ANALYSIS OF TOTAL FACTOR PRODUCTIVITY IN THE EGYPTIAN AGRICULTURE, WITH EMPHASIS ON ITS MULTI-SECTORAL DETERMINANTS.

By

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B.Sc. Agric. Sci. (Agricultural Economics), Fac. Agric., Cairo Univ., 2007
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APPROVAL SHEET

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ABSTRACT

This study was conducted for providing an up to date calculation of Agricultural Total Factor Productivity (TFP) in Egypt during the period 1961-2014 using the TornqVist Thiel approach. The included agricultural inputs were: agricultural labor, machinery, seeds, pesticides, capital stock, animal feed including green and concentrated fodder, fertilizers, and natural resources. In addition to figuring out the sources of growth in the agricultural TFP (Total Factor Productivity) in Egypt. Depending on the multi-sectoral development indicators published in the World Bank about Egypt. This was achieved through: first, illustrating the correlation between the TFP and the groups of development indicators; using the correlation coefficient matrix. Second, selecting the highly correlated indicators with the TFP and conducting multiple regressions. The indicators were divided into 3 groups according to data availability; 54 years (1961-2014), 44 years (1971-2014), and 25 years (1990-2014). As for the 54-year-analysis, the relationship among the TFP in the Egyptian agricultural sector and each of Gross Domestic Saving (GDS), and official exchange rate (OER) is positive and statistically significant. But, the relationship between the TFP and the Agri-row-material exports (ARMEX) is negative and statistically insignificant. As for the 44-year-analysis, the relationship among the TFP and each of net official development assistance (NODA), electric power consumption (EPC), and imports of goods and services (IMGS) were positive and statistically significant. But, the relationship between the TFP and the fossil fuel energy consumption (FFEC) is negative and statistically insignificant. As for the 25-year-analysis, the relationship among the TFP and each of Research and Development (RD), Rail lines (RL), and foreign direct investment inflows (FDII) were positive and statistically significant. But, the relationship between the TFP and the taxes on exports (TOEX) is negative and statistically significant.

Keywords: TFP, Tornqvist -Thiel index.

DEDICATION

I dedicate this work to my late father, who shaped my past, present and future; no word could describe how I love, respect and miss him.

To my mother, the holiest thing alive, who taught me to love and believe in everything I do.

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CONTENTS

INTRODUCTION

Agricultural growth is vital for overall economic development and poverty alleviation, especially when it comes to developing countries (Johnston and Mellor 1961). Several features of the modern world point to the increased long-term importance of agricultural productivity. They include rapid population growth, diminishing returns to traditional factor inputs, high fuel and fertilizer prices, environmental degradation, the possibility of output-reducing climate change, and declining availability of arable land, fresh water supplies and other natural resources. Furthermore, the productivity growth in the agricultural sector is both a necessary and sufficient condition for the advancement of the sector and consequently the economy. As a necessary condition; it allows agriculture to skip the Ricardo's diminishing returns law. Besides, the sufficient condition comes out of the production increase with a reduction in unit cost and prices. (Saikia, D., 2009).
There are two concepts of productivity: partial productivity and total factor productivity (TFP). Partial productivity measures single factor contribution (i.e. labor) to the growth of output and the other factors remain constant. Therefore, it doesn't clarify whether the productivity growth is due to an increase of input-use, an efficiency improvement or technological advancement. In addition, partial productivity ignores time factor, inputs other than land, labor and capital, and secondary products while all this should be included. (Saikia, D., 2009). This proves the need to the TFP; it measures the net growth of output per unit of total inputs. This way, the TFP level is determined by the efficiency and intensity of inputs utilization in production. Thus, the TFP illustrates the efficiency change as well as the technical change inclusively.

The agricultural total factor productivity (TFP) growth provides society with opportunities to increase the welfare of people. It is, therefore, worth asking what determinants should policy makers focus on to enhance the performance of the agricultural TFP? This study attempts to induce the determinants of agricultural productivity growth. It will also investigate to what extent the determinants have implications for policy. By calculating the agricultural TFP as a first step. The second step is the development indicators (or determinants) considered here are grouped under 18 headings (segments). These determinants were used to figure out more explanatory variables that influence the agricultural TFP in Egypt. These are:
agriculture and rural development, aid effectiveness, climate change, economy and growth, gender, public sector, private sector, poverty, infrastructure, science and technology, public health, social protection and