Thesis: Impact of Production Support on Farm Performance: A Case of Ghana's Agricultural Support Programme

Author: Ing. Sylvester Amoako Agyemang

Reviewer: prof. Ing. Lukáš Čechura, Ph.D.

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The thesis deals with an interesting and up-to-date topic when taking into consideration both economic as well as environmental dimension of the agricultural production in relation to agricultural support programme. In particular, the objective of the thesis is to analyse the impact of agricultural production support on farm performance and its subsequent role in the sustainable development of agriculture, using Ghana's planting for food and jobs programme, integrated with extension services and sustainable agricultural practices (SAP) adoption. The objective is well set up and justified based on both literature review as well as empirical results. Moreover, the thesis does not miss empirical soundness by providing estimates of the effect of the level of production support on agricultural production outcomes and the potential heterogeneity of production support effects in relation to farm size and using the GPS matching technique. Another empirical contribution might be the results on the effect of corruption perception and other drivers on farmers' decisions to participate in production support programmes.

The structure of the thesis meets the requirements of such type of the study. The thesis consists of eleven sections including References and Appendices and has 208 pages. The first chapter provides a brief introduction into the study topic. The second chapter contains literature review. The literature review attempts to cover all relevant topics as a theoretical background for empirical analysis. It deals with production support programmes, determinants of farmers" participation in production support programmes, effect of production support on adoption of sustainable agricultural practices and effect of production support on farm performance. While the main topics are covered the discussion of the respective problems is limited (see my specific comments).

The third section provide study background. Both chapters, 3.1 and 3.2, are very well described and contain sufficient information about the historical perspective and PFJ programme.

The fourth section presents objectives and research hypotheses. The main as well as specific objectives are concise but written clearly. Similar can be said about hypotheses. I would only recommend reformulating specific objective c) and hypotheses H3 and H4 (see my specific comments).

The fifth section is devoted to methodology. It introduces the conceptual framework, study area, data, models and techniques employed in empirical analysis (Logistic regression, Poisson regression and generalized propensity score (GPS) matching techniques). The description has a good quality, however, there are parts to be improved and/or amended (see again my specific comments).

The sixth section presents empirical results. First, it provides descriptive analysis of employed variables. Then, it presents the results of Logistic regression, Poisson regression and GPS matching techniques. GPS can be regarded at the most interesting part of the results. In general, the results are well described, however, I miss the derivation of implications from obtained results.

The next sections provide discussion, conclusions and policy recommendations. The discussion is comprehensive and detail enough. Conclusions offer the summary of main findings with relation to the objectives. This section is very well structured and provides very good overview of the thesis. I also appreciate the section on policy recommendations and especially the section on study limitations.

The final sections contain references, list of author's scientific contributions and appendices. The list of author's scientific contributions provides the evidence on the acceptance of the results in refereed international journals.

This being said, I have several specific comments/questions:

(i) Literature review:

a. 2.1.1 – I would not call this section Introduction. You use it for the first chapter.
b. Section 2.1.2 - *Why are production supports necessary?* – in this chapter I would recommend not only to highlight or discuss the positive effects of the support but also negative ones. In this respect the title of this subsection should be changed accordingly.

c. Sections 2.2 and 2.3 – only limited discussion is provided.

d. Sub-section 2.4.1 and 2.4.2 - why are these sub-sections separated? Efficiency of input use is one source of productivity growth. The title should be change being clear that it relates to total agricultural productivity. Moreover, the current content of these chapters is not consistent. I would recommend providing micro- and macro (sector) – perspective or write it in subsections. Moreover, providing international perspective of the effects of production supports would be fruitful.

(ii) Objectives and hypotheses:

a. I recommend reformulating objective c) in the part related to the amount of the input use. First, it should be use quantity measure. Second, production inputs include not only seed and fertilizer.

b. The formulation of H3 asks for improvement. In particular, H3b is relevant only if H3a is not rejected.

c. H4: the hypothesis should not be formulated in negative manner

(iii) Methodology:

a. Section 5.1: Figure 4 – I would not mix the drivers and indicators with methods/models without clear distinction that methods/models serve as a tool for measuring the effects of drivers on the indicators.

b. Statement: "Our analyses are based on three approaches: i) logistic regression ii) Poisson regression and iii) generalized propensity score matching designed to test three hypotheses (see Fig. 4)."

    i. the description should be improved – Figure 4 does not explicitly contain hypotheses. There are in the previous section. Moreover, there are 4 hypotheses.

c. Statement: "…two structural models (i.e., logistic and Poisson regressions)…"

    i. Logistic and Poisson regressions are not structural models. Please, do not use the word structural.

d. As far as the representativeness of data is concerned, you should provide detail information about the representativeness. Do you use 5 or 10% significance level?

e. Section 5.4 – Logistic regression - the model description should already contain how the variable are measured, if it is called empirical model. In this respect, Yi represents the situation whether the farmer participates or not. It is not the probability of a farmer participating in the PFJ programme. This probability is

estimated. If you want to write it as a probability you have to specify it in another way around.

f. Section 5.4 – Logistic regression – description is too concise in comparison to GPS. E.g. calculation of AME is missing.
g. For both Logistic and Poison regressions you should specify the assumptions/properties of the error term.
h. Eq. 9: *i* should be a subscript. Then, I would not use subscripts for beta but different letters.
i. Please, check equations 11 and 12 and correct notations.
j. 5.5.3. Control variables – shall be renamed to covariates.

(iv) Results:

a. Section 6.1: shall be in the section 5.5 or use different name of the section.
b. Section 6.2: I recommend always using significance level not only level. Table 10 – when p-value is provided for coefficients, it would be good to do the same for MEs.
c. For all models: You should derive implications and better interpret the results.
d. Use the distinction between the average and marginal productivity in the comments. It is not treated well.
e. On the other hand, the findings are very interesting with (potentially) strong policy impact. Thus, the study does not miss empirical soundness.

In general, the thesis is very well written and provides new empirical findings as well as advances. The author proofed very good theoretical background and skills in empirical analysis. That is why I believe that Ing. Sylvester Amoako Agyemang is a good candidate for: "Ph.D." and I recommend the thesis for the final defence.

Questions:

(i) With respect to the difficulties you encountered during the survey do you think that the groups of beneficiaries and non-beneficiaries are comparable with respect to their behaviour (production process, market, …)?

(ii) How did you measure marginal productivity? Why did you miss capital (as an important production factor)? Why did not you use TFP (total factor productivity) as the most comprehensive measure of productivity?

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prof. Ing. Lukáš Čechura, Ph.D.

Czech University of Life Sciences Prague