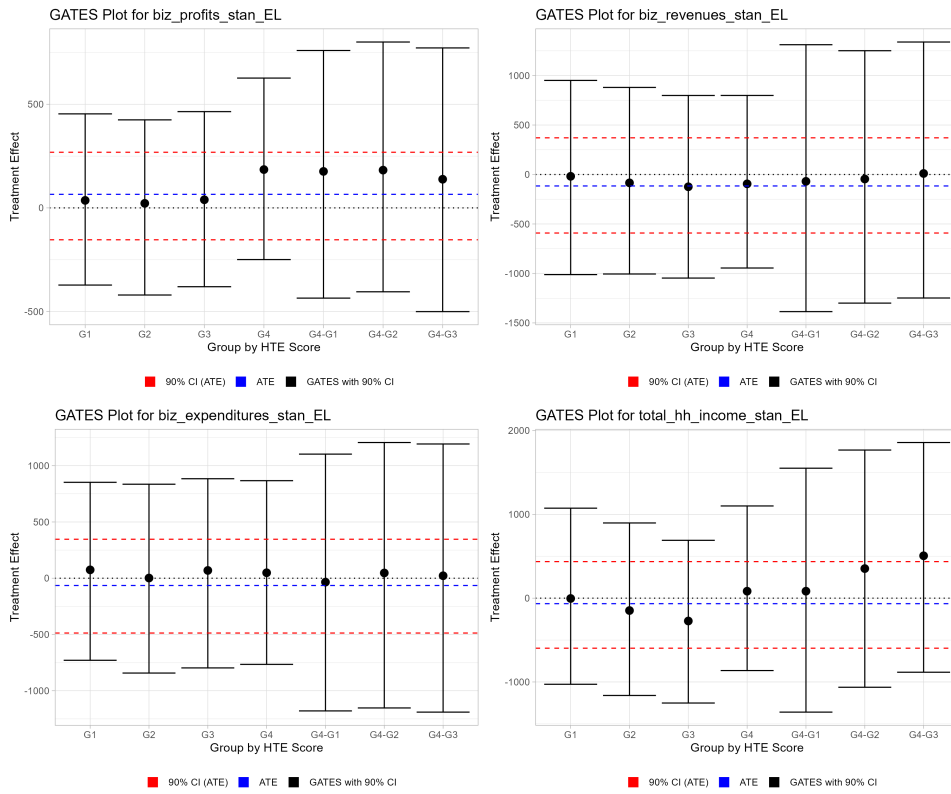
B.2 Correlation Across Targeting Algorithms

