

## ACCEPTED ARTICLE

# Estimating the Share of Agribusinesses in Iran's Gross Domestic Product and Analyzing the Reasons for Changes in Its Components

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**Running Title:** Estimating the Share of Agribusinesses in Iran

## ABSTRACT

By reducing the share of the agricultural sector in GDP in different countries, based on extensive forward and backward linkages of the agricultural sector, since the 1960s the concept of agribusiness has been introduced to explain the valuable contribution of agriculture to the national economy. This paper estimates the share of agribusiness in gross domestic product using input-output tables for 1986, 1991, 2001 and 2016. The results showed that the contribution of agribusinesses to GDP was about 2.5 times that of agricultural production (the average share of agribusinesses in 1986-2016 was about 23%, while the corresponding figure for agricultural value added was 9.25%). In a similar trend to developing and developed countries, the share of agribusinesses in GDP had decreased from 27.2 to 17 percent in 1986-2016. However, the examination of the components of agribusinesses in Iran compared to other countries shows significant differences, which can be attributed to Iran's arid and semi-arid climate, low rate of capital formation, low productivity of production factors, as well as lack of participation in regional and global chains due to long-term sanctions imposed on the economy.

**Key Words:** Agribusiness, Input-Output Table, Economic growth, Iran.

**JEL Classification:** Q13, R15, F43.

## INTRODUCTION

Despite a consensus on the role of agriculture in the development process in developed countries, its role in the economic development path has been at the center of heated debate in developing countries. Of course, attitudes towards the contribution of agriculture to economic development have changed over time. In the 1950s and 1960s, it was believed that agriculture played a minor role in development because labor could be transferred to the industrial sector at no cost (Lewis,

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30 1954) and savings had to be channeled mainly into industrial investment (Hirschman, 1958). Since  
31 the 1980s, however, the need for agricultural growth has become a fundamental part of the  
32 economic development literature (World Bank, 1982A), (World Bank, 1982B). An empirical study  
33 of 85 developing countries found overwhelming evidence that agricultural value added is the  
34 causal variable in developing countries, while the direction of causality is unclear in developed  
35 countries (Tiffin & Irz, 2006). They show that agricultural value added per worker causes GDP  
36 per capita growth.

37 However, the downward trend in the share of agriculture in GDP continues to challenge its position  
38 in the development path. Considering the extensive forward and backward linkages as the  
39 distinguishing feature of the agricultural sector, Davis & Goldberg, 1957 defined the concept of  
40 agribusiness and extended its scope to activities related to the supply of agricultural inputs,  
41 agricultural production and processing, and their distribution, which includes trade. Agribusiness  
42 is therefore a concept that goes beyond what is covered for the agricultural sector in the System of  
43 National Accounts (SNA). Accurately quantifying the size of agribusiness, and explaining the  
44 relationship between its evolution and the share of agriculture in national output not only helps to  
45 disseminate the concept of agribusiness, but can also highlight the role of agriculture in national  
46 development. Based on this insight, we try to explain the methodology of deriving the share of  
47 agribusinesses in the national economy using the input-output table. In addition, the size of  
48 agribusiness is calculated in five years over three decades. Finally, the possible causes of variation  
49 in the share of agribusinesses within this period are discussed in detail.

50 A review of studies conducted in Iran shows that the role of agriculture in Iran's economic  
51 development has been investigated both quantitatively and substantively. Momeni, et al. (2018)  
52 studied the agricultural sector and proposed three different viewpoints on the role of the  
53 agricultural sector in Iran's economy using the Social Accounting Matrix (SAM) model. The first  
54 viewpoint is the 'structural change' theory, which considers the agriculture sector as a provider of  
55 food security. The second viewpoint focuses on the backward and forward linkages of the impact  
56 of the agricultural sector on a country's economic transition, while the third viewpoint considers  
57 the agricultural sector as a provider of economic-social balance. Without quantifying the size of  
58 agribusiness, Momeni, et al. (2018) showed that agricultural production and related industries not  
59 only have a greater multiplier than other economic sectors, but also a more stable position. In

60 addition, the agricultural sector ranks first in terms of job creation and can therefore be considered  
61 as a sector that contributes to socio-economic balance (third viewpoint).

