

Multi-Level Processes of Integration and Disintegration

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IS UKRAINE READY TO GET INVOLVED IN THE EUROPEAN AGRICULTURAL INSURANCE SYSTEM? FARMER ACCESS TO AGRO-INSURANCE TECHNOLOGIES

NATALIYA GERASYMENKO*

ABSTRACT. Over the last decade the new technologies have become an integral part of everyday's business and government programs. In the European agricultural insurance, the use of new technologies has been intensified after installation of a so-called Solidarity Fund as a reaction on catastrophic floods in Central Europe and France in 2002. In turn, Ukraine makes first steps towards well-functioning agricultural insurance market as a part of the program of agricultural development. This paper analyzes the level of the development of the Ukrainian agro-insurance market compared to that of the EU based on the ability of Ukrainian agricultural producers to access new technology-based agro-insurance products.

Keywords: *Agricultural Insurance, Information and Communications Technologies, European Union, Ukraine*

1. INTRODUCTION

The development of insurance is not possible without high-quality and reliable data required to accurately quantify the risk and determine its price that would satisfy all parties involved in the transfer of risk. Insurance industry to a great extent depends on the quality of data used; therefore, data is the foundation of all agro-insurance development programs. To develop this segment of insurance market, it is essential to establish favorable conditions for collection, storage and dissemination of data.

According to the nowadays' requirements of the agricultural markets towards the information support and diligence of the agricultural insurance companies in creating the database of crop yields and land quality as well as the yield and weather history, the use of new information technologies is highly important for Ukraine.

Several developments in the last years have revolutionized the risk management field and promise to make the design and monitoring of agricultural insurance contracts more cost effective and efficient. The development of agricultural insurance will hinge critically on how quickly and how cheaply digital images, weather information, and economic statistics can be transmitted. To be successful in new insurance products, market needs to improve innovations in financial markets and allow the combination or packaging of insurance with other financial instruments. Also advances in optics and digital imaging, processing, and interpretation capability means that images at higher levels of resolution can be obtained and processed, interpreted, and transmitted with greater ease and speed. Chemical sensitive film does not have to be developed. Digital images can be quickly transferred from the capturing device to a computer, to a printer, to television, or to a website. Geo-referenced datasets with thousands of layers of information are now commonplace compared to 10 or 20 years ago. More and more insurance companies have been using geographic information systems (GIS) as a tool to

* Chair of State Management, National Agricultural University of Ukraine, Kyiv. Email: natali_gerasimenko@ukr.net

conduct pricing.

So, the main goal of this research is to determine the ability of Ukrainian agricultural producers to access such new agro-insurance products. To achieve this goal, the following questions are inquired in the paper. First, are Ukrainian agricultural producers ready to use the agro-insurance at the same level compared to Europe and the developed countries? Second, are the government, business institutions and market participants able to supply these new products according to the level of infrastructure development? At last, are agricultural producers able to afford the new products according to the actual level of consumption of the similar ones?

2. METHODOLOGY AND DATA

In this research, the digital opportunity index (DOI) is employed to identify the ability of Ukrainian agricultural producers to use the new agricultural insurance products and to compare it with the ability of those in the EU countries.

The indicators of the development of agricultural insurance markets are the following:

- ✓ the number of broadband connections per 100 inhabitants;
- ✓ the affordability of tariffs per minutes of connection/per capita GDP.

The DOI is a composite index comprising eleven separate indicators. The choice of indicators considers:

- ✓ *Opportunity* – The DOI includes price data for mobile telephony and Internet access relative to local incomes to reflect the affordability of Information and Communications Technologies (hereafter – ITC) and whether consumers can pay for mobile phone or Internet access in different countries.
- ✓ *Infrastructure* – The DOI uses household penetrations (rather than per capita penetrations) for fixed lines, Personal Computers (PCs) and Internet access, as access to ITC often begins at home.
- ✓ *Utilization* – The DOI includes measures of more advanced technologies in broadband access. It can also be used to assess market maturity, in the proportion of Internet and mobile subscriptions that have migrated to high-speed broadband access.

The DOI first calculates an average score within each of the categories and then weights these values to arrive at an overall score for each country (ITU, 2006).

In this paper, the standard scale is used for measuring this index. So, indicators in various data series are standardized on a scale of zero to one, by indexing relative to a reference value. For most indicators, this is 100 per cent, making the DOI simple and straightforward to calculate (simply dividing the indicator value by 100). Index scores in the three clusters are then averaged by simple average to give the overall DOI score for a country; between zero and one (no country achieves the upper or lower limit scores). Scores are directly comparable between countries and between years (ITU, 2006).

3. RESULTS AND DISCUSSION

According to the EU development program, the further steps of the agricultural insurance system will relate to catastrophe modeling which can provide insights in risks with low return periods, catastrophe modeling, reduction in price and access to the basic data on climatic risks, coordination and consolidation of the private and public sectors in order to develop better access to GIS data, and climate projections for the next years, decades and up to 2050.

In Ukraine, it is planned that insurance companies acquire to use the new technologies, which will

collect data for their companies and simultaneously provide data entry into the information system. In addition, users will be charged a fee by the information.

Based on the counted in this research index of information technologies opportunity and considering the common space and similar technological development, we describe the further common steps for Ukraine and European Union in the sphere of agricultural insurance and food security.