Figure B3.1:
Correlation Across Targeting Algorithms
Bosnia

Figure 1: Correlation Across Targeting Algorithms
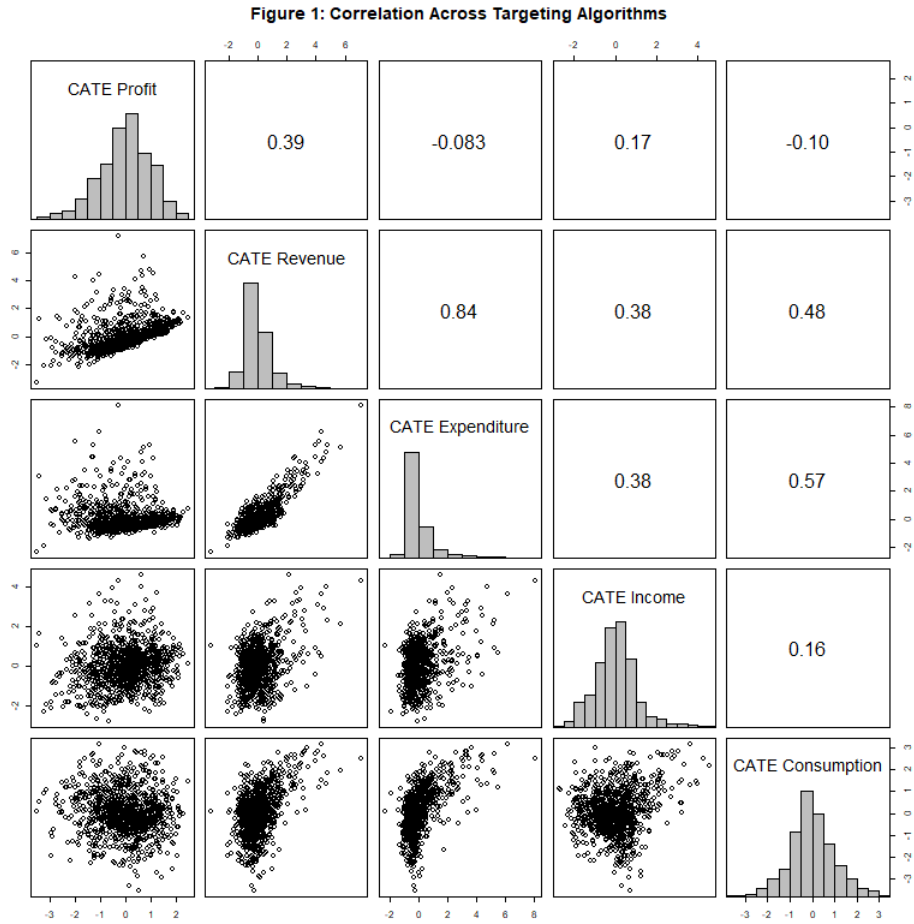
Figure B3.2:
Correlation Across Targeting Algorithms
Mexico
