

**Impact Evaluation Findings after
Three Years of the Productive and
Business Services Activity in
Handicrafts of the Productive
Development Project, El Salvador**

Final Report

June 6, 2014

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ACRONYMS

ATA	Aid to Artisans
DIGESTYC	Dirección General de Estadística y Censos (DIGESTYC)
ERR	Economic Rate of Return
FOMILENIO	Fondo del Milenio (Millennium Fund)
FTE	Full time equivalent
ITT	Intent to treat
MCC	Millennium Challenge Corporation
PBS	Production and Business Services
PDP	Productive Development Project
TOT	Treatment on the treated

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EXECUTIVE SUMMARY

Overview

Funded by the Millennium Challenge Corporation (MCC) and implemented by El Salvador's Millennium Challenge Account (known as FOMILENIO in Spanish) from 2008 to 2012, the main objective of the Productive Development Project (PDP) was to assist in the development of profitable and sustainable business ventures for poor individuals in El Salvador's Northern Zone. Over approximately four years, the PDP used nearly \$72 million in allocated funds to provide over 13,500 participants with technical and material assistance and create more than 11,000 full-time equivalent jobs. The PDP comprised three activities: Production and Business Services (PBS), Investment Support, and Financial Services. The PBS Activity offered training and technical assistance, in-kind donations, and other business development services to small farmers and business owners. The Investment Support Activity offered investment capital (in the form of long-term loans of over \$50,000) for viable business proposals. Lastly, the Financial Services Activity supported two loan guarantee programs targeting micro-, small, and medium enterprises, as well as a small technical assistance program to financial institutions.

The largest of the PDP's three activities was the PBS Activity, which provided technical and material assistance to farmers and small-scale producers to support the Northern Zone's dairy, fruit, horticulture, handicrafts, tourism, forestry, and coffee sectors. As stated in the 2006 MCC-El Salvador compact in which it was established, the goal of the PBS Activity was to "help poor farmers, organizations and micro-, small, and medium enterprises that benefit poor inhabitants of the Northern Zone successfully transition to higher-profit activities, generating new investment, expanding markets and sales, and creating new jobs in ways that stimulate sustainable economic growth and poverty reduction."¹

PBS assistance began with a pilot phase in 2008, and general implementation began in October 2009 and ended in July 2012. As defined in the compact, the PBS Activity's total funding of \$57 million was originally allocated to finance technical assistance to poor farmers, in-kind donations, business development services, as well as pre-investment studies to develop and implement viable business plans related to the activity's target value chains. Following modifications to program activities in early 2010, PBS funding was allocated to a wider array of investments, including in-kind donations, technical assistance and training, demonstration plots, technical and financial support for enterprises created and supported by FOMILENIO, and investments in innovative productive projects.

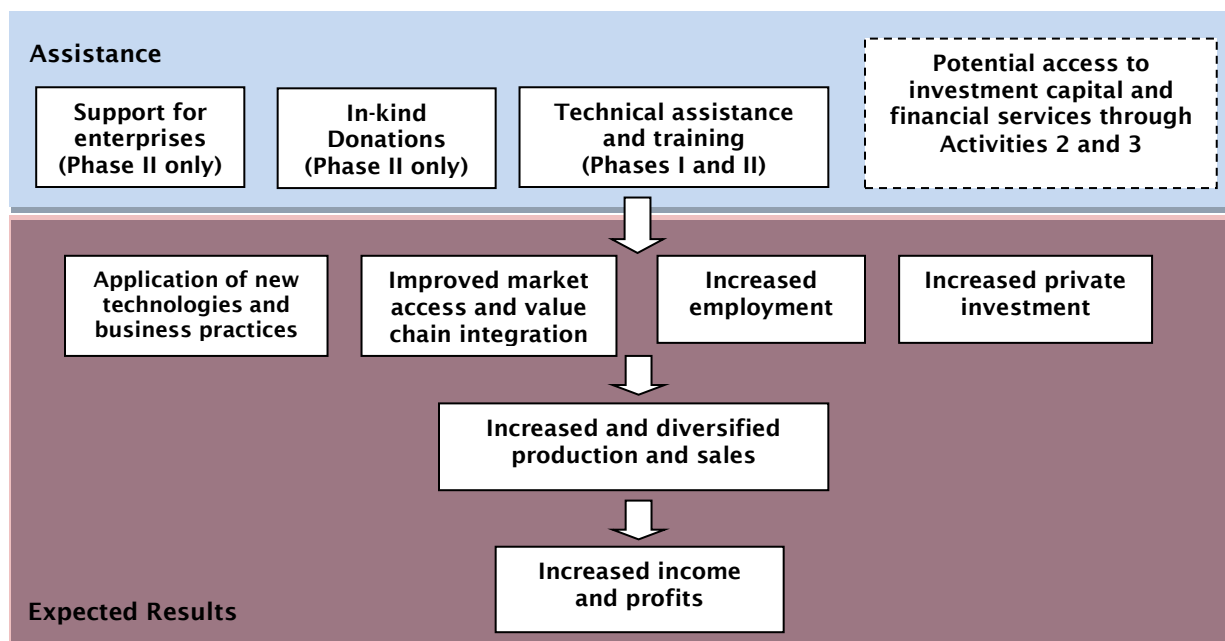
Although PBS assistance spanned a range of value chains, this report presents the impacts of PBS assistance in the handicraft value chain. Figure 1 provides a visual representation of how the Production and Business Services Activity was originally designed to achieve its key objective of economic development in the handicrafts value chain (see assistance types that were offered in Phase I, which corresponds to implementation from 2009 to mid-2010). First, PBS service providers offer technical assistance to artisans. A portion of PBS participants also has access to investment capital through Activity 2 of the PDP (Investment Support) as well as small loans through Activity 3

¹ MCC-El Salvador Compact, Schedule 2-3.

of the PDP (Financial Services).² This capital could help artisans finance new production technologies, build new locales, or make marketing or branding investments. As a result of training and assistance, artisans would develop stronger business and technical skills. With these new skills, artisans would generate increased and more diversified handicrafts, and sell these handicrafts directly to local, national, and international buyers. As defined in the compact, PBS participants in all assisted value chains were expected to increase their annual income by 15 percent, on average, over the course of the multi-year activity as a result of assistance.

In mid-2010, the PBS assistance model changed in two fundamental aspects (see assistance types that were offered in Phase II, which corresponds to implementation from mid-2010 to 2012). First, technical assistance would now be accompanied by donations of materials for handicraft production. Second, Chemonics International, a development consulting firm, would provide additional technical assistance to two handicraft cooperatives in the Northern Zone. This assistance would focus on establishing linkages with clients, product design, and strengthening networks of participating handicrafts workshops and artisans. Supported enterprises would provide participating artisans with cheaper inputs and give them handicraft orders to fill. This model marked a departure from the Phase I assistance model, which envisioned that individual artisans and workshops could be trained to interact directly with local, national, and international buyers. Under the Phase II model, FOMILENIO-supported enterprises played a key role in coordinating among artisan groups and workshops to fill large orders, thus generating increased sales, income, and profits among artisans in their extended networks.

Figure 1. PBS Logic Model, Handicrafts Chain



Source: PDP Operations Manual, December 2010.

² Although a strong intersection between PBS and Activity 2 was originally envisioned, only 15 PBS participants secured credit through Activity 2 during the compact period.

In this report, we estimate the impact of three years of the PBS Activity on a sample of handicraft producers' investments, employment, and income. This analysis serves as a complement to Mathematica's report on the impact of one year of PBS assistance to producers in the horticulture, dairy, and handicrafts value chains (Blair et al., 2012), as well as Mathematica's 2013 performance evaluation report of the full PBS Activity (Blair et al., 2013).

This in-depth analysis of PBS assistance in the handicrafts value chain reflects an interest on the part of the Salvadoran Ministry of Agriculture and FOMILENIO to learn from PBS assistance in the handicrafts value chain from 2008 to 2012. Because the Ministry designated handicrafts as a priority area for growth, representatives from the Ministry encouraged FOMILENIO and MCC to conduct this impact evaluation, with the expectation that it could help inform future handicrafts assistance programs in the country. This impact evaluation is also the result of implementation factors that were favorable for a multiyear impact evaluation of assistance in this sector. Personnel constraints, prioritization of sectors, and implementation plans dictated that artisans selected for the evaluation's control group did not receive assistance throughout the full implementation period—as opposed to the first year of PBS assistance, as originally conceived. In addition, Chemonics and FOMILENIO requested extending the follow-up period for this impact evaluation from two years to three years. In response to this request, data collectors fielded an additional follow-up survey of artisans in 2012. As a result of these factors and modifications, we can estimate the impact of approximately three years of PBS assistance in the handicraft sector, as opposed to the impact of only one year of assistance in the dairy and horticulture sectors (presented in our interim report).

Given this report's focus on handicrafts, the next sections will primarily describe project implementation in the handicrafts value chain and the impact of PBS assistance on artisans' sales, employment generation, and income.

Summary of PBS Implementation

The preparation phase of the PBS Activity began in September 2007. Managed by the Salvadoran Multi-Sector Investment Bank (known as BMI for its initials in Spanish) and SNC-Lavalin, an engineering firm based in Canada, this phase served to establish basic PBS operations and conduct diagnostic studies of investment opportunities in the Northern Zone. From July 2008 to September 2009, BMI and SNC-Lavalin oversaw the pilot phase of the PBS. During this phase, newly contracted PBS service providers initiated 13 pilot projects to provide training to small producers in the dairy, horticulture, fruit, handicrafts, and tourism chains.

In September 2009, FOMILENIO assumed direct supervision of the PBS Activity from BMI. In addition, Chemonics began coordinating and managing the various components of the PBS Activity under the PDP's general implementation phase. This coordination involved various subcontracts with service providers to offer assistance in horticulture, dairy, and handicrafts chains. During this general implementation phase (as well as during the pilot phase), the PBS Activity focused on increasing and diversifying participants' production. As such, PBS assistance during this time period—later referred to as Phase I—was oriented toward decreasing input costs, promoting new technologies, and improving productive practices. For each value chain, one service provider covered all PBS assistance in the Northern Zone. Led by Aid to Artisans, the focus of Phase I PBS assistance in the handicrafts chain was to strengthen the general productive capacity of artisans in the Northern Zone. Aid to Artisans specialists traveled to participants' communities to provide in-site training on a weekly or bi-weekly basis. Training focused on product design and production.

Participating artisan groups developed several new product lines during Phase I, and Aid to Artisans staff made efforts to contact potential clients in El Salvador and abroad.

In September 2010, the PBS Activity was reorganized and a new phase of PBS implementation began. During this phase, called Phase II, the focus of PBS expanded to include production, access to markets, and business capacity. Eligibility criteria for assistance under PBS changed from Phase I to Phase II for most value chains. Notably, Phase II participants in the handicrafts chain were required to have substantial experience in handicraft production, whereas an interest in handicraft production was sufficient in Phase I. Implemented by Swisscontact,³ an international development foundation, handicrafts assistance in Phase II was divided into beginner classes for less experienced artisans and intermediate classes for producers who had already learned a series of skills in Phase I. Beginner classes featured basic training in production techniques whereas intermediate classes focused on production, business skills, product development, and marketing. Distinct from Phase I assistance, most training sessions in Phase II were delivered at the locales of two FOMILENIO-supported cooperatives: ACOPROARTE and Moje. Assistance under Phase II continued until the expiration of field-staff's contracts in July 2012.

Table 1. Key Characteristics of PBS Handicrafts Assistance

Objective	Help artisans successfully transition to higher-profit goods, generate new investment, expand markets and sales, and create new jobs
Target Population	Poor artisans, organizations and micro-, small, and medium sized enterprises that benefit poor artisans of the Northern Zone
Total Funding	\$2.7 million
Implementing Parties	FOMILENIO and Chemonics (all phases); Aid to Artisans (pilot and Phase I); Swisscontact (Phase II)
Time Frame	2008 (Pilot); 2009 to 2010 (Phase I); 2010 to 2012 (Phase II)
Participants	1,192: 89 in the pilot phase, 635 in Phase I, and 468 new participants in Phase II
Activities/Assistance	<ul style="list-style-type: none"> • Technical assistance and training • In-kind donations • Technical and financial support for cooperatives supported by FOMILENIO: Moje and ACOPROARTE (Phase II only)

Source: PDP Operations Manual, December 2010.

By the time Phase II assistance ended in July 2012, Chemonics had provided 1,192 artisans with PBS assistance (See Table 1). These artisans represented 8 percent of the 15,319 PBS participants in all value chains. This number exceeded the initial target of 889 handicraft participants by over 30 percent. At the end of Phase II, total PBS investments in handicrafts assistance totaled \$2.7 million, or approximately 6 percent of total PBS expenditures of approximately \$46.9 million in all seven value chains (not shown in Table 1). These costs included all technical and material assistance to artisans, as well as equipment and infrastructure investments and administrative costs related to participant-supported enterprises.

³ Swisscontact provides technical and financial services across a range of economic sectors, including handicrafts. Swisscontact is represented in 27 countries with over 800 employees.

Research Questions and Methodology

In this final evaluation report, we analyze the following primary research questions related to the handicrafts chain of the PBS Activity:

- What impact did FOMILENIO's offer of PBS assistance have on intermediate outcomes, such as production levels, business practice adoption, technology adoption, and product diversification?
- What impact did FOMILENIO's offer of PBS assistance have on employment creation and artisans' investment and income?
- What impact did FOMILENIO's offer of PBS assistance have on household income?

The second question relates to income at the producer level, whereas the third addresses income at the household level—the latter the key outcome for this evaluation. Tracking income at these two levels is important because income at the producer level provides the most direct measure of the economic impact of PBS assistance, whereas income at the household level provides a measure of the ultimate effect of assistance on the well-being of producers' households.⁴ (Please see Mathematica's performance evaluation of PBS assistance for a full analysis of PBS implementation and contractor performance in the handicrafts, dairy, and horticulture chains from 2008 to 2012.)

For the impact evaluation of PBS assistance in the handicrafts value chain, Mathematica, MCC, FOMILENIO and other stakeholders chose a *randomized design*, in which some groups of artisans were randomly selected to receive PBS assistance over a three-year period, whereas other groups of artisans were randomly assigned to not receive assistance during this timeframe. The evaluation design exploited two key characteristics of PBS implementation. First, there was insufficient capacity to serve all participants given personnel and funding constraints throughout all implementation phases. Second, there were enough people in the Northern Zone who were eligible for, and interested in, participating in the PBS Activity to form a valid comparison group.

All artisans in this evaluation were originally surveyed by Chemonics contractors in a census of self-identified artisans in the Northern Zone. Artisans that Aid to Artisans deemed eligible for services—largely because they had experience or interest in handicrafts and were part of an organized group—were included in the evaluation's sample frame of individuals and groups. Because implementation plans required that Chemonics serve entire groups of producers during the same cycle, Mathematica staff was unable to randomly assign individual participants into treatment and control groups. Consequently, random assignment was done at the municipality level for the handicraft chain.

It should be noted that some census respondents were excluded from randomization (and hence the study) because Aid to Artisans classified them as high-priority artisans. In general, high-priority artisans were members of established workshops or cooperatives that had strong potential for job creation and income generation through PBS assistance. As such, implementers did not want to subject these artisans to potential selection into the control group. Because over 50 high-capacity

⁴ FOMILENIO and Chemonics defined handicraft income at the producer level to be the key economic outcome of interest, as opposed to income at the household level.

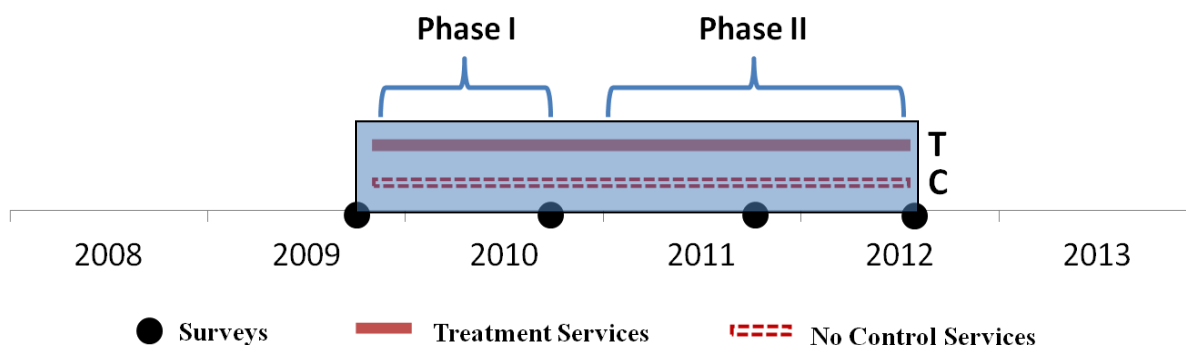
artisans were excluded from the study in 2009, these exclusions are likely to limit the study's generalizability to the full population of assisted artisans.

A total of 19 municipalities (9 in treatment and 10 in control) with 674 individuals (337 in treatment and 337 in control) were randomized into the study. The analysis sample for this evaluation includes all respondents that completed all four in-person interviews: one baseline and three follow-up interviews. This is a total of 587 individuals (289 in treatment and 298 in control). Over 85 percent of the sample completed all four surveys over three years.

It is important to note that the artisans in this evaluation were eligible for Phase I services, but not necessarily for Phase II services provided by Swisscontact. As mentioned above, selection criteria were altered in Phase II, to the extent that PBS participants had to have some understanding of handicrafts production, a strong interest in selling handicrafts, and strong potential to meet market demand. In a census of individuals in the treatment group in early 2010, Swisscontact found that only 86 of the 337 individuals assigned to the treatment group were eligible for, and interested in, continuing with PBS assistance. According to Swisscontact, most of these individuals did not have sufficient capacity or expertise to sell their production to large buyers in the short- or medium-term. However, following discussion with FOMILENIO, MCC, and Mathematica, Swisscontact staff attempted to work with all 189 individuals in the treatment group who, according to Chemonics records, had participated in Phase I assistance. Due to these individuals' relatively low business capacity and experience, Swisscontact planned to offer these individuals "partial" assistance, which included training on manual production techniques to improve the quality of their products, but not intensive assistance with marketing and creating linkages with FOMILENIO-supported handicraft cooperatives. Based on their own assessment of artisans in the treatment group, Swisscontact staff communicated their expectation that it would be difficult to generate impacts in handicraft sales and income among these artisans.

The PBS impact evaluation assesses both main and intermediate outcomes resulting from the offer of three years of PBS assistance. To create these outcome indicators, we designed the Productive Development Surveys (PDSs), which are in-person baseline and follow-up surveys that focus on productive activities and measure household income and consumption. Under a contract between FOMILENIO and the Dirección General de Estadística y Censos (DIGESTYC), data collectors administered baseline and follow-up PDSs to all eligible artisans in the evaluation, which includes all producers in the treatment group as well as the control group. Data collection included baseline data collection (right before Phase I services), the first follow-up data collection (right after the end of Phase I), a second follow-up (after one year of Phase II services), and a final follow-up one year later, approximately one month after Phase II services concluded in July 2012.

The blue box in Figure 2 illustrates the period covered in this evaluation report: approximately three years of services for treatment group producers, compared to no services for control group producers. This timeframe is consistent with the program implementers' expectations regarding when medium- to long-term gains in sales and income would be realized. In fact, Aid to Artisans representatives stated in 2009 that some positive impacts on artisan income could materialize as soon as one year following assistance. According to program implementers, artisans could feasibly apply improvements in products, production techniques, and marketing practices shortly after learning them in any phase or year of PBS assistance. Because each calendar year offers two to three peak periods for handicraft sales—including Holy Week and Christmas—assisted artisans would have multiple opportunities to market and sell their improved production over the course of the three year follow-up period.

Figure 2. Timeline of PBS Implementation for Treatment and Control Groups in the Handicrafts Chain

Artisans in the Evaluation

Artisans in the study are largely married females around the age of 40 with a basic education. Overall, artisans invested between \$400 and \$600 a year in handicrafts production, and made a profit of between \$300 and \$500 on these investments. Besides handicraft income, other key sources of income at baseline included salaries and remittances.

With an average of 19 years of handicrafts experience, artisans in the treatment group had substantial experience at baseline. In addition, the majority had worked in handicrafts during the year prior to the baseline survey (Table 3). Coupled with Swisscontact's reports that treatment group artisans were low-skilled, on average, we can conjecture that although they had several years of experience with handicrafts overall, this experience may not have been directly relevant to current market demand, particularly outside of local (municipal) markets. The treatment group's average net annual income from handicrafts of less than \$50 per month likely attests to these artisans' relatively modest skills, production, and access to markets at baseline.

Participation and Assistance Received

For this evaluation, surveyed individuals are defined as participants if they reported receiving any amount or form of PBS assistance during Phase I or Phase II, which spanned from October 2009 to July 2012. We use respondents' self-reports from surveys instead of administrative data from Chemonics because survey data provide us with more detailed, annual participation numbers, whereas administrative data indicate only if an individual participated at any time during the three-year intervention. Using participants' accounts of PBS assistance from follow-up surveys, 68 percent of treatment group artisans received PBS assistance and 21 percent of control group artisans received PBS assistance. These self-reported participation rates differ from rates calculated with Chemonics administrative records. According to these administrative records, 78 percent of artisans in the treatment group and only 1 percent of artisans in the control group received assistance.

In this analysis, we use artisans' self-reported participation rates (68 percent for treatment and 21 percent for control) as our primary measure of participation. The treatment group participation rate of under 70 percent—combined with the relatively high control group participation rate—increases the importance of analyzing the impact of PBS assistance on those artisans who actually received assistance (that is, the participants). These are known as treatment-on-the-treated (or TOT) estimates. In general, TOT impact estimates can be interpreted as the impact of an intervention among all participants—regardless of whether they were originally assigned to the treatment or

control group. This stands in contrast with an intent-to-treat (or ITT) approach, which measures the impact of *the offer* of PBS assistance, regardless of whether treatment group individuals accepted assistance, or whether control group individuals somehow received assistance as well. We use an ITT approach for our main analysis because this approach best estimates the impact of assistance interventions in real-world circumstances in which not all targeted beneficiaries actually receive services—either due to personal preference, implementation decisions, or other factors. Given that these two approaches provide different and complementary information, we present both ITT and TOT results below.

Also notable is that the total number of PBS participants in the handicraft chain involved in the study—approximately 260 individuals in treatment and control—represents only 22 percent of the 1,192 artisans who received PBS assistance from 2008 to 2012. We discuss this issue in the limitations section below.

In both phases, PBS assistance most commonly took the form of workshops, seminars, and training sessions. Also in both phases, the most common topics discussed during sessions were product design, quality control, marketing, and new technologies. Notably, less than ten percent of treatment group artisans reported receiving donations in Phase I, but 27 percent reported receiving donations in Phase II, including paint, fabric, thread, furniture, and sewing machines.

During all of Phase II—which ranged from late 2010 to mid-2012, participants in the treatment group reported attending an average of 16 training sessions. This was roughly equivalent to the average of 13 sessions reported by the 35 control group artisans who participated in Phase II (not shown). Relevant to ITT impact estimates—which measure the impact of PBS assistance on all randomized artisans, regardless of participation—treatment group members (including both participants and non-participants) attended an average of nine sessions in Phase II, compared to an average of two sessions for control group members (also including participants and non-participants).

