MICROCREDIT IMPACT ASSESSMENT:

THE BRAZILIAN AND CHILEAN CASES

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Abstract

Based in two different sources of data, Brazilian and Chilean banks and NGOs microcredit programs are evaluated. Using propensity score and matching techniques, we compare the average income of individuals that received microcredit to that of control groups, formed by people with similar characteristics. . The results for the Brazilian data show a high positive impact of microcredit programs, especially for those associated with banks. In the Chilean case the evidence is weaker for the microcredit administered by bank. As for NGO-based programs, the evidence suggests that their impact on the average income of their clients is actually negative.

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Introduction

There is increasing interest in measuring the impact and viability of microcredit programs. The evidence to date is not uniformly encouraging. Results are ambiguous and many programs are kept alive only by the injections of government subsidies.

The objective of this paper is to evaluate the impact on micro-entrepreneurs income of two Brazilian and Chilean microcredit programs. Drawing on two unique sources of data, control groups are built using the propensity score to match beneficiaries of micro-credit programs with non-beneficiaries with similar characteristics. Then the average incomes are compared. The results for the Brazilian data show a high positive impact of the microcredit programs, especially for those associated with banks. In the Chilean case the evidence is weaker for bank-based programs and NGO based programs appear to have no positive impact at all.

The methodology of propensity score and matching estimator is explained in the next section. The second and third section presents the results from the Chilean and Brazilian cases. The final section summarizes our main conclusions.

Methodology

Impact assessment requires a group affected by the program intervention, and a control group to compare the outcomes. Then, the differences between the two groups will be the impact of the program.

In Hulme (2000) words: "*Impact Assessments assess the difference in the values of key variables between the outcomes on ``agents'' (individuals, enterprises, households, populations, policy-makers, etc) which have experienced an intervention against the values of those variables that would have occurred had there been no intervention. The fact that no agent can both experience*

an intervention and at the same time not experience an intervention generates many methodological problems."

In our study the intervention will be the microcredit program. However, one of the main obstacles to assessing impact is finding or building the adequate control group. Mosley (1997) suggests several different alternatives, although all present serious limitations of the kind discussed by Hulme above. In this paper, we will use a methodology that was initially applied in the health literature and has recently been adapted by a research group led by Heckman (Heckman *et al* 1997 and 1998) for evaluating programs in economics. This methodology is known as a matching estimator and it is based on Rosenbaum and Rubin (1983). The basic idea is that using a set of similar attributes (X: characteristic, variables or regressors) for two groups of people, one subject to the treatment and the other not; a propensity score for each individual in each group can be calculated. Then, the balancing property of the propensity score makes possible to obtain the same probability distribution of X for treated and non-treated individuals in matched samples. Following Sianesi (2001), we will evaluate the causal effect of microcredit programs on household incomes of the participants, relative to a constructed control group, which has not received credit.

Let Y_1 be the outcome that would result if the individual receives microcredit and Y_0 the outcome that would result if the same individual does not receive microcredit. Let D = {0, 1} denote the binary indicator of microcredit (D = 1 if microcredit, 0 otherwise). For a given individual *i*, the observed household income is then $Y_i = Y_{0i} + D_i (Y_{1i} – Y_{0i})$. In addition, let assume that X, the set of attributes, are not affected by the microcredit program.

As Hulme (2000) noted, no individual can both receive and not receive microcredit at the same time, so that either Y_{1i} or Y_{0i} is missing for each *i.* Because it is impossible to observe the *individual* microcredit effect and thus to make causal inference without making generally un-testable assumptions, we attempt to identify the *average* treatment effect in the population, or in a sub-population, which requires generally less stringent assumptions.

Thus, following Heckman (1997 and 1998) and Sianesi (2001), we could attempt to identify the following parameters:

- The average treatment effect: $E(Y_1 – Y_0)$ is the average income difference between the two groups: the micro-entrepreneurs that receive microcredit and the rest that does not.
- The average treatment effect on the non-treated: $E(Y_1 – Y_0 \mid D=0)$ is the average income difference between the potential or expected income that the entrepreneurs who did not receive microcredit ($D=0$) would get if they had($E(Y_1)$) and the real income that they earned (Y_0).

