

Sharing the Agriculture and Industrial Sectors in the Economic Growth of Iraq: An Ordinary Least Squares (OLS) Application

¹Younis Ali Ahmed, ²Biaban Nwri Rostam and ³Burhan Ali Mohammed

¹Department of Tourism,
Faculty of Commerce, University of Sulaimania.

²Department of Economics,
Faculty of Commerce, University of Sulaimania.

³Department of Accounting,
Darbandixan Technical Institute-Sulaimani Polytechnic University

Corresponding Author: Younis Ali Ahmed

Abstract

Iraq has great resource potential that may not be available in other countries. It has a great potential of various resources that date back to thousands of years. Iraq is one of the areas that have diversity in terms of natural resources and industrial components. Due to these resources, in 1970, Iraq was among the best countries in producing and exporting wheat and barley as well as in providing industrial goods. This helped increasing the gross domestic product (GDP). Since 1980, Iraq passed three wars and economic blockade which had an extensive negative impact on economic development. Moreover, Iraq is one of the most important oil-exporting countries in the world and while its oil revenues dominate the overall countries' economic activities of the country, there has been directly and indirectly less attention given to the development of other sectors such agriculture and industrial. As a result, the contribution of agriculture and industrial sectors in Iraq's economic growth suffered from fluctuation and instability; likewise, such sectors minimally contribute to the GDP growth of Iraq. Hence, the purpose of this study examines and analyze factors (Agriculture and Industrial Sectors) that affecting economic growth of Iraq. Research on agriculture and industrial in Iraq reveals strategies and solutions to overcome the obstacles confronting the Iraqi economy by diversifying the economy. To achieve study objective the Ordinary Least Squares (OLS), multiple regressions _ Double log with economic analysis were applied in the study and the secondary data from 1980 to 2014 was used to estimate the contribution level of economic sectors to economic growth. The empirical result shows that political and security instability had negative effects on the agriculture and industrial sectors as well as on the economic growth. This study also found that both agriculture and industrial sectors had positively effected on gross domestic product (GDP). Nevertheless, the effect of industrial sector was smaller, if compared to agriculture sector. Iraqi government should give opportunities to extensively develop Agriculture and Industrial sectors and in the process help to increase gross domestic product (GDP). Furthermore, government should consider agriculture and industrial diversification as necessary strategies to develop Iraq's economy. This study contributes to the body of knowledge because this study attempts to present a clear picture of the agriculture and industrial sector of Iraq. The study also identifies the problems that facing the Iraqi economy and selects the necessary policy to solve the problems. Moreover, to the best knowledge of these researchers, no current international academic journals have published papers on the same subject.

Keywords: agriculture sector, industrial sector, economic growth, ols applications - Iraq.

INTRODUCTION

There are many different ways for developing and economic growth in a country. It is well documented that agriculture, industrial and oil sectors have significant role in accelerating economic growth of a country, however, sharing of such sectors are different according to the countries. At the first stage of economic development agriculture and industrial sectors are affective elements for an economy, because such

sectors can provide more job opportunities, security in producing sufficient food, and then poverty reduction (Michael & Stephen, 2001). Thus, both sectors are backbone of the country's economy, for the reason that countries cannot exist without agriculture development, and cannot develop without industrialization. The agriculture and industrial sector are two of sectors with great impact on the economic growth in the countries.

Both sectors are vital for economic development, for example, in increasing GDP and decreasing employment. India is one of the countries which continuously its development depends on agriculture and industrial sectors. Therefore, agriculture and industrial sectors have a positive impact on increasing GDP in India (Sahoo & Sethi, 2012). In Pakistan, GDP has increased when the agriculture improved, it means that, the relation between agriculture and GDP are significantly positive (Anwar, Farooq & Qureshi, 2015). Another study supported that the agriculture and industrial sectors have more fundamental impact on Pakistan economy and GDP growth (Nazish, Iqbal & Ramzan, 2013).

Even though investments in both sectors are beneficial for countries, the allocation of risk and returns has fundamental role in the business decisions process concerning the level of vertical combination. In the past few decades, agricultural value chains have likely focused on returns in processing and allocation, whereas the risks drop primarily on dominant manufacturing (Vermeulen & Cotula, 2010). Additionally, the distribution of risks and returns are changed because of alternation in agriculture commodity prices, by enhancing the downstream risks to processors and distributors, concerned about the provision securities, and improving returns from production (Noland & Pack, 2005). Advocates of agriculture-led growth (ALG) contend that investment in agriculture and the accompanying creation of infrastructure and institutions in other sectors is a prerequisite for national economic growth (Schultz, 1988; Stringer & Pingali, 2004).

The fundamental role that agriculture plays in development has long been recognized. In the seminal work on the subject, agriculture was seen as a source of contributions that helped induce industrial growth and a structural transformation of the economy. However, globalization, integrated value chains, rapid technological and institutional innovations, and environmental constraints have deeply changed the context for agriculture's role. Governments and donors have neglected these functions of agriculture with the result that agriculture growth has been reduced, 75% of world poverty is rural, sectoral income disparities have exploded, food insecurity has returned, and environmental degradation is widespread, compromising sustainability (Byerlee et al., 2009).

