UNDERSTANDING GLOBAL AGRICULTURE THROUGH *AGRI BENCHMARK*

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Background

Global agricultural production is the result of millions of farmers' decisions on what type of product they produce and how. Hence, understanding economic conditions and options available to farmers is a prerequisite to understanding global agriculture. Detailed knowledge of the profitability of production for individual crops and livestock products is an important ingredient. But when it comes to assessing possible structural change within a country between different farming systems or products (e.g. beef vs. crops; corn vs. wheat) a detailed understanding of the profitability of individual products alone will not allow for a realistic projection; the reason being that the system "farm" is rather complex. Assuming there is an increase in relative output prices for a certain commodity, farmers are faced with the following options in order to react:

- *Depending on the current status of production systems, there may be room for an increase in input usage leading to a growth in supply.*
- *A shift from extensive crops such as barley to a more intensive crop such as corn can become a viable option. However, this shift itself is subject to non-linearity because there may be an interaction between crops leading to non-monetary effects.*
- *Farmers can move from one production system (in terms of economic theory: production function) to another.*

Against this background it becomes obvious that a detailed understanding of the options for and determinants of farmers' decision-making is key to understanding the future of global agriculture. Forecasting based on previous trends and farmers' reactions to market signals very often will not yield meaningful results. This is particularly true in a situation where major commodity prices increased by 100 % and more compared to the pre-boom period before 2008.

Objectives

Based on case studies the presentation attempts to illustrate the value of agri benchmark in understanding global agriculture and its perspectives. One case study will look at economics of the EU sugar beet production in a more liberalized environment; the other will analyze the perspectives of beef production in Latin America. Finally, the competitiveness of Kazakhstan as a global player in legumes will be looked at.

What is agri benchmark?

The key idea of agri benchmark is to combine farm production system data with site specific expertise of producers and advisors on a global scale. Data collection is based on so-called "typical farms" which are case studies. They are established by production economists in regional hot spots for a certain product. Detailed figures on quantities and prices for variable inputs, land, machinery and labor describe the prevailing production system in a region which is the origin of a major share of the national output in a given agricultural product.

Respective farm data is validated in so-called "focus groups" which consist of growers who run a farm similar to the stylized typical farm and a regional advisor. However, focus groups are not only used to explore the status quo but also to identify and validate options for future changes in the farming system and outputs.

Main findings

The case study on indifference prices for EU sugar beets farmers regarding EU sugar production is yielding the following conclusions:

- *Taking into account rotational effects leads to a significant increase in indifference prices for sugar beets. That means any forecast about future sugar beet production which does includes rotational effects will systematically be too optimistic as far as the competitiveness of sugar beets goes.*
- *Depending on the region, the gap between the two indifference prices differs quite a bit.*

- *When comparing the conclusion that would be drawn from the analysis without rotational effects with the one including them, it appears that the former concept would suggest that in all relevant German sugar beet regions, a relatively low and uniform sugar price of about 25 €/t is needed in order to keep beets in the game. From the latter approach one would conclude that in general, much higher sugar beet prices of about 30 €/t are needed to sustain beet production*

From the case study on perspectives in Latin American beef production the following conclusion can be drawn:

- *Changing economic framework conditions such as high grain prices and hence high opportunity cost for land are creating a whole set of new options for farmers which will change incentives and drivers fundamentally.*
- *Those new options are neither obvious nor can they be explored through existing data, be it statistics or cost of production figures.*
- *Rather, those new options can only become transparent to the public through analysis which involves in-depth cooperation with farmers and advisors.*
- *The realization of those new options does not only change the input side, but at the same time and in various ways it has an impact on the output side. One might even argue that "new" products in terms of meat types (more marbling) will be on offer. Those changes will therefore also affect revenues, which is why just looking at the cost side of any of those changes may be totally misleading.*
- *Given the strong increase in productivity figures which can be achieved through the new production systems it is by no means obvious that the overall cost of beef production will change much.*
- *Furthermore, given the high importance of purchased feed cost in the feedlot system, it is likely that future beef production in Latin America will be tied much closer to global grain prices than it used to be.*

Finally, the analysis of the economics of legume production in Kazakhstan generates the subsequent outcomes:

- *Typical agri benchmark farm data from Kazakhstan reveals that indeed legumes which tend to be low yielding do compete very well in an economic environment which is created by low grain yields in Kazakhstan.*
- *Not only on-farm competitiveness of legumes tends to be high, also when comparing cost of production to those in the leading exporting country Canada one can conclude a rather promising potential for Kazakhstan.*

Conclusions

1. *With regard to the design of agricultural economic research on future development of global agriculture, the following conclusions can be drawn from the three case studies:*
2. *At least in the two cases on beef and sugar beet presented here, the complexity of structural change is rather high. An attempt to make projections derived from previous trends alone will most likely not yield realistic outcomes.*
3. *The agri benchmark concept allows the disclosure of the complexity of farm economics and farmer's decision making and the drawing of meaningful conclusions about future trends and changes in agricultural production. The building blocks for the concept are production system based farm data from typical farms and the involvement of farmers and advisors for exploring likely future changes.*
4. *In order to assess the international competitiveness of farms and products, cost of production as well as transport and logistics cost have to be generated and analyzed. In the framework of a case study on Brazilian soy exports a first approach to capture transport and logistics was developed and successfully tested.*
5. *Global projections on future agricultural production and trade can of course not be made by agri benchmark alone, cooperation with market modeling is highly advisable.*