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Opinion Article

Technological advancement and the common agricultural policy

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DESCRIPTION

With a set of equations developed from a non-nested three-factor CES production function, this research uses an alternate approach to analyse how the CAP affects agricultural productivity. We calculate the elasticity of substitution between labour, capital, and land in the EU agriculture sector using this method. We also calculate the scope and direction of technical progress as well as the effect of CAP subsidies. A farm-level panel dataset of 117,179 farms from all EU MS is used to estimate the system of equations using the GMM estimator for the years 2004 to 2015. Our findings imply that land, labour, and capital are complimentary production variables in EU farms, with land, labour, and capital-augmented technical change showing a steady decline or stasis. Larger nominal amounts of Pillar I decoupling subsidies, Pillar II investment, and LFA subsidies have a positive impact on farmers' technological change, however higher levels of Pillar I and Pillar II CAP payments as a percentage of overall agricultural income have a negative or no impact. Additionally, the CAP has a detrimental effect on agricultural technical change that is amplified the higher the share of subsidies in total agricultural income.

The European Union's (EU) Common Agricultural Policy (CAP), which has been around since the early 1960s, is still changing. One of the fundamental guiding concepts of the CAP is increasing agricultural output. The goals of the common agricultural policy shall be "to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimal utilisation of the factors of production, in particular labour," according to Article 39 of the Treaty on the Functioning of the European Union (TFEU), also known as the Treaty of Rome. The relationship between the outputs generated and the inputs needed during the production process is known as agricultural productivity. Following CAP reforms, efforts were made to raise agricultural output while addressing social and environmental issues. Agricultural production is further constrained by environmental issues, which puts pressure on the industry to adopt more sustainable techniques. In addition, the EU's expansion brought new difficulties and a broader range of geographical, environmental, and socioeconomic circumstances that needed to be taken into account, along with revised policy objectives and the requirement to respond to external change-drivers like the integration of global supply chains and climate change. The new CAP agreement, which will go into effect in 2023, and the need to adapt it to smart growth and increased productivity while also keeping viable rural communities and adapting agricultural activities to climate change and global market conditions are the present causes for concern. All of this depends on the creation of efficient policies and programmes that can be used flexibly across the EU's 27 member states. Good policy design necessitates a solid empirical base, but recent literature surveys show that one of the main challenges facing EU policy makers is the lack of clarity regarding the effect of the CAP subsidies on agricultural productivity. In light of projected budget cuts, a decline in direct subsidies, and a persistent shift from Pillar I to Pillar II assistance, models need to be better able to produce high-quality data that can support policy decisions. Policy makers are at a disadvantage when deciding the future course of CAP policies and programmes without good quality and trustworthy data. The effect of agricultural subsidies on farm productivity can be estimated using one of

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two broad modelling techniques. The “growth accounting” and the “frontier approaches” are the names of these two methods. Regression analysis is used by growth accounting methods to calculate productivity growth. These methods regard subsidies as traditional inputs in the production function, leading to inconsistent productivity assessment because subsidies by themselves cannot produce output in contrast to traditional production variables. Stochastic Frontier Analysis (SFA) is an example of a parametric frontier method. Nonparametric frontier approaches include Data Envelopment Analysis (DEA). In a two-step process, they estimate a stochastic production function and look at how subsidies affect technical inefficiency. A significant flaw in the border techniques that have been applied up to this point is that they have not taken into consideration issues with regional heterogeneity and endogeneity. Other techniques that don’t precisely fit into either of these two categories are also employed; the next section will describe them.