Iraq is one of the countries which have different resources; that can promote its economic development. However, some of the resources have potential; in other words, it has potential resource that is not available in some of other countries. Therefore, Iraq has faced three

wars after 1980; which have negative impacts on economic sectors as well as on its economic growth. The economic growth in Iraq has been fluctuating throughout that period of time. Besides that, Iraq is one of the countries who has great amount of natural resources like crude oil. Therefore, oil revenues dominate the overall economic activity of the country, thereby contributing directly and indirectly to the decreased importance given to other sectors such (agriculture and industrial). Nevertheless, this gaining has negative impact on Iraq economic growth, since the significant role of other sectors like agriculture and industrial have not been focused on Iraqi economy. However, recently fluctuation oil price and falling oil revenue they were all major reasons to once again returned to pay enough attention to the agriculture and industry sectors.

The principle aim of this article is to identify Sharing the Agriculture and Industrial Sectors in the Economic Growth of Iraq, and determine challenges faced by both sectors. The structure of this research is divided by some sections. In first Section introduction is focused; and theoretical framework of the study followed by. Also, next section in this research summarises the related literature. Data description and methodology models with the results are clarified in Section 4. The end of this study provides the conclusion.

THEORETICAL FRAMEWORK

The Concept of Agriculture

Agriculture is considered to be a vital determinant of a country's economic strength and development. In addition, it is a type of activity which involves land, labor, capital and organizer to produce plants, animals, solar energy and forest resources for consumption and providing the agrarian products which is demanded by other fields (Lawrence & Salako, 2015). Accordingly, "Beyond its primary function of producing food, agricultural activity can also shape the landscape, provide environmental benefits such as land conservation, the sustainable management of renewable natural resources and the preservation of biodiversity, and contribute to the socio-economic viability of many rural areas" (Ahluwalia, 1996).

From a policy perspective the role of agriculture has been significant for some reasons: promoting economic evolution and growth, the transient from an agro-economic to manufactured or modern economy would rely on how important the field of agriculture enables such a change (Behera & Tiwari, 2014). For instance, Pani (1984) implies that one per cent rise in agriculture production raises the net domestic product (NDP) by approximately 0.56 per cent. If growth rate of agrarian

sector did not exceed population increase of 2.5 to 3.0 per cent, is assumed to be not important, without considering disastrous.

It is well documented that agriculture sector has crucial role in employing huge numbers of workforces than other sectors (industries and services), especially in where labor productivity is not high. Agriculture in developing economies employ more than (60-70%) of the workforce, this includes India and until the 1990s China, while in developed countries less than (10%) of workers are in agriculture (Perkins et al., 2008). Until the Industrial Revolution the majority of the population depended in agriculture for their survival (Sahoo & Sethi, 2012).

The Concept of Industry

Industry is the manufacture of goods and service in well organized plants with high degree of specialization and automation. It can likewise include other commercial activities that supply goods and services like transportation and hospitality (Verspagen, 2000). In addition, such a sector refers to mining, manufacturing, construction, gas, water and electricity (Sahoo & Sethi, 2012).

The role of Industrialization sector is remarkably important for economic growth, and for poverty reduction. However, the pattern of industrialization, effects on how economy of countries advantage from growth (Sahoo & Sethi, 2012). Thus, expanding industrial field is remarkably significant for economic development (Kniivilä, 2004). Starting with the industrial revolution, technological adjustment has played crucial role in industrial sector (Sahoo & Sethi 2012). In the early 1990s, the value of world's industrial sector rises; for example, over (60%) of such a rise can be attributed to six major industrial countries - the US, Japan, Germany, Italy, the UK and France. While developing nations included 21% of manufacturing value rise. This shows that there is an obvious gap between developed and developing nations, as analyzed by (Kniivilä, 2004).

The Contribution of Agriculture and Industry Sectors in Economic Growth

Additionally, crude oil has grown universally in the 'supply-demand equilibrium'. Consumer and producer countries of crude oil have become aware of the strategic importance of oil for the world economy; growth progress and economic development have become oil dependent worldwide, despite the volatile nature of oil prices (Kapusuzoglu, 2011). Furthermore, over the past three decades, oil is one of the most significant energy resources worldwide and is known

for wide price movements; it has also enjoyed a strategic position in affecting macroeconomic activities (Kapusuzoglu, 2011). Whilst basing their study on oil market in future oil market data since 1989. Alquist & Kilian (2008) demonstrate that there is strong linkage between oil sector and GDP growth, they also observe such a connection might be as high as 80%. However, despite important crude oil has been cited as 'black gold', especially for economic growth of oil-exporter countries, because they considerably depend on oil revenues (Bamisaye & Obiyan, 2006), important to note, depending on only the oil sector as the source of revenue, budget and growth turned into a mono-cultural economy. This is because the price of oil is beyond the control and is subject a high level vulnerability as a result of political instability, global economic and financial crises. As a result, fluctuation oil price and falling oil revenue.

Based on above discussion, agriculture and industrial sectors are regarded as important elements specifically in the initial stages of economic growth of a country. Such sectors play vital role in the balanced economic development of an economy (Michael & Stephen, 2001). It is well documented that both zones have essential role in accelerating GDP growth and holding the key of overall economic development by generating employment and revenue, insuring self-reliance in food production and security, supplying tools to other fields and foreign exchange earnings, (Lawrence & Salako, 2015).