Besides this technical and material assistance in both phases, the PBS Activity’s original design included potential overlap with the other PDP Activities, the Investment Support and the Financial Services Activity. Using administrative data, we attempted to determine the extent to which artisans in the evaluation sample received a FIDENORTE investment loan (through the Investment Support Activity) or a loan that was partially guaranteed by the PROGARA NORTE guarantee fund (through the Financial Services Activity). According to these data, no artisans in the study sample were members of the artisan cooperative that received a FIDENORTE loan, and only two artisans in the study sample—one in treatment and one in control—received a loan through PROGARA NORTE related to handicraft production and sales. In this sense, PBS technical and material assistance was not accompanied by complementary financial services, as originally envisioned.

Findings

In this section, we discuss the impact of approximately three years of PBS assistance in the handicrafts chain, both at the level of the artisans in the study (Section A) as well as their households (Section B). These impact estimates in these two sections are based on an ITT approach, and thus represent the impact of PBS assistance on participants and non-participants alike. We compare and contrast ITT and TOT impact estimates below in Section C.

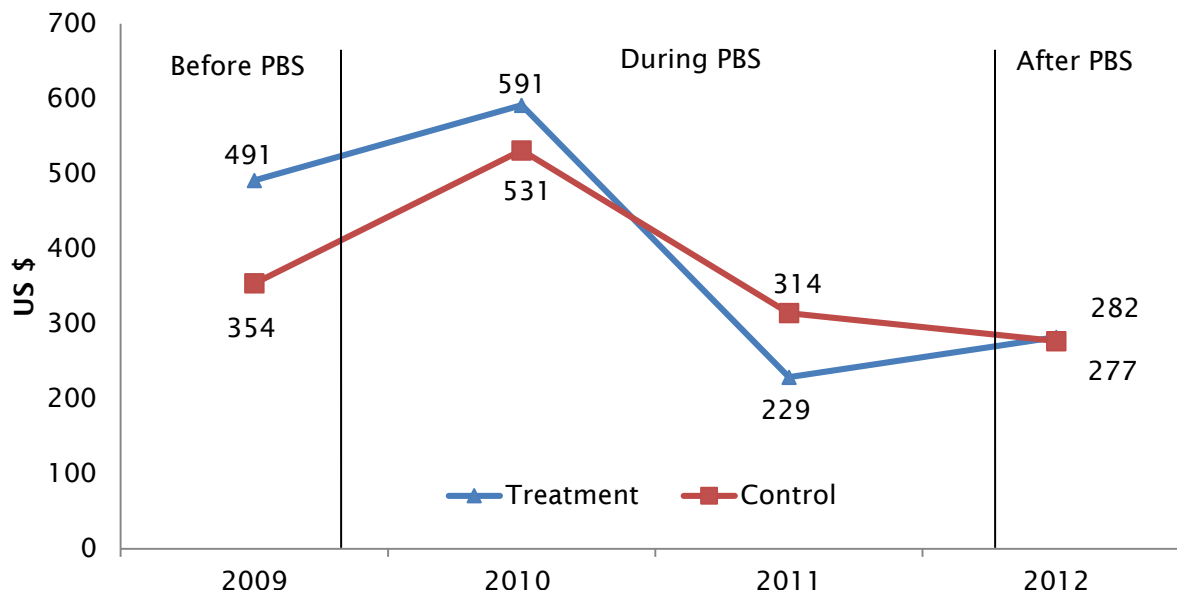
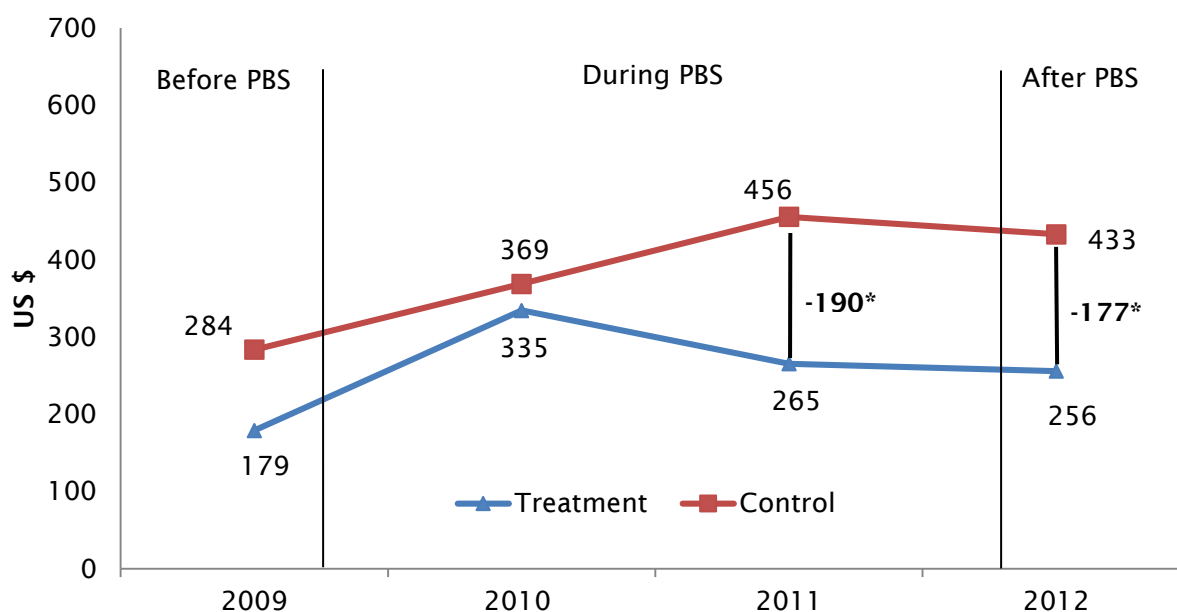
A. Producer-Level Findings

PBS influenced artisans to sell handicrafts and devote more of their own labor to handicraft production. After three years of PBS assistance, treatment group artisans were 17 percentage points more likely to sell handicrafts in the months following PBS implementation, and worked over 30 more days per year in handicrafts than control group artisans, on average (Table IV.2 of the main report). Analyzing trends from 2009 to 2012, it appears that PBS assistance influenced treatment group artisans to continue producing and selling handicrafts, whereas control group artisans were more likely to transition out of handicraft production and sales from 2010 to 2012.

PBS influenced artisans try new production techniques and seek new clients. Compared to control group artisans, treatment group artisans were 26 percentage points more likely to report trying new handicraft production techniques (significant at a 1 percent level); nine percentage points more likely to report having looked for new clients in the handicraft sector (significant at a 5 percent level); and six percentage points more likely to report creating environmentally friendly handicrafts (marginally significant just beyond a 5 percent level). In addition, treatment producers were 15 percentage points more likely to report trying new handicraft products, although this impact is not statistically significant (see Table IV.1 in main report).

PBS had a positive effect on employment during Phase I, but this effect disappeared by at the end of Phase II. Under an ITT analytic approach, artisans in the treatment group generated, on average, 0.14 more full-time equivalent jobs than artisans in the control group during late 2009 and 2010 (Figure 3).⁵ This is equivalent to over one month of additional full-time labor generated by each artisan (statistically significant at the 1 percent level). However, this positive effect of PBS on employment decreased in 2011 and disappeared by 2012. It should be noted that employment generated by treatment group artisans did not decrease over the course of PBS assistance. Rather, labor contracted by control group artisans increased in 2012 relative to previous years.

⁵ Full-time equivalent jobs are jobs that require 250 days of labor per year.

Figure 4. Artisans' Net Annual Handicraft Income, by Treatment Group and Year (in U.S. Dollars)**Figure 5. Artisans' Non-Handicraft Salaried Income, by Treatment Group and Year (in U.S. Dollars)**

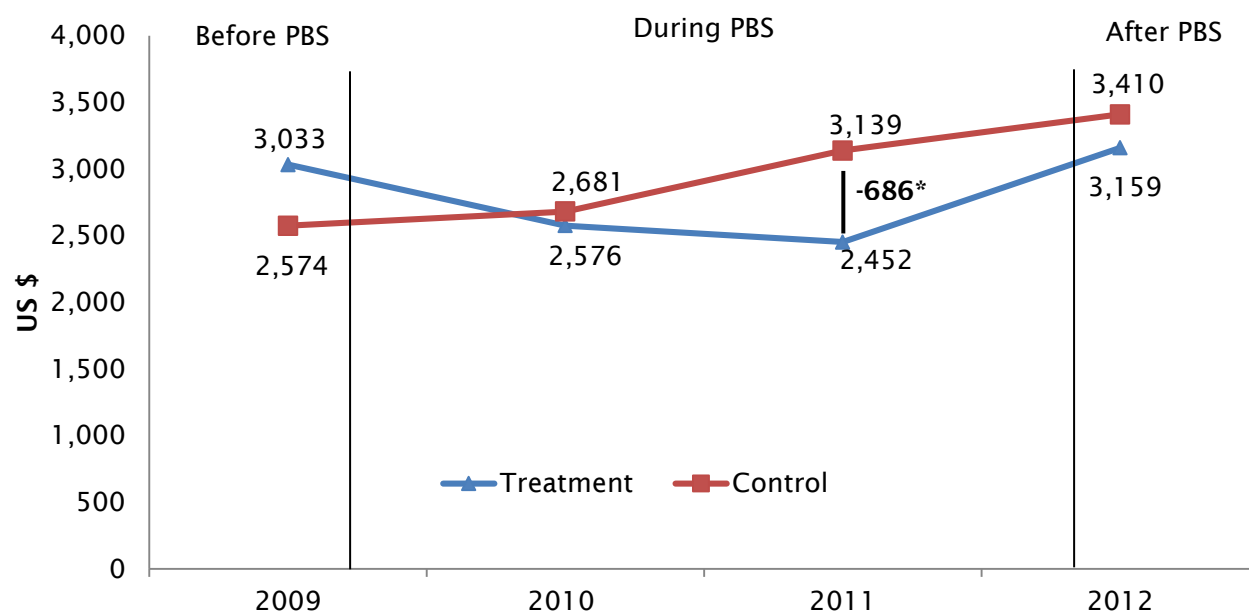
Source: Baseline and follow-up Productive Development Survey-Handicraft (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant findings at 5 percent are marked with an asterisk.

B. Household-Level Findings

We found a statistically significant negative impact of PBS on net household income in 2011, but this negative impact did not persist into 2012. Under an ITT approach, PBS assistance had a negative impact in net annual household income of \$686 in 2011. However, no noteworthy treatment-control differences in household income were found in 2012 (Figure 6). In addition, PBS had a negative impact on households' salaried income in 2012: a loss of \$298 that is statistically significant (Table IV.4 in the main report). This negative impact on salaried income—combined with higher levels of international remittance income of control group households—is largely responsible for the moderate but non-statistically significant treatment-control difference of \$251 in net household income in 2012, and the even larger (and statistically significant) treatment-control difference of \$686 in net household income in 2011 (Figure 6).

Figure 6. Net Annual Income of Artisan Households, by Treatment Group and Year (in U.S. Dollars)



Source: Baseline and follow-up Productive Development Survey (PDS) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant findings at 5 percent are marked with an asterisk.

We found no impact of PBS on household consumption. Under an ITT approach, PBS assistance did not lead to a statistically significant increase (or decrease) in household consumption related to PBS assistance during any of the evaluation's three follow-up periods (see Table IV.4 in the report). This is consistent with findings of no conclusive impact of assistance on the net income of artisans or their households.

C. Comparison of Intent-to-Treat and Treatment-on-the-Treated Estimates

Table 2 summarizes this report's main findings at the producer level under both ITT and TOT approaches. As mentioned above, ITT estimates can be interpreted as the effect of the offer of PBS assistance, regardless of whether the services were accepted, and TOT estimates can be interpreted as the effect of PBS on those who accepted these services—that is, participated in the program.⁶

Table 2. Summary of Individual-Level ITT and TOT Impacts of PBS, by Year (in U.S. Dollars unless otherwise indicated)

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Intent-to-Treat Analysis (ITT)						
Annual Handicraft Investments and Input Costs	88	0.52	88	0.49	-29	0.84
Number of Annual Full-time Equivalent Jobs Generated	0.14	<0.01	0.12	0.22	-0.01	0.79
Annual Salaried Income	-34	0.67	-190	0.03	-177	<0.01
Annual Net Handicraft Income	60	0.70	-85	0.49	5	0.96
Total Annual Income	-49	0.84	-426	0.02	-141	0.44
Treatment-on-the-Treated Analysis (TOT)						
Annual Handicraft Investments and Input Costs	211	0.54	211	0.51	-70	0.84
Number of Annual Full-time Equivalent Jobs Generated	0.33	<0.01	0.27	0.25	-0.04	0.78
Annual Salaried Income	-81	0.66	-452	0.01	-420	<0.01
Annual Net Handicraft Income	142	0.70	-202	0.51	12	0.96
Total Annual Income	-117	0.83	-1010	0.05	-334	0.44

Source: Baseline and follow-up Productive Development Survey (PDS) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are in bold.

Under both ITT and TOT approaches, we find that PBS assistance had a statistically significant and positive impact on employment generation among artisans in 2010. Among all artisans in the treatment group, PBS assistance resulted in 0.14 additional jobs (ITT), and among artisans who

⁶ To calculate TOT estimates, we used an instrumental variable approach, in which the assignment to treatment was used as an instrument for participation. Another approach is to divide ITT estimates by the participation rate of the treatment group in each chain, minus the participation rate of the control group. Bloom (1984) describes this method in detail. This technique assumes that the effect of the program on non-participants is zero, so it re-scales the ITT estimate to reflect only the effect on participants. Both approaches yielded similar impact estimates.

participated in the intervention, PBS assistance resulted in 0.33 additional jobs (TOT). This last impact is equivalent to over 80 days of full-time employment generated by each PBS participant. However, as mentioned previously, this impact does not persist in 2011 and 2012, and no positive impact of PBS assistance on investments and net handicraft income is evident in any year with either approach. In fact, we find negative impacts of PBS on salaried income with both ITT and TOT approaches in 2011 and 2012, and a negative impact of over \$400 on total annual income (at the producer level) in 2011 with the ITT approach.

Table 3 summarizes this report's main findings at the household level under both ITT and TOT approaches. As illustrated in Table 3, neither approach yields positive impacts of PBS assistance on artisans' net household income or household consumption in any follow-up year. In fact, we see a negative impact of PBS assistance on net household income in 2011 with both ITT and TOT approaches. This negative impact in 2011 is largely due to higher salaried income of control group households relative to treatment group households in 2011.⁷ PBS assistance had a particularly large negative impact on participant households (TOT), who lost over \$1,000 in 2011. However, this negative impact on net household income is not present at final follow-up in 2012.

Table 3. Summary of Household-Level ITT and TOT Impacts of PBS, by Year (in U.S. Dollars Unless Otherwise Indicated)

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Intent-to-Treat Analysis						
Annual Net Household Income	-105	0.81	-686	0.01	-251	0.42
Annual Net Household Income (Excluding Remittances and Other Transfers)	-188	0.63	-451	0.08	-168	0.54
Annual Household Consumption	-35	0.83	19	0.92	346	0.11
Treatment-on-the-Treated Analysis						
Annual Net Household Income	-252	0.80	-1,655	<0.01	-607	0.42
Annual Net Household Income (Excluding Remittances and Other Transfers)	-451	0.60	-1,087	0.04	-405	0.54
Annual Household Consumption	-86	0.83	46	0.92	835	0.15

Source: Baseline and follow-up Productive Development Survey (PDS) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group households (185 of 272), and 23 percent for control group households (62 of 265). Statistically significant impacts at 5 percent are in bold.

⁷ This negative impact persists in 2011 TOT estimates, even after excluding remittances and other transfers from household income. In this summary and in the main report, we present impact estimates on net household income excluding remittances and other transfers due to the small likelihood that these cash transfers are correlated with PBS assistance.

Conclusions and Policy Implications

In the handicrafts chain, we find a positive impact of PBS on employment generation after one year of assistance, as well as a positive impact on artisans' likelihood to devote labor to handicrafts and sell handicrafts. However, we find no significant impact on net handicraft or household income in 2010 or any subsequent year. This suggests that one or more structural obstacles to marketing and selling handicrafts may have inhibited positive impacts on artisans' handicraft income. Examples of potential obstacles could include market access difficulties, limited demand during non-peak months, or the inability of assisted artisan groups to ensure the quality of their goods to secure large orders. Also possible is that diminishing marginal returns to additional production could translate to a lack of increased sales and income, despite increased investments in paid labor.

Particularly interesting is the negative impact of PBS assistance on salaried income—both at the individual and household levels. These findings suggest that the opportunity cost of handicrafts work—or the salaried income that artisans forewent to pursue handicrafts work—could have outweighed their returns from handicraft sales. Particularly in 2011, there is conclusive evidence that the intervention actually reduced total household income as a result of lost opportunities to earn salaried income outside of handicrafts.

In March 2014, Mathematica staff shared these impact findings with a Swisscontact representative. The representative was not surprised by these findings, as he stated that most artisans in the treatment group were artisans with survival-oriented businesses who did not possess the relevant skills to meet current market demand for handicrafts. Swisscontact generally provides artisans fitting this profile with technical assistance in sectors outside of handicrafts, provided that the potential for them to succeed in handicrafts is limited.

Regarding policy implications, the study's main findings suggest that providing technical and material assistance to low-capacity, low-income artisans may not generate real improvements in these individuals' economic outcomes in the medium term. In fact, a better approach to income generation for subsistence-level, low-income artisans may be to provide them with training to transition into alternate sectors with greater potential for salaried income.

Limitations

The results of this evaluation can provide MCC and other stakeholders with unbiased estimates of the overall effectiveness of PBS assistance on the study sample during the specified timeframe. In addition, the evaluation is intended to provide MCC with information that could inform future funding decisions or project designs. However, because less than 200 of the 635 artisans who participated in PBS in Phase I—and none of the 468 new participants who joined in Phase II—are included in the study sample, these impact findings are not generalizable to the entire population of 1,192 artisans who received some form of PBS assistance from 2007 to 2012.⁸ In particular, these results are not generalizable to the 468 artisans who began receiving PBS assistance in Phase II under more restrictive selection criteria.

⁸ These 1,192 participants include 89 artisans who participated in the PBS pilot.

In addition, due to implementation constraints, the total number of randomized municipalities of producers in the handicrafts value chain was lower than originally planned. As a result, minimum detectable differences—or the smallest true effects that could be detected given the study’s sample size—were relatively large. In fact, the true impact of PBS assistance on participants’ handicraft income would have to be over \$300, and the true impact of PBS assistance on household income would have to be over \$600 to be statistically identified in this analysis. In other words, the design is “underpowered” in that it is not capable of identifying small to moderate impacts of PBS on key economic outcomes.

The relatively small number of randomized municipalities—9 treatment and 10 control—could also affect our impact estimates due to the regression model’s inability to fully control for socioeconomic factors that may affect municipalities in different ways. For example, if economic and employment trends in the U.S. caused remittance income to increase or decrease in treatment municipalities relative to control municipalities, estimates of the impact of PBS assistance on artisans’ business or remittance income could reflect these trends. For this reason, Chapter IV of this report presents impacts of PBS on household income including and excluding remittance income—which is unlikely to be correlated with handicraft production.

Next Steps

Following the submission of this report, Mathematica will consult with MCC to schedule a final stakeholder workshop on the PDP. If possible, this workshop should combine findings from this handicrafts analysis and findings from the final analysis of the Investment Support and Financial Services Activities of the PDP.

I. INTRODUCTION AND BACKGROUND

In this report, we estimate the impact of three years of the Production and Business Services (PBS) Activity of the Productive Development Project (PDP) on small handicraft producers' investments, employment, and income. This analysis serves as a complement to Mathematica's report on the impact of one year of PBS assistance to producers in the horticulture, dairy, and handicrafts value chains (Blair et al., 2012), as well as Mathematica's 2013 performance evaluation report of the full PBS Activity (Blair et al., 2013).

This in-depth analysis of PBS assistance in the handicrafts value chain reflects an interest on the part of the Salvadoran Ministry of Agriculture and FOMILENIO (Fondo del Milenio) to learn from PBS assistance in the handicrafts value chain from 2008 to 2012. Because the Ministry designated handicrafts as a priority area for growth, representatives from the Ministry encouraged FOMILENIO and Millennium Challenge Corporation (MCC) to conduct this impact analysis, with the expectation that it could help inform future handicrafts assistance programs in the country. This impact analysis is also the result of implementation factors that were favorable for a multiyear impact evaluation of assistance in this sector. Personnel constraints, prioritization of sectors, and implementation plans dictated that artisans selected for the evaluation's control group did not receive assistance throughout the full implementation period—as opposed to the first year of PBS assistance, as originally conceived. In addition, Chemonics International, a development consulting firm, and FOMILENIO requested extending the follow-up period for this impact analysis from two years to three years. In response to this request, the Dirección General de Estadística y Censos (DIGESTYC), at the request of Mathematica, fielded an additional follow-up survey of artisans in 2012. As a result of these factors and new data, we can estimate the impact of approximately three years of PBS assistance in the handicraft sector, as opposed to the impact of only one year of assistance in the dairy and horticulture sectors (presented in our interim report).

The report is organized in five chapters. In this first chapter, we provide a summary of the overall PBS Activity, followed by an in-depth summary of PBS assistance to handicraft producers and businesses and general assessment of the activity's implementation. In Chapter II, we present the impact evaluation's methodology, including the study's goals, research questions, design, and data sources. In Chapter III, we provide a description of the study sample for the impact analysis. In Chapter IV, we present the impacts of PBS after three years of services for producers in the handicrafts value chain and their households. Chapter V provides a summary of the findings and presents the report's conclusions.

A. Summary of the PDP and PBS Activity

In 2006, MCC reached an agreement with the Government of El Salvador on a five-year, \$461 million compact to be executed between September 2007 and September 2012. The compact was designed to reduce poverty through strategic investments in agricultural production, rural business development, transportation infrastructure, education and public services, with a strategic focus on El Salvador's Northern Zone (MCC 2012). Due to its relatively high poverty rates, low education levels, and weak infrastructure relative to the country's coastal region and capital, the Northern Zone was selected as the key area of influence for all compact investments. The compact included three projects: the Human Development Project, the PDP, and the Connectivity Project. Administered under the supervision of the Millennium Challenge Account (known as FOMILENIO in Spanish), the main objective of the PDP was to assist in the development of profitable and sustainable business ventures for poor individuals in El Salvador's Northern Zone.

Between 2008 and 2012, the PDP used nearly \$72 million in allocated funds to serve over 13,500 participants and create more than 11,000 full-time equivalent jobs.⁹ The PDP comprised three activities: Production and Business Services (PBS), Investment Support, and Financial Services. The PBS Activity offered training and technical assistance, in-kind donations, and other business development services to small farmers and business owners. The Investment Support Activity offered investment capital (in the form of long-term loans of over \$50,000) for viable business proposals. Lastly, the Financial Services Activity supported two loan guarantee programs targeting micro-, small, and medium enterprises, as well as a small technical assistance program to financial institutions.

The largest of the PDP's three activities was the PBS Activity, which provided technical and material assistance to farmers and small-scale producers to support the Northern Zone's dairy, fruit, horticulture, handicrafts, tourism, forestry, and coffee sectors. As stated in the 2006 MCC-El Salvador compact in which it was established, the goal of the PBS Activity was to "help poor farmers, organizations and micro-, small, and medium enterprises that benefit poor inhabitants of the Northern Zone successfully transition to higher-profit activities, generating new investment, expanding markets and sales, and creating new jobs in ways that stimulate sustainable economic growth and poverty reduction."¹⁰

These economic sectors—including the handicrafts sector—were selected as sectors in the Northern Zone with high potential for growth. In particular, the PDP would target poor artisans in an effort to provide a vulnerable population that was predominantly female with training and technical assistance. This assistance would build these individuals' human capital, which was a primary constraint to economic growth in the region (MCC-El Salvador Compact 2006).

