Chapter 79
Agricultural Growth Accounting and Total Factor Productivity in Jordan: Trends, Determinants, and Future Challenges

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ABSTRACT

This article develops new estimates of historical agricultural productivity growth in Jordan. It investigates how public policies such as agricultural research, investment in irrigation capital, and water pricing have contributed to agricultural productivity growth. The Food and Agriculture Organization (FAO) annual time series from 1961 to 2011 of all crops and livestock productions are the primary source for agricultural outputs and inputs used to construct the Törnqvist Index for the case of Jordan. The log-linear form of regression equation was used to examine the relationship between Total Factor Productivity (TFP) growth and different factors affecting TFP growth. The results showed that human capital has positive and direct significant impact on TFP implying that people with longer life expectancy has a significant impact on TFP growth. This article concludes that despite some recent improvement, agricultural productivity growth in Jordan continues to lag behind just about every other region of the world.

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1. INTRODUCTION

Jordan has experienced spells of high growth, but the country has always faced the challenge of sustaining them. In the first half of the 1980s, Jordan's Gross Domestic Product (GDP) growth averaged 7.4 percent. Subsequently, as the regional economies entered into recession in the wake of a sharp fall in oil prices, the country's growth plummeted to -14 percent in 1988 and it took about 18 years for Jordan's GDP per capita to revert to its level of the late 1980s. Jordan posted an average 6.7 percent growth during 2000-2008, then the country's growth dropped sharply to 2-3 percent during the global financial crisis of 2009-2010. Jordan's resilience to exogenous shocks has remained extremely weak over the last 30 years.

The contribution of agriculture to the GDP in relative terms declined sharply from 40% in the 1950s to less than 4% in 2011 (Bahdousheh et al. 2010), while its contribution in absolute terms has increased from Jordan Dinar (JD) 32 million in 1964 to JD 560 million in 2010 (The Central Bank of Jordan, 2011). Despite the increase in absolute monetary terms, the contribution of agriculture to the national economic growth is very modest, reflected in the remarkable decline in the sector's share compared to other sectors.

The importance of the agricultural sector stems from the fact that it is not only the major source of food items especially dairy products, fruits and vegetables, but is also one of the sources of hard currencies originated from exports. About 25% of the total poor in Jordan live in the rural areas depending mostly on agriculture (e.g., livestock keepers, small holder farm households, and landless former agriculturalists), and in spite of poor motivation of the rural youth, agriculture is an important employer of the rural communities. Additionally, cultural, social, and environmental considerations and mainly because of its strong forward and backward linkages with other sectors and activities, agriculture remains a very important sector that must be considered in the rural development and poverty reduction plans. The sector employed about 124,000 people (a total of 2.1% of the entire population or about 7.7% of the active labor-force of 1.771 million), and contributed to 17% of total national exports (equivalent to JD 795 million) in 2011 (MOA, 2012).

A major weakness of the sector is caused by the scarcity of irrigation water and overexploitation of groundwater; use of poorly treated brackish and sewage water, land fragmentation and reduction in the size of agricultural holdings; weak extensions services; poor transportation, packaging and processing; infrastructure; unfavorable price policies, and low investment in marketing infrastructure, post-harvest and quality enhancing facilities (e.g., grading, packing, storage). The claim that agriculture consumes 62% of the Jordanian scarce water resources leaving scant reserves for domestic and industrial use is unrealistic and is yet to be proven. However, the claim generally reflects the extent of poor water use practices in agriculture, and indicates the need for adopting alternative and modern agricultural practices and techniques.

The agricultural output growth is usually due to three types of factors: area growth, yield growth, and prices change. Area growth is related to an increase in the quantities of inputs use in addition to land. However, yield growth is generated by both inputs use growth and total factor productivity (TFP) growth. Then, TFP growth is the result of both technical change and the efficiencies deployed to lead to increased output. Growth patterns could be then defined as a trade-off between these two sources which determines TFP growth. Although all choices of growth patterns can achieve the substantive growth of TFP, the distributions between both sources should be coordinated.

There have been virtually no sector-level studies on agricultural productivity in this region or on the role of public policies in improving productivity growth. This article develops new estimates of historical productivity growth and water use in Jordan. It investigates how public policies such as agricultural