According to (Karshenas, 1996) there is an interdependency between the sectors of traditional agricultural and modern industrial to a nation's overall economic growth. Growth in agriculture relies on the industrial demand for agricultural products. Correspondingly, industrial growth relies on a rise in purchasing power of the agricultural field for manufactured products and on the providing of raw materials for processing. Many emerging nations have realized the significance of the agricultural field and its role in industrialization for their economic development, (Rangarajan, 1982).

More specifically, agriculture is essential source of resource for countries that want to industrialize, which could be used for investment in the emerging activities. Accordingly, outstanding industrialization demands a solution to the problems connected with the creation, transition, and the surplus of agrarian resource. Generation of an increasing surplus requires an increasing output of farming resources (Souza & Paulo, 2014).

Growth of industrial sector in developed world generated a rise in demand for primary goods from developing countries. Technological improvements in communication, transportation, and infrastructure developed the trade opportunities. However, emerging nations still continued to fundamentally rely on agrarian or mining. Significant components of manufacturing have moved to developing world which provide industrial exports to the wealthy nations (Naudé & Szirmai, 2012). Expansion of exports can promote economic growth both directly as a part of aggregate output, likewise indirectly through efficiency in resource allocation, bigger capacity, exploitation of economic scales, stimulating technological progress owing to competition of overseas market (Awokuse, 2009). Moreover, production of manufactured goods for exports stimulates efficiency throughout the economy. This is important when the output of an industry is used as an input of another domestic industry (Mahdavi and Fatemi, 2007)

However, exporting agriculture and industrial products is not considered as a significant source of GDP growth for oil producing countries, since the finding of crude oil. This is because of high reliance on oil and deficiency of basic and moderate planning toward non-oil exports advancement (Awokuse, 2009). Based on this, Mahdavi & Fatemi (2007) who analyzed share of non-oil sector in the GDP growth of Iran, conclude that investment in industrial sector is not high, therefore, such a sector has small share in GDP of Iran. Besides, assembling "investments to fast-payback and trade-based activities" has resulted in severe deficit of financial resources in creative fields of economy and thereby has confined their access to new tools and modern technologies. Therefore, they imposed that weak effect of agriculture and industrial sectors on economic development in oil producers and low factor productivity in export sector relative to non-oil exports. The main reason of this is probably because of insignificant combination of non-oil exports and high portion of traditional and agricultural products in total exports. Hence, in plans of economic growth, rising of exports is indicated as one of the basic tools to gain growth and economic development. Also, a successful export field in the world trade is relied on heavy industrial sector.

Although several studies have outlined the potential contribution of agriculture, industry and oil sectors to economic development. Their role is been a subject of controversy among development economists. For example, some argued that agricultural evolution is a prerequisite to industrialization; others firmly disagree for a distinct path. Nevertheless, few believe that

sharing oil sector in economic growth is more beneficial; particularly for oil-exporter nations.

In favor of agriculture role, several authors contend that growth in the entire economy relies on the evolution of the agriculture field (Schultz, 1988; Gollin, Parente, & Rogerson, 2002). These analysts outline that growth in agrarian sector can be a catalyst for growth of domestic output via its impact on rural incomes and supplying of resources for transformation into manufactured economy (Delgado, 1995; Schneider & Gugerty, 2011). According to the finding of Awokuse (2009) agriculture indirectly affects on aggregate economic growth, which can provide better caloric nutrient for the poor, stability in the price of food, job opportunity particularly in low-income nations, improvement in the quality of production factors namely (capital and labor), and poverty reduction. Additionally, previous growth theories acknowledged the agriculture field as a magnificent source of resources to finance the industrial sector's development (Johnston & Mellor, 1961; Schultz, 1988).

In contrast to the above arguments, supporters of opposite perspective argue that there is not strong connection between sector of agriculture and other fields. In such a sector, sufficient innovative structure is essentially required to promote higher productivity and export evolution (Stringer & Pingali, 2004). In addition, in many emerging countries, the sector of agriculture was subject to abundant taxation. For instance, beyond the reform of agriculture in 1979 Chinese agriculture was under large taxation and the incomes were adopted to help development of industrial sector (Yao, 2000). Despite, in theoretical analysis, Jinding & Koo (1990) investigated sharing industry sectors in promoting economic growth, and emphasized those countries where export industrial products can generate higher level of GDP growth to support more income and tax, which are significant to fund initiation of life quality such as health care and infrastructure in the economy. This sector is also essential for supplying job opportunity, especially for those who qualified in different fields of engineering.

Although there is overwhelming theoretical and empirical evidence emphasize that oil is a useful source of economic growth, but may not be depended on for long-term continuous growth. The crude oil is not stable source of economic development; an economy can merely relies on other sectors such as agriculture and industry. Because such a sectors have more stability in accelerating aggregate economic growth (Difiglio, 2014). Also, Hamilton (2003) indicates that although until 1973 there was stability in the movement of oil

prices, since then, the effect of oil price changes on the economic world has been harsher. He also found a strong negative correlation between future GDP growth and rises in the oil price. Fayyad & Daly, (2011) state that recently shifts in world oil price have increased unprecedentedly; this is partially because of the fast increase in the demand for oil by India and China.