As defined in the compact, the PBS Activity's total funding of \$57 million was originally allocated to finance technical assistance to poor farmers, in-kind donations, business development services, as well as pre-investment studies to develop and implement viable business plans related to the activity's target value chains. Following modifications to program activities in early 2010, PBS funding was allocated to a wider array of investments, including technical assistance, in-kind donations, demonstration plots and group training sessions, technical and financial support for enterprises created and supported by FOMILENIO, and investments in innovative productive projects related and unrelated to agricultural sectors.

B. Design of the PBS Activity

Figure I.1 provides a visual representation of how the Production and Business Services Activity was originally designed to achieve its key objective of economic development in the handicrafts value chain (see assistance types that were offered in Phase I, which corresponds to implementation from 2009 to mid-2010). First, PBS service providers offer technical assistance to artisans. A portion of PBS participants also has access to investment capital through Activity 2 of the PDP (Investment Support) as well as small loans through Activity 3 of the PDP (Financial

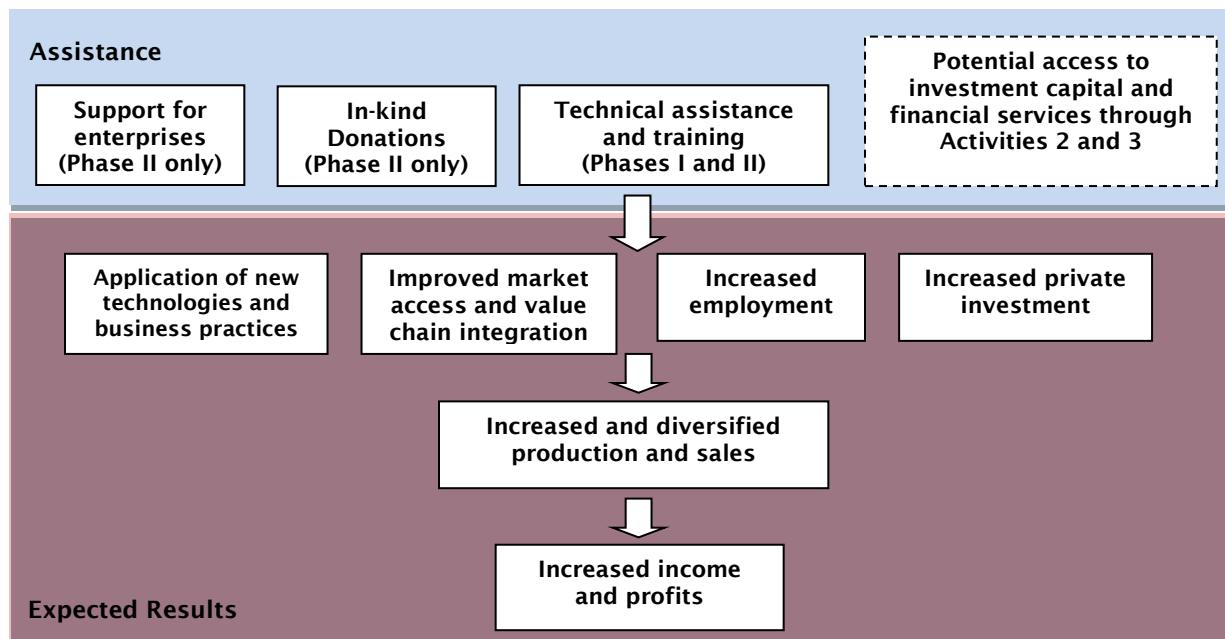
⁹ According to FOMILENIO and MCC, a PBS participant is an individual who takes part in PBS training or technical assistance, and or receives donations as part of the PBS activity. This is distinct from a beneficiary, who is defined as an individual who experiences improved outcomes as a result of PBS assistance.

¹⁰ MCC-El Salvador Compact, Schedule 2-3.

Services).¹¹ This capital could help artisans finance new production technologies, build new locales, or make marketing or branding investments. As a result of training and assistance, artisans develop stronger business and technical skills. With these new skills, artisans generate increased and more diversified handicrafts, and sell these handicrafts directly to local, national, and international buyers. As defined in the compact, PBS participants were expected to increase their annual income by 15 percent, on average, over the course of the multi-year activity as a result of assistance.

In mid-2010, the PBS assistance model changed in two fundamental aspects (see assistance types that were offered in Phase II, which corresponds to implementation from mid-2010 to 2012). First, technical assistance would now be accompanied by donations of materials for handicraft production. Second, Chemonics would provide additional technical assistance to two handicraft cooperatives in the Northern Zone. This assistance would focus on establishing linkages with clients, product design, and strengthening networks of participating handicrafts workshops and artisans. Supported enterprises would provide participating artisans with cheaper inputs and give them handicraft orders to fill. This model marked a departure from the Phase I assistance model, which envisioned that individual artisans and workshops could be trained to interact directly with local, national, and international buyers. Under the Phase II model, FOMILENIO-supported enterprises played a key role in coordinating among artisan groups and workshops to fill large orders, thus generating increased sales, income, and profits among artisans in their extended networks.

Figure I.1. Phase I and Phase II PBS Logic Model, Handicrafts Chain



Source: PDP Operations Manual, December 2010.

¹¹ Although a strong intersection between PBS and Activity 2 was originally envisioned, only 15 PBS participants secured credit through Activity 2 during the compact period.

C. Expected Rate of Return

MCC and FOMILENIO developed a projected economic rate of return (ERR) for the PBS Activity, which included the dairy, horticulture, and handicraft value chains. MCC uses ERRs to assess the economic cost-benefit of most proposed large-scale investments. In general, an ERR of approximately 12 percent meets MCC's basic cost-benefit requirement. In the case of PBS assistance, the primary benefit streams were increased income per hectare resulting from technical and material assistance, as well as wages for new employees as assisted businesses expanded throughout and following assistance. Comparing the annual benefits of increased income with the costs of PBS assistance, MCC and FOMILENIO projected an ERR of 18.4 percent for the activity in 2010.

D. Literature Review and Evidence Gaps

A review of relevant literature found that no rigorous evidence exists regarding the effectiveness of technical and material assistance programs in enhancing artisans' sales and income in Latin America and the Caribbean region. However, several performance evaluations have been conducted of handicraft projects, including an USAID-funded Aid to Artisans assistance program in Honduras. The evaluation found that the project, implemented from 2001 to 2003, "contributed to an increase in sales in handcrafted products of approximately US\$614,000 for Honduran artisans, while generating 802 jobs in the artisan sector." However, this evaluation did not use a comparison group, or what sales or job creation would have occurred in the absence of the intervention. Another non-experimental study was conducted regarding the appropriate size of loans needed to finance handicraft activities in Brazil (Bamberger 1986), but this study is tangential to the research question of whether artisan assistance programs can generate positive economic outcomes.

As such, there is a complete absence of rigorous evidence on the effectiveness, cost-effectiveness, or cost-benefit of artisan assistance programs in any region or socioeconomic setting as of 2014. This impact analysis in this report sheds some light on the potential impact of a multiyear assistance program that offered a mix of technical and material assistance to predominantly female, low-income artisans in Central America. To our knowledge, this is the first analysis of its kind in the realm of handicrafts.

E. Implementation of the PBS Activity

First, we provide an overview of PBS implementation in all value chains from 2007 to 2012. Then we provide a detailed summary of implementation in the handicrafts value chain, as this is the focus of this impact analysis. This includes a summary of findings from the PBS performance evaluation, which covered PBS assistance in the handicrafts chain from 2007 to 2012.

1. Overview of PBS Implementation Phases

In September 2007, the preparation phase of the PBS Activity began. Managed by the Salvadoran Multi-Sector Industrial Bank (known as BMI for its initials in Spanish) and SNC-Lavalin, an engineering firm based in Canada, this phase served to establish basic PBS operations and conduct diagnostic studies of investment opportunities in the Northern Zone. From July 2008 to September 2009, BMI and SNC-Lavalin oversaw the pilot phase of the PBS. During this phase, \$5 million was disbursed to 13 productive projects. Projects included technical assistance for dairy farmers, technical and material assistance for artisans, and training for small farmers related to fruit and vegetable production. Pilot projects benefited 155 groups and 3,625 people with technical and material assistance.¹² In the handicrafts chain, Aid to Artisans conducted a small pilot project in the municipalities of Guatajiagua, La Palma, and Ilobasco that provided less than 100 artisans with technical training. No impact evaluation of the pilot phase of the PBS Activity was completed.¹³

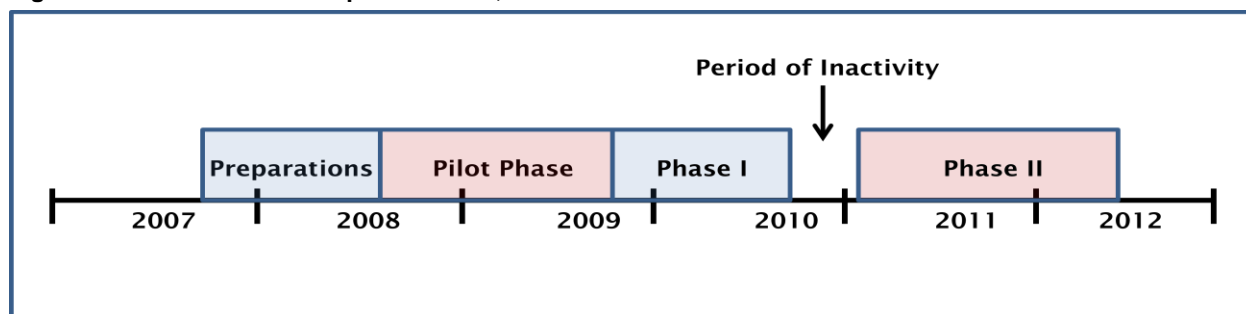


Artisans supported by PBS sell their merchandise at a handicrafts fair (photo courtesy of Chemonics, 2011).

Phase I Implementation. In September 2009, FOMILENIO assumed direct supervision of the PBS Activity from BMI. In addition, Chemonics International, a development consulting firm, began coordinating and managing the various components of the PBS Activity under the PDP's general implementation phase. This coordination involved various subcontracts with service providers to offer assistance in the horticulture, dairy, handicrafts, tourism, and forestry value chains. During this general implementation phase (as well as during the pilot phase), PBS assistance in the handicrafts value chain focused on increasing and diversifying artisans' production. As such, PBS assistance during this time period—later referred to as Phase I—was oriented toward decreasing input costs, promoting new technologies, and enhancing productive practices. The service provider for the handicrafts value chain, Aid to Artisans, worked strictly with groups of producers, as opposed to individual producers. Due to changes in some service providers and contract renewals during late 2010, very few beneficiaries in the handicrafts value chain received services from September 2010 to mid-January 2011. (See timeline of PBS handicrafts implementation in Figure I.2)

¹² These figures are based on monitoring reports submitted by pilot phase implementers.

¹³ However, a process analysis of the pilot was conducted by FOMILENIO.

Figure I.2. Timeline of PBS Implementation, Handicrafts Chain

Phase II Implementation. Starting in September 2010, the PBS Activity was reorganized and a new phase of PBS implementation began. Phase II assistance was formulated in response to lessons learned during Phase I—namely, that increased and more diversified production was not sufficient to guarantee higher sales and income among participating producers. As such, PBS assistance in this phase featured more explicit marketing and business development components. In the artisan value chain, two existing handicraft cooperatives, Moje and ACOPROARTE, received technical assistance and donations under the PBS activity, and one existing dairy cooperative, Lácteos de Morazán, was reorganized and assisted under PBS.

Phase II artisan training programs were implemented concurrently with enterprise support services discussed above. In the handicrafts chain, most training was provided on-site at Moje and ACOPROARTE locales. Service providers in Phase II were different from those that provided technical assistance in Phase I.

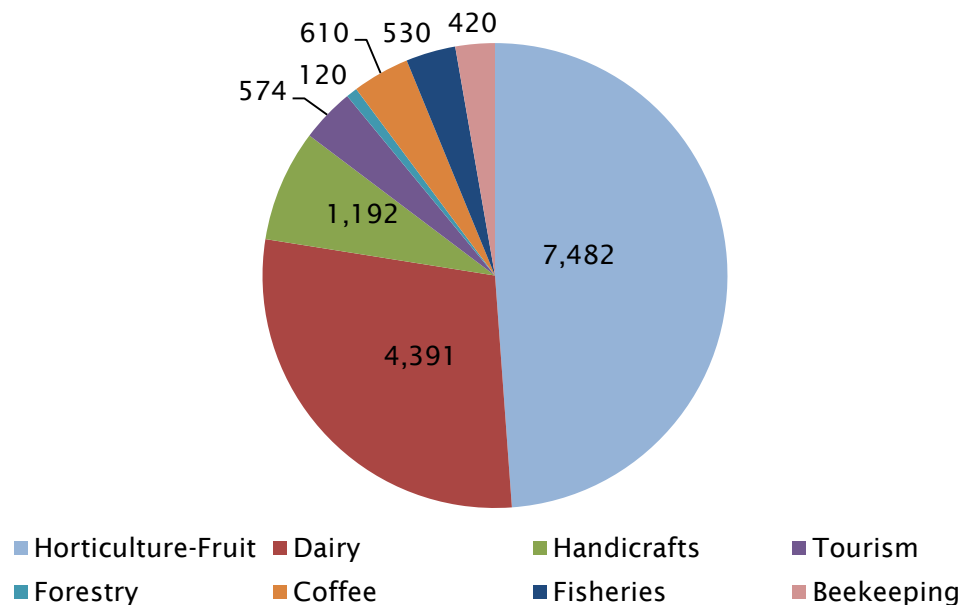
In addition, eligibility criteria for assistance under PBS changed from Phase I to Phase II for most value chains. In the handicrafts chain, assisted individuals in both phases were required to belong to a group (or a small business) that produced handicrafts. However, Phase II participants in the handicrafts chain were required to have experience and some expertise in handicraft production, whereas an interest in handicraft production was sufficient in Phase I. Additional requirements introduced in Phase II included at least two members of the group being able to read, write and perform basic arithmetic; a willingness of group-members to work with Moje or ACOPROARTE; experience producing handicrafts that meet current market needs; and having a list of prices for all handicrafts produced by the group. (See Appendix A for a full list of Phase I and Phase II eligibility criteria.) An interviewed Swisscontact representative stated that in Phase II, Swisscontact was looking for “winners,” or professional artisans with several years of experience and established locales, and potentially existing contacts with buyers.

By the time Phase II assistance ended in July 2012, Chemonics had provided 1,192 artisans with PBS assistance. Of these 1,192 participants, 89 began participating in the pilot phase, 635 began assistance in Phase I, and 468 began assistance in Phase II. These artisans represented 8 percent of the 15,319 PBS participants in all value chains (See Figure I.3). This number of participants exceeded the initial target of 889 handicraft participants by over 30 percent. In interviews, stakeholders cited FOMILENIO’s programmatic emphasis on meeting participant targets, in addition to sufficient human and financial resources to serve artisan groups in both phases, as a primary reason that participation targets were met.

At the end of Phase II, total PBS investments in handicrafts assistance totaled \$2.7 million, or approximately 6 percent of total PBS expenditures of approximately \$46.9 million in all value chains. These costs included all technical and material assistance to artisans, as well as equipment and

infrastructure investments and administrative costs related to participant-supported enterprises. The average cost per participant in the handicraft chain was around \$2,250, which was lower than the average cost per participant of around \$3,050 among all value chains in PBS assistance.

Figure I.3. Number of PBS Participants, by Value Chain



Source: Chemonics administrative data, September 2012.

2. Comparison of Phase I and Phase II Assistance

Table I.1 provides a summary of assistance provided in Phase I and Phase II of the handicrafts value chain. As shown, training sessions were provided weekly in both Phase I and Phase II. However, Phase II involved a larger number of actors, as two producer-owned enterprises, ACOPROARTE and Moje, were incorporated into the project in accordance with the intervention's new marketing and sales focus. Also noteworthy is that Aid to Artisans provided assistance in Phase I through community-based training sessions, and Swisscontact provided assistance in Phase II primarily at ACOPROARTE and Moje locales.

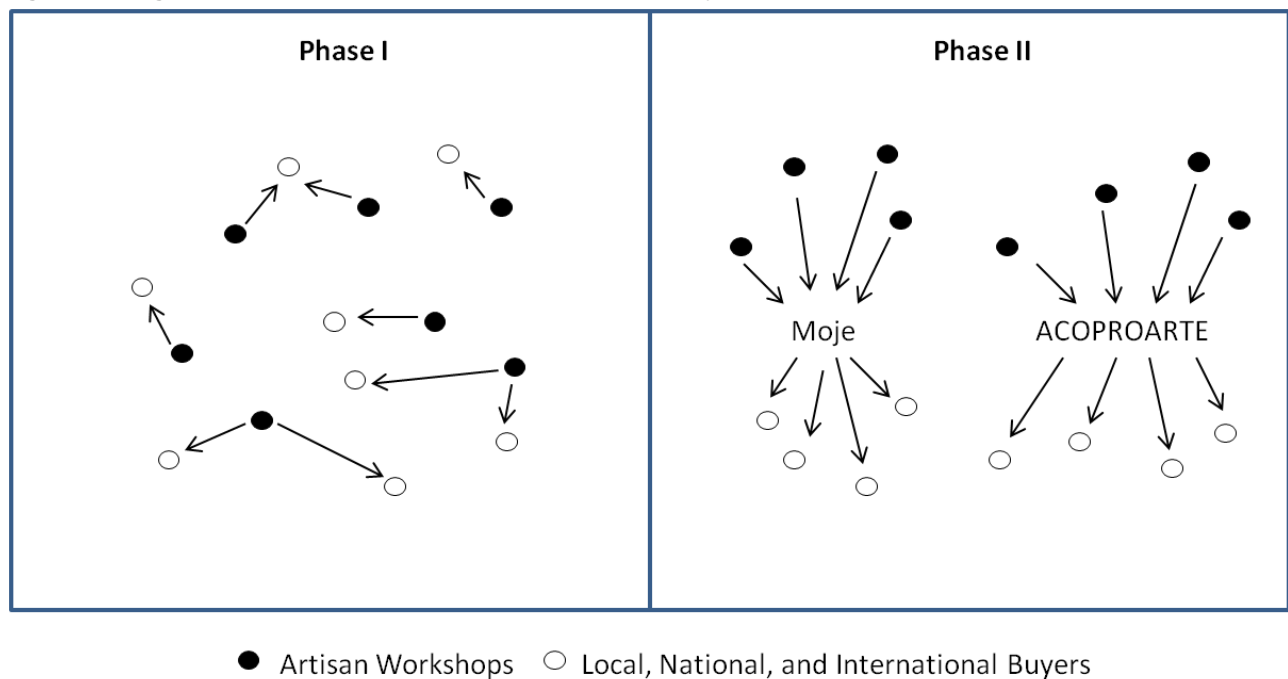
Table I.1. Comparison of Phase I and Phase II PBS Assistance in the Handicrafts Chain

Phase I	
Key Actors	Contractors: Aid to Artisans (ATA)
Assistance Provided	<p>Start-date: October 2009 for most groups</p> <p>End-date: End of August 2010</p> <p>Frequency: Weekly sessions in participants' communities. ATA staff also responded to pressing issues as necessary.</p> <p>Technical staff: Groups were served by teams of specialists, including a handicrafts design specialist and a marketing specialist.</p> <p>Assistance: Topics covered in trainings were design, marketing, quality control and accounting. ATA had a designer and a trainer in charge of helping groups track costs, set prices, and keep financial records. ATA also introduced design molds in order to reduce costs and standardize quality. In addition, training had an organizational component; new artisan groups and workshops were formed and some training covered topics of teamwork and division of labor.</p>
Phase II	
Key Actors	<p>Contractors: Swisscontact and BERDAL de CV</p> <p>Businesses: Two handicrafts businesses, ACOPROARTE and Moje bought production from beneficiary groups.</p>
Assistance Provided	<p>Start-date: Meetings with Swisscontact officially started on October 1, 2010. However, field implementation did not begin until early 2011.</p> <p>End-date: July 2012</p> <p>Frequency: Weekly sessions at ACOPROARTE and Moje locales</p> <p>Technical staff: Swisscontact staff ran most training sessions. According to FOMILENIO, this organization had a strong knowledge base.</p> <p>Assistance: Similar to training model used by ATA, with a focus on design, business skills, and marketing/sales. Marketing and sales assistance in Phase II was more intensive, and featured training in accounting systems, self-governance of workshops and cooperatives, and client relations. More material assistance, including sewing machines and raw materials for production, was offered in Phase II.</p>

Source: Chemonics program manuals and in-person interviews conducted by Mathematica staff in October 2010.

Phase I assistance focused on production. Led by Aid to Artisans, the focus of Phase I PBS assistance in the handicrafts chain was to strengthen the general productive capacity of artisans in the Northern Zone. Aid to Artisans specialists traveled to participants' communities to provide in-site training on a weekly or bi-weekly basis. Training focused on production techniques and product development. Artisan workshops developed several new product lines during Phase I, and Aid to Artisans staff made efforts to contact potential clients in El Salvador and abroad.

According to a former Aid to Artisans employee, Phase I assistance was oriented toward developing new skills, particularly product design and basic pricing and costing. In Phase I, Aid to Artisans attempted to prepare artisan groups or workshops to interface directly with clients by giving them marketing materials and developing catalogues of their products. The premise was that artisan groups could negotiate directly with buyers and establish regular orders through these negotiations (left side of Figure I.4).

Figure I.4. Organizational Structure of Artisan Workshops, Buyers, and Assisted Enterprises

Phase II assistance focused on production and market access. Implemented by Swisscontact, assistance in Phase II was divided into beginner classes for less experienced artisans and intermediate classes for producers who had already learned a series of skills in Phase I. Beginner classes featured basic training in production techniques. In contrast, intermediate classes focused on production, business skills, product development, and marketing. Distinct from Phase I assistance, training sessions in Phase II were delivered at the locales of the two FOMILENIO-supported enterprises: ACOPROARTE and Moje. These enterprises had a combined network of 148 artisan workshops: 74 of these workshops were owned by individuals, and the other 74 were artisan cooperatives (Chemonics, 2012).

Under this new scheme, ACOPROARTE and Moje—working in partnership with Swisscontact—liaised with potential clients to determine market preferences, and Swisscontact design specialists provided technical assistance to produce handicrafts according to these preferences. Specifically, Swisscontact staff helped the enterprises develop new product lines and trained workshop members to fulfill specific orders. Swisscontact also provided enterprises with assistance in costing and inventory control. In addition, Chemonics distributed donations among enterprises and workshops, including sewing machinery and other production tools.

In working with Moje and ACOPROARTE, Swisscontact marketing specialists attempted to organize a network of workshops and strengthen linkages between producers and enterprises in two major geographic regions. The objective was to create productive capacity, strengthen cooperation between all relevant actors in the regions, and foster long-standing relationships with large buyers. Specifically, the onus of interacting with clients, securing large orders, and coordinating production fell primarily on Moje and ACOPROARTE in Phase II. This represented a departure from Phase I, in which individual artisan workshops were responsible for finding clients, securing orders, and managing production to fill these orders (right side of Figure I.4).

3. Performance Evaluation Findings: Handicrafts

In 2012, Mathematica staff conducted a series of qualitative interviews with Swisscontact, Moje and ACOPROARTE staff, Chemonics representatives, and artisans who participated in PBS assistance. The goal of these interviews was to document implementation and key results of PBS assistance to artisans and artisan cooperatives. In the following paragraphs, we summarize our main findings regarding program implementation and results from 2007 to 2012 (Please see Blair and Campuzano 2012 for the full set of performance evaluation results).