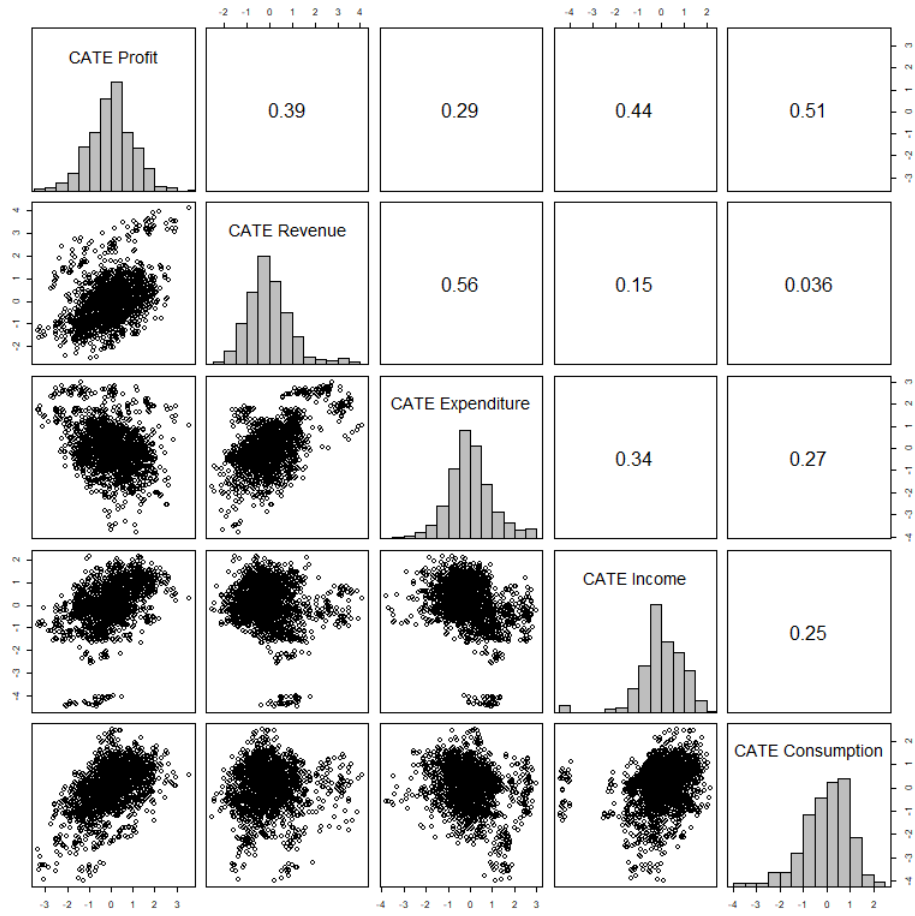
Figure B3.3:
Correlation Across Targeting Algorithms
Morocco
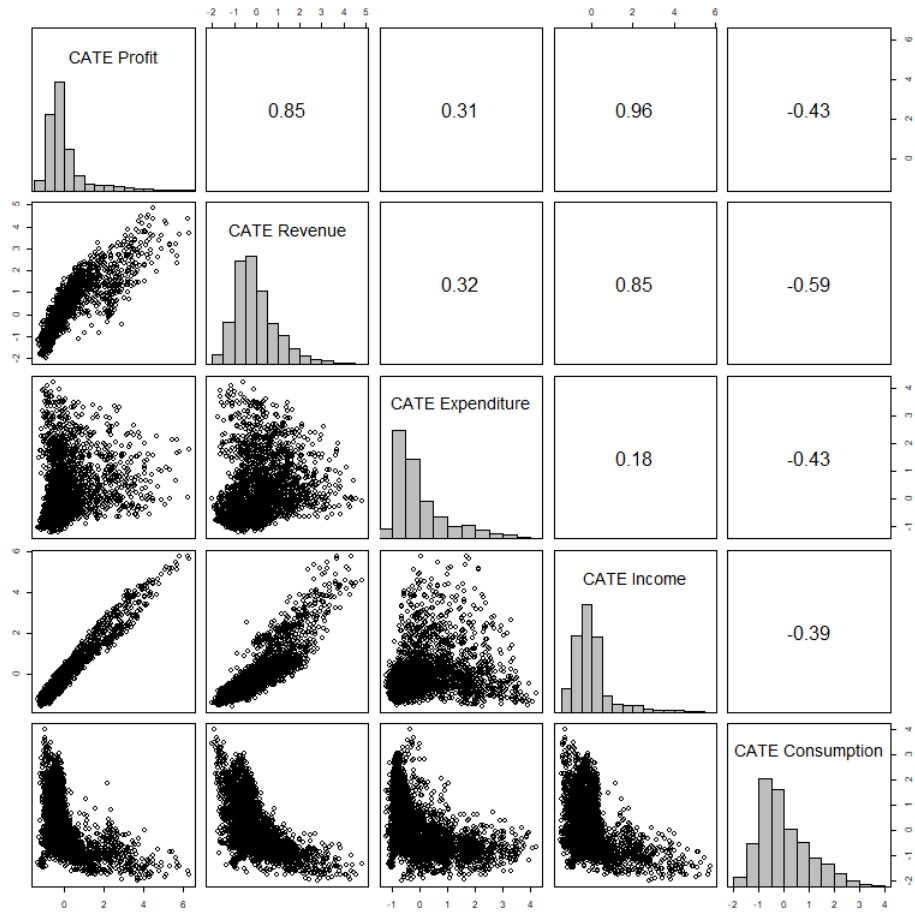
Figure B3.4:
Correlation Across Targeting Algorithms
Philippines