Moreover, according to the analysis of Kilian, (2008a) prices of crude oil have been affected by universal macroeconomic instability since the 1970s. For instance, it is widely approved that a 'global business cycle expansion' (as in current years) tends to increase crude oil prices. It could be that crude oil prices might be derived from the same economic shocks that influence macroeconomic aggregates. Therefore, Mahdavi & Fatemi, (2007) contend that large reliance of domestic economy on the revenues of oil export has negatively influenced other sectors of economy. Therefore, fluctuation in oil price impacts on national income and the plan of financing other fields. This potentially causes reduction especially in importing intermediate goods which are necessary in industrial sector and cause decrease in investment expenditure and by that influence domestic growth and development trend.

Agriculture and Industry: Theory of Investment

Investment theory is a body of knowledge that can be used to support "the decision making process" for choosing appropriate way of investing, among various investment options. It encompasses the capital asset pricing model, efficient market hypothesis, portfolio theory, arbitrage pricing theory, and rational pricing (Eklund, 2013).

In order to decide whether an investment is to be initiated or not, with the consideration of high degree of profit, there are a number of different decision rules. Such rules commonly consider the future expected cash flow caused by investment, investment cost and capital cost of the company (Love & Zicchino, 2006). Further, Scheibl & Wood (2004) conclude that there are four investment objectives, such as: rise in market share, increase the output of existing capacity, modernize; minimize shareholdings. In addition, Richardson (1960) imposes that the profitability of an investment business relies on other firms' investment behavior. Alfredo & Vicente, (2010) defined investment behavior as how investors work, expect, examine and review the decision making processes, which incorporates the psychology of investment, accumulation of information, comprehending and defining, research and examination. In respect of evaluating an investment opportunity is profitable Richardson (1960) also emphasizes that, it is

remarkably important to know whether firms have adequate information. He contended that a necessary demand for constant reaction to the opportunities of profit is for 'imperfections or frictions' and 'market connections' which 'clog the competitive system' to continue. Frictions enforce a restraint on the length to which competitor reacts could react and differ the reaction times of various firms. Friction presences supply firms with adequate knowledge of the entire supply reaction, so that contributing to the resolving the co-ordination problem.

In addition, comprehensive bodies of literature have examined investment behavior of the sectors of industrial and agriculture. For instance, regarding the investment behavior, Scheibl & Wood (2004) adopted the combination of quantitative and qualitative data to exam British brick industries to promote a grounded investment theory. They outline that the high capital cost which associated with overinvestment ought to supply the circumstances that weather stimulate firms to prevent surplus capacity or create pre-emption especially effective. Therefore, in order to the industry significantly profit, the brick firms' capacity decisions are made, by the combinations of these features. The fundamental determinant of a brick firm's capacity is the 'size and number of its kilns'. Therefore, the size of kiln and plant has dramatically grown.

Besides, Jorgenson and Stephenson (1967 b) examine investment theory by using quarterly data on investment expenditures for entire durable and non-durable manufacturing. They outline that based on the neo-classical theory of optimal capital accumulation; investment behavior model satisfactorily establishes clarification of real investment expenditure. Thus, their conclusion suggest that policy instruments, which have a key role in determining investment expenditures involve the tax form and tools that impact the capital cost.

An extensive analysis of investment behavior in agriculture was tested by Brase & LaDue (1989), even though this basically promoted accumulated investment models. However, Sand (2002) studied the model of investment and outlined that there is no normal conclusions can be drawn concerning what controls investments of farm. They indicated that investor's decision depend on attitude, personality and convenience, as much as it relies on financial conditions.

While in high income nations, Investment in industrial sectors is high; investment in agriculture is recently getting bigger in low and mid income nations

(Vermeulen & Cotula, 2010). This is because of some structural aspects, for instance; Population development, rise in urbanization rate (which explore the contribution of the world's population that relies on buying food) and diet changes (such as increasing demand for fast food and meat in large industrial nations), and therefore, this leads to increasing demand for food (Godfray et al. 2010). Additionally, agriculture increasingly becomes attractive investment option, when demand for agriculture commodities and energy increases worldwide, meanwhile; when technological and industrial capacity for higher products and returns increase (Kniivilä, 2004).

Despite the market forces, Investments in agriculture and industrial sector are motivated by policy adjustment. More spastically, in several food-importing nations, governments have supported investments in agricultural in oversea nations as component of their domestic food security strategies (Tiffen & Mortimore, 1990). In addition to political aspects, economic forces motivate more involvement of agribusiness in production (Souza & Paulo, 2014). Furthermore, promoted investment tend to bring high level of macro-benefits (GDP development, larger government returns), and provide more opportunities for increasing provincial living standards. Investors can play significant role in catalyzing economic growth in rural regions, it is also can deliver knowledge, technology, capital, infrastructure and market access. Therefore, this situation may generate motivations for agrarian firms to focus on activities upstream (supplying of inputs, machinery and seeds) and downstream (altering and allocation), and to benefit production of agriculture from regional sources provision (Tiffen & Mortimore 1990). Growth in agriculture production is attractive as an investment options, encompassing the gain of land as such, but likewise of contributions in firms holding earth generating fertilisers, supplying management services or alternatively engaged in upstream agribusiness aspects (The Economist, 2009).