Implementation challenges included a lack of donations and focus in Phase I. Stakeholders mentioned several challenges to PBS implementation in the handicrafts chain. Notably, Phase I assistance featured very few donations. FOMILENIO staff stated that the absence of donations (as well as financing) in Phase I assistance to artisans introduced a key constraint in the production process. Participants were capable of producing a variety of handicrafts as a result of technical assistance, but often lacked the working capital necessary to buy raw materials for production. In addition, interviewed participants noted a lack of focus in technical assistance provided in Phase I; service providers made efforts to train a large number of individuals, but the ultimate purpose of this training was unclear. In addition, stakeholders noted that product development in Phase I was somewhat untargeted and inefficient, in that artisans produced a wide range of potential products, but were unsuccessful in securing many orders for these new products. However, participants noted that assistance in Phase II was improved in that all training and support provided by Swisscontact was oriented toward producing and marketing products to satisfy local, national, or international buyers (see Table I.2).

Another implementation challenge was artisan workshops' low level of marketing skills and resources to find clients and secure orders. Following Phase I assistance, most artisan groups had only rudimentary skills in marketing and client relations. Furthermore, they faced financial and logistical constraints in communicating directly with buyers—either by phone or in person—and filling large orders. As a result, assisted workshops did not secure regular orders with national and international buyers, as envisioned. According to a Swisscontact source, the artisan workshops “simply weren’t ready” to interface directly with buyers at the close of Phase I assistance.

The delay between Phase I and Phase II assistance also had detrimental effects. The multi-month gap between Phase I and Phase II had a negative impact on the continuity of training and technical assistance, as well as artisans’ trust in implementers. One implementer estimated that the six-month gap in services between phases, in addition to organizational delays in the field, meant that under the best conditions, artisans who participated in both phases likely received only 28 months of assistance—as opposed to three full years of assistance.

Implementation facilitators included organizational work in Phase I and stakeholders’ efforts to reorganize assistance in Phase II. At the outset of Phase I, Aid to Artisan staff made a large investment in organizing individual artisans into groups, or workshops. Through weekly trainings, the members of these groups formed personal and professional relationships with one another, and learned similar skills. According to a Swisscontact representative, this organizational work paid dividends in Phase II when Moje and ACOPROARTE harnessed these networks of established workshops to fill large orders.

Stakeholders praised Phase II’s stronger emphasis on assessing and meeting market demand. In Phase II, Swisscontact staff took several steps that facilitated overall implementation,

including conducting an initial assessment of artisans' skills and needs. In regards to determining the form of assistance for each participant, Swisscontact developed modules on product design and marketing based on market demand. Once participating workshops had the capacity to produce a variety of handicrafts, Swisscontact communicated directly with national and international buyers to explain the designs and materials that were available, as well as to distribute viable product samples. Buyers considered these options and ordered personalized items, and the enterprises organized workshops in their network to fill these orders. Other implementation facilitators included regular coordination among stakeholders, in which Swisscontact staff provided all assistance with production, sales, and marketing at these enterprises' locales. During interviews, stakeholders also cited the development of product lines, steps to transition from local market to national and international markets, and stakeholders' flexibility to make programmatic changes as key implementation facilitators (see Table I.2 for additional facilitators and challenges).

Participants and supported enterprises reported high satisfaction with Phase II assistance and positive results. Overall, stakeholders were highly satisfied with Swisscontact's collaboration with Moje and ACOPROARTE. During interviews, enterprise staff noted that Swisscontact's assistance played a vital role in generating increased sales and income among members and their networks of suppliers. Swisscontact's outreach efforts with international buyers resulted in several large-scale orders of at least \$20,000. In addition, Swisscontact worked with ACOPROARTE to secure a \$60,000 order of religious items for an international client.

Table I.2. Implementation Facilitators and Challenges to PBS Assistance in the Handicrafts Chain

Facilitators
<ul style="list-style-type: none"> • Conducting an initial assessment of artisans' skills and needs. • Aligning the structure and content of assistance with market demand. • Vertical organization and regular coordination among stakeholders. • Development of product lines. • Flexibility to make programmatic changes. • Use of an interdisciplinary team.
Challenges
<ul style="list-style-type: none"> • Phase I assistance featured very few donations. • Unfocused assistance in Phase I. • Lack of teamwork and commitment among some assisted artisans. • Multi-month delay between Phase I and Phase I services.

Source: Mathematica qualitative data collection, July 2012.

Workshop owners reported large increases in sales and income under PBS assistance. Overall, workshop owners affiliated with Moje and ACOPROARTE benefited substantially from new contracts established under Phase II PBS assistance. In 2012, workshop owners affiliated with ACOPROARTE reported monthly sales of between \$4,000 and \$5,000 in 2012, with a healthy profit margin of around 30 percent. In interviews, the owners reported that these sales were much higher than their sales prior to FOMILENIO assistance.

Two types of small-scale artisans reported large impacts in production and sales. Stakeholders stated that two types of small-scale artisans generally benefited most from Phase II assistance: Single mothers whose primary source of income was handicraft production, and young people who generally had support from their parents. According to field-staff, both types of beneficiaries usually had some type of community support, which field-staff mentioned was a good source of financing.

II. EVALUATION DESIGN

This chapter describes the evaluation design for Mathematica’s impact evaluation of the PBS assistance to artisans. Given MCC’s goal of evaluating interventions with the most rigorous methods available, Mathematica, MCC, FOMILENIO, and other stakeholders, the evaluation of the PBS Activity uses a random design, which allows us to estimate unbiased impact of PBS on producers’ income and employment.

A. Impact Evaluation Questions and Design Summary

In this final evaluation report, we analyze the following primary research questions related to PBS assistance in the handicrafts chain:

- What impact did FOMILENIO’s offer of PBS assistance have on intermediate outcomes, such as production levels, business practice adoption, technology adoption, and product diversification?
- What impact did FOMILENIO’s offer of PBS assistance have on employment creation and artisans’ investment and income?
- What impact did FOMILENIO’s offer of PBS assistance have on household income?

The second question relates to income at the producer level, whereas the third addresses income at the household level. Tracking income at these two levels is important because income at the producer level provides the most direct measure of the economic impact of PBS assistance, whereas income at the household level provides a measure of the ultimate effect of assistance on the well-being of artisans’ households.¹⁴ (Please see Mathematica’s performance evaluation of PBS assistance for a full analysis of PBS implementation and contractor performance from 2008 to 2012; Blair and Campuzano 2012)

For the impact evaluation of PBS assistance in the handicrafts value chain, Mathematica, MCC, FOMILENIO and other stakeholders chose a *randomized design*, in which some groups of producers were randomly selected to receive PBS assistance over a multiyear period, whereas other groups of producers were randomly assigned to not receive assistance during this timeframe. The evaluation design exploited two key characteristics of PBS implementation. First, there was insufficient capacity to serve all participants simultaneously given personnel and funding constraints. Second, there were enough people in the Northern Zone who were eligible and interested to participate in the PBS Activity to form a valid comparison group. Because implementation plans required that Chemonics serve entire groups of producers during the same cycle, we were unable to randomly assign individual participants into treatment and control groups. Consequently, random assignment was done at the municipality level for the handicraft chain. As discussed below, random assignment at the municipality level placed nontrivial limitations on the statistical power of the study.

It should be noted that some census respondents were excluded from randomization (and hence the study) because Aid to Artisans classified them as high-priority artisans. In general, high-

¹⁴ FOMILENIO and Chemonics define handicraft income at the producer level to be the key economic outcome of interest, as opposed to income at the household level.

priority artisans were members of established workshops or cooperatives that had strong potential for job creation and income generation through PBS assistance. As such, implementers did not want to subject these artisans to potential selection into the control group. Because over 50 high-capacity artisans were excluded from the study in 2009, there are likely negative consequences of these exclusions for the study's generalizability to the full population of assisted artisans.

B. Impact Evaluation Implementation

The implementation of the randomized rollout design for the handicrafts analysis of the PBS evaluation consisted of the following eight steps presented in Table II.1.

Table II.1. Key Dates in the PBS Impact Evaluation: Handicraft Chain

Compilation of Lists	July–September 2009
Randomization	October 2009
Baseline Data Collection	October 2009
Assistance Offered to Treatment Group (Phase I)	October 2009
Follow-up (Round 1) Data Collection	November 2010
Phase II Assistance Offered to Treatment Group	Late 2010
Follow-up (Round 2) Data Collection	September 2011
Follow-up (Round 3) Data Collection	August 2012

Source: Mathematica administrative records.

As illustrated, baseline data collection took place before the treatment group first received assistance. In late 2009, Aid to Artisans staff received random assignment results from Mathematica and began serving individuals in the nine municipalities randomized into the treatment group. This Phase I assistance ended in late August 2010, although some program implementers estimated that field visits (and hence technical assistance) ended in July 2010.

In late 2010, the project transitioned to Phase II under the guidance of Swisscontact. During this transition, incomplete information was transferred to Swisscontact regarding the impact evaluation. As a result, there were no plans to continue serving treatment group artisans in 2010, nor any safeguards in place to avoid serving control group producers. During this period, Mathematica, MCC and FOMILENIO staff worked with Chemonics and Swisscontact to “rescue” treatment group producers and provide them with Phase II services.

In a census of individuals in the treatment group in early 2010, Swisscontact found that only 86 of the 337 individuals assigned to the treatment group were eligible for, and interested in, continuing with PBS assistance. According to a Swisscontact source, a lot of treatment group artisans were not willing to participate in Phase II after being “abandoned” at the conclusion of Phase I. According to Swisscontact, most of these individuals did not have sufficient capacity or expertise to sell their production to large buyers in the short- or medium-term. One subset of treatment group artisans was fully inconsistent with Swisscontact's definition of artisans; they were school employees, farmers, and other individuals that had worked in handicrafts at some point, but were not currently producing and selling handicrafts. Another subset of the treatment group was practicing artisans who made goods that didn't have a strong regional demand, primarily basic handicrafts sold at municipal markets. These included hammocks and rudimentary backpacks that had no distinguishing characteristics or added value compared to similar products sold at markets. A Swisscontact source estimated that over half of artisans in the treatment group made these types of products. To further complicate matters, Swisscontact reported that many treatment group artisans

were located in isolated parts of the Northern Zone, including rural villages in Morazán that had few natural handicraft markets or linkages.

Swisscontact uses a classification scheme to describe the different levels of organization and capacity of artisans. Level 1 artisans are the most developed, and often have the capacity to export their products; Level 2 artisans are professional artisans with retail stores in San Salvador or other cities; Level 3 artisans were those that had some skills, some commercial connections, and some support networks for handicraft production and sales; and Level 4 artisans had few relevant skills, connections, and supports. One Swisscontact representative estimated that most artisans in the treatment group were Level 3 and 4 artisans. This stood in contrast to most PBS participants that Swisscontact served outside of the study population, who were largely Level 1 and 2 artisans. According to the interviewee, these Level 1 and 2 artisans had worked in handicrafts all their life, and their skills and connections were substantially better developed than those of artisans in the treatment group.

Despite the inherent disadvantages facing treatment group artisans, Swisscontact staff attempted to work with all 189 individuals in the treatment group who, according to Chemonics records, had participated in Phase I assistance. Due to these individuals' relatively low capacity, Swisscontact planned to offer these individuals partial assistance, which included training on manual production techniques to improve the quality of their products, but not intensive assistance with marketing and creating linkages with producer-owned handicraft cooperatives. Based on their own assessment of artisans in the treatment group, Swisscontact staff communicated their expectation that it would be difficult to generate impacts in handicraft sales and income among these artisans.

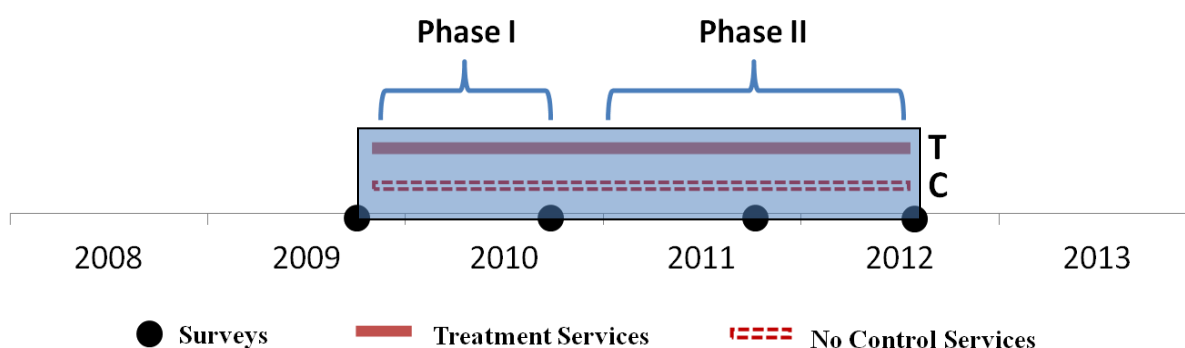
During much of Phase II implementation, Swisscontact staff attempted to assist low-skilled artisans in the treatment group. This meant teaching them new production techniques to make different products with more market demand. If possible, Swisscontact tried to link treatment group artisans with Moje or ACOPROARTE, which provided steady work through large-scale orders. For example, one artisan workshop in the treatment group learned a new technique of sewing handbags, and eventually supplied these handbags to ACOPROARTE. However, these cases of treatment group artisans that created successful commercial linkages to FOMILENIO-supported enterprises were particularly rare, given treatment artisans' skill sets and geographic locations. As such, treatment group artisans did not receive the key component of Phase II assistance—coordination with artisan cooperatives—that was designed to generate increased production and sales.

DIGESTYC fielded the second follow-up survey in September 2011, one year following the start of Phase II. Phase II assistance ended in mid-2012, and data collectors conducted a final follow-up survey in August 2012. By the end of 2012, all data collection for this analysis was complete. This was nearly three years after PBS assistance was first offered to treatment group artisans.

Figure II.1 illustrates the unique implementation and data collection timeline for the handicraft value chain. Under the randomized design, treatment group producers in the handicrafts chain were eligible to receive assistance starting in October 2009, whereas control group producers did not have access to services during the course of the compact period. The blue box in Figure II.1 illustrates the period covered in this evaluation report: approximately three years of services for treatment group artisans, compared to no services for control group artisans.

It should be noted, however, that PBS participants in the treatment group did not receive three years of continuous assistance. Rather, in a best-case scenario, assisted artisans received 28 months of assistance from two different service providers, with a gap in services of six months in 2010 and early 2011. Despite these factors, a 28 month (or even a two-year) timeframe is consistent with the program implementers' expectations regarding when medium- to long-term gains in sales and income would be realized. In fact, Aid to Artisans representatives stated in 2009 that some positive impacts on artisan income could materialize as soon as one year following assistance. According to program implementers, artisans could feasibly apply improvements in products, production techniques, and marketing practices shortly after learning them in any phase or year of PBS assistance. Because each calendar year offers two to three peak periods for handicraft sales—including Holy Week and Christmas—assisted artisans would have multiple opportunities to market and sell their improved production over the course of the three year follow-up period.

Figure II.1. Timeline of PBS Implementation for Treatment and Control Groups in the Handicrafts Chain



Throughout the three-year evaluation period, Mathematica and FOMILENIO monitored the treatment protocol. On a bi-monthly basis, FOMILENIO staff provided Mathematica with a list of PBS participants in the treatment and control groups, populated with administrative data from Chemonics. During Phase I, Mathematica determined that some level of non-compliance—or receipt of services among control group participants—had occurred. To discourage additional non-compliance, we coordinated with Chemonics to reinforce the rule that control group artisans should not receive assistance during the evaluation period.

C. Outcomes and Data Sources

The PBS impact evaluation assesses both main and intermediate outcomes resulting from the offer of PBS assistance. To create these outcome indicators, we designed the Productive Development Surveys (PDSs), which are in-person, surveys that focus on productive activities and household income and consumption. These surveys were fielded at baseline and at three points after the start of the intervention. Under a contract between FOMILENIO and DIGESTYC, data collectors administered PDSs to all eligible artisans in the evaluation, which included all producers in the treatment group as well as the control group. Data collection included baseline data collection (right before the first cycle of services); the first follow-up data collection (right after the end of Phase I); a second follow-up (after one year of Phase II services); and a final follow-up one year later, approximately one month after Phase II services concluded in July 2012 (see Figure II.1).

Main Outcomes. The ultimate goal of PBS is to increase the employment and household income of producers in El Salvador's Northern Zone (See program logic in Figure I.1). Using the PDSs, we collected information on sources of income that were most directly affected by the

training programs, specifically income from handicraft production. We also tracked employment information, measured by the number of people contracted by artisans in the study sample and the amount of time they worked in the past year. Given that MCC is ultimately interested in measuring economic outcomes at the household level, we collected income at the producer level as well as the household level, and asked a series of questions about household consumption. Data on these outcomes were collected at baseline and follow-up.

Intermediate Outcomes. In addition to employment and income outcomes, we examined intermediate outcomes through which the training programs were intended to improve household income, including production and sales, adoption of new practices and technologies, as well as enhanced product diversification and value chain integration. As with the study's main outcomes, data on these intermediate outcomes were collected at baseline and for three follow-up points. In Table II.2, we define the evaluation's main and intermediate outcome measures.

Table II.2. Definitions of Main and Intermediate Outcomes, PBS Impact Evaluation: Handicrafts

Measure	Definition
Main Outcomes	
Full-time Employment Generation	The number of full-time equivalent (FTE) jobs generated by the artisan in the past year. One FTE is 250 days of labor per year.
Annual Handicraft Investment and Input Costs	The sum of respondents' annual short- and medium-term handicraft investments and costs, including inputs, labor, transportation, packaging, and marketing expenses.
Net Annual Handicraft income	Respondents' annual income from handicraft sales after subtracting the costs of all investments and inputs.
Net Annual Household Income	The sum of all household members' annual handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.
Net Annual Household Consumption	The sum of all annual household expenses on food, household items, utilities, health care, transportation, and education, among others.
Intermediate Outcomes	
Handicraft Sales	Value of items sold in and outside of the artisan's workshop or cooperative.
Technology Adoption	Binary measures of whether the artisan used new information technologies and production techniques in the past year.
Diversification	Binary measures of whether the artisan tried new products in the past year.
Business Practices	Binary measures of whether the artisan conducted quality control measures, developed an inventory, composed a business plan, or took measures to cut costs in the past year.
Value Chain Integration	Binary measures of whether the artisan looked for new clients in the sector, as well as the number of clients in the past year.

The number of producers in randomized municipalities and the number of producers in the evaluation sample for the handicrafts value chain are found in Table II.3, in addition to survey response rates. A total of 19 municipalities (9 in treatment and 10 in control) were randomized into the study. The corresponding sample size is 674 individuals (337 in treatment and 337 in control) who were originally included in the study.

The analysis sample for this evaluation includes all individuals in the original study sample that completed all four interviews: one baseline and three follow-up interviews. This is a total of 587 individuals (289 in treatment and 298 in control). As shown, over 85 percent of the study sample completed all four surveys. The maps in Figure II.2 illustrate the geographic dispersion of treatment and control handicraft producers in the final analysis sample.

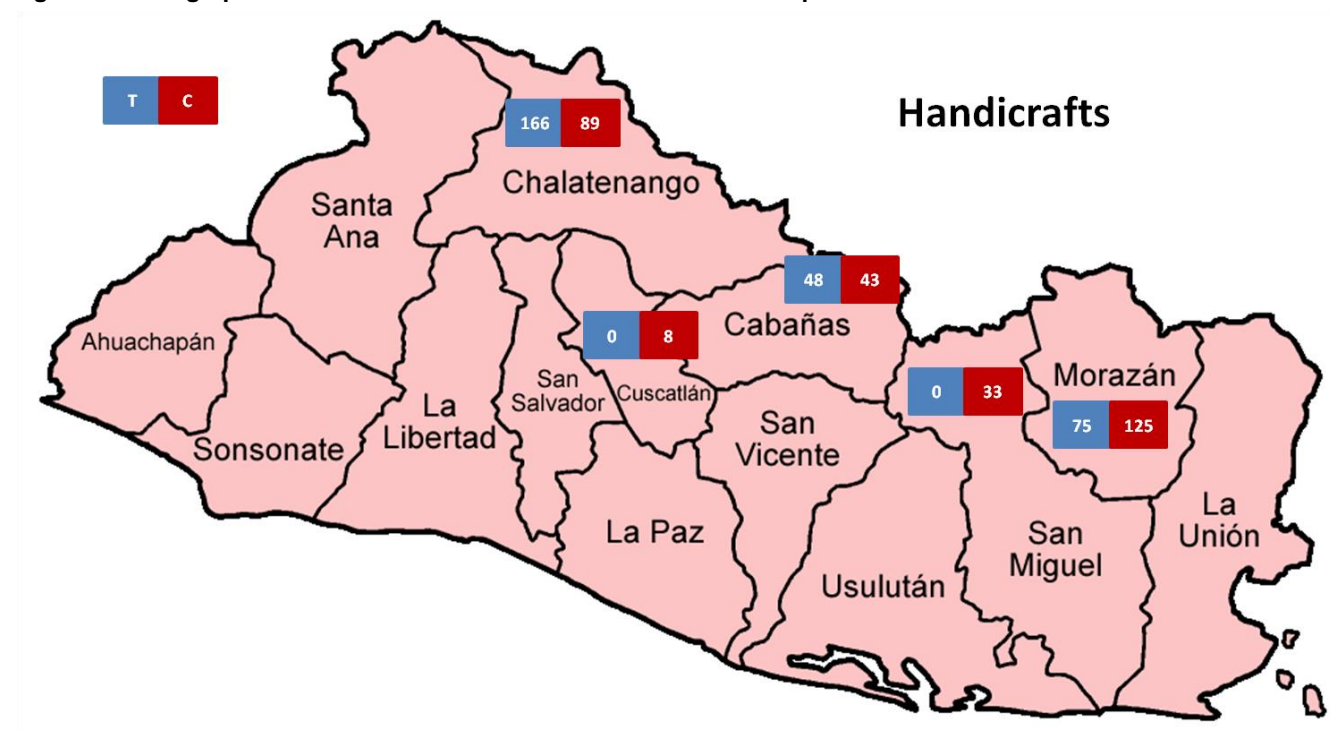
Table II.3. Artisans in the PBS Impact Evaluation, by Treatment Group

	Handicrafts	
	T	C
Number of Randomized Municipalities	9	10
Number of Individuals in Randomized Municipalities	337	337
Number of Completed Baseline Interviews	331	327
Number of Completed First Follow-up Interview	307	328
Number of Completed Second Follow-up Interview	316	324
Number of Completed Third Follow-up Interview	310	317
Number that Completed Baseline and Third Follow-up Interview	307	309
Number that Completed All Interviews (Analysis Sample)	289	298
Percentage that Completed All Interviews (Analysis Sample)	86	88

Source: Mathematica administrative records.

Note: T = Treatment, C = Control

Figure II.2. Geographic Distribution of Artisans in the Evaluation Sample



Source: Mathematica administrative records.

Note: T = Treatment; C = Control

D. Impact Estimation Approach

The key advantage of implementing a study design based on random assignment is that, on average, producers in the treatment group and producers in the control group are statistically indistinguishable on all observed and unobserved characteristics at the beginning of the intervention. Hence, after the first cycle of services, the difference between the mean of the outcome of interest for the treatment group and the mean of that same outcome for the control group is an unbiased estimate of the impact of the offer of PBS for all groups that were randomized. To improve the precision of impact estimates, we use a regression model that controls for baseline characteristics. Furthermore, regression adjustments allow us to control for any differences between the treatment and control groups in baseline characteristics due to chance.