?? The average treatment effect on the treated $E(Y\,1 - Y\,0 \mid D=1)$. This parameter is the one receiving most attention in the evaluation literature and measure the average income difference between the income that the entrepreneurs who received microcredit earned and the income that they would get if they had not received credit.

Two unknown values: $E(Y_1 \mid D=0)$ and $E(Y_0 \mid D=1)$ prevent doing inference directly. Therefore, we need to estimate them based on some usually un-testable identifying assumptions that justify the use of the observed $E(Y_1 \mid D=1)$ and $E(Y_0 \mid D=0)$.

Sianesi (2001) notes that treated individuals may not be a random sample of the population, but they may receive treatment on the basis of characteristics, which also influence their outcomes. For example, microcredit institutions may try to pick out the best candidates such that micro-entrepreneurs who receive microcredit are of better quality than the rest and would have done well anyway. This would result in an over-estimate of the impact of the microcredit program: $E(Y_1 \mid D=1) - E(Y_0 \mid D=0)$ would in general be an upward-biased estimate of the effect of treatment on the treated.

Statistical matching offers a way to construct a control group to partially address the selection bias issue (see Sianesi 2000). Rosenbaum and Rubin (1983) show that treatment and non-treatment observations with the same value of the propensity score have the same distribution of the full vector of regressors. It is thus sufficient to match exactly on the propensity score to obtain the same probability distribution of the explanatory variables for treated and non-treated individuals in matched samples.

The Chilean Case

In order to get the information about the Chilean micro-entrepreneurs, we developed a questionnaire following the methodologies developed by Barnes (1996), Chen (1997), Hulme and Mosley (1996), Hulme (2000), Mosley (1997), Sultana and Nigam (1999) and Tsilikounas (2000).

The survey was run in February and March of 2002. The sample was obtained randomly from the databases of the bank Bandesarrollo and the NGO Propesa: respectively 56 observations for Antofagasta (II Region) and 30 observations for Melipilla (Metropolitan Region).

The CASEN (the Chilean survey of national socio-economic characterization) for the year 2000 was used to build the control group. This survey was run on November 2000.

A set of variables from both surveys (location, age and employment status) was used to identify the control group from CASEN. . We selected people who were living in Melipilla or Antofagasta, who were employees and who were older than 17 and younger than 66. The final control group sample contained 715 observations. After cleaning the sample extracted from the Bandessarollo database, we were left with 81 cases of "treated" individuals leaving us with a total of 796 observations. The variables dictionary for both groups is shown in Table 1.

Table 1: Variable dictionary

Variables	Description
Ide	Identification
Tret	=1 if the individual microcredit, =0 otherwise
Sex	=1 if females, =0 if male
Age	in years
Ms	marital status: =1 if married, =0 otherwise
Hhs	household size
Nemp	number of employees in the individual enterprise
Hxw	hours per week worked by the individual
Hh	head of household = 1, =0 otherwise
Hhsp	head of household spouse = 1, =0 otherwise
Mfinc	income from micro-firm or the main job
Hhinc	household income
Loc	Location
Spro	= 1 if the firm is in the productive sector, except retail
Sserv	= 1 if the firm is in the services sector, except retail
Edbas	= 1 if the education level is at most primary
Edsec	= 1 if the education level is at most secondary
Edhig	= 1 if the education level is higher than secondary

The set of variables was chosen according to the matching techniques' requirements. First, that they were not affected by microcredit program. With the exception of income,

all the other variables comply with this requirement. To build the control group we estimated the propensity score as a function of these variables. We used a probit specification and the results are shown in Table 2 for the total sample, the bank clients (Bandesarrollo) and the NGO clients (Propesa).

To measure the impact of the microcredit program we compare the average income of the people who received microcredit with the average income of the "similar" people who did not receive microcredit in the constructed control group: $E(Y_1 - Y_0 | D=1)$.