**Figure 1: Correlation Across Targeting Algorithms**
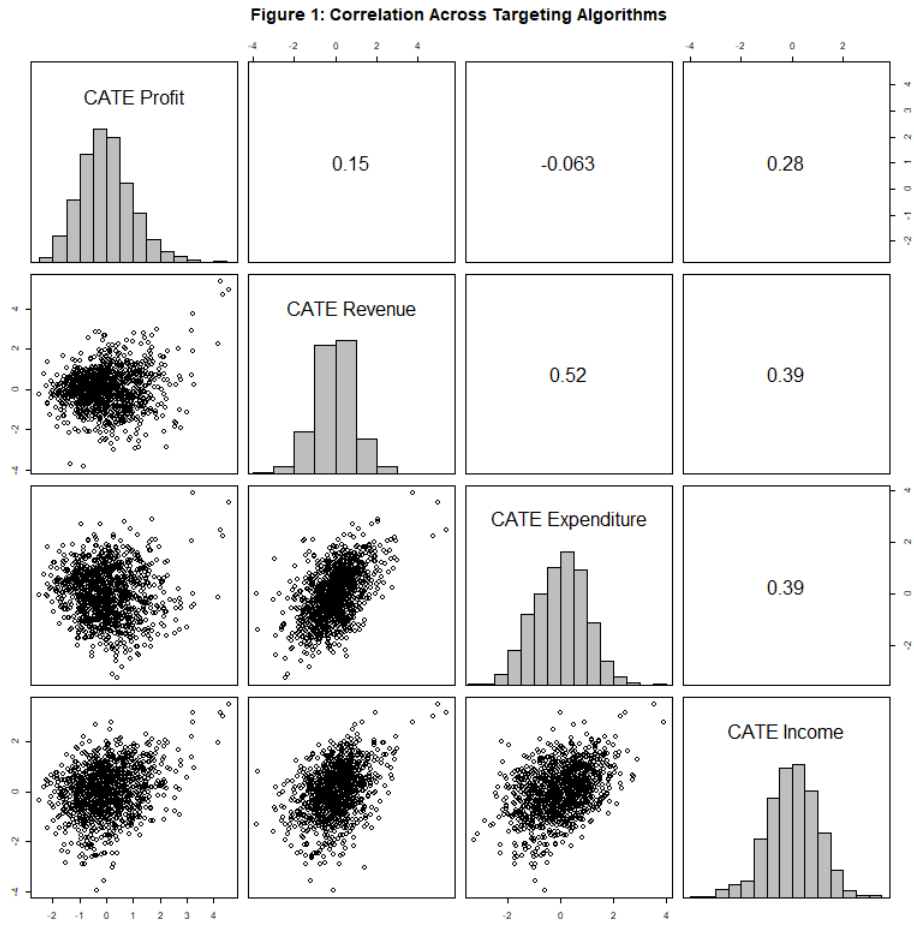
B.3 Max Gains Pattern Plots

