Impact of VietGAP Tea Production on Farmers’ Income in Northern Vietnam

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I Introduction

Tea production is one of economically commercial crops of Vietnam. Pesticide and chemical components has been popularly used to protect the crop. Particularly pesticide is more highly applied in production of fruits and leaf-oriented crops like vegetable, tea which are main food and daily drinking of people. High intake of chemical compound residues in consumed food was reported in Vietnam (Kuruthachalam et al., 1992; Jansen et al., 1996). In response to the recent concerns about human health, ecosystem sustainability and thus demands for food safety, production of clean produce, particularly daily-consumed foods, is essential. Tea production using Vietnamese Good Agricultural Practices (VietGAP) has been strongly encouraged to improve its quality and safety since 2009. In fact, economic advantage of this tea practice is still controversial with different reports from organizations and production areas. Therefore, this study was conducted to analyze impact of VietGAP tea production on farmer’s income and what are its determinants.

II Methods and materials

Farm-level data was essential in the study and collected by interviewing tea farmers based on structured questionnaires that were strictly constructed. A total sample of 326 farmers were selected in study area, including 116 VietGAP and 210 conventional tea farmers. Following Fischer & Qaim (2012), a farmer’s decision to adopt one tea production can be analyzed in a random utility framework. Measuring the direct effects of treatment using OLS regression has not overcome issue of self-selection which can lead to biased result estimation (Wang et al., 2014). Thus, the propensity score matching (PSM) is developed to reduce the dimension by similarly matching participants and non-participants in terms of their observable features (Imbens 2004). PSM is a two-step mathematic procedure. The first step is to estimate the farmer’s propensity score. In the second step, tea farmers with similar propensity score between groups are matched to estimate the average treatment effect for the treated (ATT).

III Results and discussion

Descriptive statistics reveal that there appears to be differences in tea yield, sale price, total revenue and tea income between two tea production groups. Adoption of VietGAP standards has positive effects on tea production. Conversely, adopters also spent more total production cost than conventional tea farmers. The matching process is conducted by specification of the propensity scores for the treatment variable. The logit model was used to predict the probability of adopting VietGAP standards for tea farms.
### Table 1. Estimation of average treatment effects on the treated

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>ATT</th>
<th>ATU</th>
<th>ATE</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tea yield</td>
<td>935.78*</td>
<td>513.67</td>
<td>663.86</td>
<td>2.75</td>
</tr>
<tr>
<td>Total revenue</td>
<td>50658.84***</td>
<td>40046.48</td>
<td>43822.66</td>
<td>4.52</td>
</tr>
<tr>
<td>Total cost</td>
<td>12210.58***</td>
<td>7605.41</td>
<td>9244.05</td>
<td>3.16</td>
</tr>
<tr>
<td>Tea income</td>
<td>38448.32***</td>
<td>32441.06</td>
<td>34578.61</td>
<td>3.72</td>
</tr>
</tbody>
</table>

Note: "***", "," and "*" denote significance at the 1%, 5% and 10%, respectively.

Source: Author’s surveyed data

The result of the estimated effect of nearest neighbor matching method for VietGAP tea farmers is significantly positive, with a difference of about 38.4 mil.vnd for tea income. Higher yield and selling price of the tea product are attributed higher income of VietGAP tea farmers. The result is in line with study of Islam et al., (2012). The study also reports the estimation of average treatment effect (ATE) and average treatment effect on the untreated (ATU). Of which the ATE is the average effect, at the population level, of moving an entire population from conventional tea farm to VietGAP tea farms. And ATU measures the impact that the program would have had on those who did not participate in this tea production program. The results reveal the economic benefits achieved by farmers adopting those standards for their tea farms compared to those practicing conventional tea production. Taking the test of matching quality indicates that there are not systematical and significant differences between VietGAP and conventional tea farmers after matching. Moreover, test of matching quality for Overlap condition is also met. In short, matching quality is adequately accepted.

### IV Conclusion

This study is the first effort toward providing insight into economic performance of VietGAP tea farmers using robust econometric method with correction of selection bias. The study result demonstrates the positive impact of tea production following VietGAP standards on total revenue, tea income compared to conventional tea farms with the same quality characteristics. This can be considered as the opportunity cost of conventional tea farms. The better price and tea yield are attributed to higher income of adopters. The findings of the study suggest that the effect of tea farmers’ knowledge about VietGAP production supported the need for technical training courses through extension services. Thus, gaining financial support and funding sources should be given further attention in order to deliver such training for promoting production conversion process.

### References


