Agriculture and economic development in Uzbekistan

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Abstract
Uzbekistan is one of the fastest growing economies in the world. Structural changes have been occurring during the last two decades since its independence in 1991. In this paper we analyze the structure of the economy of Uzbekistan to measure the influence of agricultural sector on it. By reviewing the dynamic changes in agricultural development in Uzbekistan for the last 20 years, including share of agriculture in GDP, population, employment in agriculture, etc., we argue that growth in agricultural productivity is central to development, a message that also appears prominently in the traditional development literature.

Key words: agriculture, GDP growth, structure of the economy, Uzbekistan

JEL Classification: Q01, O11, O13

1. Introduction
With its favorable climatic conditions for crop production, agriculture has long been considered one of the priority areas of the economy of Uzbekistan. Currently, this sector accounts for around 30% of employment and 18% GDP. As is typical of economies dependent on agriculture, Uzbekistan has low income per capita: $5,316 compared with $2,227 for neighboring Kazakhstan or $25,635 for Russia (PPP equivalents, 2014 data from World Development Indicators). Such relatively low income and the high agrarian profile justify and drive the efforts for deeper understanding the role of agriculture.

2. Literature review
Developing economies have generally been described as dual economies with a traditional agricultural sector and a modern capitalist sector; and productivity is assumed to be lower in agriculture than in the modern sector. The canonical model was put forward by Lewis (1954) and subsequently extended by Ranis and Fei (1961). Lewis’ model rests on the idea of surplus labor in the agricultural sector. With lower productivity in agriculture, wages will be higher in the modern sector, which induces labor to move from agriculture to the modern sector, which in turn generates economic growth.

Other precursors, such as Schultz (1964), also point out the importance of food supply by the agricultural sector. In Schultz’s view, agriculture is important for economic growth in the sense that it guarantees subsistence for society, without which growth is not possible. This early view on the role of agriculture in economics matched Kuznets’ (1966) empirical observation that the importance of the agricultural sector declines with economic development. In this view, the role of agriculture in economic development is to supply cheap food and low wage labor to the modern sector. Otherwise, both sectors have few
interconnections. Growth and higher productivity in the agricultural sector can contribute to overall economic growth by releasing labor as well as capital to other sectors in the economy.

Building on the Lewis model, Johnston and Mellor (1961) account explicitly for agriculture as an active sector in the economy. In addition to providing labor and food supply, agriculture plays an active role in economic growth through production and consumption linkages. For instance, agriculture can provide raw materials to nonagricultural production or demand inputs from the modern sector. On the consumption side, higher productivity in agriculture can increase the income of the rural population, thereby creating demand for domestically produced industrial output. Moreover, agricultural goods can be exported to earn foreign exchange in order to import capital goods.

The importance of such linkages was further stressed by Singer (1979) and explicitly embodied in Adelman’s general equilibrium idea of “agricultural demand-led industrialization” (ADLI), according to which, because of production and consumption linkages, a country’s development strategy should be agriculture-driven rather than export-driven and increased agricultural productivity would be the initiator of industrialization. Moreover, emphasis should be placed on small-to-medium-size farmers because they are more likely to use domestically produced intermediate goods, as opposed to large scaleproducers who might import machinery and other inputs, which would weaken the linkages between agriculture and other sectors (Adelman, 1984).

On the other hand, Matsuyama (1992) suggests that the relation between agricultural growth and overall economic growth depends on the openness of a country to international trade. Whereas agricultural growth goes hand in hand with economic growth in small, closed economies—where gains in agricultural productivity will lead to the linkage effect described above—the relation might be reversed in the case of an open economy. If the country has a comparative advantage in agriculture, openness to trade will draw resources away from the modern sector into agriculture, which might be less productive than industry.

Thus, there is a vast literature, ranging from critical contributions that do not support “agriculture first” approaches to more recent “agro-pessimism” views. The latter are based on the observation that agriculture in developing countries might be the least productive sector in the economy. Dercon (2009) derives this conclusion from a two-sector model elaborated by Eswaran and Kotwal (1993). He explains that, in an open economy, in which both agricultural and modern-sector goods can be traded, linkages between the two sectors become less important for overall growth. As a result, there is less necessity to increase agricultural productivity to induce overall growth.