Figure B4.1:
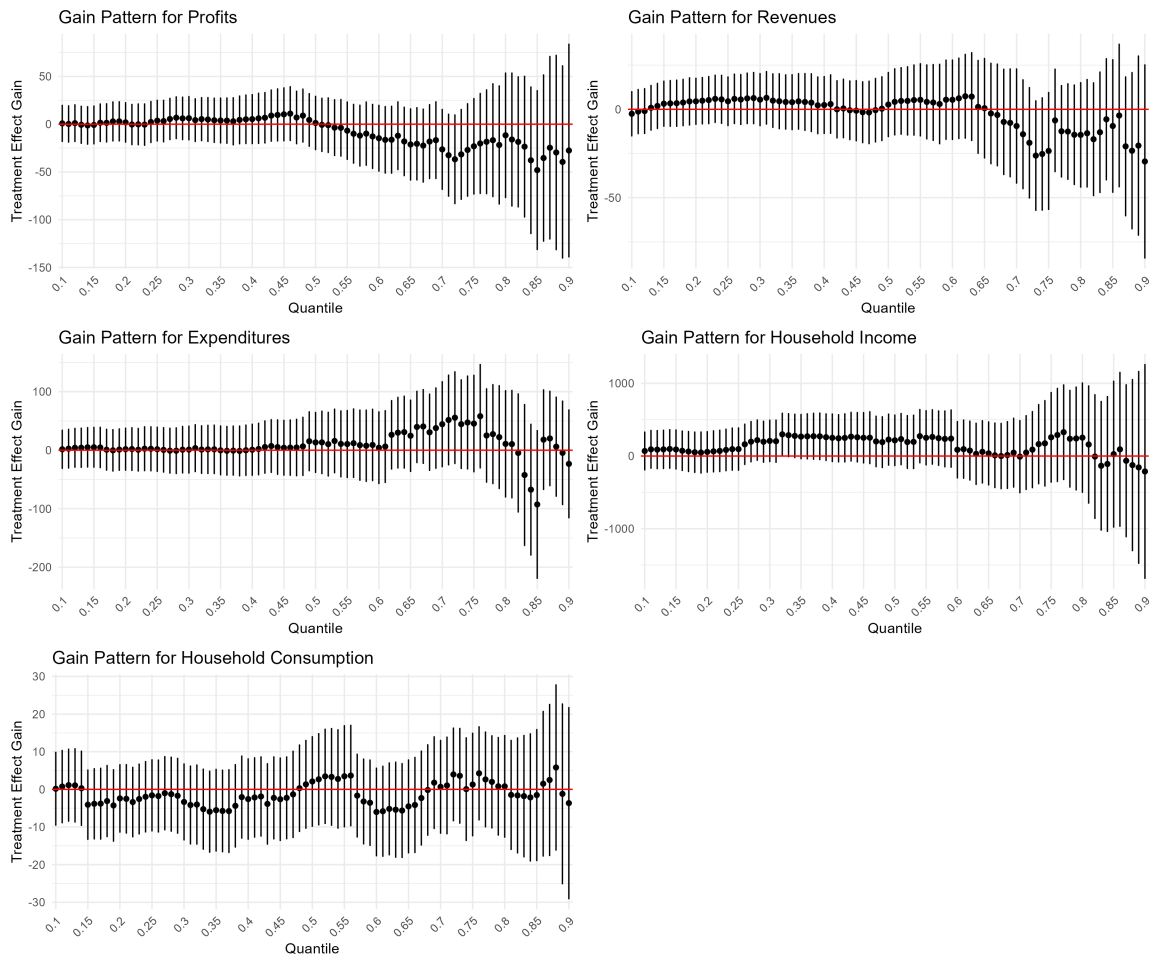Pattern of Treatment Effect Gains Across Target Quantiles
Bosnia
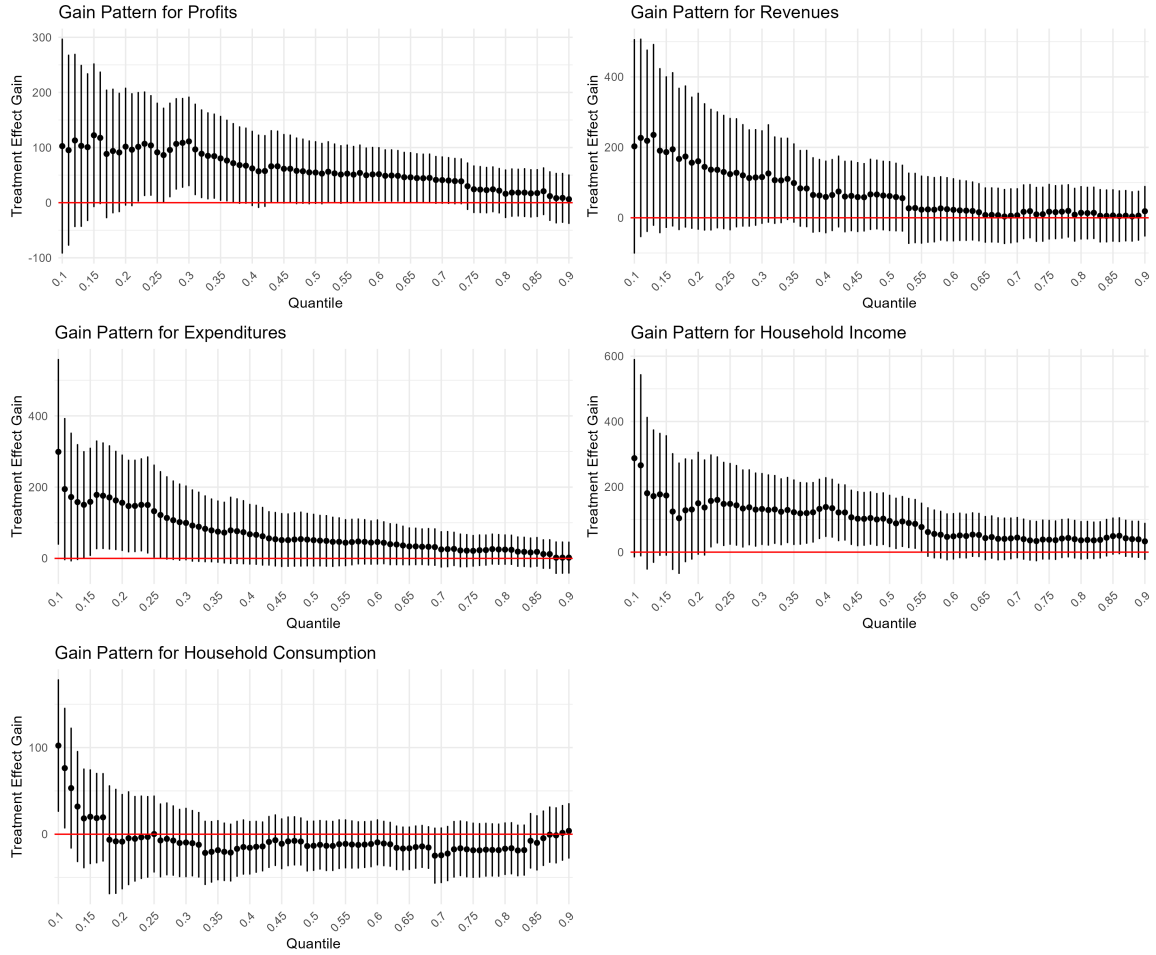
Notes: This figure plots the pattern of treatment effect gains generated by dropping the bottom X^{th} percentile of the $\hat{\Delta}_i$ distribution. Each point represents $\{\hat{\beta}_c^p - \hat{\beta}_b\}$: the difference between the counterfactual average treatment effect estimated when filtering out individuals below the pth percentile and the benchmark average treatment effect of the full sample.