62 Sadatbarikani & Irannejad (2013) ranked the economic sectors of Iran on the basis of input-output  
63 tables for the years 1973, 1986, 1991 and 2001. The results showed that the agricultural sector is  
64 one of the two most important economic sectors and has a good potential to stimulate production  
65 in other sectors, while the industrial sector is better at driving economic growth due to its stronger  
66 inter-sectoral linkages. Zand & Mosavi (2022) also found similar results by calculating backward  
67 and forward linkages using the 2011 version of the social accounting matrix and showed that the  
68 industry and agriculture sectors have more backward and forward linkages than other sectors.

69 Banouei, et.al. (2003) showed that the results can vary depending on the choice of multiplier  
70 calculation method. While the multiplier calculation using the Leontief and Miyazawa models  
71 favors the development and expansion of the industrial sector over the agricultural and service  
72 sectors, the social accounting matrix model favors the agricultural sector over the industrial and  
73 service sectors. Banouei, et.al, (2012), using the framework of a supply-driven social accounting  
74 matrix (2015 version), showed that a 25 percent reduction in agricultural production reduces the  
75 value added of other sectors by 3.2 percent. The worth note is that all of the above studies limited  
76 agriculture to activities related to agricultural production, without addressing the broader concept  
77 of agribusiness. While various quantitative methods have been introduced to measure the share of  
78 agribusiness in the national economy following Davis & Goldberg, 1957, in the first attempt to  
79 measure the share of agribusiness in Iran's economy, Khaledi, et.al. (2019) used the share of  
80 agricultural value-added and the economic growth coefficient of the direct effect in an analytical-  
81 descriptive approach. They estimated the total direct and indirect share of agriculture-in Iran's  
82 economy during 2004-2014 at 22.5 percent.

83 Xianhui & Yingheng (2010) use the input-output table to calculate the share of agribusiness in the  
84 Chinese economy during 1987-2002, and compare the results with the American and Japanese  
85 economies. They show that the share of agribusinesses in GDP is 26%, 10% and 12% in China,  
86 the US and Japan respectively, while the share of agriculture in GDP is 8.91%, 1.34% and 1.44%.  
87 In order to explain the relationship between economic growth and structural change of  
88 agribusinesses based on the concept of Davis & Goldberg (1957), Yan, et.al. (2011) presented a  
89 comprehensive framework of the agribusinesses system by dividing the value added of  
90 agribusinesses into four groups named agricultural inputs, production, processing, and distribution.

91 They showed that as economic development progresses, the share of agribusinesses and  
92 agricultural production in GDP decreases, while the share of agricultural processing and  
93 distribution in GDP increases. Kamińska & Nawrocka (2016) used input-output tables to  
94 determine the share of agribusiness in GDP in EU member states. As expected, the results showed  
95 that the share of agriculture and agribusiness in GDP is much higher in less developed countries  
96 than in developed countries. The results of the correlation between gross value added per capita  
97 and the share of agribusiness in national income also showed that although the share of  
98 agribusiness in GDP has been decreasing in all countries during the period under study, the  
99 decreasing trend of the share of agribusiness begins to stop as countries reach a higher level of  
100 development.

101 Bajan & Kamińska (2019) showed that the size of agribusinesses in China decreased from 18.9 to  
102 14.5 percent during the period 2000-2014, while at the same time the share of the agricultural  
103 sector in the Chinese economy fluctuated between 5 and 6 percent. Cepea (2020) states that in  
104 2020, the share of the agricultural sector in the Brazilian economy will be around 7%, while the  
105 share of agribusinesses will be more than 3.8 times higher, or around 26.7%.

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**Table 1.** Methodology used and results obtained in previous studies.