However, although various theoretical models suggest opposing roles for agriculture in development, they do not necessarily contradict each other. The models are derived under different economic assumptions (e.g., openness to trade). Therefore, it is not surprising that they derive different policy implications. For instance, World Development Report (World Bank, 2007), which suggests that in agriculture-based economies, agriculture can be the main engine of growth, whereas in transforming countries, agriculture is already less important as an economic activity but still a major instrument to reduce rural poverty. In urban countries, by contrast, agriculture plays the same role as other tradable sectors and subsectors with a comparative advantage and can help to generate economic growth.

So far our discussion has mostly considered theoretical models. We now turn to empirical investigations of the relation between the agricultural sector and economic growth. Timmer (2002) uses a panel of 65 developing countries over 1960–1985 to show a positive correlation between growth in agricultural GDP and its lagged values and nonagricultural GDP growth. He suggests that this correlation can be explained by “first-order” effects of agricultural...
growth on lower food prices, labor migration, and capital flows from agriculture, as well as ‘second order’ effects, such as improved nutritional intake, which improves workers’ productivity. Similarly, Self and Grabowski (2007) establish a positive relation between different measures of agricultural productivity and average growth of real GDP per capita over 1960–1995 for a cross-section of countries. However, on the basis of panel data from 52 developing countries during 1980–2001, Gardner (2005) concludes that agriculture does not seem to be a primary force behind growth in national GDP per capita.

Although these empirical investigations establish a correlation between agriculture and GDP growth, they do not imply causation in either direction. The correlation observed could be spurious if both sectors have been growing independently of each other or as a result of a common third factor. As a result, some authors criticize studies that argue that there is a causal effect of agricultural growth on economic growth. To address this issue of endogeneity in empirical work, Tiffin and Irz (2006) use Granger causality tests to establish that agricultural value added per worker has a positive effect on GDP per capita in developing countries. Bravo-Ortega and Lederman (2005) employ panel data tools, such as GMM and Granger causality tests, to re-estimate the effect of agricultural growth on the overall growth rate. Using 1960–2000 panel data, they find that an increase in agricultural GDP raises nonagricultural GDP in developing countries, whereas a reverse relation exists for developed countries.

3. Data and Methodology

How to value the contribution Agriculture for Economic growth? Via our method and data analysis we will see the relative contribution between agriculture for development in Uzbekistan. We observe share of agriculture in GDP, annual growth in this sector to find contribution for economic development in Uzbekistan. We use the comparative analysis to find out the coefficient between agriculture and economic development. Although this method will be checked through descriptive statistics analysis.

Economic development in Uzbekistan during the years of development

Uzbekistan is one of the fastest growing economies in the world. In the past 11 years, including the current 2015, the growth rate of gross domestic product is stable stored at more than 8 per cent, provided the balance of macroeconomic indicators, a stable surplus of the State budget and balance of payments, the growth of exports and foreign exchange reserves, while the public external debt not more than 18.5 per cent of GDP. [1]

Another important driving factor behind economic growth is external demand. [2] During the years of independence (1991-2014) years GDP increased by 4.5 times, while exports grew by 4 times. The growth of exports was facilitated primarily by increasing the exports of non-commodity goods and products with high value-added (i.e., cars and transportation services), which in turn allowed for a current account surplus.

The main driving factors of the economic growth were the high rates of economic activity which have been largely explained by liberalization to foreign economic activity and faster development of export capacity, large-scale investments into the economy, and gradual improvement of its composition.

Despite the global economic crisis, the economy grew by almost 6 times the real per capita income increased by more than 9 times. In just the past 5 years in the economy sent about 67 billion dollars, more than 21 percent of them - it is foreign investment.
The continuation of the new investments boom is directly related to the modernization and technical overhaul of the companies, modernization of fixed assets according to the targeted programs for development of the sectors of the economy, construction of industrial infrastructure and social facilities.