Table 2: Probit Estimate to predict the Propensity Score and Program Effect[2]

	Total Sample		Bank		ONG	
Sample size	796		424		372	
Number of Treated	81		51		30	
LR $?^2(13)$	263		214		100	
Prob. > $?^2$	0.00		0.00		0.00	
Pseudo R^2	0.50		0.69		0.48	
	Coefficients	z	Coefficients	z	Coefficients	Z
Sex	0.9357	4.30	1.3932	3.93	0.8492	2.25
Age	0.0276	3.06	0.0546	2.92	0.0181	1.22
Ms	-0.3581	-1.43	-0.2505	-0.58	-0.2378	-0.57
Hhs	0.1212	2.93	0.0734	1.13	0.1919	2.77
Edbas	2.0487	3.08	7.4690	10.89	0.7929	1.12
Edsec	2.0278	3.05	6.7686	10.37	1.2891	1.78
Edhig	2.2302	3.12			2.1819	2.80
Spro	-0.1797	-0.72	0.7833	1.56	-0.6928	-1.88
Sserv	-0.2736	-1.23	0.7560	1.74	-1.3144	-3.48
Nemp	-0.7796	-6.95	-0.7842	-4.80	-1.0002	-4.28
Hxw	0.0207	4.45	0.0394	4.66	0.0063	0.98
Hh	1.1692	3.73	6.9145	16.87	0.9015	2.00
Hhsp	0.4463	1.11			-0.0237	-0.03
Constant	-5.3795	-5.75	-19.1409	-12.88	-2.7455	-2.40
Income Mean of Matched Treateds		$342,062		$436,608		$181,333
Income Mean of Matched Controls		$273,494		$317,176		$400,817
Microcredit Program Effect		$68,568		$119,432		-$219,484
T-statistics for Ho: Effect = 0		0.92		1.30		-2.49

The results shown in Table 2 are as expected and with a high value for the explained variance for this kind of models. In general older women who do not have a husband with some education and household heads are the ones with highest probability of receiving microcredit. However, there are some significant differences between the bank and NGO clients. While the bank clients who belong to the productive or service sectors have a higher propensity to receive microcredit, the NGO clients that belong to the same sectors have a lower than average propensity to receive microcredit. This fact is reflected in the sign change of the coefficients on the variables productive sector (spro) and service sector (sserv) for the bank clients (positive) and the NGO clients (negative).

Evidence on the quality of the matching for the total sample, the bank clients and the NGO clients is presented in Appendix A, where the mean for each variable is calculated for the treated and the control groups, for the whole sample and for the matched sub sample. The difference between the treated and control group are lower for the matched sub sample than for the whole sample. The results further show that the matching procedure worked better for the whole sample and for the NGO clients, while for bank clients the improvement from matching were not as significant .The main explanation is that even though there was some improving in matching the individual according to the chosen variables, the matching of household head and household head spouse was not good. .

The impacts of the microcredit programs are showed at the end of Table 2. The first two results are positive although not statistically significant. The microcredit program as a whole has a positive impact in the average income of the micro-entrepreneurs. This positive impact means that those receiving microcredit earn on average 25% more than those that did not. This impact is about 38% (Ch$119,432 about US$ 220) for those who received credit from the Bandesarrollo. Those receiving credit from the NGO program appear to have a negative and significant impact on incomes of about 50%.

[2] Calculated using the psmatch routine written by Sianesi (2001a). The one-to-one matching with replacement was used in all the calculations.

Alternatives explanation can be given for this finding. First, we could blame on the quality of the matching. Appendix A shows that we only get positive results from the worst matching. On the other side, when we collect the information, the form

The Brazilian Case

The Brazilian data was collected in February and March 2002. Five institutions provided information about their micro-entrepreneur clients: Microcred (bank from Sao Paulo), Socialcred (bank from Rio de Janeiro), CEAPE (NGO from Goias), Bancri (NGO from Santa Catarina) and Bco Povo Sto Andre (NGO from Sao Paulo). In addition, the information collected by PNAD (Brazilian National Survey on Households) 1999 was used to build the control group.