Study	Objectives	Methodology	The share of agribusinesses calculation	Results
<a href="#">Momeni et al., 2018</a>	Defining the role of the agricultural sector in Iran's economy	The social accounting matrix	Not done	The agriculture sector provides the socio-economic balance
<a href="#">Sadatbarikani and Irannejad, 2013</a>	Identifying the key sectors of Iran's economy	The input-output tables	Not done	Agriculture is one of the two key sectors of Iran's economy, but the industrial sector has greater growth potential due to stronger inter-sectoral linkages.
<a href="#">Zand and Mosavi, 2022</a>	Comparison of backward linkages and linkages between different sectors of the Iran's economy	The social accounting matrix	Not done	Industry and agriculture have more forward and backward linkages than other sectors.
<a href="#">Banouei et al., 2003</a>	Examining the chain effects of demand on production in different sectors in Iran's economy	The social accounting matrix	Not done	The multiplier calculation method affects the obtained results, and the Social Accounting Matrix model prioritizes the economic and social effects of agricultural development over the industrial and services sectors.
<a href="#">Banouei et al., 2012</a>	Assessing the impact and consequences of declining agricultural production on Iran's economy	The social accounting matrix	Not done	A decline in agricultural production reduces value added in other sectors of Iran's economy.
<a href="#">Khaledi et al., 2019</a>	Measuring the share of agribusinesses in Iran's economy	Analytical-Descriptive	Done	The share of agribusiness is estimated to be around 22.5%.
<a href="#">Xianhui and Yingheng, 2010</a>	Comparing the structure of Chinese agribusiness with that of the US and Japan	The input-output tables	Done	Agricultural output accounts for 8.91%, 1.34% and 1.44% of total sector output in China, the US and Japan respectively.
<a href="#">Yan et al., 2011</a>	Comparing the structure of Chinese agribusiness with that of the US and Japan	The input-output tables	Done	As economic development progresses, the share of agribusiness in GDP decreases, while the share of agricultural processing and distribution in GDP increases.
<a href="#">Kamińska and Nawrocka, 2016</a>	Determining the share of agribusiness in EU Member States	The input-output tables	Done	The correlation between gross value added per capita and the share of agribusiness in national income shows that the sector's contribution to national income ceases to decline when economic development is high.
<a href="#">Bajan and Kamińska, 2019</a>	Determining the contribution of agribusiness to the Chinese economy	The input-output tables	Done	Between 2000 and 2014, the share of these businesses fell from 18.9% to 14.5%, while the agricultural sector's share of the Chinese economy fluctuated between 5% and 6% of GDP.
<a href="#">Cruz, 2022</a>			Done	In 2020, agribusiness as a whole was responsible for 26.7% of Brazil's GDP, while the agricultural sector represented 7% of national GDP.

132 Table 1 clearly shows that although many attempts have been made in recent years to estimate the  
133 share of agribusiness in different countries, and even efforts have been made to explain the factors  
134 affecting its changes, no methodological work has been carried out in Iran. Therefore, based on  
135 the Kamińska & Nawrocka (2016) method, this article attempts to determine the real impact of the  
136 agricultural sector on Iran's economy by calculating the share of agribusinesses in GDP. The reason  
137 for the choice of the method is explained in the materials and methods section.

## 138 139 **Materials and methods**

140 The input-output model is commonly used in agribusiness study. So far, it is the only method used  
141 to analyze the volume and structure of material flows in the agri-food sector. Woś (1979) states  
142 that a complete and sufficiently detailed input-output table in terms of value makes it possible to  
143 determine the material flows between the spheres of agribusiness, which in turn makes it possible  
144 to determine the share of individual spheres in agribusiness output. Czyżewski and Grzelak (2012)  
145 emphasize that the assessments made with the use of input-output balances enable and expand the  
146 research perspective, taking into account the importance of the studied sectors (product groups) in  
147 the economy, their macroeconomic efficiency and interdependencies in the development process  
148 (Rolnej, 2021).

149 Input-output tables are considered to be one of the most appropriate methods for measuring the  
150 importance of agribusiness in the national economy, as they allow the most complex inter-sectoral  
151 flows to be tracked (Miller & Blair, 2009). Two general methods can be distinguished in the  
152 literature on input-output tables. The first is the method presented by Davis & Goldberg (1957),  
153 which is explained in detail in an article by Leones, et.al. (1994). Since input-output tables are not  
154 published for certain periods, this method estimates the share of agribusiness in GDP by assuming  
155 the stability of the technical coefficients in the input-output tables; this method does not give a  
156 correct estimate because of this limiting assumption. Another method proposed by Furtuoso, et.al.  
157 (1998) estimates the share of agribusiness in GDP directly from input-output tables without  
158 assuming the stability of technical coefficients. They divided the agribusinesses into the following  
159 four subcategories:

- 160 1. Agricultural inputs, which includes sectors that supply agricultural inputs;
- 161 2. Agricultural production;

162 3. Agriculture-based industries (processing industries): related to agriculture in terms of  
163 demand for products;

164 4. Distribution, which estimates the share of agricultural products in the value added of the  
165 transport, trade and services sectors.

