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POLICY BRIEF

Total Factor Productivity in Tunisian Agriculture: Measurement and Determinants

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Key messages

1. Intensification of production systems is needed to improve food security;

2. International trade should not be hampered;

3. Productivity growth in has occurred because of investments in the agricultural sector, particularly capital investments (e.g. intensive production systems, irrigation systems and the adoption of new production technologies);

4. Private investment is a key determinant in productivity growth;

5. Agricultural subsidies in favor of agricultural machinery or equipment can be introduced without negatively affecting the rural labor force;

6. Medium-size farms seem to be more efficient in adopting improved technologies, such as more efficient irrigation systems;

7. It is important to strength extension mechanisms in Tunisia.

What is at stake?

Agriculture assumes significant social and economic importance in the Tunisian economy. The main contribution of the agricultural sector is not in terms of GDP, around eight percent in 2011 (World Bank, 2013), but as a source of employment engaging approximately 810,000 people in 2012 (FAOSTAT, 2013) or 19.5 percent of the working population (FAOSTAT, 2013). Particularly important are the number of jobs the agricultural sector generates for the most vulnerable: women and the youth. In 2005 agriculture employed 38 percent of total female employment in rural areas (INS, 2008), while agriculture constituted 23 percent of the youth employment in 2010 (World Bank, 2013).

Why measuring productivity is important?

One of the major factors contributing to the sustained economic growth of a nation is agricultural productivity (Huffman, 1993), which sheds light on competitiveness in the agricultural sector, efficiency in the distribution of scarce resources, agricultural technology adoption, strategies to improve domestic food security and employment. Hence, focusing on productivity will be a timely contribution to the ongoing discussion on how to tackle the problem of increasing productivity that contributes to household wellbeing while conserving natural resources.

Assessing the impacts of public and private R&D investments in productivity growth in Tunisian agriculture

- Assessing the public and private investment in agricultural R&D is particularly important because agriculture productivity growth is an essential source of overall growth in Tunisian economy, however, this is lacking.
- Improving agricultural productivity and assessing its determinants is the first logical step in a process to provide a sustainable development and consequently ensuring food security.

What can be said about agricultural productivity in Tunisia?

In Tunisia agricultural productivity experienced a moderate annual growth between 1981 and 2007 of 1.2 percent per year, which has been below the country's population growth (2.03 per year for the same period), suggesting that intensification of production systems is needed to improve food security. International trade has been supplementing food gaps, though stakes can be high if world food prices sky up as they did in 2007–2008.

Empirical findings show that capital and land were the most important contributors to agricultural productivity. In particular, land growth was high in 1991–2000 but later decreased in 2001–2007. Productivity growth has occurred because of investments in the agricultural sector, particularly in the last decade with the use of intensive production systems, water resource mobilization (i.e. irrigation), and the adoption of new production technologies. Increased productivity is important for Tunisia's competitiveness as the country looks to take further advantage of existing bilateral and multilateral trade partnerships (e.g. World Trade Organization, Euro-Med Free Trade Area, and the Arab Maghreb Union).

Cross-price elasticities between capital and labor indicate complementarity between these two production factors when used in agriculture. Thus, the adoption of farm mechanization will not displace agricultural labor since mechanization intensifies production (i.e. more output), offsetting possible effects on labor displacement. For example, the mechanization of olive production in Tunisia caused an increment in the

Recommendations

- Positive impact of public investment suggests that Tunisia should now invest more comprehensively in its own agricultural infrastructure, especially in efficient water management technologies;

- Private investment in the agricultural sector is one of the major determinants of productivity growth, and hence should be supported;

- Agricultural policies such as subsidies to agricultural machinery or equipment can also be introduced without negatively affecting the rural labor force.

requirement of agricultural labor. This is clear evidence that demonstrates that technological innovation in the olive sector is profitable and that does not display manpower. Hence production, especially the new plantations should be fully mechanized (pruning and harvesting included) which will fully realize the potential of the sector to generate wealth and employment.

Hence, a number of concrete actions that could be undertaken to improve agricultural productivity in Tunisia:

Action points: The way forward

- Expand such empirical analysis that is needed to support decision- makers designing optimal policies to enhance agricultural productivity growth through joint public-private co-investments.
- Improve property rights for agricultural land which would contribute to achieve higher levels of agricultural productivity, reducing food prices and increasing consumer's welfare. In addition, in the context of an open economy for Tunisia, productivity growth can improve the agriculture competitive position.
- Introduce subsidies to agricultural machinery or equipment without the fear of negatively affecting the rural labor force.

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