

Report on Bachelor / Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

Student:	David Valenta
Advisor:	Petr Janský Ph.D.
Title of the thesis:	Determinants of Technical Efficiency and its Change among Ghanaian Cocoa Farmers

OVERALL ASSESSMENT:

The thesis is devoted to an extensive empirical analysis of efficiency of cocoa farmers in Ghana. After short Introduction, Chapter 2 presents background of cocoa production in Ghana, review of relevant empirical literature and details about data origin. Chapter 3 is devoted to description of methodology. Findings of the thesis are described in Chapters 4 and 5. First, main characteristics of the data are presented and discussed. After that, main results of the empirical analysis of farmers' efficiency are thoroughly described and commented.

The thesis assesses three separate issues concerning the efficiency of cocoa farmers. First, it calculates technical efficiency of individual farmers using output-oriented variable returns to scale data envelopment analysis (DEA) and searches for determinants of the technical efficiency using Tobit regression. Second, it analyses determinants of change in the technical efficiency. Finally, it evaluates scale efficiency and its determinants. The last two parts of the analysis use OLS regression. The chosen methodological approach is definitely legitimate.

The thesis is well structured and its findings might be quite helpful for enhancement of productivity of agriculture-oriented economies of developing world in general, not only in Ghana. There, I see the main and valuable contribution of the thesis. Even though, I have following concerns about concrete details of the thesis:

- The Introduction and the part of the Chapter 2 devoted to thematic background are quite brief. I would prefer broader description of farming practices and typical life conditions of cocoa producers in Ghana, as it would increase possibility of critical discussion and interpretation of results gained by the empirical analysis. Exactly this background information is generally not known to average reader. For example, the thesis several times argue by the time needed for a cocoa tree to bear fruit. It would be valuable to mention that it needs on average 6 years to mature and then yields for other 25-35 years. This itself explains why any investment in new cocoa fields cannot increase efficiency within the time span of the study (2004-2010).
- I find the discussion of possible bias of the results (p. 16) confusing. It is not explained why the noise in the data should cause significant downward bias and upward bias only in individual cases. Coelli et al. (2005), who are cited by the thesis with respect to the mentioned statement, discusses the issue of bias in case of noise in data on p. 202-203 and state that an upward bias characteristic for the DEA method by its definition could be exceeded by the effect of random noise and thus turned into opposite direction. This however does not mean that the bias from noisy data is generally supposed to be downward, only that it can be such.
- I also find the claim of the thesis that the difference in average age of the male and female farmers "could be caused (...) by the gender differences" (p. 22) too vague. I would like to know which ones concretely the author has in mind.
- Concerning the finding of the thesis that "The variance in efficiency change in our sample is in general higher than we would expect, and it could suggest the farmers' efficiency is not very stable for particular individuals over time, which could be quite important phenomenon." (p. 35) I would be more cautious. Taking into account problematic nature of the dataset, especially changes in questions asked (p. 4), I would attribute the changes more to this fact.
- Wrong interpretation of the results occurs on p. 41, where the thesis claims that "findings suggest farms using replanting are more efficient than the one buying the seeds." The Table 5.5 however shows that the effect of variable *seeds – replacing share* is positive and significant. Based on this, I would suppose that higher replacing of own seeds by bought ones leads to increase in technical efficiency. The opposite of what the thesis claims.

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- Regarding the effect of the *age of trees* variable, I would propose to include also the quadratic form of the variable into the regression model, as I would suppose this to fit better the reality.
- Concerning the finding of the thesis that the effect of investment into children's education on efficiency is negative, I would point out that except of the two explanations proposed by the author (that farmers maybe "have fewer resources available for cocoa production or (...), they might give less importance to it", p. 44) investment in education can be seen also as investment in future effectiveness of cocoa production, as the thesis itself has found significant and positive effect of education on technical efficiency (p. 39).
- More generally, the thesis has found no or negative effect of investment in expansion of the farm, in other land or in children education. However, this is not surprising as returns on such kinds of investment cannot be gained within the time span of the dataset used for the analysis. This fact should be mentioned in the thesis when discussing given results.
- As regards the analysis of the scale efficiency of cocoa producers, I miss any kind of reasoning why factors of production are included into regression model in such a specific form (except of the variable itself also its quadratic and logarithmic values).
- In the Conclusion, there is no comment on the results of the third part of the analysis (scale efficiency). As this assessment is declared in the Introduction as one of the aims of the thesis, absence of any notion about obtained results in the Conclusion should be thought as a flaw.

Finally, as the main drawback of the thesis I see insufficient level of English and quite large number of typing errors in the text. Sometimes it is hard to find out what the author wanted to express. Proofreading before submission of the thesis would have been beneficial.

Suggested question for the defence is:

- Did you think about adding interaction variable *female*education* into your regressions to see what is the exact effect of women's education? Why, or why not? What effect would you expect for it and how do you think the results for these two individual variables would change?

In case of successful defence, I recommend "velmi dobře" (good, 2).

SUMMARY OF POINTS AWARDED:

CATEGORY	POINTS
Literature (max. 20 points)	20
Methods (max. 30 points)	25
Contribution (max. 30 points)	23
Manuscript Form (max. 20 points)	10
TOTAL POINTS (max. 100 points)	78
GRADE (1 - 2 - 3 - 4)	2

NAME OF THE REFEREE: Mgr. Pavla Břizová

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Referee Signature