Original Research Article

A pricing model for agricultural insurance based on big data and machine learning

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ABSTRACT

Agricultural insurance is a crucial element of policies that promote and protect agriculture. It protects agriculture from risk and distributes agricultural hazards. The rural economy's stabilization has been a significant stabilizer function. But as agriculture insurance has quickly advanced, a number of issues have unavoidably come to light. Agricultural insurance still offers a wide range of products and services available today. Big data will play a significant supporting role in the pressing need to innovate and improve goods and services. Other information supporting agricultural insurance includes agricultural data connected to it. The two previously most often utilized agricultural index insurances are regional yield insurance and weather index insurance. They struggle with risk pricing mostly due to a lack of appropriate empirical data, complicated dependence linkages between various hazards, and the prevalence of basis risk. A comprehensive study and review of pertinent research findings are carried out by modelling regional yield risk, building weather indicators and their distribution fitting, modelling agricultural dependence risk, and measuring and reducing basis risk. This article highlights the flaws in the current pricing models as well as the problems that need to be addressed in future studies. The need to further develop agricultural index insurance's risk modelling techniques and increase the objectivity and precision of the pricing outcomes cannot be overstated in terms of their practical importance.

Keywords: agricultural insurance; basis risk; big data; machine learning

1. Introduction

In recent years, with the deepening of big data technology, a large number of commercialized big data companies in agricultural related fields have emerged in China[1]. These big data companies, relying on their own advantages, not only carry out applications and services in their respective fields, but also collect big data in related fields. These enterprise big data are mostly distributed among various companies and serve the main business of the enterprise, with few integrated applications with agricultural insurance[2]. Agricultural insurance is the "stabilizer" and "safety valve" of agricultural production and operation, and artificial intelligence, as the core technology of insurance technology, is changing the business model of agricultural insurance companies[3]. First, determine the internal and external drivers of agriculture insurance businesses' digital operations and the rationale behind their shift to an AI approach; Second, examine the route of artificial intelligence enabling the whole business process of agricultural insurance firms by dividing the front-end, mid-range, and back-end business processes of these organizations[4]; examining the difficulties that arise while implementing technology, changing