Table 3 shows the variables that were used in the analysis. These variables are not exactly the same as the ones used in the Chilean case because the Chilean CASEN uses a different questionnaire than the Brazilian PNAD. However, we tried to have proxies for the same concepts, even if measured by different variables. The only variable that was not available in the PNAD is marital status. In addition, for hours worked by week and number of employees in the firm, PNAD provides ranges and not number of hours and workers respectively. It is worth noting, however, that PNAD does provide information on variables that are not available in the Chilean case, such as the location of the micro-firm (home or outside).

Table 3: PNAD Variable Descriptions

Variables	Description (PNAD code)
Ide	Identification
Tret	=1 if the individual microcredit, =0 otherwise
Sex	=1 if females, =0 if male (v0302)
Age	in years (v8005)
Hhs	household size (v4725)
Nemp1	= 1 employee, 0 otherwise
Nemp2	= 1, 2 employees, 0 otherwise
Nemp3	= 1, 3-5 employee
Nemp4	= 1, more than 5 employee
Hxw1	= 1, if Hours per week is lower than 15 (v4707)
Hxw2	= 1, if Hours per week is larger than 14 and lower than 40
Hxw3	= 1, if Hours per week is larger than 39 and lower than 45
Hxw4	= 1, if Hours per week is larger than 44 and lower than 49
Hxw5	= 1, if Hours per week is larger than 48

Hh	head of household = 1, =0 otherwise (v0402)
Hhsp	head of household spouse = 1, =0 otherwise (v0402)
Mfinc	income from micro-firm or the main job
Hhinc	Income from all the sources
Spro	= 1 if the firm is in the productive sector, except retail
Sserv	= 1 if the firm is in the services sector, except retail
Edbas	= 1 if the education level is at most primary
Edsec	= 1 if the education level is at most secondary
Edhig	= 1 if the education level is higher than secondary
Locmf	=1 if microfirm is located at home, 0 otherwise (v9054)

In total we were able to use 198 observations from micro-entrepreneurs of five different states that had received microcredit, either from NGOs (152) or from banks (46). For the control group, we selected 34.887 observations from PNAD, for the same five states.

In order to make income comparisons across treatment and control groups, one needs to take into account the different reference periods for the income information available for microcredit clients (January 2000) and the control group from PNAD (September 1999). The price variation in Brazil during these 4 months is showed in Table 4: income differences of that order of magnitude across treated and control groups can be explained purely by price changes.

Table 4: Price Index and Variation between September 1999 and January 2000

Period	IGP-M - geral (ago. 1994 = 100) (**General Market Price Index**)	IPCA - geral - índice (dez. 1993 = 100) **Broad Consumer Price Index**	IPC - geral - índice (ago. 1994 = 100) **Consumer Price Index - Brazil**	IPC - geral - índice (jun. 1994 = 100) - RMSP **Consumer Price Index - SP**
1999 09	167.997	1545.83	176.344	173.8829
2000 01	180.301	1598.41	182.871	180.3469
Index Var.	7.32%	3.40%	3.70%	3.72%

The large sample collected in Brazil allowed for better comparisons than in Chile. We estimated the effect of microcredit programs using the total sample and comparing the entrepreneurs that received microcredit, first, with the whole set of employers and self-employed in the PNAD sample, and second with the PNAD sample of salaried workers.

We are aware of the possibility that some of the employer or self-employed individuals in the control group may also be clients of a microcredit program. However, we do not have the information required to recognize them. Therefore, when the PNAD sample of individuals in the employer and self-employed status[3] is used as a control group, we can expect the difference between treated and non-treated to be downwardly biased estimate of the impact of the microcredit program hereby considered. On the other hand, estimates based on the control group built using only salaried workers from the PNAD sample could overestimate the effect of the microcredit program because those worker may lack the entrepreneurial skills that account for a share of the income of individuals in the treatment group.

