PTTA impact evaluation in the Northeast

Smart subsidy programs have been advocated in number of developing countries to increase the adoption of modern inputs and increase agricultural productivity. Evidence from Sub-Saharan Africa has shown that one-time targeted subsidies can be effective at increasing adoption of fertilizer and increase agricultural productivity (Carter, Laajaj and Yang, 2015). The PTTA program in Haiti similarly provides subsidies for modern inputs, by providing vouchers for certain labor tasks, fertilizer, and pesticides. A randomized evaluation was built into the PTTA program for rice farmers in the Northeast of Haiti. In the fall of 2013, 521 households from 39 habitations were identified as eligible to receive rice vouchers. 16 of these habitations were randomly selected in an early-treatment group, and eligible farmers in these habitations received vouchers in 2014. Eligible farmers in the control habitations were to receive vouchers after the August 2015 survey. Many of the selected farmers already used fertilizer and pesticide without subsidies, and seem to do so in part by taking loans, often from traders or informal sources.

This note reports preliminary results of the short-and medium term impacts of the voucher distribution. It is based on data collected right after the 2014 agricultural seasons (during which the early treatment group received vouchers), and data collected in August 2015, capturing one-to-two seasons in which the early treatment no longer had subsidies, while the control group had not yet received the transfers. Both 2014 and 2015 were years in which many of the farmers were facing drought conditions. Building on the baseline that was conducted in fall 2013, and on the randomized assignment, we derive lessons both about the immediate impact during the year farmers were benefitting from the subsidy, and the impact one year after receiving subsidies. Almost all farmers could be re-interviewed during the two follow-up surveys; 87% of all early treatment farmers reported receiving transfers, while only 3 farmers in the control reported receiving vouchers. We hence can interpret the differences between the treatment and the control households at follow-ups as program impacts.[2]

We start by considering rice productivity. Figure 1 shows that treatment farmers did not achieve higher yields on their rice plots than control farmers in the year they received the vouchers (2014). The average yield for treatment farmers was less than yield in control, though this difference is not significant. The impact on the total value of rice production is negative and significant in 2014. Rice yields and production values for farmers in the treatment group are also significantly lower in 2015 than in control, which reflects seasons where they did not receive vouchers, and this difference is significant. The 2015 result in part reflects that not all households had harvested yet by the time of the survey. We therefore also report results for only plots that were planted early in 2015 (the 1st completed season), and find decreased yields for these plots as well. These results are robust to a variety of specifications.

[2] Except otherwise noted, estimates present ITT results on all eligible households, including those not producing rice (as the decision to produce rice itself is endogenous to treatment assignment). All

Figure 1: Rice Yields and Rice Production Values

See footnote 2 for graph interpretation. 2014 and 2015 yield outcomes shown here can be interpreted as householdǃă average yield per season. They are total rice harvested per year over total area used for rice, where if the same plot is used in two seasons, its area is included twice in the denominator. Where K2dzăŜK2ťŘă LJNJl·ǑůʎǑŜ ǻNJŜů2ƴƴƐΣ 2NJ Ɣdzťůʎ LJťŜ Kl·NJØŜăůă ŦNJ2Ɣ ůKŜ ăl·ƔŜ ăŜŜŘăΣ ůKŜ LJť2ů l·NJŜl· ʎă l·ťă2 ʎƴǑťdzŘŜŘ ůøʎǑŜ ʎƴ ůKŜ denominator. Yields are only defined for rice growers. First season 2015 only includes households (310) that had a completed season of rice (harvested or lost, not including entirely lost seedbeds) by the time of the August 2015 survey. Rice production values are defined for all farmers, except for the first season of 2015.

ϞFirst season 2015 does not control for baseline outcomes.

What can explain this unexpected decrease in productivity? The reasons are undoubtedly diverse, but considering the impacts on input use can provide part of the explanation. Figure 2 shows that the program led to a significant decrease in the amount of fertilizer

Importantly, household agricultural profits (for rice cultivation) do not show the same negative impact as found for yields or production values. When considering the value of the vouchers as spending, profits are unchanged in 2014. When the vouchers used are not counted as spending, there is a positive impact on nominal profits in 2014 as inputs were provided for free, though this positive impact in profit is smaller than the value of the vouchers.

Figure 4: Rice Profits

See footnote 2 for graph interpretation. 2014 profits include all costs incurred during the survey period and is defined for all farmers. First season 2015 only includes households (310) that had a completed season of rice (harvested or lost, not including entirely lost seedbeds) by the time of the August 2015 survey.

½2014 with voucher value not included and 1st completed season in 2014 do not control for baseline outcomes.

The weather context in both years is important to understand these results. First, because of the adverse drought conditions in the beginning of 2014, the program decided to delay most of the voucher distribution. Possibly as a result, the treatment farmers on average planted about 20 days later than the control farmers, implying that weather shocks may have affected their crops differently. Treatment farmers are indeed more likely to report crop losses due to drought. Overall, drought conditions were bad for many farmers, and under those conditions, lower input use might well have been perceived by treatment farmers to have been a good strategy. This could explain why they persist in taking less loans and using less inputs the year after the voucher distribution. In addition, in 2015 treatment farmers seem to have shifted to plots with less reliable water access. This is consistent with lowered fertilizer use, as water and fertilizer are complimentary inputs. Indeed 2015, was another year with unreliable rainfall, resulting in low profits for both treatment and control farmers, but no significant differences between them. While we do not observe any clear impacts on other welfare indicators, there are notably positive

Figure 5: Opinion of Government

See footnote 2 for graph interpretation. Trust levels as ǁĤăǇƶƴãĤă ǘƶ ǘKĤ Ĳdzĥăǘƛƶƴ́ ά ² KI·ǘ fĤØĤf ƶŦ ǘǁdzăǘкŎƶƴŦƛŘĤƴŎĤ Řƶ èƶdz KI·ØĤ ƛƴ́ ǘKĤ ƎƶØĤǁƴƳĤƴǘкƳ ƛƴƛăǘǁè ƶŦ I·ƎǁƛŎdzfǘdzǁĤKέ DƶØĤǁƴƳĤƴǘ ĤØI·fdzI·ǘƛƶƴ ƛndex constructed based on the answers to 7 questions concerning the role of government.
Does not control for baseline outcomes.

Overall, these results, while still preliminary, suggest important lessons for PTTA and related programs. In contrast with smart subsidy programs in Sub-Saharan Africa where subsidies allow farmers to learn and adopt new technologies, the PTTA subsidies in the Northeast were for inputs that were already widely used. The subsidies instead may have allowed farmers to shift to a new lower-intensive equilibrium, paying off their loans and taking less new ones, while using less fertilizer. Given the high risk related to rain-fed agriculture, this may well be an optimal strategy. A possible implication is that annual rain-fed crops in Haiti might not be the ideal focus area for a smart subsidy program, in particular if the objective is to increase yields. This likely holds especially for crops for which farmers are already using key inputs (as was the case for rice), as the vouchers may just serve to substitute for other forms of financing. This