The impact analysis relies on a core regression specification for each value chain. In this specification, we take into account that randomization occurred at the group (or cluster) level for each value chain.¹⁵ The econometric specification compares how groups (or clusters) in the treatment group changed over time with how groups (or clusters) in the control group changed over time, controlling for idiosyncratic differences in the two groups. The basic model can be expressed as follows:

$$y_{igt} = \alpha + \beta^t x_{igt-1} + \delta y_{igt-1} + \lambda T_g + \varepsilon_{igt}$$

where y_{igt} is the outcome of interest for producer i in group or cluster g at time t ; x_{igt-1} is a vector of baseline characteristics of producer i in group or cluster g ; y_{igt-1} is the baseline value of the outcome indicator of producer i in group or cluster g ; T_g is an indicator equal to one if group or cluster g is in the treatment group and zero if it is in the control group;¹⁶ and ε_{igt} is a random error term for beneficiary i in group or cluster g observed at time t . The parameter estimate for λ is the estimated impact of the program for each value chain.

In studies of this kind, we must verify that differential or overall attrition does not threaten the study's internal validity. Given the low attrition rates for the handicraft chain, the PBS evaluation does not face this threat. Attrition at the level of random assignment (group or municipality) was non-existent, and attrition at the producer level was low: overall attrition was 13 percent (with a 2 percent treatment-control differential). We also did statistical tests to verify that the groups were equivalent at baseline; these tests are discussed in the next section. Few differences were found at baseline, and we control for these differences in the regression analysis.

For the evaluation, we produce two types of impact estimates: intent-to-treat (ITT) estimates and treatment-on-the-treated (TOT) estimates. ITT estimates capture the impact of the offer of PBS, regardless of whether the producers in the treatment group accepted this offer. To construct these estimates, we compare the entire sample of producers in the treatment group to the entire sample of producers in the control group, regardless of whether producers participated in PBS.

¹⁵ A key aspect of this model is that standard errors are clustered at the level of random assignment—that is, the municipalities.

¹⁶ A fixed-effect specification was not feasible in this analysis because the main variable of interest, treatment, had no variation within group or cluster. While feasible, a random effects specification was not used due to the sensitivity of this specification to the inclusion and exclusion of baseline controls.

However, another important question is the effect of PBS on the producers who actually received PBS assistance. This is particularly important for this evaluation of the handicrafts value chain, given that the treatment group participation rate was 68 percent. To answer this question, we present TOT estimates, which can be interpreted as the effect of PBS on the producers who accepted the PBS offer. To calculate TOT estimates, we use an instrumental variable approach, in which the assignment to the treatment group is used as an instrument for participation.¹⁷

E. Design Limitations

The results of this evaluation can provide MCC and other stakeholders with unbiased estimates of the overall effectiveness of PBS assistance on this sample during the specified timeframe. In addition, the evaluation is intended to provide MCC staff with information that could inform future funding decisions or project designs. One important limitation is the impact findings are not generalizable to the entire population of 1,192 artisans who received some form of PBS assistance from 2007 to 2012.¹⁸ This is because less than 200 of the 635 artisans assisted under PBS in Phase I—and none of the 468 new participants who joined in Phase II—are included in the sample frame (see participation estimates in Section III). In particular, these results are not generalizable to the 468 artisans who began receiving PBS assistance in Phase II under more restrictive selection criteria.

In addition, due to implementation constraints, the total number of randomized municipalities of producers in the handicrafts value chain was lower than originally planned. As a result, minimum detectable differences—or the smallest true effects that could be detected given the study’s sample size—were relatively large. In fact, the true impact of PBS assistance on participants’ handicraft income would have to be over \$300, and the true impact of PBS assistance on household income would have to be over \$600 to be identified in this analysis. In other words, the design is “underpowered” in that it is not capable of identifying small to moderate impacts of PBS on key economic outcomes.

The relatively small number of randomized municipalities—9 treatment and 10 control—could also affect our impact estimates due to the regression model’s inability to fully control for socioeconomic factors that may affect municipalities in different ways. For example, if economic and employment trends in the U.S. caused remittance income to increase or decrease in treatment municipalities relative to control municipalities, estimates of the impact of PBS assistance on artisans’ business or remittance income could reflect these trends. For this reason, Chapter IV of this report presents impacts of PBS on household income including and excluding remittance income—which is unlikely to be correlated with handicraft production.

¹⁷ Another approach is to divide IIT estimates by the participation rate of the treatment group in each chain. Bloom (1984) describes this method in detail. This technique assumes that the effect of the program on non-participants is zero. As a sensitivity test, we also calculated TOT estimates using this method.

¹⁸ These 1,192 participants include 89 artisans who participated in the PBS pilot.

III. IMPACT EVALUATION SAMPLE

In this chapter, we provide a description of the beneficiary population and evaluation sample, and address whether treatment and control group producers were equivalent at the time of randomization. We also analyze producers' participation in the PBS intervention, and provide a basic characterization of this assistance.

A. Description of the Evaluation Sample

1. Demographic Characteristics: Producers

In Table III.1, we summarize the baseline characteristics of all handicraft producers in the evaluation. In this table, we present summary statistics for treatment and control group artisans, as well as the pooled sample of artisans. As illustrated, artisans in the study are largely married females around the age of 40 with a basic education. Overall, artisans invested between \$400 and \$600 a year in handicrafts production, and made a profit of between \$300 and \$500 on these investments. Besides handicraft income, other key sources of income at baseline included salaries and remittances.

With an average of 19 years of handicrafts experience, artisans in the treatment group had substantial experience at baseline. In addition, the majority had worked in handicrafts during the year prior to the baseline survey (Table III.1). Coupled with Swisscontact's reports that treatment group artisans were low-skilled, on average, we can conjecture that although they had several years of experience with handicrafts overall, this experience may not have been directly relevant to current market demand, particularly outside of municipal markets. The treatment group's average net income from handicrafts of less than \$50 per month likely attests to these artisans' relatively modest skills, production, and access to markets at baseline.

Table III.1. Baseline Information on Artisans, by Treatment Group (Averages in U.S. Dollars Unless Otherwise Indicated)

Characteristic/Measure	Treatment	Control	Pooled
Female (%)	88	81	84
Age (in years)	40	41	40
Married or Cohabiting (%)	70	66	68
Educational Level (%)			
None	23	21	22
Basic	70	65	67
More than Basic	8	13	11
Member of a Productive Group (%)	63	28	45
Experience with handicrafts (in years)	19	19	19
Worked in handicrafts in past year (%)	84	78	81
Annual Investment and Input Costs for Handicraft Activities ^a	597	464	529
Net Annual Handicraft Income ^b	455	328	391
Annual Income from Salaries	166	263	215
Net Annual Business Income	123	53	88
Annual income from Agricultural Activities	-11	-8	-10
Annual Income from Remittances and Other Transfers	279	243	261
Total Net Annual Income ^c	1,012	878	944
Employed Workers Last Year (%)	5	6	6
Average Number of Full-time Productive Jobs Offered by Producer Last Year	0.02	0.03	0.03
Artisans	289	298	587
Randomized Municipalities	9	10	19

Source: Baseline Productive Development Survey-Handicraft (PDS-H) interviews conducted in October 2009.

^aThis is the sum of respondents' short- and medium-term productive investments and costs, including the cost of machinery, feed, materials, packaging, transportation, and marketing.

^bThis is the sum of respondents' sales after subtracting the costs of all investments and inputs.

^cThis is the sum of respondents' handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.

Using PBS data compiled by FOMILENIO, we can compare a limited number of demographic characteristics of individual producers in our study sample to all PBS participants for whom baseline data are available. Regarding participants' sex and age, the full population of PBS participants (including Phases I and II) had a similar average age as artisans in the study (39 years in late 2009, versus 40 years among the study population) and a similar gender balance (82 percent female versus 84 percent female in the study population). In addition, we compared these baseline income estimates with baseline data compiled by Chemonics for a large portion of artisans assisted during Phase I implementation in 2009 and 2010, and found that our estimates of net and gross income were similar to, but generally lower than, those of Chemonics. Specifically, our estimate of baseline net handicraft income of around \$400 was similar to Phase I participants' average net income of \$550 at baseline. However, due to these small but nontrivial baseline differences in income between the study sample and all Phase I PBS handicraft participants at baseline, we cannot extrapolate this study's impact estimates to the full population of the handicrafts chain.¹⁹

¹⁹ These differences may be the result of real differences in income between the study sample and all Phase I participants, or differences in data collection tools used by evaluators and implementers. Because a systematic comparison of data collection tools was not conducted, we cannot determine the true cause of these differences.

2. Demographic Characteristics: Households

In Table III.2, we summarize the characteristics of all handicraft households in the evaluation. These are all the households corresponding to the producers described in Table III.1. Because some interviewed producers reported belonging to the same households, the number of households is lower than the number of producers in the analysis sample. As shown, households have an average of five members with an average of roughly \$2,600 of total net annual income. The two largest components of household net income are annual income from salaries (\$1,570) and net handicraft income (\$476).

B. Baseline Equivalence

We verified that the treatment and control groups in the analysis sample were equivalent at baseline using statistical tests (see Tables B.1 and B.2). In general, we find that artisans in the treatment group are similar to artisans in the control group, except that treatment group artisans were more likely to report being a member of an artisan group. Comparing treatment and control households, we found no statistically significant treatment-control differences in economic outcomes at baseline. However, the average net annual income of treatment households of around \$2,800 is substantially higher than that of control households, \$2,400. We account for this baseline difference through use of regression techniques.

Table III.2. Baseline Information on Artisan Households, by Treatment Group (Averages in U.S. Dollars Unless Otherwise Indicated)

Characteristic/Measure	Treatment	Control	Pooled
Average Household Size (people)	4.9	4.9	4.9
Female-Headed Household (%)	33	34	34
Net Annual Handicraft Income ^a	539	411	476
Annual Income from Salaries	1,579	1,561	1,570
Net Annual Business Income	274	114	195
Annual Income from Agricultural Activities	-59	-150	-104
Annual Income from Remittances and Other Sources	478	443	461
Total Net Annual Income ^b	2,812	2,387	2,602
Annual Consumption ^c	2,479	2,084	2,284
Households in Poverty (Based on Income) (%)	61	58	60
Households in Poverty (Based on Consumption) (%)	79	83	81
Artisan Households	272	265	
Randomized Municipalities	9	10	19

Source: Baseline Productive Development Survey-Handicraft (PDS-H) interviews conducted in October 2009.

^aThis is the sum of handicraft income generated by all household members, after subtracting the costs of all investments and inputs—including paid labor.

^bThis is the sum of all household members' handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.

^cIncludes all household expenses on food, household items, utilities, health care, transportation, and education.

C. Participation in the PBS Activity

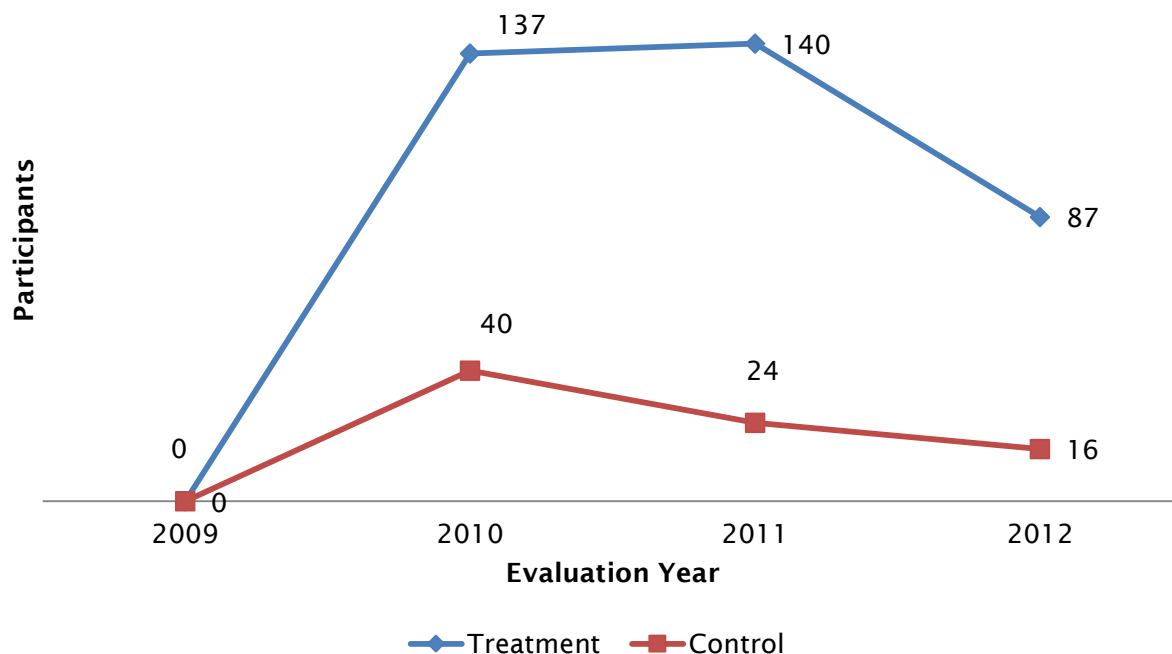
For this evaluation, surveyed individuals are defined as participants if they reported receiving PBS assistance during Phase I or Phase II, which spanned from October 2009 to July 2012.²⁰ We use respondents' self-reports from surveys instead of administrative data from Chemonics because survey data provide us with more detailed, annual participation numbers, whereas administrative data indicate only if an individual participated at any time during the three-year intervention. Using participants' accounts of PBS assistance from follow-up surveys, 68 percent of treatment group artisans received assistance and 21 percent of control group artisans received assistance (Table III.3). The analysis of participation by implementation phase shows that slightly less than half of treatment group artisans received assistance in Phase I, and slightly more than half of treatment group artisans received assistance in Phase II. Figure III.1 provides a summary of participation by evaluation year.

Table III.3. Participation in PBS Activities, by Treatment Group and Phase

	Treatment	Control
Phase I (2010)		
Number	137	40
Percentage	47	13
Phase II (2011 or 2012)		
Number	157	35
Percentage	54	12
Any Phase		
Number	196	63
Percentage	68	21
Artisans	289	298
Randomized Municipalities	9	10

Source: Baseline and final follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

²⁰ We defined participation using a simple Yes/No question in the survey, in which respondents were asked if they had received assistance from Aid to Artisans, Swisscontact, Chemonics, or FOMILENIO in the past 12 months.

Figure III.1. Number of Artisans Who Received Assistance, by Treatment Group and Year

Source: Baseline and final follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

Note: Sample size includes treatment and control producers who completed surveys at baseline and for all three follow-up years. Participation (in either Phase) was 68 percent for treatment group producers (196 participating treatment producers), and 21 percent for control group producers (63 participating control producers).

The finding that 21 percent of control group artisans reported receiving assistance is surprising, provided that program implementers agreed to not offer PBS assistance to individuals in the control group. This level of participation among control group artisans may be the result of miscommunication between Chemonics and its contractors, or decisions on the part of field staff. However, it is possible that during in-person interviews, control group participants overstated their involvement in PBS assistance—perhaps by confusing PBS assistance with another form of FOMILENIO assistance. If this is the case, we would expect this overestimation of assistance to affect both treatment and control groups equally—meaning that the treatment group participation rate of 68 percent would be upwardly biased by a similar magnitude as the control group participation rate.

Mathematica staff discussed this issue of non-compliance—or receipt of services by control group artisans—with Swisscontact staff during a follow-up visit in March 2014. Regarding the high non-compliance rates (or the substantial proportion of control artisans that reported receiving PBS assistance in follow-up surveys), the Swisscontact representative reasoned that it was probable that several individuals in the control group received training during Phase I, as there was no strong demarcation between treatment and control artisans in the field. However, he reasoned that Phase II implementation (particularly in 2011 and 2012) had less non-compliance, given Swisscontact's vigilant monitoring efforts. This is consistent with artisans' self-reported participation in follow-up surveys, which showed a notable decrease in the number of control group artisans who reported receiving assistance in 2011 versus in 2010 (See Figure III.1).

It should be noted that these self-reported participation rates differ from rates calculated with Chemonics administrative records. According to these administrative records, 78 percent of artisans in the treatment group and only 1 percent of artisans in the control group received assistance. In Appendix D, we compare and contrast artisans' self-reported participation and participation according to Chemonics records, and conduct exploratory analyses to ensure that TOT estimates do not change substantially when we use self-reports versus administrative records to define PBS participation. This additional analysis is important, provided that there is no clear evidence that self-reported participation rates are more valid than participation rates based on administrative records, or vice versa.

The treatment group participation rate of under 70 percent—combined with the relatively high control group participation rate of 21 percent—increases the importance of analyzing the impact of PBS assistance on those artisans who actually received assistance (that is, the participants). These are known as treatment-on-the-treated (or TOT) estimates. In general, TOT impact estimates can be interpreted as the impact of an intervention among all participants—regardless of whether they were originally assigned to the treatment or control group. This stands in contrast with an intent-to-treat (or ITT) approach, which measures the impact of *the offer* of PBS assistance, regardless of whether treatment group individuals accepted assistance, or whether control group individuals somehow received assistance as well. We use an ITT approach for our main analysis because this approach best estimates the impact of assistance interventions in real-world circumstances in which not all targeted beneficiaries actually receive services—either due to personal preference, implementer decisions, or other factors. Given that these two approaches provide different and complementary information, we present both ITT and TOT results below.

Table III.4 provides a summary of PBS assistance to treatment group artisans during Phases I and II, as reported. In both phases, assistance most commonly took the form of workshops, seminars, and training sessions. Also in both phases, the most common topics discussed during sessions were product design, quality control, and production technologies.

Notably, less than ten percent of treatment group artisans reported receiving donations in Phase I, but 27 percent reported receiving donations in Phase II, including paint, fabric, thread, furniture, sewing machines, and scissors. The higher rate of donation receipt in Phase II is consistent with the general finding from the PBS performance evaluation that stakeholders reported too few donations in Phase I, to the extent that potential behavior change was stifled by a lack of donated materials in the handicrafts chain.

During all of Phase II—which ranged from late 2010 to mid-2012, participants in the treatment group reported attending an average of 16 sessions (Table III.4). This was roughly equivalent to the average of 13 sessions reported by the 35 control group artisans who participated in Phase II (not shown). Relevant to ITT impact estimates—which measure the impact of PBS assistance on all randomized artisans, regardless of participation—treatment group members (including both participants and non-participants) attended an average of nine sessions in Phase II, compared to an average of two sessions for control group members (also including participants and non-participants).

Table III.4. Characteristics of PBS Assistance, as Reported by Treatment Group Artisans

	Phase I	Phase II
Form of Assistance (%)		
Workshops, seminars, trainings	74	88
Meetings with other artisans	24	55
Individual training or consultation	35	38
Material assistance (donations)	8	27
Trips and local fairs	4	1
Subjects Covered in Assistance (%)		
Product design	90	97
Quality control	53	52
Production technologies	30	41
Product marketing	36	37
Accounting	11	8
Among participants, average number of sessions completed	NA ^a	16
Among participants and non-participants, average number of sessions completed ^b	NA ^a	9
Treatment Artisans Reporting PBS Participation	137	157

Source: Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in 2011 and 2012.

^a Information on the frequency of training sessions was not collected by surveys for Phase I, under the assumption that more valid information on service delivery would be available through administrative records. When it became clear that these data were unavailable (and would be unavailable for Phase II), questions on the number of training sessions attended were added to 2011 and 2012 follow-up surveys.

^bThis variable has a sample size of all 587 artisans in the evaluation sample: 289 in treatment and 298 in control.

Besides this technical and material assistance in both phases, the PBS Activity's original design included potential overlap with the other PDP Activities, the Investment Support and the Financial Services Activity. Using administrative data, we attempted to determine the extent to which artisans in the evaluation sample received a FIDENORTE investment loan (through the Investment Support Activity) or a loan that was partially guaranteed by the PROGARA NORTE guarantee fund (through the Financial Services Activity). According to these data, no artisans in the study sample were members of the artisan cooperative that received a FIDENORTE loan, and only two artisans in the study sample—one in treatment and one in control—received a loan through PROGARA NORTE related to handicraft production and sales. In this sense, PBS technical and material assistance was not accompanied by complementary financial services, as originally envisioned.

IV. IMPACTS OF PBS ASSISTANCE

In this chapter, we discuss the impact of approximately three years of PBS assistance to artisans in the Northern Zone. Because this period includes both Phase I and Phase II services, these impacts can be interpreted as the combined effect of Phase I and Phase II services. When relevant, however, we will compare impacts of Phase I assistance (captured in 2010 follow-up surveys) to impacts in later years (captured in 2011 and 2012 follow-up surveys). Our interim impact report on PBS assistance covers the impact of Phase I services in the handicrafts chain in more depth (Blair et al., 2012).

As described before, we produce two types of impact estimates: (1) intent-to-treat (ITT) effects that capture the impact of the offer of PBS, regardless of whether the producers in the treatment group accepted this offer, and (2) treatment-on-the-treated (TOT) effects, which can be interpreted as the effect of PBS on producers who accepted PBS assistance. Our main analysis uses an ITT approach, but we discuss TOT findings at the individual level at the end of Section B, and TOT findings at the household level at the end of Section C.

A. Impacts of PBS on Productive Practices

In analyzing the impact of PBS on artisans' income, we start with a discussion of these individuals' productive practices. According to the PBS program logic (Figure I.1), treatment group artisans should more likely than control group artisans to report adopting new technologies and business practices. As a result of this behavior change, we would expect to find some treatment-control differences in production, sales, and income by the final follow-up survey in 2012.

In our interim analysis of Phase I assistance, we found that the offer of PBS had no effect on artisans' overall technology adoption or diversification. However, artisans in the treatment group were 12 percentage points more likely than control group artisans to report trying new production techniques (Blair et al., 2012). However, this difference was not statistically significant due to small sample sizes associated with surveying only group leaders and independent artisans for these outcomes. In addition, we found no significant effects of the offer of PBS on artisans' attempts to try new products.

In our final analysis of Phase I and Phase II assistance, we find that treatment group artisans, compared to control group artisans, were 26 percentage points more likely to report trying new production techniques (significant at a 1 percent level); nine percentage points more likely to report having looked for new clients in the commercial sector (significant at a 5 percent level); and six percentage points more likely to report creating environmentally friendly products (marginally significant just beyond a 5 percent level).²¹ In addition, treatment producers were 15 percentage points more likely to report trying new products, although this impact is not statistically significant (Table IV.1).

²¹ This impact of 26 percentage points on trying new production techniques is large in magnitude, but feasible given that assistance largely centered on introducing new handicraft production techniques and technologies. This impact estimate assumes that most PBS participants who participated in assistance applied at least one new technique covered in training.

Continued assistance to participants during 2011 and 2012 may explain the larger and more statistically significant impacts on artisans' practices following three years of assistance compared to one year of assistance. However, it is also likely that added statistical power in the final two rounds of data collection (due to asking these questions of all artisans, not just group leaders) allows us to better identify impacts that began in Phase I and persisted throughout Phase II.