Table 5: Probit and Microcredit program Effect Estimates

	Total Sample		Employers		Workers	
Sample Size.	35085		9384		25899	
Number of Treated	198		198		198	
LR $?^2$(13)	1164		917		1454	
Prob. > $?^2$	0.00		0.00		0.00	
Pseudo R^2	0.48		0.48		0.63	
Variables	Coefficients	z	Coefficients	z	Coefficients	z
Sex	0.1440	1.72	0.5776	5.87	-0.0153	-0.15
Age	0.0382	11.12	0.0292	7.34	0.0453	10.66
hhs	-0.0855	-3.07	-0.0603	-1.79	-0.0947	-2.83
edbas	0.5011	2.09	0.2528	0.93	0.7836	2.68
edsec	1.1084	4.52	0.8036	2.90	1.4264	4.69
edhig	1.0941	4.33	0.6784	2.37	1.6094	5.15
spro	-0.4542	-4.43	-0.3995	-3.40	-0.6959	-5.22
sserv	-0.8680	-9.78	-0.6287	-6.37	-1.1953	-10.45
nemp2	1.2708	9.65	0.7293	5.27	3.2287	9.74
nemp3	1.3606	11.32	0.8174	6.35	3.3233	12.31
nemp4	0.6491	3.39	0.1770	0.87	2.5137	5.93
hxw2	-1.2849	-5.10	-1.3854	-5.00	-1.2668	-4.49
hxw3	-0.5385	-3.16	-0.1425	-0.75	-0.9162	-4.44
hxw4	0.0349	0.21	0.5649	3.00	-0.3026	-1.53
hxw5	-0.2105	-1.28	0.1034	0.56	-0.3520	-1.78
hh	-1.1156	-13.22	-1.3687	-14.61	-0.9226	-9.25
hhsp	-2.0802	-8.59	-2.5279	-10.47	-2.0582	-5.78
locmf	1.3989	15.29	1.1695	11.61	1.6433	13.88
Constant	-3.7593	-10.60	-3.0041	-7.58	-3.8119	-8.84
Income Mean of Matched Treateds		$2,118		$2,118		$2,118

[3] We will hereafter use the term employer to refer to both employers and self-employed individuals.

Income Mean of Matched Controls	$930	$767	$684
Microcredit Program Effect	$1,188	$1,351	$1,434
T-statistics for Ho: Effect = 0	4.41	5.68	4.95

Table 5 shows the results for the three alternative control groups (total PNAD sample, employers only and salaried workers only), while Appendix B presents evidence on the respective quality of the matching.

From Appendix B we see that in all three cases the matching procedure generally leads to significant reductions in the average differences among treated and control groups. This is specially the case when the matching is performed using the PNAD sample of employers as control group. It is worth noting, however, that although gains are considerable for most variables, there are some variables for which average differences across the two groups actually increase after the matching.

Contrary to our results on Chile, the microcredit programs examined in Brazil appear highly effective, with high and statistically significant increases in the average income of their clients. If we adjust the mean income in the PNAD sample for the inflation between September 1999 and January 2000(see Table 4), the difference between entrepreneurs who received microcredit and other entrepreneurs or workers with similar characteristics is still above 100%. When we compare the estimates obtained with control groups of, respectively, employers and salaried workers, we find, as expected, that the impact of microcredit is lower in the first case. However this impact is still high (Br$ 1,351 or about US$ 350 of the average monthly income) and highly significant. (t-statistic = 5.68).

As in the Chilean case, we compare the differences between those who received microcredit from a bank-based program to those who were clients of an NGO-based program. Results are shown in Table 6 for both types of control groups (employers and salaried workers).

Before further commenting on these results, it is worth noting that the average income of bank clients is about 20% higher than that of NGO clients. As for the matched control groups, in the case of bank-based programs the average income of the employers control group is 80% higher than that of the salaried workers control group (Br$ 934 versus Br$ 516). This is different from the NGO case, where the average income of the employers matched control group is lower than that of the salaried workers control group (Br$860 and Br$1,053, respectively). Moreover, the average income of the employers matched control group is higher for bank- than for NGO-based programs, while the opposite is true when comparisons are made across salaried workers control groups. The main conclusion arising from these results is that banks and GNOs have very different clients in terms of their incomes as we also had seen in Chile.