If we look to structure of GDP of Uzbekistan, so far agricultural sector was dominating in the sphere of real production in Uzbekistan. However, due to implementation of structural reforms during 1991-2014, the share of agricultural sector in GDP declined from 37% to 18% while the share of service increased from 26% to 47%. Industry is fluctuating during 1991-2010 due to macroeconomic policy, but it remains around 33% (Figure 1).

**Figure 1. Share of sectors in GDP of Uzbekistan**

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture, value added (% of GDP)</th>
<th>Industry, value added (% of GDP)</th>
<th>Services, etc., value added (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>26,5</td>
<td>36,6</td>
<td>37,0</td>
</tr>
<tr>
<td>1995</td>
<td>39,9</td>
<td>27,8</td>
<td>32,3</td>
</tr>
<tr>
<td>2000</td>
<td>42,5</td>
<td>23,1</td>
<td>34,4</td>
</tr>
<tr>
<td>2005</td>
<td>48,9</td>
<td>23,2</td>
<td>28,0</td>
</tr>
<tr>
<td>2010</td>
<td>48,4</td>
<td>32,5</td>
<td>19,1</td>
</tr>
<tr>
<td>2014</td>
<td>47,5</td>
<td>33,7</td>
<td>18,8</td>
</tr>
</tbody>
</table>

Source: World Development Indicators 2015

Uzbekistan is one of the major countries in the region producing agricultural products. The existing potential provides Uzbekistan with the first place in agricultural production in Central Asia. Particularly, leadership of the country in gross collection of fruits and vegetables is clearly marked: its share in total volume of fruits collection makes about 4/5 of total production in the region.

During the short period of independent development, a major reforms are implemented in Uzbekistan, allowing to almost entirely diversify agricultural sector and provide population with main food crops, as well as establish large volumes of their export.

GDP in Uzbekistan as well as the production volume of agricultural products is increasing year by year in a stable manner as a result of economic reforms being carried out by the government.

Since 1997, our agriculture demonstrates steady positive growth of 6-7% annually. Starting 1991, the volume of agricultural production has more than doubled, allowing to increase per capita consumption of meat by 1.3 times, milk and dairy products – 1.6 times, potatoes – 7 times, vegetables – more than 2 times, fruits – almost by 4 times. Currently, over 17 million tons of fruits and vegetables are produced in the country annually, constituting 300 kg of vegetables, 75 kg of potatoes and 44 kg of grapes. These figures are roughly three times higher than the average consumption rates. [4]

The comprehensive measures helping to steadily increase the export potential of the industry. In recent years, Uzbekistan has become a major exporter of high quality and competitive fruit
and vegetable products. In order to ensure year-round supply, a significant attention to the processing and storage is devoted. Over the past 10 years, the volume of processing of vegetables and grapes increased by 3.5 times, including the canned fruits and vegetables by 2.5 times, dried fruits – 4 times, natural juices – 7 times. More than 16% of total production of vegetables and grapes are processed. Currently, more than 180 types of fresh and processed fruit and vegetable products are exported. Its share in the structure of exports is 73%. [4]

The geography of horticulture and viticulture exports is also expanding. Previously Uzbekistan traditionally supplied Russia, Kazakhstan and other CIS countries, whereas now it exports to the markets of more than 120 countries worldwide, including Indonesia, Norway, Mongolia, Saudi Arabia, Slovakia, the USA, Thailand and Japan.

**Agricultural development in Uzbekistan**

Uzbekistan has been an agrarian country, with its rural population at more than 60% and agriculture accounting for around 30% in employment and 18% in GDP (World Bank, 2013). As is typical of economies, dependent on agriculture. [5]

In terms of developments over time, the share of agriculture in GDP has declining from 36% to 18% since 1991, showing a definite downward trend during the last twenty four years although the Agriculture GDP in 2014 is 2.11 times as much as the data in 1991 because the GDP grows 4.5 times since year 1991. It was meaning, the remaining sectors, such as: industry, service increase much faster than Agriculture, and the country is going industrialization.

**Figure 3. Agricultural and GDP growth in Uzbekistan.**

[Graph showing the relationship between GDP growth and agricultural added value in Uzbekistan.]