Agriculture and Industry: Theory of Growth

Economic growth is an increase in the production and consumption of goods and services. It entails increasing population and/or per capita consumption. Growth rates vary enormously across countries over long periods of time. The Gross Domestic Product (GDP) is considered as essential measure of economic growth which indicates the economic performance (Ayres & Warr, 2005). An increase in real GDP means rise in the value of national output and expenditure (Bjork, 1999). In addition, GDP is defined as "an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production

(plus any taxes, and minus any subsidies, on products not included in the value of their outputs)" by (Zanoli et al, 2007).

In the Adam Smith (1776) theory income per capita or GDP is the indicator for the average level of country's prosperity. It is not necessary to consume annual income during the year, but what is not consumed is saved and become other investment or an export surplus. In both uses it adds to the national wealth and thereby becomes a source of future consumption, and then growth (Sørensen & Whitta-Jacobsen, 2010). In the Fei-Ranis model, technological progress and aggregation of capital are significant in the growth of an economy country (Souza & Paulo, 2014). In classical (Ricardian) economics, whereby enhancing either production factors (capital or labor), although expecting the other fixed and assuming no technological change, will rise output (Michael & Stephen, 2001). Additionally, according to the neoclassical Solow–Cass–Koopmans model, the rate of growth in an economy relies on the initial level of gross domestic (Acemoglu, 2009).

The extensive body of literature examines the economic growth. In order an economy grow several factors are required, for instance; energy sources, natural capital, including water timber, soil and energy sources (Bjork, 1999). Economic development is a significant macroeconomic tool because of enabling high standard of living and supplying more job opportunities; this encompasses rise in aggregate demand ($AD=C+I+G+X-M$), and rising aggregate supply which means growth in capital, investment, higher labor productivity (Acemoglu, 2009).

In recent history, the evolution of economic development varies across countries, therefore; the interaction of sectors is different, for example in the developed world sectors of agriculture, industry and services have fundamental role in accelerating economic growth. While such a role is not more significant in the oil nations (Karshenas, 1996). Hence, this study analyses the impact of agriculture and industrial sectors on economic growth.

Industrial development has had an influential role in the growth of economy. Some countries have managed to obtain growth with equity, while in others inequality has stayed high (Noland & Pack, 2005). Syrquin (1986) examines that, when overall growth accelerates, manufactured sectors commonly leads the way and grows faster than other fields. However, in low income nations the role of manufacturing in GDP is not high,

and its immediate attribution to aggregate growth is small.

According to the finding of (Ricardo), who investigate the linkage between agriculture and industrial sectors and their sharing in promoting economic growth, while such a field is subject to declining returns, labor productivity declines the demand for agriculture workforce, differently; employment opportunities in manufactured sector develop (labor surplus in agriculture would turn on to industrial sector) without causing an increase in wages role (Michael & Stephen, 2001). Consequently, production in industry takes over a larger contribution of GDP than agriculture and employment in industry becomes predominant. Ranis & Fei (1961) also examined the relation of both sector in the process of economic growth; they assumed that the agriculture and industrial sectors rely on each other. Industries prefer to employing people who have prior knowledge of working in factories instead of inexperienced farmers (Stringer & Pingali, 2004). Accordingly, Awokuse, (2009) implies that without growth in agriculture, no country can exist and without industrialization countries can not develop.

Economic growth implies that the scale of production in a country generally increased and that a country used its economic resources efficiently to produce goods and services. Adam Smith's (1776) "An Inquiry into the Nature and Causes of the Wealth of Nations" may be considered a suitable starting point for economic growth theories, in which capital accumulation, technological progress, and institutional and social factors are crucial in the economic growth process of a country (Kibritcioglu, 1997). In the neoclassical Solow–Cass–Koopmans model, the rate of growth in an economy depends on the initial level of income (GDP). The Growth domestic product (GDP) is the fundamental measure of the growth output from economic activity. An extensive body of literature has determined the mechanisms that explain growth. Explaining the growth rate of output over a time period usually employs either of two complementary approaches, namely, (i) growth theory, which deals with the interaction among factor supplies, productivity growth, saving, and investment in the process of growth, and (ii) growth accounting, which attempts to quantify the contribution of different sectors of output growth (Balaguer & Cantavella-Jorda, 2000).

Economic growth is the outcome of a complicated interaction among all sectors, specifically the agriculture, industrial, and service sectors. Each sector exerts direct and indirect effects on economic growth based on policy work in countries. Ethanol producers

are part of a manufacture sector that adds substantial value to agriculture commodities produced in the United States and makes a significant contribution to the American economy (Urbanchuk, 2009).

EMPIRICAL LITERATURE REVIEW

There are number of studies that suggest agriculture and industrial sectors have high contribution to economic growth in different countries. The two sectors are considered as backbone for economic development in many countries. However, some literatures have supported other sectors; for example, oil sector; it is argued that such sector has significant effect on economic growth. However, it is difficult for countries to develop without agriculture and exist without industrialization.