Table IV.1. Intent-to-Treat Impact of Three Years of PBS Assistance on Artisans' Productive and Marketing Practices (Percentages Unless Otherwise Indicated)

Measure	Handicrafts			
	T	C	Impact	p-value
Technology				
Used New Information Technologies	7	1	6	0.13
Tried New Production Techniques	39	13	26	0.01
Created Environment-friendly Products	8	2	6	0.05
Diversification				
Tried New (Handicraft) Products	34	19	15	0.45
Business Practices				
Conducted Quality Control	13	17	-4	0.45
Took Measures to Cut Costs	19	26	-7	0.44
Developed/Used a Business Plan	8	1	7	0.10
Value Chain Integration				
Looked for New Clients in the Commercial Sector^a	11	2	9	0.02
Sold to Enterprises Supported Under PBS	0	0	0	NA
Average Number of Buyers in Past Year (enterprises and individuals)	14.7	4.9	9.8	0.34
Artisans	289	298		
Randomized Municipalities	9	10		

Source: Baseline and final follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Note: Estimates reflect treatment-control differences at third follow-up, after controlling for baseline differences. Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are in bold.

^aThis variable has a smaller sample size of 37 treatment producers in five municipalities and 28 control producers in six municipalities.

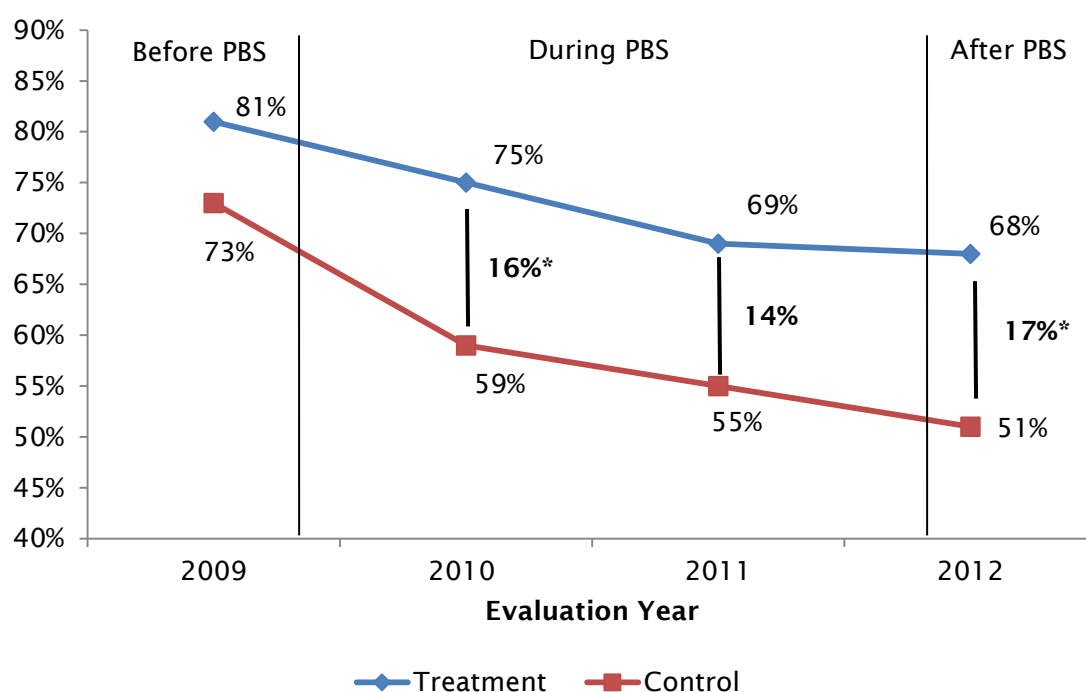
B. Impacts of PBS on Producer-Level Production, Employment, and Income

In this section, we focus on producer-level impacts on investment and input costs, handicraft income, and employment generation. These are important outcomes, as they are the most direct mechanism through which PBS assistance was likely to affect the evaluation's final outcome of net household income. We present ITT estimates in our main analysis, followed by a comparison of ITT and TOT estimates.

1. Intent-to-Treat Impact Estimates

In our final analysis of three years of PBS assistance, we find that treatment group artisans were 17 percentage points more likely to sell handicrafts at the conclusion of PBS implementation (Figure IV.1), and worked (on average) 32 more days per year in handicrafts than control group artisans: 129 days a year versus 98 days a year in control (Table IV.2). Analyzing the trends in Figure IV.1, it appears that PBS assistance influenced treatment group artisans to continue producing and selling handicrafts, whereas control group artisans were more likely to transition out of handicraft sales.

Figure IV.1. Percentage of Artisans Selling Handicrafts, by Treatment Group and Year



Source: Baseline and final follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are marked with asterisks.

Table IV.2. Intent-to-Treat Impact of Three Years of PBS Assistance on Artisans' Investment, Income, Employment, and Labor (in U.S. Dollars Unless Otherwise Indicated)

Measure	Treatment	Control	Impact	p-value
Annual Investment, Sales, and Income (US\$)^a				
Sold Handicrafts Last Year (%)	68	51	17	0.01
Handicraft Investments and Input Costs ^a	418	448	-29	0.84
Net Handicraft Income ^b	282	277	5	0.96
Income from Salaries	256	433	-177	<0.01
Other Business Income ^c	233	207	26	0.51
Income from Agricultural Activities	40	-22	61	0.13
Income from Remittances and Other Sources	402	418	-16	0.81
Total Net Income	1,163	1,304	-141	0.44
Annual Employment of Workers				
Percentage of Artisans Who Employ Workers Outside the Group/Cooperative	8	8	0	0.97
Average Number of Full-time Equivalent Jobs Offered by Artisan Last Year Related to Handicrafts ^d	0.17	0.18	-0.01	0.79
Labor Devoted to Handicrafts				
Average Months Worked in Handicrafts by Artisan During Last Year	6.0	4.6	1.3	0.07
Average Days Worked per Month During the Month with Highest Sales	7.9	5.7	2.2	0.07
Average Days Worked per Month During the Month with Lowest Sales	3.6	3.8	-0.2	0.85
Total Days Worked Last Year	129	98	32	0.04
Artisans	289	298		
Randomized Municipalities	9	10		

Source: Baseline and final follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Note: Estimates reflect treatment-control differences at third follow-up, controlling for baseline differences. Income components do not sum perfectly to total net income, given a procedure by which total net income was not calculated if more than one income component was missing. Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are in bold.

^aThis is the sum of respondents' short- and medium-term handicraft investments and costs, including raw materials, labor, transportation, packaging, and marketing expenses.

^bNet handicrafts income is individual income from handicraft sales after subtracting costs of all investments and inputs—including paid labor.

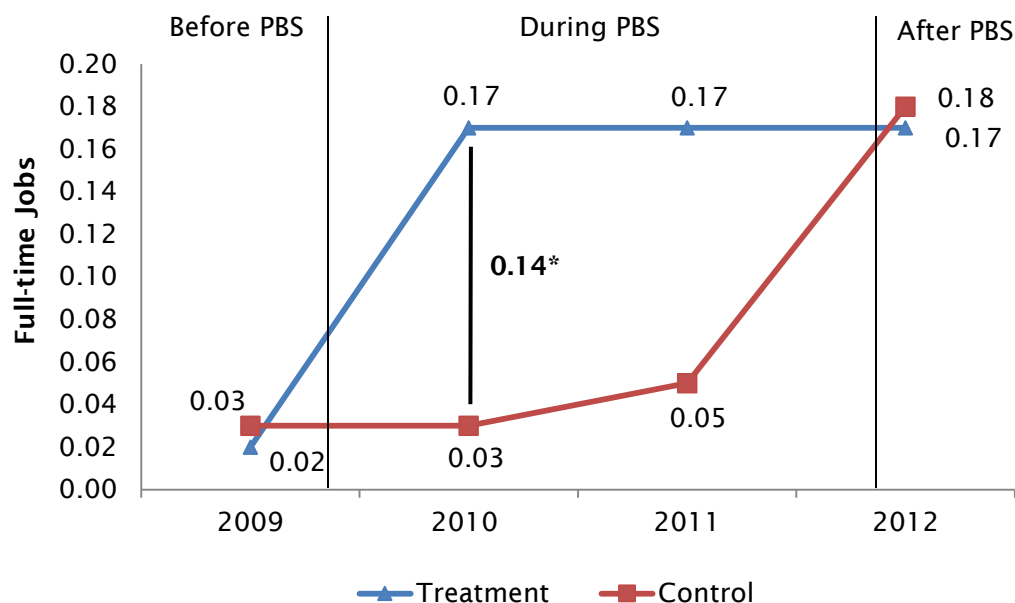
^cThis is the sum of respondents' income from non-agricultural and non-handicraft businesses, including retail shops.

^dNumber of full-time equivalent jobs is calculated as the number of jobs that require 250 days of work a year.

In Phase I, the offer of PBS I had a positive and significant effect on the number of full-time jobs offered by artisans (see 2010 treatment-control differences in Figure IV.2). Driven by relatively high levels of employment among approximately 30 producers—half of whom did not report employees at baseline—treatment group artisans generated 0.14 more full-time jobs than control group artisans in 2010; this translates to over 30 additional days of labor per year (statistically significant at the 1 percent level). By 2012, this impact eroded to essentially zero, as control group artisans began employing workers at similar levels as treatment group artisans. This added

employment among control group artisans was driven by heightened production among a small number of individuals. Because these control group artisans were just as likely to be PBS participants as non-participants, their increased handicraft employment may not be linked to PBS assistance. (See Appendix C for additional exploratory analysis.)

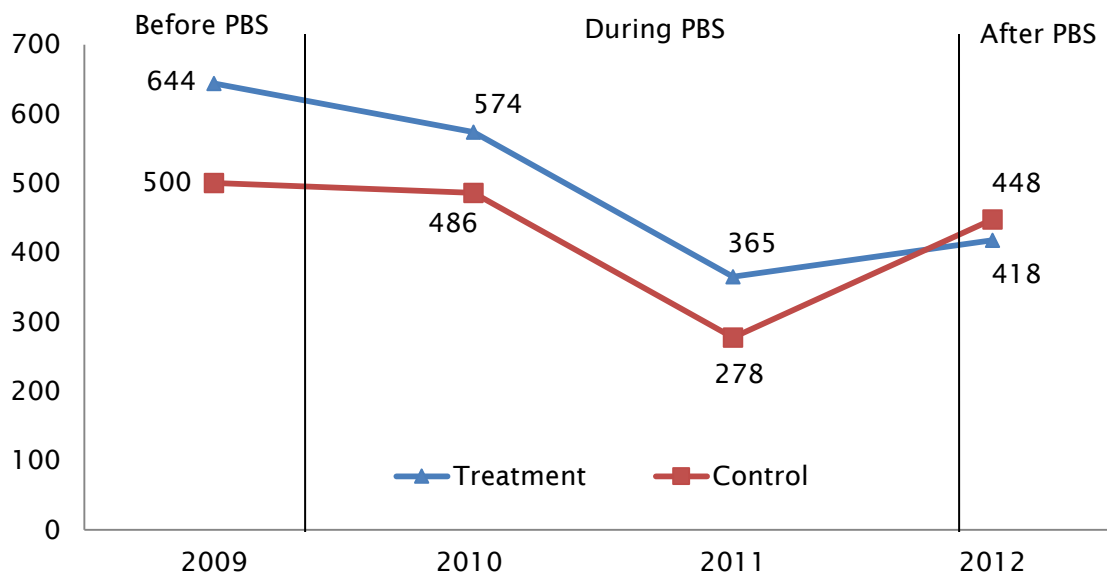
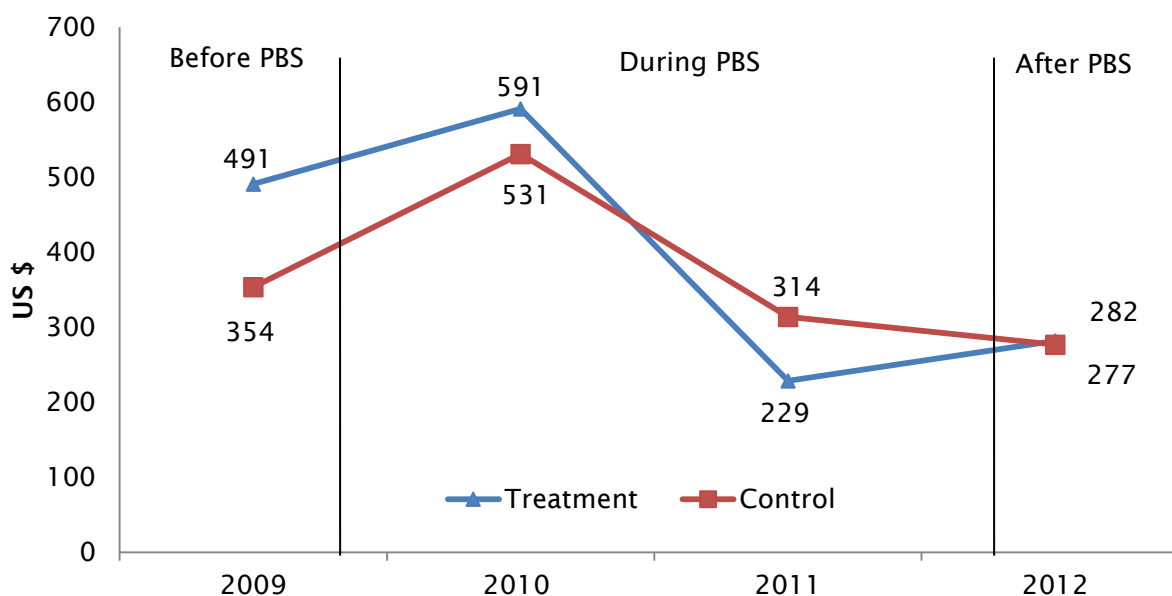
Figure IV.2. Annual Employment Generated by Artisans, by Treatment Group and Year (in Full-time Jobs)



Source: Baseline and follow-up Productive Development Survey-Handicraft (PDS-H) interviews conducted from October 2009 to August 2012.

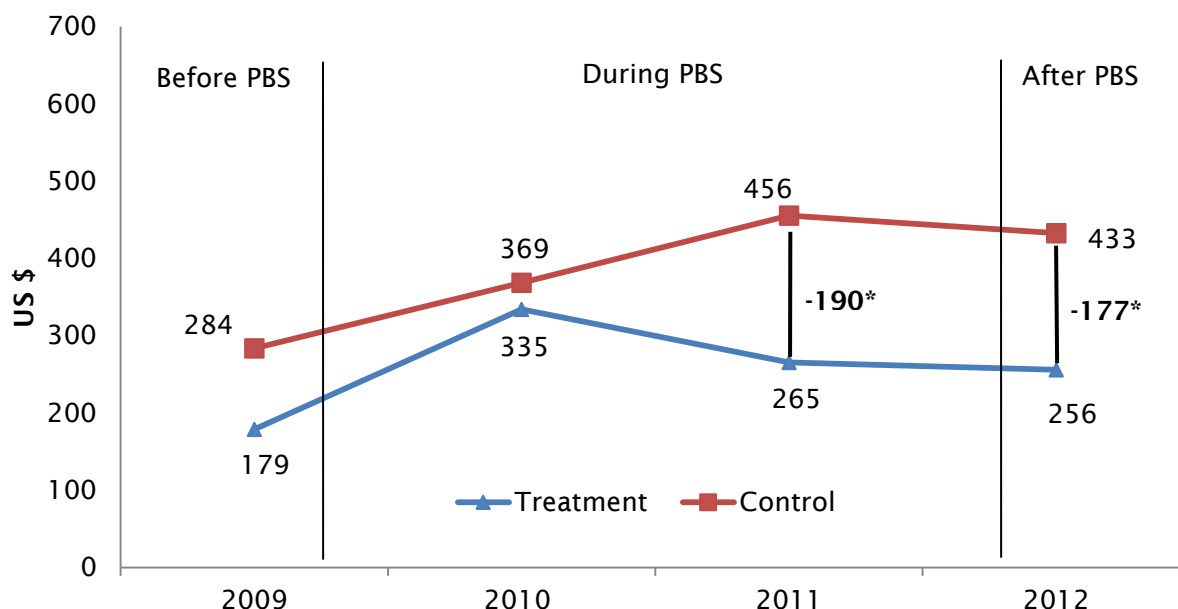
Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are marked with an asterisk.

In addition, there is no evidence that treatment group artisans invested more capital on handicraft production or earned significantly more net handicraft income during PBS implementation or directly following the intervention (Figures IV.3 and IV.4). In fact, the only statistically significant finding for economic outcomes at the final follow-up in 2012 is the negative impact of PBS assistance on artisans' salaried income: a loss of \$177 that is highly statistically significant (Table IV.2 and Figure IV.5). This negative impact first emerged in 2011—a loss of \$190 in salaried income—and persisted into 2012.

Figure IV.3. Artisans' Handicraft Investment and Input Costs, by Treatment Group and Year (in U.S. Dollars)**Figure IV.4. Artisans' Net Annual Handicraft Income, by Treatment Group and Year (in U.S. Dollars)**

Source: Baseline and follow-up Productive Development Survey-Handicraft (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298).

Figure IV.5. Artisans' Non-Handicraft Salaried Income, by Treatment Group and Year (in U.S. Dollars)

Source: Baseline and follow-up Productive Development Survey-Handicraft (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are marked with an asterisk.

Given the two notable impacts of PBS assistance at final follow-up—the positive impact on artisans' decision to sell handicrafts and the negative impact on artisans' salaried income—we explored the extent to which artisans transitioned from selling handicrafts to obtaining a salaried (non-handicraft) position, and vice versa. We found that during the first two years of PBS assistance, a total of 37 artisans in the treatment group (14 percent) reported a salaried job that they did not report the previous year. However, during the same time period, 86 artisans in the control group (32 percent) reported a salaried job that they did not report in the previous year (see Figure C.3). During 2010 and 2011, 25 of these 86 artisans in the control group—29 percent of those that began a salaried job during these two years—reported that they stopped selling handicrafts since the previous year. In contrast, only 5 treatment artisans reported beginning a salaried job and ceasing handicraft sales in the same period.

These findings provide some context for impact estimates presented above. As artisans in the control group transitioned into salaried employment—often abandoning handicraft sales in the process—their income from salaried income grew relative to artisans in the treatment group. The lower number of treatment group artisans that transitioned out of selling handicrafts (and into salaried positions) relative to control group artisans suggest that the PBS intervention influenced

artisans to continue working in the sector, despite potential opportunities for salaried, non-handicraft positions.²²

In March 2014, Mathematica staff shared these impact findings with a Swisscontact representative. The representative was not surprised by these findings, as he stated that most artisans in the treatment group were Level 4 artisans—or artisans with survival-oriented businesses who do not possess the relevant skills to meet current market demand for handicrafts. Swisscontact generally identifies Level 4 artisans and provides them with technical assistance in sectors outside of handicrafts, provided that the potential for them to succeed in handicrafts is limited. The Swisscontact representative stated that the negative impacts in salaried income were a validation of Swisscontact’s general practice of transitioning Level 4 artisans to other types of employment, if possible. When Swisscontact staff identifies a substantial number of Level 4 artisans, they generally conduct a market demand analysis in these artisans’ municipalities, and coordinate with potential employers in the region to teach these artisans skills that are in demand—including cooking, manufacturing, and cell phone sales. This confirms our preliminary interpretation of the findings: that PBS assistance to this particular artisan profile influenced them to pursue handicrafts production and sales despite the possibility of earning more income through salaried employment.

2. Comparison of Intent-to-Treat and Treatment-on-the-Treated Impact Estimates

In this section, we summarize the impacts of PBS at the producer level and compare and contrast intent-to-treat (ITT) and treatment-on-the-treated (TOT) estimates at this level. As mentioned, ITT estimates can be interpreted as the effect of the offer of PBS assistance, regardless of whether the producer accepted the offer, and TOT estimates can be interpreted as the effect of PBS on those who accepted these services.

Under both ITT and TOT approaches, we find that the offer of PBS assistance had a statistically significant and positive impact on employment generation among artisans in Phase I. Among all artisans in the treatment group, PBS assistance resulted in 0.14 additional jobs (ITT), and among artisans who participated in the intervention, PBS assistance resulted in 0.33 additional jobs (TOT, Table IV.3). This second impact is equivalent to over 80 days of full-time employment per year generated by each treatment group participant. However, as with the ITT impacts on employment, analogous TOT employment impacts declined to essentially zero by 2012.

Consistent with ITT results presented above, we find no impacts of PBS assistance on artisans’ investments and input costs or net handicraft income in any year of the intervention using a TOT approach. However, we find negative impacts of PBS assistance on salaried income in 2011 and 2012 with both ITT and TOT analytical approaches. According to TOT estimates, PBS participants lost over \$400 in 2011 and 2012 in salaried income as a result of PBS assistance (Table IV.3). In additional sensitivity tests using ITT and TOT approaches (not shown), we confirmed that negative impacts on salaried income were present among experienced artisans as well as less experienced artisans—as well as relatively high-income versus relatively low-income artisans in the sample.

²² In additional exploratory analyses, we confirmed that artisans transitioning from handicrafts to salaried positions were well distributed across municipalities. Their even distribution across nearly all municipalities in the control group provides further evidence in support of attributing their behavior to the intervention, as opposed to economic opportunities in a specific municipality or region that were unrelated to the intervention.

Similarly, negative impacts on salaried income were experienced by artisans with high net income at baseline as well as those with low net income at baseline.

Table IV.3. Summary of Individual-level ITT and TOT Impacts of PBS, by Year (in U.S. Dollars Unless Otherwise Indicated)

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Intent-to-Treat Analysis (ITT)						
Annual Handicraft Investments and Input Costs	88	0.52	88	0.49	-29	0.84
Number of Annual Full-time Equivalent Jobs Generated in Handicrafts	0.14	<0.01	0.12	0.22	-0.01	0.79
Annual Salaried Income	-34	0.67	-190	0.03	-177	<0.01
Annual Net Handicraft Income	60	0.70	-85	0.49	5	0.96
Total Annual Income	-49	0.84	-426	0.02	-141	0.44
Treatment-on-the-Treated Analysis (TOT)						
Annual Handicraft Investments and Input Costs	211	0.54	211	0.51	-70	0.84
Number of Annual Full-time Equivalent Jobs Generated in Handicrafts	0.33	<0.01	0.27	0.25	-0.04	0.78
Annual Salaried Income	-81	0.66	-452	0.01	-420	<0.01
Annual Net Handicraft Income	142	0.70	-202	0.51	12	0.96
Total Annual Income	-117	0.83	-1010	0.05	-334	0.44

Source: Baseline and follow-up Productive Development Survey-Handicraft (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant impacts at 5 percent are in bold.