Table 6: Probit and Microcredit program Effect Estimates for Type of Clients

	Bank Clients				NGO Clients			
	Employers		Workers		Employers		Workers	
Sample Size	9232		25747		9338		25853	
Number of Treated	46		46		152		152	
LR $?^2$(13)	255		458		497		1006	
Prob. > $?^2$	0.00		0.00		0.00		0.00	
Pseudo R^2	0.44		0.68		0.32		0.54	
Variables	**Coef.**	**z**	**Coef.**	**z**	**Coef.**	**z**	**Coef.**	**z**
Sex	0.1539	0.89	-0.2243	-1.08	-0.1143	-1.23	-0.2833	-2.77
Age	0.0330	4.69	0.0555	6.29	0.0192	5.02	0.0357	8.65
Hhs	0.0274	0.48	-0.0564	-0.85	-0.1607	-4.72	-0.1426	-4.03
Edbas	4.8480	9.85	4.8428	0.00	0.1324	0.57	0.5374	2.07
Edsec	5.7572	12.94	6.2103	23.99	0.6402	2.70	1.1069	4.05
Edhig	5.5011	11.95	6.0831	18.74	0.5653	2.30	1.3203	4.70
Spro	-0.6685	-2.68	-1.1787	-2.81	-0.2983	-2.73	-0.6389	-5.01
Sserv	-0.5875	-3.58	-1.3011	-5.72	-0.6186	-6.48	-1.1834	-10.10
Nemp2	1.0359	4.65	3.5136	7.96	0.5498	3.98	2.9577	9.03
Nemp3	0.8969	3.91	3.0321	7.33	0.6823	5.52	3.1419	12.17
Nemp4	0.5513	1.75	2.1335	3.18	-0.0396	-0.19	2.3862	5.88
hxw2					-0.8479	-3.37	-0.8918	-3.24
hxw3	0.3979	1.74	-0.3244	-1.16	0.1503	0.79	-0.5031	-2.38
hxw4	0.4415	1.63	-0.1715	-0.57	0.9214	4.95	0.1348	0.67
hxw5	0.5068	2.30	0.2795	1.11	0.3299	1.81	-0.0111	-0.05
Hh	-1.2760	-7.61	-1.1987	-5.46	-0.7681	-8.46	-0.5480	-5.59
Hhsp	-1.5785	-5.80	-1.3463	-3.58				
Locmf	1.3491	7.06	1.9800	8.16	1.1263	11.39	1.5529	12.84
Constant	-9.3971	0.00	-9.9487	-16.81	-2.8169	-7.73	-3.6477	-8.86

Income Mean of Matched Treateds	$2,428	$2,428	$2,024	$2,024
Income Mean of Matched Controls	$934	$516	$860	$1,053
Microcredit Program Effect	$1,494	$1,913	$1,164	$971
T-statistics for Ho: Effect = 0	2.59	3.48	4.14	2.94

Although in the case of the control groups used for bank clients, salaried workers earn much less than employers with similar characteristics, the behavior of average incomes in the matched control groups constructed for the sample of NGO clients is very different. While the average income of employers matched to NGO clients is 9% lower than the average income of employers matched to bank clients, the average income of salaried workers matched to NGO clients is larger than the average income of employers matched to NGO clients by 22%. This last result is however not surprising if one takes into consideration the educational level and number of workers in the firm, both of which are positively and significantly related to the propensity to receive microcredit in the sub-sample of salaried workers.

One characteristics of the Brazilian labor market is that people tend to have more than one job to increase their income. On the other hand, micro-entrepreneurs tend to over estimate the number of hours that really work, especially in the case when they use their home as the business location. These elements have two implications for our work. First, we decided to compare average monthly income rather than average hourly income. Second, we re-estimated average income of the control group using all the income sources of salaried workers and employers.