To investigate the impact of agriculture and industrial sector on economic growth of India, Sahoo and Sethi (2012) used data for the period between 1950 - 2010 and performed ordinary least Square (OLS). The Finding suggests that both sectors positively affect economic growth. However, the impact of industrial sector was more important to the GDP growth of India than agriculture sector. For instance, the sharing of industrial sector to the Indian GDP is about (28.6%) while agriculture sector is only about (14.6%).

The important role of industrial and agricultural sectors in China's economic development can be seen as an essential evident. Before the economic reform, the industrial sector was not as important as the agriculture sector in Chinese economy. The production of goods and services fundamentally depended on agricultural sector. However, such a role has changed in recent years, because Chinese government has crucially supported industrial sector rather than agriculture sector. The Chinese government focus on industrial sector particularly started from 1985 onwards. In addition, one of the significant factors in industrial and agriculture growth is the role of labor. However, labor has much more impact on the industrial sector rather than agriculture (Koo and Lou, 1997). In addition, the contribution of industrial sector is fundamental in economic development Taiwan, Korea and Indonesia (Kniivila, 2004).

Agriculture on the other hand impacts on distribution of income, reducing poverty and economic development in Southern Africa. Countries in Southern Africa also depend on Oil industry to improve their economies (Bahata, Willemsse and Grove, 2014). Additionally, in Brazil, agriculture sector has a great impact on GDP growth (Roe and Spolador, 2013). According to another study in Nigeria, agriculture field is one of the sectors

which considerably important for its economic growth. The country's agriculture sector contributes to GDP growth approximately (75%). Nonetheless, after the discovery of oil, the role of agriculture has reduced and its impact on Nigerian GDP growth is less than oil sector's role (Yusuf, 2014).

Agricultural growth has long been recognized as an important instrument for poverty reduction. Yet, measurements of this relationship are still scarce and not always reliable. The study of Janvry & Sadoulet found that GDP growth originating in agriculture induces income growth among the 40 percent poorest, which is on the order of three times larger than growth originating in the rest of the economy. The power of agriculture comes not only from its direct poverty reduction effect but also from its potentially strong growth linkage effects on the rest of the economy. Finally, using the example of Vietnam, the authors show that rapid growth in agriculture has opened pathways out of poverty for farming households. While the effectiveness of agricultural growth in reducing poverty is well established, the effectiveness of public investment in inducing agricultural growth is still incomplete and conditional on context. (Janvry & Sadoulet, 2009).

Economic growth and Oil sector enormously impact on economic stability of countries (Aliyu, 2009). According to Gimenez-Rodriguez & Sanchez (2005) the oil price increase has a marked impact on GDP. Nour (2011) states that the Sudanese oil sector develops the economy and raises the GDP rate. Furthermore, increasing oil price has positive impact for exporting countries and it has negatives for importing countries. Conversely, in some studies, oil sector has negative impact on economic development and it cannot dramatically increase the GDP; because the governments focused the oil sector more than other sectors such as, agriculture and industrial sectors. Therefore, Hooker (1996) found that the relation between oil price and economic growth are negative. For example, increase the GDP approximately 0.6% percentage, when the oil price 10% increased. Also, According to the study of Hamilton (1996) and Lee and Ni (2002) there is negative relationship between economic development and oil price.

Methodology, Variables and Data Description

The econometric model identifies functional relationships between economic growth and its determinants using Ordinary Least Square Model. The OLS approach to multiple linear regressions was introduced by Gauss in 1794. The OLS technique is the simplest type of estimation procedure used in statistical

analyses (Burke, 2010). OLS is performed in economics (econometrics), political science, and electrical engineering (control theory and signal processing), among many areas of application. The OLS model includes dependent, independent variables. Additionally, each of these variables must be estimated; therefore, the accuracy of the estimation depends on the reality and precision of each data sample (Witt & Witt, 1995). However, to benefit from the refined properties of an OLS estimate, numerous assumptions must be satisfied. OLS computational techniques are commonly used to test hypotheses on differences among factor-level means in repeated measures data and are available in various commercial statistical software packages, generally under the rubric of general linear model.

Explaining the growth rate of output over time is usually referred to as growth accounting approach, which attempts to quantify the contribution of different determinants (e.g. Agriculture, Industrial and Service sector) of economic growth. GDP is one of the most commonly-used macroeconomic indicators for measuring economic growth (Slocum, 2006; Chen & Chiou-Wei, 2009).

There are several different frameworks in which the linear regression model can be cast in order to make the OLS technique applicable. Each of these settings produces the same formulas and same results. The only difference is the interpretation and the assumptions which have to be imposed in order for the method to give meaningful results. The choice of the applicable framework depends mostly on the nature of data in hand, and on the inference task which has to be performed (Lim, 1997; Abdullah et al, 2010 ; Ishikawa and Fukushige, 2007; Hutcheson, 2011). In fact, several factors influence economic growth; each of them includes several items and has different measures and different units of measurement. Hence, GDP growth for industry and agriculture sectors by ordinary least squares (OLS) methods which can be written as below:

$$EG = F (Ag_t , In_t , Z_t) \dots\dots\dots (1)$$

Where:

EG = Economic growth presented by real GDP in Iraq during the time period t;

Ag = Contribution (Add-Value) of the Agricultural sector in Iraq during the time period t;

In = Contribution (Add-Value) of the Industrial sector in Iraq during the time period t;

Z_t = Vector of other factors that affect Economic growth.