C. Impacts of PBS on Household Income, Consumption, and Poverty

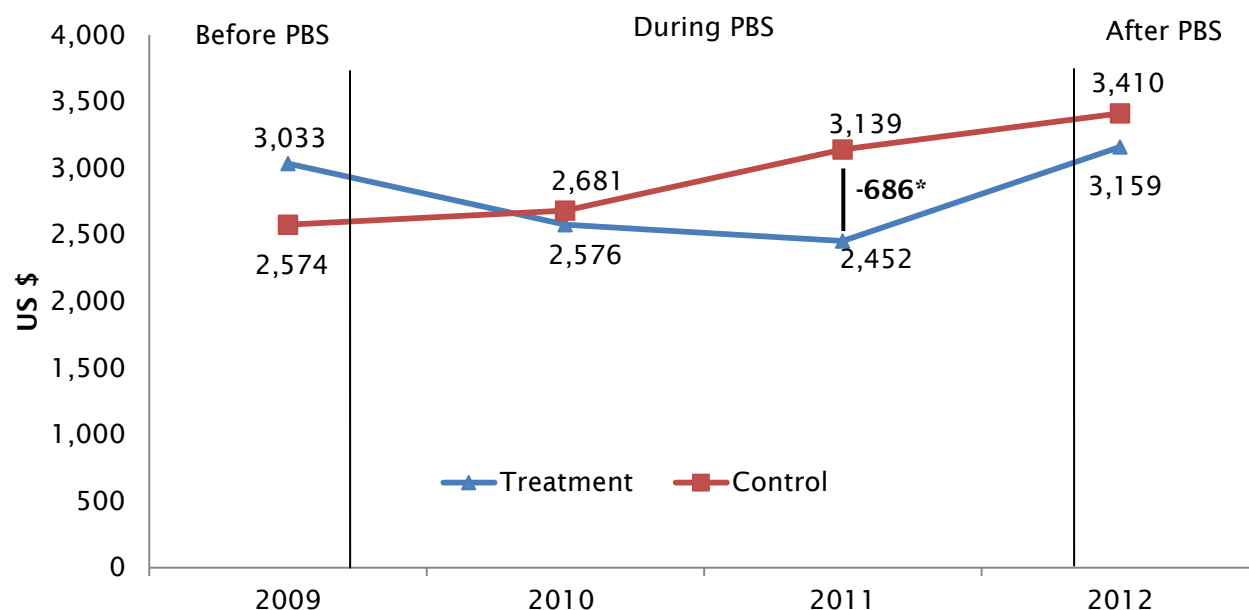
In this section, we focus on income and consumption at the household level. This information comes from sections in the PDS in which we asked respondents about the income of each member of their household, in addition to monthly, bi-yearly, and annual household expenditures. Based on these responses, we created household-level income and consumption measures. If two respondents in the study sample belonged to the same household, a portion of their responses was averaged to create one set of income and consumption variables per household. We present ITT estimates at the household level, followed by a comparison of ITT and TOT estimates at this level.

In this final analysis of three years of PBS assistance, we find no impact on net household income or consumption in 2012 (Table IV.4). However, we see a negative impact of \$298 on salary income at the conclusion of PBS assistance (Table IV.4). This finding is driven, in part, by the

negative impact of PBS assistance on the salaries of surveyed artisans presented above (a loss of \$177; p-value of less than 0.01). Because several households contain more than one artisan—some of whom are also in the study sample—it is logical that this negative impact on salaries at the household level is larger than the negative impact at the individual level presented above.

The negative impact of PBS on salaried income—combined with higher levels of remittance income of control group households—is largely responsible for the sizable but non-statistically significant treatment-control difference of \$251 in net household income in 2012, and the even larger (and statistically significant) treatment-control difference of \$686 in net household income in 2011 (Figure IV.6). However, once remittances and other direct transfers are excluded (because of the moderate to strong likelihood that they are uncorrelated with handicraft production and sales), treatment households made only \$168 less than control households during 2012 and \$451 less than control households in 2011, on average (see Table 3 in the executive summary). These treatment-control differences are not statistically significant for 2012 (p-value of 0.54), but they are marginally statistically significant for 2011 (p-value of 0.08).

Figure IV.6. Net Annual Income of Artisan Households, by Treatment Group and Year (in U.S. Dollars)



Source: Baseline and follow-up Productive Development Survey-Handicraft (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group households (185 of 272), and 23 percent for control group households (62 of 265). Statistically significant impacts at 5 percent are marked with an asterisk.

In addition, we find no significant effect of the offer of PBS on consumption (Table IV.4).²³ This is not surprising given the lack of impact of PBS on total household income. However, there appears to be a marginally statistically significant negative impact of PBS assistance on poverty when this measure is constructed with annual household income; the treatment group was more likely to be in poverty at final follow-up data collection (55 percent of treatment households versus 42 percent in control; marginally statistically significant at 5 percent). In contrast, a consumption-based measure of poverty revealed no statistically significant treatment-control differences. Taken together, these measures produce inconclusive findings regarding the impact of PBS on household poverty.

Table IV.4. Intent-to-Treat Impact of Three Years of PBS Assistance on Annual Household Income, Consumption, and Poverty (in U.S. Dollars Unless Otherwise Indicated)

Measure	Treatment	Control	Impact	p-value
Net Handicraft income	537	396	140	0.51
Income from Salaries	1,649	1,947	-298	0.02
Other business income ^a	496	387	109	0.63
Agriculture Income	-170	-84	-86	0.22
Remittances and Other Transfers	690	798	-108	0.17
Total Net Income ^b	3,159	3,410	-251	0.42
Total Net Income (Excluding Remittances and Other Transfers)	2,464	2,631	-168	0.54
Consumption ^c	2,063	1,717	346	0.11
Percentage of Households in Poverty (Based on Income) ^d	55	42	13	0.05
Percentage of Households in Poverty (Based on Consumption) ^c	85	88	-3	0.50
Artisan Households	272	265		
Randomized Municipalities	9	10		

Source: Baseline and final follow-up Productive Development Survey (PDS) interviews conducted in October 2009 to August 2012, respectively.

Note: Estimates reflect treatment-control differences at third follow-up, after controlling for baseline differences. Participation (in either phase) was 68 percent for treatment group households (185 of 272), and 23 percent for control group households (62 of 265). Statistically significant impacts at 5 percent are in bold.

^aThis is the sum of all household members' income from non-agricultural and non-handicraft businesses, including retail shops.

^bThis is the sum of all household members' handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.

^cIncludes all household expenses on food, household items, utilities, health care, transportation, and education, among others.

^d Includes households in extreme and relative poverty. Extreme poverty is defined as gross household income of less than \$0.93 per person per day. Relative poverty is defined as gross household income of less than \$1.86 per person per day (DIGESTYC 2009).

²³ In addition, there was no statistically significant impact of PBS assistance on the natural log of consumption. Given that all households often report a non-zero value for consumption, estimating the impact of an intervention on the natural log of consumption is a common sensitivity test to verify the robustness of results. This test was conducted in light of the substantively meaningful \$350 difference between average consumption levels between treatment and control households. Given these findings, we cannot conclude that PBS assistance had any impact—either negative or positive—on household consumption.

Examining household handicraft income, total household income, and household consumption by the gender of the head of household, we found statistically significant differences between male-headed and female-headed households on salaried income (see Table IV.5). Interestingly, PBS assistance had a large negative impact on salaried income in male-headed households (a loss of \$665) but no impact on salaried income in female-headed households. These findings illustrate that the negative impact of PBS assistance on salaried income (presented above) was largely concentrated in male-headed households. Given that the vast majority of artisans in the evaluation are women, instances in which PBS assistance had a negative impact on household salaried income appear to occur largely in families in which male heads the household had no involvement in PBS assistance (and possibly no involvement in handicrafts), but their spouses and/or children chose to pursue handicrafts production and sales instead of salaried jobs.

Table IV.5. Intent-to-Treat Impact of Three Years of PBS Assistance on Female- versus Non-Female-Headed Households (in U.S. Dollars)

Measure	Impact for Female- Headed Households	p-value	Impact for Male- Headed Households	p-value	Difference	p-value
Net Handicraft Income ^a	15	0.95	214	0.45	-199	0.64
Annual income from salaries (US)	351	0.16	-665	<0.01	1,016	<0.01
Net annual business income (US)	207	0.11	215	0.42	-8	0.98
Annual income from agricultural activities (US)	-85	0.02	-82	0.39	-3	0.98
Annual income from remittances and other transfers	42	0.67	-232	0.02	273	0.06
Total Net income	271	0.42	-488	0.24	759	0.21
Total Net income (minus income from remittances and other transfers)	271	0.42	-377	0.31	649	0.25
Consumption	637	0.02	209	0.37	428	0.24
Percentage of Households in Poverty: Using Income	8	0.28	14	0.05	-6	0.58
Percentage of Households in Poverty: Using Consumption	-9	0.26	-2	0.74	-7	0.42
Artisan Households	181		356			
Randomized Municipalities	10		9			

Source: Baseline and final follow-up Productive Development Survey (PDS) interviews conducted in October 2009 to August 2012, respectively.

Note: Estimates reflect treatment-control differences at third follow-up, after controlling for baseline differences. Participation (in either phase) was 68 percent for treatment group households (185 of 272), and 23 percent for control group households (62 of 265). Statistically significant impacts at 5 percent are in bold.

^aNet handicraft income is all household income from handicraft sales after subtracting the costs of all investments and inputs.

Among female-headed households, we find a small negative impact of PBS on agricultural income, but a positive impact of over \$600 on household consumption. This positive impact on household consumption for female-headed households is consistent with the positive direction of treatment-control differences in salary income and total income among female-headed households. However, these treatment-control differences in income are not statistically significant.

Table IV.6 summarizes this report's main findings at the household level under both ITT and TOT approaches. As illustrated, neither approach yields positive impacts of PBS assistance on artisans' net household income or household consumption in any follow-up year. In fact, we see a negative impact of PBS assistance on net household income in 2011 with both ITT and TOT approaches. This negative impact in 2011 is largely due to higher salaried income of control group households relative to treatment group households in 2011. PBS assistance had a particularly large negative impact on participating households (TOT), who lost over \$1,000 in 2011. However, this negative impact on net household income is not present at final follow-up in 2012.

Table IV.6. Summary of Household-level ITT and TOT Impacts of PBS, by Year (in U.S. Dollars Unless Otherwise Indicated)

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Intent-to-Treat Analysis						
Annual Net Household Income	-105	0.81	-686	0.01	-251	0.42
Annual Net Household Income (Excluding Remittances and Other Transfers)	-188	0.63	-451	0.08	-168	0.54
Annual Household Consumption	-35	0.83	19	0.92	346	0.11
Treatment-on-the-Treated Analysis						
Annual Net Household Income	-252	0.80	-1,655	<0.01	-607	0.42
Annual Net Household Income (Excluding Remittances and Other Transfers)	-451	0.60	-1,087	0.04	-405	0.54
Annual Household Consumption	-86	0.83	46	0.92	835	0.15

Source: Baseline and follow-up Productive Development Survey (PDS) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group households (185 of 272), and 23 percent for control group households (62 of 265). Statistically significant impacts at 5 percent are in bold.

V. CONCLUSIONS AND POLICY IMPLICATIONS

A. Key Findings

In this chapter, we summarize key findings from the impact evaluation and outline some policy implications of the main findings. We also provide updated ERR parameters based on impact estimates. Whereas program close-out ERR parameters completed in 2012 used one-year impact findings from the interim PBS impact evaluation, these updated parameters reflect the benefits of three years of assistance to artisans.

There are four key findings regarding the impact of PBS on employment and income in the handicraft value chain:

- PBS assistance motivated artisans to produce handicrafts during the study period, or at least to continue producing handicrafts, at higher rates than artisans in the control group. At final follow-up, 68 percent of treatment group artisans reported selling handicrafts, versus 51 percent of control group artisans, after controlling for baseline differences. This sizable impact of PBS assistance of 17 percentage points is clearly statistically significant. In addition, PBS assistance influenced artisans to devote more of their own labor to handicrafts. At follow-up, treatment group artisans reported working over 30 days more in handicrafts in the past year than control group artisans.
- The offer (and delivery) of PBS services had a statistically significant and substantively positive impact on employment generation among artisans in 2010 after Phase I assistance. However, this impact diminished to zero by 2012, due to increased employment generation among control group artisans.
- Despite the increased investment in labor following Phase I assistance, there is no evidence that the offer (and delivery) of PBS assistance to handicraft producers significantly raised these individuals' handicraft incomes. Although there was no statistical difference in treatment and control producers' total net incomes at final follow-up, treatment group producers experienced a negative impact on salaried income as a result of the intervention.
- Male-headed households that were offered PBS assistance appeared to fare worse than female-headed households. Male-headed households in the treatment group reported (non-handicraft) salaried income that was over \$650 lower than male-headed households in the control group, whereas female-headed households in the treatment group reported salaried incomes that were on par with female-headed households in the control group. These results may reflect the higher propensity of females in male-headed households to forego salaried (non-handicraft) jobs to pursue handicraft production and sales.

It is difficult to compare these findings with the PBS Activity's ultimate goal of a 15 percent increase in annual income across all value chains covered by the PBS Activity. This income goal is a before-after difference, whereas this impact analysis is centered upon comparing treatment and control groups at final follow-up, after controlling for pre-intervention differences between the two. Most importantly, our estimates are valid for this study's sample, as opposed to the full sample of PBS participants in the handicraft chain (or all value chains served by PBS). We therefore cannot conclude that three years of PBS assistance in the handicrafts chain is associated with a net average income increase of 15 percent from 2007 to 2012.

Despite these methodological challenges, we can make some conjectures about the effect of PBS assistance on artisans of the treatment group. Based on this analysis, we estimate that three years of PBS assistance actually resulted in a 14 percent decrease of treatment group artisans' total income relative to that of control group artisans' total income. However, this negative change in total income of 16 percent is derived from the non-statistically significant impact estimate of negative \$141 in total annual income in 2012 (Table 4). Due to its lack of statistical significance, this estimate should be treated as suggestive of the actual change.

B. Updated Rate of Return Parameters

In 2012, MCC staff updated pre-intervention PBS rate of return calculations with impact estimates from the final PBS impact evaluation. This evaluation estimated the impact of one year of assistance in the dairy, horticulture, and handicrafts chains. MCC estimated the final closeout average rate of return among the dairy, horticulture and handicraft chains at 26 percent over 20 years. Below, we update the FTE, net income, participation rate, and total cost parameters used to estimate the rate of return for the handicrafts value chain; all other parameters below are identical to those of the close-out rate of return. With this update, the estimated impact per participant in the handicrafts chain—or the average increase in productive and employment income generated by PBS for each participant—drops from \$293 to negative \$222. However, because handicrafts producers comprised less than 8 percent of all PBS participants, the global ERR for dairy horticulture, and handicrafts drops only one percentage point from 26 to 25 percent as a result of these updated parameters.

We should make the following important notes about these updated parameters:

- Following the initial ERR tabulation procedure, all updates are based on ITT impact estimates, which are then divided by the treatment group participation rate.
- Updated estimates use a sample of less than 300 treatment group producers. We caution against generalizing the findings of this evaluation to the entire population of 1,192 assisted artisans in PBS, due to qualitative evidence that the study sample of artisans was systematically different from the full number of assisted artisans.
- 2012 estimates are computed with final follow-up survey data. By 2012, gains in contracted labor (in the form of FTEs) that occurred in 2010 had disappeared, as had statistically significant losses in total income associated with participation in the activity. As such, 2012 estimates fail to account for positive and negative benefit streams that commenced and ceased during the course of program implementation. For this reason, we have also included the average of 2010, 2011, and 2012 impact estimates for job creation and artisan income. It is unclear if the average of these estimates across three years provides a better guide for the projected long-term benefit stream of PBS assistance. However, it provides MCC with an alternative estimate of benefits. As shown below, both methods reveal similar negative impacts per participant.
- It should be noted that none of the impact estimates from this evaluation—including those for FTE increases and artisan income—are statistically significant.

Table IV.7. Updated Parameters for PBS Assistance to Artisans

Variable	Unit	Close-out Estimates (2010 data)	2012 Estimates	Average of 2010-2012 Estimates
Total Cost of PBS Activity	% of total costs	7	6	
Intent to treat Impact on Artisan Net Income	2012 USD	\$22	-\$141 ^b	-\$206 ^b
% of treatment sample that participated	%	65	68	
Increase in FTEs per participant	FTE	0.17	-0.01 ^b	0.08 ^b
Wage w/o project	2012 USD/day	\$2.14	\$2.14	
Fulltime wage	2012 USD/day	\$6.10	\$6.10	
Days Worked Per year	Days	250	250	
Chain Participants	people	1,005	1,192	
Impact per participant ^a	2012 USD	\$293	-\$222	-\$182
ERR (for dairy, horticulture, and handicrafts)	%	26	25	25

^a MCC developed this formula, which is the change in artisan net income plus the change in annual wages generated by artisans (the product of the wage differential and the number of new days worked), divided by the participation rate.

^bThese impacts are not statistically significant.

C. Discussion and Policy Implications

In the handicrafts chain, we find a positive impact of PBS on employment generation after one year of assistance, as well as a positive impact on artisans' likelihood to sell handicrafts and devote their own labor to handicraft production and sales following assistance. However, we find no significant impact on net handicraft or household income in 2010 or any subsequent year. This suggests that one or more structural obstacles to marketing and selling handicrafts may have inhibited positive impacts on artisans' handicraft income. Examples of potential obstacles could include market access difficulties, limited demand during non-peak months, or the inability of assisted artisan groups to ensure or improve the quality of their goods to secure large orders. Also possible is that diminishing marginal returns to additional production could translate to a lack of increased sales and income, despite increased investments in paid labor.

Particularly interesting is the negative impact of PBS assistance on salaried income—both at the individual and household levels. These findings suggest that the opportunity cost of handicrafts work—or the salaried income that artisans forewent to pursue handicrafts work—could have outweighed their returns from handicraft sales. Particularly in 2011, there is conclusive evidence that the PBS intervention actually reduced total household income as a result of lost opportunities to earn salaried income outside of handicrafts.

Overall, there appears to be some disconnect between the largely positive reports from stakeholders regarding Phase II implementation, and this evaluation's findings of no impact on artisans' sales or income as a result of PBS assistance. This may reflect the fact that stakeholders who reported positive outcomes in Phase II—namely established artisans who benefited from intensive assistance from Swisscontact and a sustained supply of orders from Moje and ACOPROARTE—were largely unrepresented in the study sample. In addition, due to their lack of handicrafts expertise, the artisans in the study sample's treatment group received only partial assistance from Swisscontact in Phase II; this assistance largely excluded marketing and commercial components that were central to Phase II assistance. As such, many positive effects of the

intervention in 2011 and 2012 (discussed in Section I) may not have been captured in this impact analysis.

Regarding policy implications, the study's main findings suggest that providing technical and material assistance to low-capacity, low-income artisans may not generate real improvements in these individuals' economic outcomes in the medium term. In fact, a better approach to income generation for subsistence-level, low-income artisans may be to provide them with training to transition into alternate sectors with greater potential for salaried income.

Based on these findings, it is not clear whether targeting more highly skilled (and perhaps higher-income) artisans with more potential to meet national and international market demand may hold more promise, from a return-to-investment perspective, than targeting subsistence-level artisans. At least conceptually, higher capacity artisans would have stronger stores of human and financial capital needed to accept and apply technical assistance with production and marketing, establish and coordinate large orders with national and international buyers, and secure the investment and working capital needed to maintain and grow their businesses. Unfortunately, we cannot test this hypothesis given the initial PBS target population of artisans, and consequently the study's sample of artisans.

D. Next Steps

Following the submission of this report, Mathematica will consult with MCC to schedule a final stakeholder workshop on the PDP. If possible, this workshop should combine findings from this handicrafts analysis and findings from the final analysis of the Investment Support and Financial Services Activities of the PDP.

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APPENDIX A

SELECTION CRITERIA FOR PBS ASSISTANCE

Phase I: Selection Criteria for Production and Business Services

Selection Criteria for the Handicrafts Value Chain

The individual must comply with each of the following requirements:

- Experience or interest in producing and selling handicrafts
- Work within associated groups with at least 10 members or small businesses with at least 5 employees
- Receive a score of at least 2 or more in all the diagnostic questions, and at least a total score of 34 out of 50 possible points.
 - Service providers will give priority to groups with many members, groups with good market potential, and groups with a strong entrepreneurial attitude

Phase II: Selection Criteria for Production and Business Services

Selection Criteria for the Handicrafts Value Chain

The individuals and groups must comply with each of the following requirements:

- Be willing to work with textiles, clay, wood, or recycled materials
- Have at least the basic tools for making the products they manufacture
- Be organized in groups of between 2-8 members
- At least 2 of the members must be able to read, write, and perform basic arithmetic (add, subtract, multiply and divide)
- Willingness to work with one of the project's "anchor" associations
- Possess an entrepreneurial spirit and a willingness to improve their job skills and get involved in all phases of the business (production, marketing their products, and managing activities as appropriate)
- Already produce handicrafts that meet current market needs (or incorporate suggestions and proposals of the anchor associations)
- Have products with an acceptable level of quality to meet market demand or are otherwise easily modified to meet market demand (to be evaluated by the program specialist and anchor association)
- Have a list of prices that permit the marketing of products in target markets defined by the anchor association
- Have a sustainable raw material supply
- Have a disposition to work and coordinate with a diverse group of local and external organizations (municipalities, town councils, NGOs, etc.)
 - Willingness to be trained in human rights and economic issues related to the success of the program

APPENDIX B

SUPPLEMENTARY TABLES TO THE IMPACT ANALYSIS

Table B.1. Producers' Baseline Demographic Information, by treatment group (Averages in U.S. Dollars Unless Otherwise Indicated)

Characteristic	Treatment	Control	Difference	p-value
Female (%)	88 (33)	81 (39)	7	0.45
Average Age (in years)	40 (13)	41 (14)	-1	0.66
Married or Cohabiting (%)	70 (46)	66 (47)	4	0.63
Education (%)				
None	23 (42)	21 (41)	1	0.80
Basic	70 (46)	65 (48)	4	0.51
More than basic	8 (27)	13 (34)	-6	0.37
Member of a Productive Group (%)	63 (48)	28 (45)	34	0.03
Annual Investment and Input Costs for Productive Activities ^a	597 (2,548)	464 (1,281)	133	0.70
Net Annual Handicraft Income ^b	455 (1,271)	328 (941)	127	0.50
Annual Income from Salaries	166 (674)	263 (819)	-97	0.28
Net Annual Business Income	123 (583)	53 (1,152)	71	0.36
Annual income from agricultural activities (US)	-11 (215)	-8 (145)	-3	0.83
Annual Income from Remittances and Other Sources	279 (552)	243 (631)	36	0.53
Total Net Annual Income ^c	1,012 (1,645)	878 (1,749)	134	0.63
Average Number of Full-time Productive Jobs Offered by Producer Last Year	0.02 (0.20)	0.03 (0.34)	-0.01	0.68
Producers	289	298		
Randomized Municipalities	9	10		

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009.

Note: Standard deviations are provided in parentheses. Income components do not sum perfectly to total net income, given a procedure by which total net income was not calculated if more than one income component was missing.

^aThis is the sum of respondents' short- and medium-term productive investments and costs, including the cost of machinery, feed, materials, packaging, transportation, and marketing.

^bThis is the sum of respondents' sales after subtracting the costs of all investments and inputs.

^cThis is the sum of respondents' handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.

Table B.2. Baseline Annual Household Income, Consumption, and Poverty (Averages in U.S. Dollars Unless Otherwise Indicated)

Measure	Handicrafts			
	Treatment	Control	Difference	p-value
Household Size (people)	4.9 (2)	4.9 (2)	0	1.00
Net Handicraft income	539 (1,373)	411 (1,032)	129	0.61
Income from Salaries	1,579 (4,642)	1,561 (2,241)	18	0.96
Other Business Income	274 (4,278)	114 (1,453)	160	0.56
Agricultural income	-59 (840)	-150 (2,112)	92	0.53
Income from Remittances and Other Sources	478 (1,029)	443 (1,308)	34	0.78
Total Net Income ^a	2,812 (6,366)	2,387 (3,736)	425	0.37
Consumption ^b	2,479 (3,020)	2,084 (2,153)	395	0.34
Percentage of Households in Poverty ^c (based on income)	61 (49)	58 (49)	3	0.75
Percentage of Households in Poverty (based on consumption)	79 41	83 37	-4	0.45
Households	272	265		
Randomized Municipalities	9	10		

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009.

Note: Standard deviations are provided in parentheses. Income components do not sum perfectly to total net income, given a procedure by which total net income was not calculated if more than one income component was missing.