Figure B4.2:
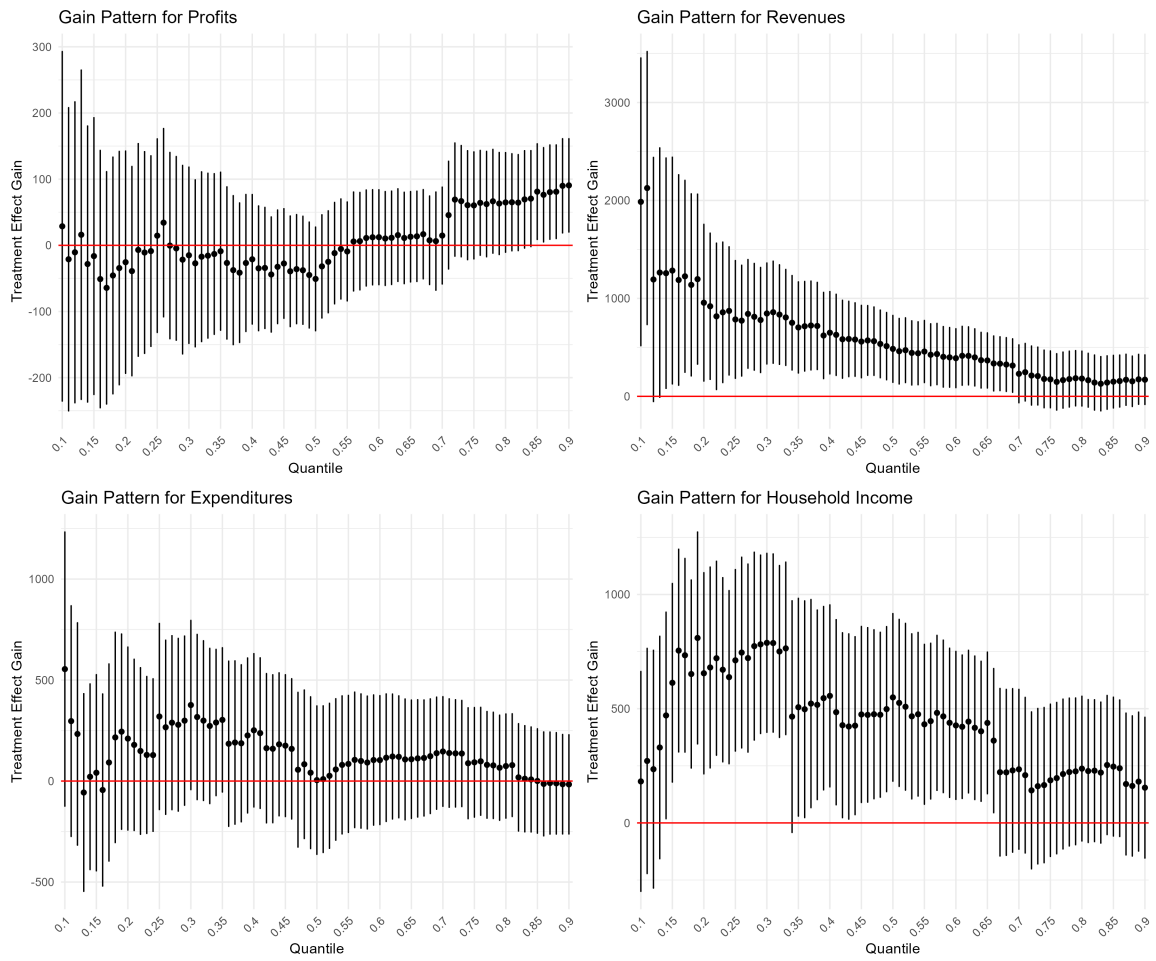Pattern of Treatment Effect Gains Across Target Quantiles
Mexico
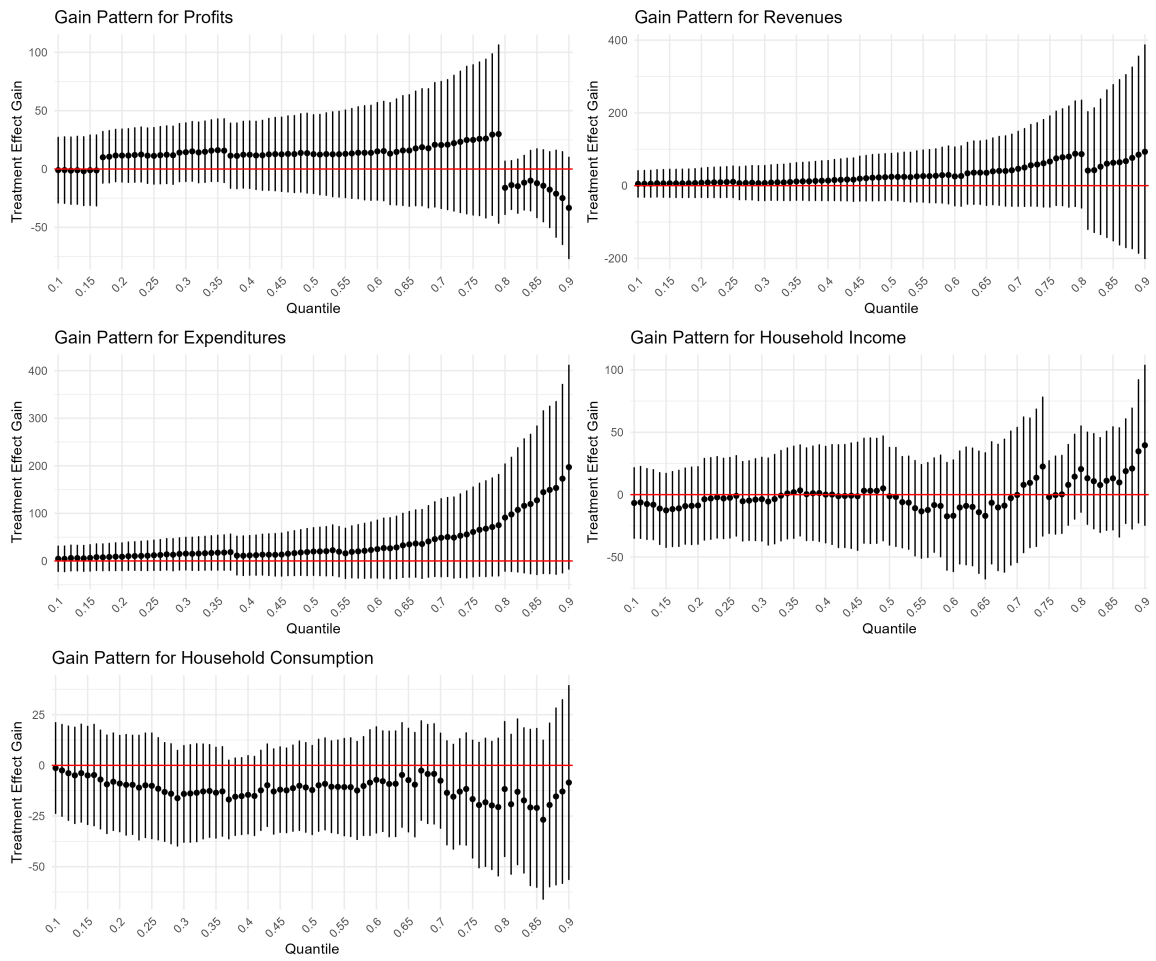
Notes: This figure plots the pattern of treatment effect gains generated by dropping the bottom X^{th} percentile of the $\hat{\Delta}_i$ distribution. Each point represents $\{\hat{\beta}_c^p - \hat{\beta}_b\}$: the difference between the counterfactual average treatment effect estimated when filtering out individuals below the pth percentile and the benchmark average treatment effect of the full sample.