The above model is determined to measure the sharing of both agriculture and industry (including oil sector as using as controlling variable) of gross domestic product. In sum, in this study the following steps are performed to estimate the economic growth models for Iraq for time period 1980 to 2014:

- First:** Stationary test with OLS approach.
- Second:** Using OLS approach to estimate Economic Growth Model.
- Third:** Diagnostic Checking and Accurate Estimation of OLS model.

Stationary Test with OLS Approach

Stationarity is an assumption about variables in the classical regression model. The typical regression model assumes that variance of time series should tend to converge at a fixed finite constant in large samples. The stationary test results are reported in the tables below:

Table 1: Result of Unit root test for variables in economic growth model

(Augmented Dickey-Fuller test statistic(ADF) at Level)				
Variables	Intercept	Prob.*	Intercept with Trend	Prob.*
ln GDP (Growth)	-1.8027	0.3729	-1.8027	0.3729
ln AG (Agriculture)	-1.8971	0.3295	-2.8428	0.1931
ln IN (Industrial)	-0.8840	0.7803	-3.7020**	0.0363
(Augmented Dickey-Fuller test statistic (ADF) at First Difference)				
Variables	Intercept	Prob.*	Intercept with Trend	Prob.*
ln GDP (Growth)	-5.6576*	0.0000	-5.7337*	0.0003
ln AG (Agriculture)	-6.0531*	0.0000	-6.0809*	0.0001
ln IN (Industrial)	-8.5476*	0.0000	-8.3916*	0.0000
(Augmented Dickey-Fuller test statistic (ADF) at Second Difference)				
Variables	Intercept	Prob.*	Intercept with Trend	Prob.*
ln GDP (Growth)	-7.8268*	0.0000	-7.6927*	0.0000
ln AG (Agriculture)	-4.8091*	0.0007	-4.6693*	0.0050
ln IN (Industrial)	-8.3705*	0.0000	-8.2267*	0.0000
Note: (*), (**), (***) denotes Significant at 1%, 5% and 10% respectively.				
Note: Number of observations is 35.				
Data Source: World Bank, World Development Indicators (2013). www.worldbank.org and CBI. www.cbi.iq .				

From table (1), all variables (GDP, AG, IN) are stationary in the first difference and second difference

(Intercept and intercept with trend) at the 1% and 5% significance level. The OLS estimation procedure is performed after validating the relevance in the first order I (I) of the co-integration concept.

Using OLS Approach to Estimate Economic Growth Model

OLS regression is particularly powerful because it allows relative ease in checking the model assumption, such as linearity, constant variance, and the effect of outliers using simple graphical methods. Moreover, OLS regression is one of the major techniques used to analyze data. It serves as the basis of many other techniques. (Lim, 1997; Abdullah et al, 2010 ; Ishikawa and Fukushige, 2007; Hutcheson, 2011). Many types of samples have been used (e.g., OLS) to estimate the elasticity of variables that explain Economic growth. Different levels of aggregation are used to investigate the agriculture and industrial of economic growth.

This section applies the macroeconomic view to relate GDP as a measure of economic growth. The purpose of this section is to estimate the contribution of Agriculture and Industrial sectors to the economic growth in Iraq. Thus, based on Equation (1), can investigate study objectives, which is to identify Sharing the agriculture and industrial Sectors in the economic growth in Iraq by applying data from 1980 to 2014. The results of the OLS estimation are reported in Table 2.

Table 2: estimates for economic growth of Iraq by applying Ordinary Least Squares Estimation

Regressors	Coefficient	p.value	t-test	Standard Error	Decision
Constant	0.002	[0.566]	0.079	0.032	-
Gross Domestic Product (GDP)	1.420	[0.002]	7.685	0.185	Accept H ₀
Agriculture Sector (AG)	0.702	[0.033]	3.190	0.220	Accept H ₁
Industrial Sector (IN)	0.366	[0.002]	3.438	0.107	Accept H ₁
(*) , (**), (***) denotes Significance at 1%, 5% and 10% respectively.					

Table 2 shows that a one percent increase in agriculture (value add) increases the Iraqi GDP by (0.70%), and a one percent increase in industrial (value add) increases the GDP of Iraq by (0.36%)*. These results also demonstrate that the GDP contribution of Agriculture

* These increments demonstrate the only direct effect of Agriculture and Industrial sectors on the GDP, and also the other variables excluded from the economic growth model may produce a significant effect on GDP e.g. oil sector, because more than (80%) of Iraqi GDP come from oil revenue . *

Sector is much greater than that of Industrial Sector, and consistent with our expectation.