Table 7: Microcredit Program Effect Estimates Using Income From All Sources

	Bank Clients		NGO Clients	
	Employers	Workers	Employers	Workers
Comparison Using Incomes From All Sources				
Income Mean of Matched Treateds	$2,428	$2,428	$2,024	$2,024
Income Mean of Matched Controls	$1,131	$597	$996	$1,152
Microcredit Program Effect	$1,297	$1,831	$1,028	$872

T-statistics for Ho: Effect = 0	2.34	3.84	5.10	3.86

Table 7 shows the results of comparing the income of the micro-entrepreneurs that received micro-credit with the total income, from all sources, of matched salaried workers and employers. Though the microcredit program effect is lower than the one showed in Table 6, it is still high and significant both for clients of bank- and NGO-based programs.

Conclusions

We estimate the income impacts of two Chilean and five Brazilian microcredit programs. We study the bank and the NGO (non-governmental organization) programs separately because the previous literature suggests that they attend different shares of the market.

We use a relative new method to build control groups, in order to deal with some of the most serious problems that have plagued previous assessments of microcredit programs.

We find weak evidence of positive impacts for the Chilean bank-based program. As for the Chilean NGO clients, it seems that the impact of microcredit on income are not positive but negative. On the other hand, the Brazilian evidence shows a highly positive and significant impact of microcredit programs on clients' income, especially in the case of those administered by bank.

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Appendix A. Quality Matching for the Chilean Sample: Means.

Total Sample

	Before Matching			After Matching		
Regressors	Treated	Controls	% dif	Treated	Controls	% dif
sex	0.65	0.31	36%	0.65	0.59	5%
age	49	39	12%	49	49	0%
ms	0.64	0.65	-1%	0.64	0.53	9%
hhs	4.9	4.6	3%	4.9	4.9	0%
edbas	0.43	0.21	34%	0.43	0.36	9%
edsec	0.47	0.50	-3%	0.47	0.42	6%
edhig	0.09	0.21	-42%	0.09	0.22	-44%
spro	0.23	0.45	-32%	0.23	0.27	-7%
sserv	0.54	0.40	16%	0.54	0.42	13%
nemp	1.35	3.10	-39%	1.35	1.26	3%
hxw	62	49	12%	62	54	7%
hh	0.77	0.50	21%	0.77	0.77	0%
hhsp	0.16	0.16	0%	0.16	0.19	-7%

Bank Clients

	Before Matching			After Matching		
Regressors	Treated	Controls	% dif	Treated	Controls	% dif
sex	0.69	0.32	36%	0.69	0.78	-7%
age	52	39	14%	52	51	0%
ms	0.69	0.67	1%	0.69	0.94	-16%
hhs	4.5	4.6	-1%	4.5	5.4	-9%
edbas	0.47	0.10	64%	0.47	0.63	-14%
edsec	0.51	0.54	-3%	0.51	0.35	18%
edhig	0.02	0.30	-88%	0.02	0.02	0%
spro	0.24	0.38	-24%	0.24	0.02	85%
sserv	0.69	0.45	21%	0.69	0.88	-12%
nemp	1.33	3.16	-41%	1.33	1.33	0%
hxw	66	48	16%	66	56	9%
hh	0.82	0.50	25%	0.82	0.27	50%
hhsp	0.20	0.17	6%	0.20	0.73	-57%

ONG Clients

	Before Matching			After Matching		
Regressors	Treated	Controls	% dif	Treated	Controls	% dif
sex	0.60	0.29	34%	0.60	0.63	-3%
age	45	39	7%	45	43	2%
ms	0.57	0.63	-5%	0.57	0.47	10%
hhs	5.4	4.6	8%	5.4	5.0	4%
edbas	0.37	0.33	5%	0.37	0.30	10%
edsec	0.40	0.46	-7%	0.40	0.37	4%
edhig	0.20	0.11	30%	0.20	0.27	-14%
spro	0.23	0.53	-39%	0.23	0.17	17%
sserv	0.30	0.34	-6%	0.30	0.20	20%
nemp	1.37	3.03	-38%	1.37	1.53	-6%
hxw	54	49	5%	54	57	-2%
hh	0.67	0.51	14%	0.67	0.63	3%
hhsp	0.10	0.14	-18%	0.10	0.10	0%

Appendix B. Quality Matching for the Brazilian Worker/Employer Samples: Means.

