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Productivity and environmental costs from intensification of farming. A panel data analysis across EU regions

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Abstract

This paper addresses the need of finding new ways of measuring the environmental and economic consequences of farming. The aim of this study is to inquire into the impacts that excessive intensification has on productivity and environmental costs in the long term and additionally, to explore empirically the trend of these two indicators over time. The contribution of this paper is to perform an empirical study of the trends of productivity and environmental costs of farming in the long-term. To this end, this paper performs a panel data analysis of productivity and environmental costs on a farm accounting database across European regions over the 1989-2009 period. The models proposed take (i) farm output per hectare as indicator of productivity, and (ii) expenditures on energy, pesticides and fertilisers per hectare as proxy indicators of environmental costs. Results provide empirical evidence that the regions under study have a negative trend of productivity and a positive trend of environmental costs over the time frame mentioned. These results correlate negatively with both, economic and environmental sustainability of farms. Arguably, this is aggravated in the latter due to hidden environmental costs valued at zero in traditional accounting.

Keywords: energy; European agriculture; fertilisers; pesticides; productivity; sustainability accounting.

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1. Introduction

Agriculture is facing at the very least, a twofold increasing global pressure. On the one hand, an economic pressure due to an increase in global food demand due to population growth and, on the other hand, an environmental pressure to bring economic performance in line with environmental issues (WHO, 2005). In other words, agricultural sustainability revolves around many interconnected topics including but not limited to food security, food quality, environmental concerns and socio-economic issues. Over recent decades, intensive practices (e.g. economies of scale, use of genetically modified seeds, and reliance on external inputs, irrigation and the substitution of land) brought about significant changes in agricultural production. Although

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