Source: World Bank 2015

If you see chart, there are close relationship between GDP growth and agricultural added value in Uzbekistan. From 1991 to 1997 GDP growth was depended to Agriculture. During this time agricultural growth and GDP fluctuated between -11 to 5% growth annually.
Even simple coefficient of correlation also shows a very high relationship between growth rates of GDP and agriculture. During years 1991 to 2014 correlation index of GDP and agriculture growth was 0.82.

The share of rural population, shown in Figure 4, is steadily increasing over time due to higher population growth rates in rural areas from a constant 60% up to 1990 to 64% in 2004-2006.

The share of agricultural employment also remained steady at 40% up to 1990, but after a slight increase to 44% in the beginning years of transition (1991-1993) the trend changed to a downward slide. The share of agriculture in total employment had dropped to 25.8% by 2012 (curve, green line below). Usually, agricultural employment keeps steady around 40%, but the situation changes from 2008, and the opposing trends sharply dropping down from 38% to 27% in 2009. In the past a few years, the number is slightly decreasing.

On the other hand, the total number of employment in Uzbekistan is raising stable from 1991 to 2007, then in 2008 the total number of employee in Uzbekistan dropped down 1.5 Million since the number of agriculture employee came down.

**Figure 4: Agriculture Labor Force Growth Rate in Uzbekistan during 1991-2012**

![Agriculture Labor Force Growth Rate in Uzbekistan during 1991-2012](http://dx.doi.org/10.15414/isd2016.s12.05)

Source: World Bank/CIA

During 2008 and 2012, agriculture employee rising quickly from 2.75 million to 4.34 million, but the percentage of agriculture employee descend from 27% to 25.9% because the employee in the other sector is ascending much faster than agriculture labor force.

From Figure 4, we can see that there are 3 phases of the growth rate trend of Labor force in Agriculture. The first phase from 1991 to 1996, the labor force growth rate is fluctuate from 10% in 1991 to 14% in 1992, then -6% in 1993, 9% in 1994,-10% again in 1996. The first phase from 1997 to 2007, the growth rate of labor force in Agriculture is quite stable around 3%. The third phase from 2008 to 2012, the labor force growth rate fall down from 3% in 1997 to -35% in 2008, then bounce back to 13% in 2009. In year 2010 and 2012, the number keep 4%, but in year 2012, it is increased to 26%.
At the same time, there are a number of problems in the agricultural sector that require systemic solutions in the country. For example, there is imbalance in the production, distribution, storage, purchase of agricultural products, including those for public use, and that in general, tend to reduce the efficiency of agricultural production and reduce the profitability of farmers and agricultural producers.

According to estimates of national experts, from the total annual grown fruits and vegetables in the country about 25-30% (more than 1 mln. Tons annually) lost to waste and do not reach the customer. The long chain of intermediaries and dealers to the end user, reducing profit margins of farmers and dekhkan farms, and in general, their cost-effectiveness.

Until now, there is an urgent need for improvement in agricultural productivity, processing, reduction of losses from spoilage at the stage of production and sale to the final consumer. In this regard, it should be noted a number of important government decisions, including the government program for the construction of vegetable stores and industrial refrigerators in the country. However, the available power outages reduce the profitability and efficiency of their programs, as well as the safety of products.

A particularly important issue, for which annually draws attention to the Government is to increase employment in rural areas through the creation of new jobs, additional handling and processing, storage of horticultural products, the expansion of services. Consistently improved welfare of farmers and rural residents by diversifying production, growing more crops more efficient that leads to higher yields of agricultural producers of the country. In this direction, there are some positive results, which should be strengthened and further developed.

The most acute problem of agriculture is the overall technical and technological lag in updating the fixed assets and technological equipment, poor implementation of information and communication technologies in the industry.

**Conclusion**

For a number of agricultural issues notes the complexity of the distribution and implementation of national and international scientific developments in farming, and in general agriculture. And the increase of economic efficiency of agricultural production and depends on many factors, in particular the access to new technologies and equipment of agricultural production, training, knowledge, skills, strengthen information flows, etc.

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