3.1. *The DOI Index and its role for the agricultural producers*

The main idea in communication technologies – the internet, broadband connections, wireless networks, etc. – is that information can be more rapidly and easily shared than ever before. The cost of transmitting kilobits per second continues to drop as telecommunication industries are subject to more competition and the number of ISP users and networked computers increases rapidly. Two of the most relevant indicators of the development of agricultural insurance markets are the number of broadband connections per 100 inhabitants and the affordability of tariffs per minutes of connection/per capita GDP. The development of agricultural insurance will hinge critically on how quickly and how cheaply digital images, weather information, and economic statistics can be transmitted. Unfortunately, these data are scarce. Most of the data that exist are for OECD countries and a few middle-income Asian countries.

According to the 2006 DOI assessment by World Information Society Report 2006, Ukraine ranks as the medium-DOI country together with the Latin America and the Caribbean, Asia and North Africa. Notably, medium-DOI countries for this year's release of the DOI include China, Brazil, Egypt, Indonesia and India. Non-OECD European countries generally also have medium-DOI scores (e.g., Albania, Belarus, Bosnia and Ukraine). Medium-DOI countries have high average *Opportunity* equaling 0.89 (in Ukraine – 0.91) due to a good mobile coverage and relatively low prices. Good infrastructure and growing use of advanced technologies distinguishes this group from the low-DOI economies, but only at levels around a third of those achieved by high-DOI economies. They are also growing very fast - Brazil is now the tenth-largest Internet market in the world, while India appears in the top fifteen largest Internet markets for the first time.

One interesting observation among the medium-DOI group is that there are a growing number of countries where *Utilization* scores exceed *Infrastructure*. Last year, *Utilization* exceeded *Infrastructure* scores in only six economies. This year, *Utilization* exceeds *Infrastructure* scores in nineteen economies, thirteen of which are medium-DOI economies. The strong growth in broadband worldwide means that some economies are successfully leveraging their investments in infrastructure to yield more rounded growth and more advanced forms of usage across a broad Information Society. This may represent a new form of technological 'leapfrogging', where operators investing in Internet infrastructure are able to adopt the latest technologies.

3.2. *Frequent Agricultural Monitoring*

Customers need to receive field-based information including crop identification, crop area determination, crop condition monitoring, and growth stage determination. These services are useful for crop management and to monitor crops grown under contract. The frequent agricultural monitoring means crop information over wide areas, such as commodity traders, logistics planners, and food supply managers. Government agencies on local, regional, state, national and international levels administer various kinds of programs related to agriculture. Many of these programs include regulations concerning uncultivated and agricultural lands, such as management restrictions or payments. The EU crop subsidy and US crop insurance programs are two examples. Administering and verifying these programs often requires regular monitoring of large areas at detailed levels, assist the involved agencies in area and acreage determination, distance measurements, land use and crop type determination, as well as up-to-date status information at critical times.

3.3. *Damage Assessment & Risk Management*

The agricultural insurance and re-insurance industry often faces a critical lack of information when conducting damage assessments or evaluating and managing risk. In many cases, objective information about crop damage is inaccurate or not available when natural disasters like hail, floods or droughts occur. Additionally, information about the crop status before the damage occurred may be unavailable. The ability to monitor damaged areas quickly and compare the images with archived data allows providing estimates about the spatial extent and magnitude of damages, services help experts in the field perform damage assessments efficiently, accurately, and with more transparency, to provide entire solutions to support crop insurance processes: insurance application and acceptance, risk determination and damage assessment. By accurately locating the insured fields and analyzing the risk exposure, helps lower crop insurers' risks and expenses, while enabling them to process claims with greater speed and ease Precision Farming Services.

3.4. Agri-Environmental Services

In recent years, environmental standards and legislation have been introduced in many countries in order to prevent and minimize the environmental impact of inappropriate farming practices. Possible environmental consequences are land degradation, loss of biodiversity, or pollution of soils and water. In some cases, following environmental standards is tied to payments granted to farmers (cross compliance). Verification of compliance is costly, time consuming, and difficult to implement in large areas. Such systems can assist governmental agencies in compliance verification in cases such as land clearing restrictions or cultivation bans in buffer zones close to sensitive habitats or water systems. Additionally, compliance to early-season cutting prohibitions in sensitive grassland habitats can be monitored.

The main requirements for processing systems are:

- ✓ Customized industry specific solutions tailored to government and business needs for agriculture, forestry, environment, energy and infrastructure, security and emergency, and spatial markets;
- ✓ Access to the broad knowledge and experience via multi-disciplinary teams;
- ✓ Quick, reliable delivery of services based on satellite imagery in “near real-time”.

4. CONCLUSIONS

The modern development of insurance in agriculture requires comprehensive data to design the crop insurance system. This data has to involve: historical information about the weather conditions (thirty years or more of weather data – precipitation, temperature, relative humidity, wind, barometric pressure); limited missing values and out of range values; data and recording procedure integrity, and consistency of observation techniques; limited changes in instrumentation, orientation, configuration, as well as limited potential for measurement errors; actual crop yield data at the district level and at the farm level; agronomic crop yield models and metadata, etc.

REFERENCES

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