There is a major body of literature providing strong evidence across many countries on the contributing agriculture and industrial sectors on economic growth. However, there are different views about such sectors; it is argued that agrarian evolution is a prerequisite to industrialization. We can compare the results of this research with several studies, which were described in section 3. For example, Koo & Lou (1997) and Sahoo & Sethi (2012) in these studies (China and India) are included, they also performed various econometric models. They showed that both agriculture and industrial sectors have statistically important impact on economic growth. Kniivila (2004) found that industrial sector is an important source of economic growth in Taiwan, Korea and Indonesia. Nevertheless, Janvry & Sadoulet (2009), Roe and Spolador (2013) and Bahata, Willemsse and Grove (2014) outlined that agriculture

sector has positive effect on economic development of Vietnam, Brazil and Southern Africa, respectively. Comparably, the empirical evidence of this study revealed that the response of Iraq's economic growth to agriculture sector is more important.

Diagnostic Checking and Accurate Estimation of OLS model

After estimating the economic growth model, the diagnostic checking is conducted using (Microfit 4.1. and E-views 8.0). The purpose of diagnostic checking is to check the adequacy of the estimation. In current study, diagnostic test is applied to ensure the appropriateness of the OLS estimation based on both theory and statistics tools; this study used several diagnostic tests, including the tests for serial correction, heteroscedasticity, normality and function form. The F-statistics and critical values are reported in Table 3.

Table 3: Diagnostic Checking and accurate estimation of OLS model

Diagnostic Test			
Test statistics:	LM version	F version	Decision
Serial Correlation / LM test	CHSQ(1)= 6.003 [0.014]	F(1, 3) = 0.948 [0.402]	Accept H ₀
Heteroscedasticity /ARCH test	CHSQ(1)= 0.108 [0.743]	F(1, 23) = 0.099 [0.755]	Accept H ₀
Functional Form /Ramsey test	CHSQ(1)= 9.432 [0.002]	F(1, 3) = 1.818 [0.270]	Accept H ₀
Normality /Jarque-Bera	CHSQ(2)= 2.212 [0.331]	Not applicable	Accept H ₀
D.W-statistic test	1.478	1.478	Accept H ₀
R-Squared	0.98	S.E	0.08
R-Bar-Squared	0.93	F(20, 4)	16.369[0.007]
Notes: t-value in the parentheses (...) and p-value for diagnostic test in parentheses (*), (**), (***) denotes Significant at 1%, 5% and 10% respectively.			

Table 3 show that the Lagrange multiplier (LM) and the F-statistic are less than the critical value. The null hypothesis (H₀; the econometrics model does not exist) is accepted across economic growth model. As shown in Table 3, there is no evidence of autocorrelation presented in this table. The ARCH tests suggest that the errors are homoscedastic and independent of the repressors. The model passes the normality tests. Therefore, the OLS model is correctly specified. Furthermore, table 3 also shows the value of S.E regression given its minimal value, is small. The R² show that OLS model is the appropriate.

Overall, OLS models produced results that were statistically accurate, consistent with economic theory, and compatible with our data and objectives.

SUMMARY AND CONCLUSION

Based on theoretical hypothesis and empirical investigation, this study provides comprehensive evidence of the Contribution of Agriculture and Industrial Sectors in the economic growth of Iraq. The methodological examination incorporated secondary

data for the period 1980 to 2014. In addition, the empirical approach was based on some econometric models: Ordinary Least Squares (OLS), multiple regressions _ Double log with economic analysis were applied in the study.

The empirical investigation of Stationary test with OLS approach provides evidence of stationary in the first and second difference (Intercept and intercept with trend) for all variables (GDP, AG, IN) at the 1% and 5% significance level. The results of the OLS estimation shows that both sectors significantly impact on economic growth of Iraq, but the impact of agriculture is more effective, for instance, as it is founded one percent rise in agriculture sector, will increase GDP by (70%).

In summary, the empirical results indicate that the GDP growth of Iraq is influenced by Agriculture and Industrial fields; however, the impact of former is more significant. Likewise, the finding indicates that political instability had negatively effects on the agriculture and industrial sectors as well as on the economic growth. In

order to progress in its economy, Iraqi government should give opportunities to extensively develop agriculture and industrial sectors, because such sectors can help in increasing gross domestic product (GDP) and diversify Iraqi economy.

The main limitation of this study and makes suggestion for future research, study focused on the share and contribution of the agriculture and industrial sectors in the economic growth of Iraq. Therefore, for future research in this subject, it would be appropriate and interesting to expand the study by including more variables for example oil sector, because Iraqi economy significantly depends on oil revenue. Moreover, current study applied the OLS and time period from 1980-2014. Consequently, a future study can formulate and apply different techniques and can also use a different time period to compare and evaluate.

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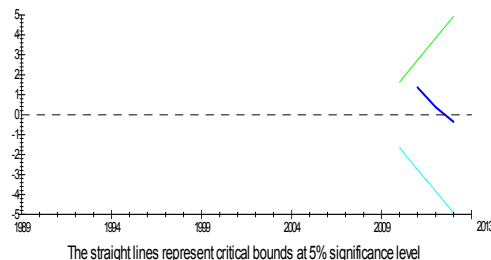
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APPENDIX

Plot of Cumulative Sum of Recursive Residuals



Plot of Cumulative Sum of Squares of Recursive Residuals