^a This is the sum of all household members' handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.

^b Includes all household expenses on food, household items, utilities, health care, transportation, and education, among others.

^c This includes both extreme and relative poverty. Extreme poverty is defined as gross household income of less than \$0.93 per person per day. Relative poverty is defined as gross household income of less than \$1.86 per person per day (DIGESTYC 2009).

Table B.3. Impact of Three Years of PBS on Handicraft Producers' Investment, Income, and Employment (Averages Unless Otherwise Indicated)

Measure	Treatment	Control	Impact	p-value
Annual Investment and Income (US\$)^a				
Handicraft Investments and Input Costs ^a	418 (1,519)	448 (1,555)	-29	0.84
Net Handicraft Income ^b	282 (600)	277 (1,131)	5	0.96
Income from Salaries	256 (741)	433 (1,127)	-177	<0.01
Other Business Income	233 (690)	207 (724)	26	0.51
Annual income from agricultural activities (US)	40 (620)	-22 (131)	61	0.13
Income from Remittances and Other Transfers	402 (633)	418 (777)	-16	0.81
Total Net Income	1,163 (1,511)	1,304 (1,784)	-141	0.44
Annual Employment of Workers				
Percentage of Artisans Who Employ Workers Outside the Workshop or Group	8 (30)	8 (30)	0	0.97
Average Number of Full-time Equivalent Jobs Offered by Artisan Last Year Related to Handicrafts ^c	0.17 (0.74)	0.18 (1.07)	-0.01	0.79
Producers	289	298		
Randomized Municipalities	9	10		

Source: Baseline and final Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Note: Estimates reflect treatment-control differences at third follow-up, after controlling for baseline differences. Standard deviations are provided in parentheses. Income components do not sum perfectly to total net income, given a procedure by which total net income was not calculated if more than one income component was missing. Participation (in either Phase) was 68 percent for treatment group producers (196 total treatment participants), and 21 percent for control group producers (63 total control participants).

^aThis is the sum of respondents' short- and medium-term handicraft investments and costs, including raw materials, labor, transportation, packaging, and marketing expenses.

^bNet handicraft income is individual income from handicraft sales after subtracting the costs of all investments and inputs.

^cNumber of full-time equivalent jobs is calculated as the number of jobs that require 250 days of work a year.

Table B.4. Additional Descriptive Statistics on Handicrafts Producer Groups' Production and Sales in 2012 (Averages Unless Otherwise Indicated)

Measure	Treatment	Control	Difference
Number of People in the Group	11.0	8.4	2.6
Percentage of Groups in Which Members Produce Jointly	60	63	-3
Percentage of Groups Producing:			
Ropework	53	36	17
Metalwork	0	11	-11
Dyed Textiles	8	7	1
Mats and Bedrolls	32	20	12
Jewelry	3	0	3
Other	17	29	-12
Median price received per item sold (\$):			
Ropework	27.14	15.00	12.14
Metalwork	NA	3.00	NA
Dyed Textiles	9.17	5.05	4.12
Mats and Bedrolls	2.50	3.00	-0.50
Jewelry	1.66	1.35	0.31
Percentage of Sales Destined for Export	1	0	1
Group's Annual Gross Income (in US\$)	2,969	2,483	487
Randomized Municipalities	8	7	

Source: Baseline and final Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Table B.5. Impact of Three Years of PBS on Annual Household Income, Consumption, and Poverty (in U.S. Dollars Unless Otherwise Indicated)

Measure	Handicrafts			
	T	C	Impact	p-value
Net Handicraft Income	537 (1,999)	396 (1,302)	140	0.51
Total Net Income ^a	3,159 (976)	3,410 (883)	-251	0.42
Consumption ^b	2,063 (2,294)	1,717 (1,184)	346	0.11
Percentage of Households in Poverty ^c (based on income)	55 (50)	42 (49)	13	0.05
Percentage of Households in Poverty (based on consumption)	85 (35)	88 (33)	-3	0.50
Households	272	265		
Randomized Municipalities	9	10		

Source: Baseline and final Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Note: Estimates reflect treatment-control differences at third follow-up, after controlling for baseline differences. Standard deviations are provided in parentheses. Participation (in either Phase) was 68 percent for treatment group producers (185 total treatment participants), and 23 percent for control group producers (62 total control participants).

^aThis is the sum of all household members' handicraft income, wages, business income, and additional income (including remittances), after subtracting agricultural and business expenses.

^bIncludes all household expenses on food, household items, utilities, health care, transportation, and education, among others.

^cIncludes extreme and relative poverty. Extreme poverty is defined as gross household income of less than \$0.93 per person per day. Relative poverty is defined as gross household income of less than \$1.86 per person per day (DIGESTYC 2009).

APPENDIX C

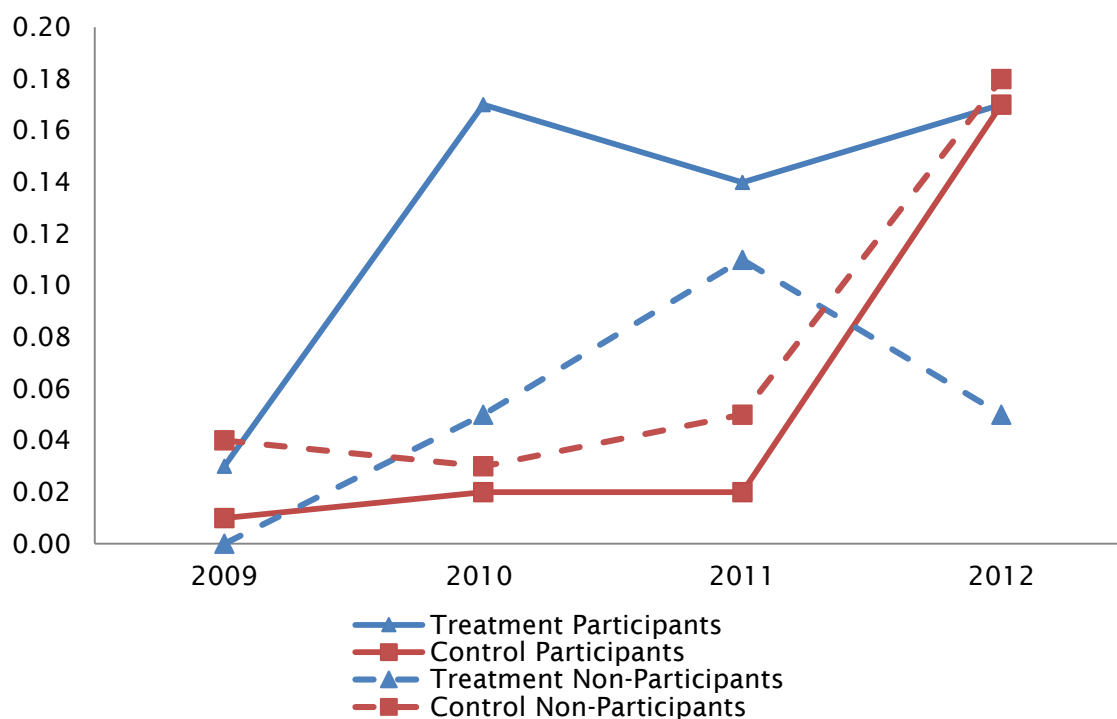
ADDITIONAL EXPLORATORY FINDINGS

We conducted additional exploratory analysis on key outcomes of employment generation, handicraft income, and salaried income from 2009 to 2012. For this analysis, we used unadjusted means from baseline and follow-up surveys. We discuss these analyses in more depth below.

Employment findings. To further analyze employment findings, we classified treatment group and control group artisans as either participants or non-participants (according to artisans' self-reports). The goal of this exercise was to determine whether participants, non-participants, or both were driving our key finding of an initial boost in employment related to handicrafts that dissipated by 2012.

As illustrated in Figure C.1, treatment group participants were responsible for the large increase in employment in 2010. This is to be expected, as increased investment in handicraft production was an expected outcome of the intervention. Turning to 2012 figures, a small number of control group artisans reported dramatic increases in paid labor at final follow-up, and these increases drove the average increase in FTEs generated among control group producers. However, these control group artisans were an even mix of PBS participants and non-participants. In conjunction with the lack of commercial relationships between artisans in the study and PBS-supported handicraft businesses (as reported by the artisans themselves), this finding suggests that at least a portion of the increased employment generated by control group participants was independent of the PBS Activity.

Figure C.1. Average Employment Generation Over Time, by Treatment Group and Participation (in Full-Time Jobs)



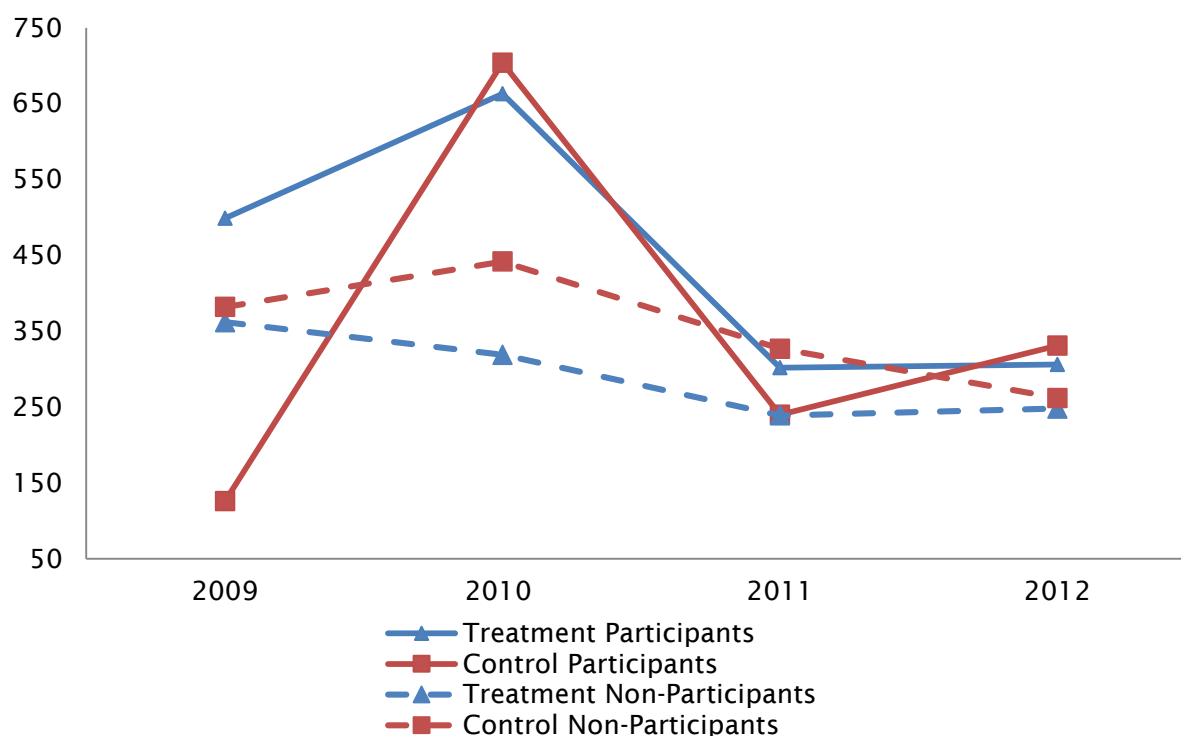
Source: Baseline and final Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted in October 2009 and August 2012, respectively.

Note: Participation (in either Phase) was 68 percent for treatment group producers (185 total treatment participants), and 23 percent for control group producers (62 total control participants). Means are not adjusted to reflect baseline differences.

Handicraft income findings. To further analyze handicraft income findings, we classified treatment group and control group artisans as either participants or non-participants (identical to the employment analysis above). The goal of this exercise was to determine whether participants' handicraft income differed from that of non-participants, despite our key finding no positive impact of PBS assistance on net handicraft income from 2010 to 2012.

During the full follow-up period, it appears that PBS participants (regardless of whether they were in treatment or control) had similar trajectories of net handicraft income, and non-participants had similar trajectories (regardless of whether they were in treatment or control). Despite the lack of positive impacts on net handicraft income in any year, an examination of unadjusted means shows that in 2010 in particular, treatment group participants had higher net incomes than treatment group non-participants, and control group participants had higher net incomes than control group non-participants. However, by 2011 and 2012, participants and non-participants in both groups tended to have similar net incomes. (Figure C.2) These findings do not mean that Phase I assistance to artisans had a positive impact, as participants in both treatment and control groups may have had more resources or motivation than non-participants. However, the correlation between Phase I participation and increased income could reflect some positive effects of assistance provided by Aid to Artisans from late 2009 to mid-2010.

Figure C.2. Average Net Handicraft Income Over Time, by Treatment and Participation (in U.S. Dollars)



Source: Baseline and Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

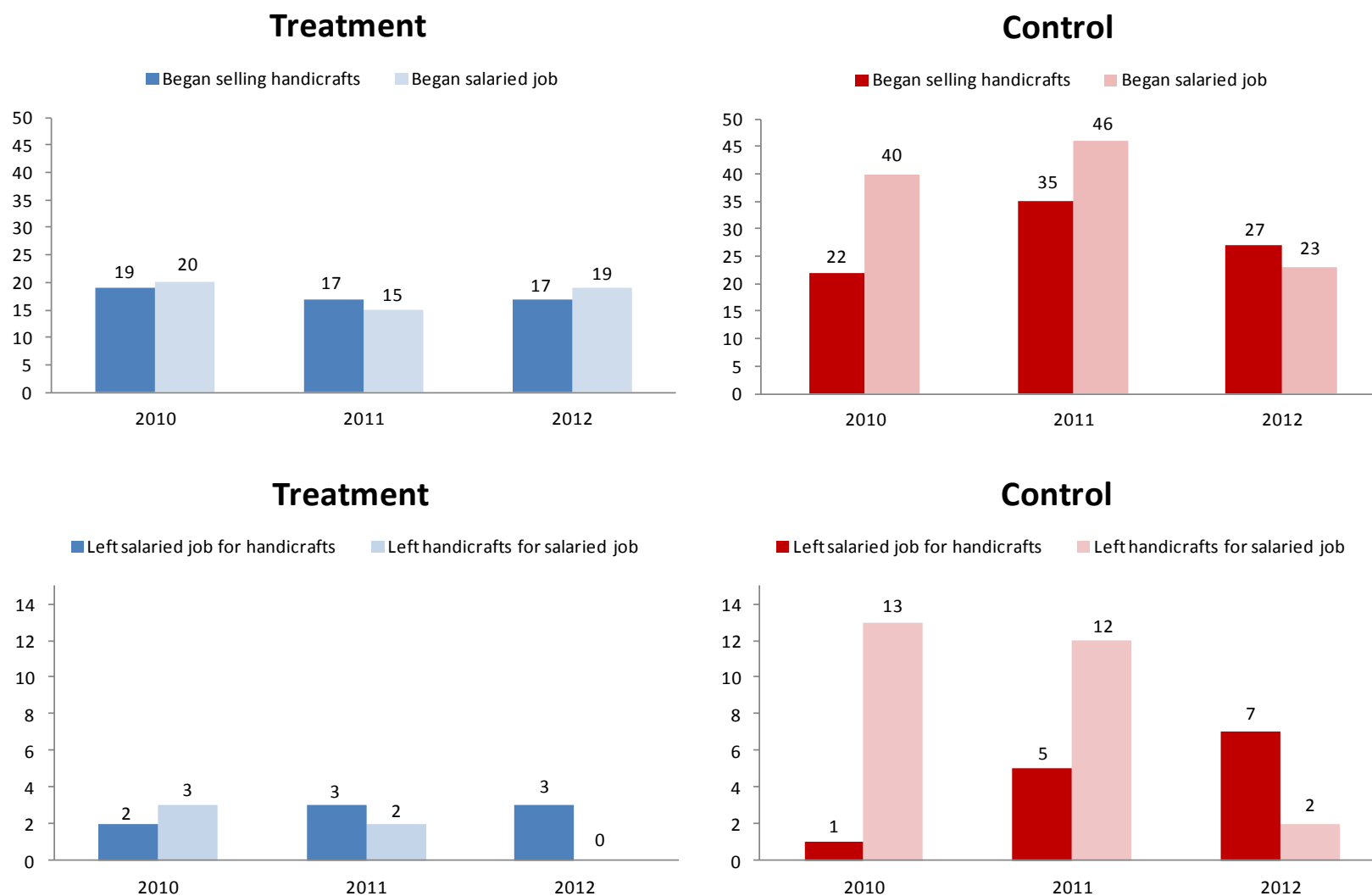
Note: Participation (in either Phase) was 68 percent for treatment group producers (185 total treatment participants), and 23 percent for control group producers (62 total control participants). Means are not adjusted to reflect baseline differences.

Transitions to and from Handicrafts. Given the two primary impacts of PBS assistance—the positive impact on artisans’ decisions to make and sell handicrafts, and the negative impact on artisans’ salaried income—we explored the extent to which artisans transitioned from selling handicrafts to obtaining a salaried (non-handicraft) position, and vice versa. We found that during the first two years of PBS assistance, a total of 37 artisans in the treatment group (14 percent) reported a salaried job that they did not report the previous year. However, during the same time period, 86 artisans in the control group (32 percent) reported a salaried job that they did not report in the previous year (see Figure C.3). During 2010 and 2011, 25 of these 86 artisans in the control group—29 percent of those that began a salaried job during these two years—reported that they stopped selling handicrafts since the previous year. In contrast, only 5 treatment artisans reported beginning a salaried job and ceasing handicraft sales in the same period.

These findings provide some context for impact estimates presented above. As artisans in the control group transitioned into salaried employment at much higher rates than artisans in the treatment group—often ceasing handicraft activities in the process—their income from salaried income grew relative to artisans in the treatment group. The lower number of treatment group artisans that transitioned out of selling handicrafts (and into salaried positions) relative to control group artisans suggest that the PBS intervention influenced artisans to continue working in the sector, despite potential opportunities for salaried, non-handicraft positions.²⁴

²⁴ In additional exploratory analyses, we confirmed that artisans transitioning from handicrafts to salaried positions were well distributed across municipalities in the evaluation. Their even distribution across nearly all municipalities in the evaluation provides further evidence in support of attributing their behavior to the intervention, as opposed to economic opportunities in a specific municipality or region that were unrelated to the intervention.

Figure C.3. Transitions to and from Handicraft Sales and Salaried Jobs (Number of Individuals, by Treatment Group)



Source: Baseline and Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

Note: Participation (in either Phase) was 68 percent for treatment group producers (185 total treatment participants), and 23 percent for control group producers (62 total control participants). Means are not adjusted to reflect baseline differences.

APPENDIX D

COMPARISON OF PBS PARTICIPATION RATES

According to Chemonics administrative records, 224 (or 78 percent) of the 337 artisans in the treatment group received at least one training session or technical assistance visit over the three-year evaluation period. However, according to self-reported participation data, 196 (or 68 percent) of artisans in the treatment group received assistance (Table D.1). When we combine these self-reports and administrative data, 171 (or 58 percent) of artisans in the treatment group reported receiving assistance, and their report was corroborated by Chemonics administrative records.

Table D.1. Comparison of Participation Rates, PBS Handicrafts Assistance: 2009-2012

		Treatment	Control
Self-Reports	N	196	63
	%	68	21
Chemonics Data	N	224	4
	%	78	1
Combined: Self-Reports and Chemonics Data	N	171	4
	%	59	1
Producers in the Analysis Sample		289	298

Because it is unclear which of these participation rates is most accurate, we ran a sensitivity analysis of treatment-on-the-treated (TOT) estimates using all three definitions of participation: (1) self-reports—see Table D.2, (2) Chemonics reports—see Table D.3, and (3) self-reports corroborated by Chemonics reports—see Table D.4. As shown below, these alternate definitions of participation do not alter findings significantly, in that the positive impact of PBS on employment creation in 2010 and the negative impact of PBS on artisans' salaried income in 2011 and 2012 and net household income in 2011 is present using all three definitions of participation. However, the positive impact of PBS assistance on employment generation in 2010 is largest (0.33 FTEs versus 0.24 and 0.18 in the other analyses) when we define participation according to respondents' self-reports. Similarly, the negative impact of PBS on household income is largest (a loss of over 1,600 versus losses of 870 and 1,140 in the other analyses) when we define participation according to self-reports. This trend is also true for negative impacts on salaried income in 2011 and 2012.

Another minor difference between these three models is that after remittances and other transfers are excluded from household income, the negative impact of PBS assistance on household income is not present when we define participants using Chemonics data, either as the sole determinant of participation or in combination with self-reports.

Table D.2. Main TOT Results Using Self-Reported Participation

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Individuals						
Annual Handicraft Investments and Input Costs	211	0.54	211	0.51	-70	0.84
Number of Annual Full-time Equivalent Jobs Generated in Handicrafts	0.33	<0.01	0.27	0.25	-0.04	0.78
Annual Net Handicraft Income	142	0.70	-202	0.51	12	0.96
Annual Net Salaried Income	-80	0.66	-452	0.01	-420	<0.01
Households						
Net Household Income	-252	0.80	-1,655	<0.01	-607	0.42
Net Household Income (Excluding Remittances and other Transfers)	-451	0.60	-1,087	0.04	-405	0.54
Household Consumption	-86	0.83	46	0.92	835	0.15

Source: Baseline and Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 68 percent for treatment group artisans (196 of 289), and 21 percent for control group artisans (63 of 298). Statistically significant findings at 5 percent are marked with an asterisk.

Table D.3. TOT Results Using Chemonics' Account of Participation

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Individuals						
Annual Handicraft Investments and Input Costs	118	0.53	117	0.50	-39	0.84
Number of Annual Full-time Equivalent Jobs Generated in Handicrafts	0.18	<0.01	0.15	0.23	-0.02	0.79
Annual Net Handicraft Income	80	0.70	-114	0.50	7	0.96
Annual Net Salaried Income	-46	0.67	-252	0.03	-235	<0.01
Households						
Net Household Income	-136	0.81	-884	0.01	-323	0.42
Net Household Income (Excluding Remittances and other Transfers)	-242	0.62	-580	0.08	-216	0.54
Household Consumption	-46	0.83	24	0.92	447	0.12

Source: Baseline and Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 78 percent for treatment group artisans (224 of 289), and 1 percent for control group artisans (4 of 298). Statistically significant impacts at 5 percent are in bold.

Table D.4. TOT Results Using Self-Reports and Chemonics Data to Define Participation

	2010		2011		2012	
	Impact	p-value	Impact	p-value	Impact	p-value
Individuals						
Annual Handicraft Investments and Input Costs	155	0.54	156	0.51	-52	0.84
Number of Annual Full-time Equivalent Jobs Generated in Handicrafts	0.24	<0.01	0.20	0.26	-0.03	0.79
Annual Net Handicraft Income	106	0.71	-148	0.51	9	0.96
Annual Net Salaried Income	-60	0.67	-334	0.03	-310	<0.01
Households						
Net Household Income	-177	0.81	-1,157	0.01	-423	0.41
Net Household Income (Excluding Remittances and other Transfers)	-317	0.61	-760	0.07	-282	0.54
Household Consumption	-59	0.83	33	0.92	582	0.13

Source: Baseline and Follow-up Productive Development Survey-Handicrafts (PDS-H) interviews conducted from October 2009 to August 2012.

Notes: Estimates reflect treatment-control differences at all follow-up periods, after controlling for baseline differences. All values have been adjusted to 2012 dollars in El Salvador using World Bank inflation indices (<http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>). Participation (in either phase) was 58 percent for treatment group artisans (168 of 289), and 1 percent for control group artisans (4 of 298). Statistically significant impacts at 5 percent are in bold.