Figure B4.3:
Pattern of Treatment Effect Gains Across Target Quantiles
Morocco

Notes: This figure plots the pattern of treatment effect gains generated by dropping the bottom X^{th} percentile of the $\hat{\Delta}_i$ distribution. Each point represents $\{\hat{\beta}_c^p - \hat{\beta}_b\}$: the difference between the counterfactual average treatment effect estimated when filtering out individuals below the pth percentile and the benchmark average treatment effect of the full sample.

Figure B4.4:
Pattern of Treatment Effect Gains Across Target Quantiles
Philippines

Notes: This figure plots the pattern of treatment effect gains generated by dropping the bottom X^{th} percentile of the $\hat{\Delta}_i$ distribution. Each point represents $\{\hat{\beta}_c^p - \hat{\beta}_b\}$: the difference between the counterfactual average treatment effect estimated when filtering out individuals below the pth percentile and the benchmark average treatment effect of the full sample.

C   Analysis with Raw Variables

Table C1: Benchmark ITT - Outcomes of Interest (Raw)

Panel A: Bosnia

	Profit (BAM)	Revenue (BAM)	Expenditures (BAM)	Household Income (BAM)	Household Consumption (BAM)
Treatment	793.819	1654.553	733.243	250.651	−130.305
	(570.553)	(1022.077)	(603.659)	(855.672)	(443.397)
Control Mean	3083.49	4606.49	1707.05	15991.15	4568.41
R^2	0.028	0.030	0.028	0.106	0.059
Num. obs.	994	994	994	994	994

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel B: Mexico

	Profit (Mexican pesos)	Revenue (Mexican pesos)	Expenditures (Mexican pesos)	Household Income (Mexican pesos)	Household Consumption (Mexican pesos)
Treatment	−17.12	227.59	250.11*	−57.52	−41.69
	(150.38)	(184.67)	(143.18)	(347.32)	(66.69)
Control Mean	178.86	539.7	366.84	5926.36	1457.91
R^2	0.00	0.02	0.02	0.00	0.00
Num. obs.	1823	1823	1823	1684	1623

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel C: Morocco

	Business profits (MAD)	Business revenues (MAD)	Business expenditures (MAD)	Household income (MAD)	Household consumption (MAD)
Treatment	1225.630	1403.044*	4520.917**	−231.193	−16.880
	(1227.272)	(800.915)	(2008.125)	(1463.130)	(52.319)
Control Mean	7790.99	5439.51	19040.7	26062.08	2906.78
R^2	0.069	0.058	0.108	0.091	0.180
Num. obs.	3614	3614	3614	3614	3605
N Clusters	162	162	162	162	162

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel D: Mongolia

	Profit (Mongolian Togrog)	Revenue (Mongolian Togrog)	Expenditure (Mongolian Togrog)	Household income (Mongolian Togrog)	Household consumption (Mongolian Togrog)
Treatment	−8409.91**	2320.22	11285.52**	130113.96	77622.74
	(3803.05)	(2732.34)	(4245.24)	(389992.90)	(51560.43)
Control Mean	-12113.88	19263.27	31377.15	893145.85	308041.59
R^2	0.01	0.06	0.06	0.02	0.12
Num. obs.	961	961	961	955	961
N Clusters	40	40	40	40	40

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel E: Philippines

	Business profits (Phil. peso)	Business revenues (Phil. peso)	Business expenditures (Phil. peso)	Household income (Phil. peso)
Treatment	2425.763	−3191.131	−2662.325	−4000.790
	(2065.674)	(6779.215)	(5647.341)	(7336.188)
Control Mean	14198.33	56973.92	41496.67	66417.99
R^2	0.037	0.027	0.026	0.041
Num. obs.	1113	1113	1113	1078

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Table C2: Counterfactual ITTs - Causal Forest (Raw)

Panel A: Bosnia

	Business profits (BAM)	Business revenues (BAM)	Business expenditures (BAM)	Household income (BAM)	Household consumption (BAM)
Treatment	3141.89**	4529.79**	4034.18**	3839.96**	−253.64
	(1263.15)	(2202.26)	(1850.67)	(1788.93)	(614.96)
Control Mean	4496.39	5423.13	2415.95	16255.61	2849.97
R^2	0.13	0.12	0.14	0.14	0.04
Num. obs.	249	249	248	249	248

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel B: Mexico

	Profit (Mexican pesos)	Revenue (Mexican pesos)	Expenditures (Mexican pesos)	Household Income (Mexican pesos)	Household Consumption (Mexican pesos)
Treatment	100.72	815.21	820.30	−118.15	−98.17
	(204.88)	(724.13)	(555.41)	(367.30)	(66.73)
Control Mean	230.15	1242.45	541.82	5128.76	1389.27
R^2	0.00	0.02	0.01	0.00	0.00
Num. obs.	911	456	456	428	1211

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel C: Morocco

	Business profits (MAD)	Business revenues (MAD)	Business expenditures (MAD)	Household income (MAD)	Household consumption (MAD)
Treatment	1664.30	2073.28**	4741.62*	1758.95	15.40
	(1453.12)	(937.28)	(2547.38)	(3460.72)	(67.99)
Control Mean	9667.85	6925.07	26095.99	27512.23	2751.1
R^2	0.09	0.07	0.11	0.16	0.34
Num. obs.	2710	2710	2710	904	904
N Clusters	160	160	160	153	148

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel D: Mongolia

	Profit (Mongolian Togrog)	Revenue (Mongolian Togrog)	Expenditure (Mongolian Togrog)	Household income (Mongolian Togrog)	Household consumption (Mongolian Togrog)
Treatment	−7964.50*	1922.20	12638.83**	−225920.84	83741.57*
	(4241.17)	(3264.33)	(4947.19)	(241048.97)	(48741.95)
Control Mean	-15067.38	16446.05	39976.6	768644.96	352182.8
R^2	0.04	0.10	0.07	0.01	0.28
Num. obs.	720	480	720	718	480
N Clusters	40	40	40	40	40

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel E: Philippines

	Profit (Phil. peso)	Revenue (Phil. peso)	Expenditures (Phil. peso)	Household Income (Phil. peso)
Treatment	5288.119***	13271.486*	−219.460	10296.426
	(1873.094)	(7967.669)	(5994.877)	(14399.948)
Control Mean	14413.41	59051.42	37956.79	59378.81
R^2	0.045	0.071	0.033	0.106
Num. obs.	834	556	834	273

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Table C3: Counterfactual ITTs - OLS (Raw)