Total Sample

	Before Matching			After Matching		
Regressors	Treated	Controls	% dif	Treated	Controls	% dif
sex	0.44	0.39	7%	0.44	0.55	-10%
age	43.39	36.14	9%	43.39	41.85	2%
hhs	3.16	3.68	-8%	3.16	3.31	-2%
edbas	0.30	0.54	-28%	0.30	0.25	10%
edsec	0.48	0.25	31%	0.48	0.46	2%
edhig	0.19	0.15	14%	0.19	0.26	-15%
spro	0.20	0.32	-24%	0.20	0.26	-14%
sserv	0.30	0.51	-26%	0.30	0.29	1%
nemp2	0.15	0.01	83%	0.15	0.26	-28%
nemp3	0.21	0.02	86%	0.21	0.15	17%
nemp4	0.05	0.02	49%	0.05	0.03	29%
hxw2	0.02	0.15	-81%	0.02	0.02	-14%
hxw3	0.21	0.38	-29%	0.21	0.27	-13%
hxw4	0.35	0.20	27%	0.35	0.31	5%
hxw5	0.34	0.25	16%	0.34	0.35	-1%
hh	0.28	0.55	-32%	0.28	0.31	-5%
hhsp	0.01	0.21	-91%	0.01	0.02	-33%
locmf	0.55	0.14	59%	0.55	0.58	-3%

Employers

	Before Matching			After Matching		
Regressors	Treated	Controls	% dif	Treated	Controls	% dif
sex	0.44	0.29	22%	0.44	0.60	-15%
age	43.39	40.67	3%	43.39	38.49	6%
hhs	3.16	3.62	-7%	3.16	3.29	-2%
edbas	0.30	0.60	-33%	0.30	0.26	7%
edsec	0.48	0.21	40%	0.48	0.52	-4%
edhig	0.19	0.14	16%	0.19	0.20	-1%
spro	0.20	0.33	-25%	0.20	0.17	7%
sserv	0.30	0.44	-19%	0.30	0.27	4%
nemp2	0.15	0.05	49%	0.15	0.17	-8%
nemp3	0.21	0.06	56%	0.21	0.16	14%
nemp4	0.05	0.06	-12%	0.05	0.03	29%
hxw2	0.02	0.18	-84%	0.02	0.03	-25%
hxw3	0.21	0.23	-5%	0.21	0.23	-5%
hxw4	0.35	0.15	40%	0.35	0.41	-8%
hxw5	0.34	0.40	-8%	0.34	0.27	12%
hh	0.28	0.67	-41%	0.28	0.26	3%
hhsp	0.01	0.20	-90%	0.01	0.02	-20%
locmf	0.55	0.17	52%	0.55	0.55	0%

Workers

	Before Matching			After Matching		
Regressors	Treated	Controls	% dif	Treated	Controls	% dif
sex	0.44	0.43	2%	0.44	0.52	-7%
age	43.39	34.52	11%	43.39	42.10	2%
hhs	3.16	3.71	-8%	3.16	3.75	-8%
edbas	0.30	0.52	-27%	0.30	0.38	-12%
edsec	0.48	0.27	28%	0.48	0.36	14%
edhig	0.19	0.15	13%	0.19	0.25	-14%
spro	0.20	0.32	-23%	0.20	0.18	5%
sserv	0.30	0.53	-28%	0.30	0.28	4%
nemp2	0.15	0.00	100%	0.15	0.23	-22%
nemp3	0.21	0.00	100%	0.21	0.19	4%
nemp4	0.05	0.00	99%	0.05	0.07	-22%
hxw2	0.02	0.13	-80%	0.02	0.03	-33%
hxw3	0.21	0.44	-35%	0.21	0.19	5%
hxw4	0.35	0.22	23%	0.35	0.19	30%
hxw5	0.34	0.19	28%	0.34	0.57	-25%
hh	0.28	0.50	-29%	0.28	0.56	-33%
hhsp	0.01	0.21	-91%	0.01	0.00	100%
locmf	0.55	0.13	61%	0.55	0.57	-2%