
Data: Can we use it to address Food Security?

Global country risks, weather uncertainty, crop failure, lack of hedging instruments, increased capital costs, lack of insurance mechanisms, and logistical bottlenecks are just a few of the issues that cause volatility in agricultural commodity prices. This volatility, combined with a steady increase in demand for food around the world, has led us to accept that Food Security is a National Issue without borders.

From a food demand standpoint, there are two key changes happening. First, more people are coming out of poverty in various parts of the world, creating a demand led by an associated income effect. Second, an increasing population is driving up demand. On the supply front, while there have been improvements, the steadiness exhibited by the demand side has unfortunately seldom been complemented by the supply side. Invariably, there have also been a lot of supply shocks leading us to face the prospect of agricultural produce scarcity.

To address the issue above, governments have included Food Security on their national agendas and even created Sovereign Funds to invest in agricultural commodities. In my opinion, this hasn't yet provided a robust solution, as these investments thus far have mainly gone towards land ownership. For example, the Middle Eastern countries own considerable land in South America and in the Black Sea region. As we have observed, neither does land ownership guarantee actual supply of agricultural goods, nor is it the optimal decision for incentivizing growth in production. In short, capital allocation in this manner is relatively inefficient and can easily lead to inefficient future outcomes.

Data analytics can solve this inefficiency problem. A keen review of data can tell us what assets to invest in and where to invest, so that people can be secure in having food on their table and know in advance how much their meal is going to cost them.

To illustrate my point, let's take the example of bread and the Middle East. While bread is a staple food in the region, wheat is barely grown in that part of the world. The Middle East is a net importer of wheat, and it pays the world market prices to acquire wheat for bread production. As the Middle East is petroleum rich, it can afford to subsidize bread for its populations. To protect its interest in wheat, its national governments have many options, including: 1) getting into long-term wheat supply agreements with a producer, like USA/Russia/Ukraine, 2) buying arable land in South America to help secure wheat supply 3) owning ports and having control wheat distribution logistics. These are only some of the options at hand. In the current time, in order to make the best choice, the region would ideally need to employ a bit of clairvoyance given the opacity inherent in this type long-term strategy planning. Barring that ability, what the region needs to do is look into critical *data* surrounding each of these options and make a predictive model of possible outcomes to determine which of the options is most most suitable. In this model, the risks need to be quantified: risks associated with foreign policy decisions, for example can hurt wheat supply; yield reductions can increase prices and reduce wheat quality; improper logistics or a sudden increase of freight costs can hurt wheat purchases; and so on. Factoring all of these risks and making an optimal decision based on myriad data inputs would be inordinately time consuming using even an expert's brain, we can agree. And yet, human decisions, supported often with only heuristics, still drive the majority of these far-reaching food policy decisions today.

The power afforded by Data Analytics, as we have seen in other areas of policy and private sectors, can help solve the food security puzzle. In the case described above, we would take all of the data on wheat we have - historical yields, prices, protein quality, origins, freight charges, water content, and weather forecast, and generate probabilistic scenarios of where the wheat that the Middle East demands will be grown in the world with a high probability of good-yield, the best prices, and logistical advantage. Given this analytical output, decision-making for the governments becomes easier, and it is rooted in a *calculated* view of the future, with a greater confidence of prudent choice for investments in wheat origination.

If we now consider the whole world as a massive multiple of the wheat and Middle East scenario just discussed, it is clear the applications of data analytics in food security planning would have corresponding, positive multiplier effects on a global scale. We would reduce lead times, increase yields, decrease wasteful inventories, reduce volatility of prices and bring the food from the producer to the consumer in much more efficient manners.

An irony we face as a global community is that we have ample food in the world being produced, but unfortunately it still often does not reach the people who need it, or when or if it does, it is at an unaffordable price. As we look to the future, it is clear that data analytics and smart applications of information-based decision support in this arena will help both solve the ongoing food issues we contend with as well as give us a much greater chance of achieving Food Security.

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