Panel A: Bosnia

	Business profits (BAM)	Business revenues (BAM)	Business expenditures (BAM)	Household income (BAM)	Household consumption (BAM)
Treatment	5094.97***	6992.19***	2553.59*	4370.18**	2656.48**
	(1628.09)	(2525.82)	(1362.39)	(1805.45)	(1034.40)
Control Mean	3083.49	4606.49	1707.05	15991.15	4568.41
R^2	0.10	0.13	0.15	0.21	0.12
Num. obs.	248	248	249	249	249

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel B: Mexico

	Profit (Mexican pesos)	Revenue (Mexican pesos)	Expenditures (Mexican pesos)	Household Income (Mexican pesos)	Household Consumption (Mexican pesos)
Treatment	−78.03	−359.88**	−188.46**	−1586.06***	−85.12
	(295.73)	(150.31)	(71.15)	(469.62)	(66.59)
Control Mean	197.08	491.95	389.04	5889.51	1429.82
R^2	0.00	0.04	0.26	0.02	0.00
Num. obs.	911	455	450	425	1217

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel C: Morocco

	Business profits (MAD)	Business revenues (MAD)	Business expenditures (MAD)	Household income (MAD)	Household consumption (MAD)
Treatment	−1766.11	−269.27	2465.33	−7079.52**	23.79
	(1158.28)	(860.10)	(2167.14)	(3392.55)	(88.61)
Control Mean	8391.47	6235.04	20271.83	27391.96	2966.94
R^2	0.07	0.06	0.12	0.14	0.31
Num. obs.	2710	2710	2710	904	902
N Clusters	162	162	162	162	162

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel D: Mongolia

	Profit (Mongolian Togrog)	Revenue (Mongolian Togrog)	Expenditure (Mongolian Togrog)	Household income (Mongolian Togrog)	Household consumption (Mongolian Togrog)
Treatment	−8409.91**	2320.22	11285.52**	130113.96	77622.74
	(3803.05)	(2732.34)	(4245.24)	(389992.90)	(51560.43)
Control Mean	-18088.4	20051.25	38139.65	970681.58	348514.49
R^2	0.01	0.06	0.06	0.02	0.12
Num. obs.	961	961	961	955	961
N Clusters	40	40	40	40	40

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel E: Philippines

	Profit (Phil. peso)	Revenue (Phil. peso)	Expenditures (Phil. peso)	Household Income (Phil. peso)
Treatment	6014.62***	16123.75**	3452.54	30741.60***
	(2024.22)	(6910.24)	(5761.66)	(11507.15)
Control Mean	17629.65	54732.47	38846.47	69143
R^2	0.06	0.06	0.03	0.12
Num. obs.	826	554	834	269

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Table C4: Counterfactual ITTs - SVM (Raw)

Panel A: Bosnia

	Business profits (BAM)	Business revenues (BAM)	Business expenditures (BAM)	Household income (BAM)	Household consumption (BAM)
Treatment	793.82	1654.55	733.24	250.65	−130.30
	(570.55)	(1022.08)	(603.66)	(855.67)	(443.40)
Control Mean	3083.49	4606.49	1707.05	15991.15	4568.41
R^2	0.03	0.03	0.03	0.11	0.06
Num. obs.	994	994	994	994	994

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Panel B: Mexico

	Profit (Mexican pesos)	Revenue (Mexican pesos)	Expenditures (Mexican pesos)	Household Income (Mexican pesos)	Household Consumption (Mexican pesos)
Treatment	41.70	1041.44	655.76	−694.26	−12.86
	(286.74)	(770.23)	(393.93)	(454.39)	(69.68)
Control Mean	237.09	937.13	588.31	5611.53	1448.8
R^2	0.00	0.01	0.04	0.00	0.00
Num. obs.	911	456	456	419	1224

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel C: Morocco

	Business profits (MAD)	Business revenues (MAD)	Business expenditures (MAD)	Household income (MAD)	Household consumption (MAD)
Treatment	2637.84*	2209.89**	5340.71**	6610.67***	−317.66***
	(1398.16)	(908.39)	(2390.66)	(2123.00)	(110.28)
Control Mean	6857.43	5965.08	22445.31	22470.72	2816.44
R^2	0.08	0.07	0.10	0.19	0.34
Num. obs.	2710	2710	2710	904	901
N Clusters	160	162	162	157	160

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel D: Mongolia

	Profit (Mongolian Togrog)	Revenue (Mongolian Togrog)	Expenditure (Mongolian Togrog)	Household income (Mongolian Togrog)	Household consumption (Mongolian Togrog)
Treatment	−8253.24*	1087.95	14355.80***	428491.30	78995.23
	(4139.91)	(2740.58)	(4054.75)	(474827.62)	(60146.82)
Control Mean	-16472.89	19216.05	39239.07	1072392.04	371067.46
R^2	0.01	0.07	0.09	0.03	0.07
Num. obs.	720	480	720	715	480
N Clusters	40	40	40	40	40

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Panel E: Philippines

	Profit (Phil. peso)	Revenue (Phil. peso)	Expenditures (Phil. peso)	Household Income (Phil. peso)
Treatment	3707.94*	3241.14	−1408.64	−10621.61
	(2014.65)	(8022.53)	(5809.96)	(15665.14)
Control Mean	15100.03	49295.5	38231.64	55963.81
R^2	0.05	0.05	0.04	0.18
Num. obs.	834	556	834	270

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$