166 Following the methodology of Kamińska & Nawrocka (2016) and Kamińska & Bajan (2019), this  
167 article uses the tripartite classification of Woś (1979) to estimate the share of agribusiness in GDP.  
168 It is worth noting that both recent studies also used the methodology of Furtuoso et.al. (1998) to  
169 estimate the share of agribusinesses in GDP. In this method, agribusinesses include activities  
170 related to agricultural production, the food industries that provide support services to the  
171 agricultural sector. The first two parts of this classification are defined by codes A01-A03 and  
172 C10-C12 in the fourth revision of ISIC.

$$173 \text{GDP}_{\text{Agribusiness}} = \text{GDP}_I + \text{GDP}_{II} + \text{GDP}_{III} \quad (1)$$

174 where  $\text{GDP}_{\text{Agribusiness}}$ ,  $\text{GDP}_I$ ,  $\text{GDP}_{II}$  and  $\text{GDP}_{III}$  denote the gross domestic product of  
175 agribusiness and the gross domestic product of the three activities respectively (Woś, 1979).

176 The first step in calculating Gross Domestic Product (GDP) is to determine the value added at  
177 producer prices in the I/O table. According to the system of national accounts, value added at  
178 producer prices is total value added at basic prices plus net taxes on products:

$$179 \text{VA}_{PP} = \text{VA}_{EP} + \text{NT}_{OP} \quad (2)$$

180 Where  $\text{VA}_{PP}$ ,  $\text{VA}_{EP}$  and  $\text{NT}_{OP}$  are value added at producer prices, value added at basic prices and  
181 net of tax (tax less subsidies) respectively. To determine the GDP of the activities of the I group,  
182 the ratio of the GDP of the different sectors contributing to the agricultural and food industries is  
183 calculated. For this purpose, the coefficients of the value-added flows of the different sectors  
184 ( $\text{CVA}_i$ ) are determined and multiplied by the value of the products and services (inputs) supplied  
185 by the sectors related to agriculture ( $z_{ia}$ ) and the food industry ( $z_{if}$ ). The flow of value added  
186 (resulting from the supply of the agricultural and food industries) is deducted from the amount  
187 calculated above in order to avoid double counting. The value-added flow coefficients for each  
188 sector are calculated by dividing the value added by the producer prices in the relevant for the  
189 respective production, that is:

$$190 \text{CVA}_i = \frac{\text{VA}_{ppi}}{X_i} \quad (3)$$

191 Where  $CVA_i$ ,  $VA_{PPi}$  and  $X_i$  denote the value-added coefficient of sector  $i$ , the value added of sector  
 192  $i$  at basic producer price and the output of sector  $i$  respectively. According to the above equations,  
 193 the gross domestic product of the activities of group **I** will be as follows:

$$194 \quad GDP_i = \sum_{i=1}^n (z_{ia} * CVA_i) + \sum_{i=1}^n (z_{if} * CVA_i) - (z_{aa} * CVA_a) - (z_{ff} * CVA_f) \quad (4)$$

195 where  $z_{ia}$ ,  $z_{if}$  and  $z_{aa}$  are respectively the value of the inputs supplied by the sector to the first stage  
 196 activities of the agribusiness, the activities of the food industry and the value of the inputs of the  
 197 first stage activities of agribusiness, and  $CVA_i$ ,  $VA_a$  and  $CVA_f$  are respectively the value-added  
 198 coefficients of the sector, the value added of the agricultural sector and the value added of the food  
 199 industry.

200 The calculation of the gross domestic product of the activities of the group **II** involves the  
 201 determination of the value added of agriculture at producer prices. In order to avoid double  
 202 counting, the value added of agriculture supplied to the food industry (included in the GDP of the  
 203 activities of group **I**) is deducted from the total GDP of this stage:

$$204 \quad GDP_{II} = VA_{ppa} - z_{af} * CVA_a \quad (5)$$

205 Where  $VA_{PPa}$  is the value added of the agricultural sector at producer prices,  $z_{af}$  is the value of the  
 206 inputs supplied by the sector to the food industry and  $CVA_a$  is the value-added coefficient of the  
 207 agricultural sector.

208 The gross product of group three activities is also calculated in the same way; the value added of  
 209 the food industry at producer prices is deducted from the value added supplied by the food industry  
 210 to the agricultural sector (gross domestic product of group one activities):

$$211 \quad GDP_{\square\square\square} = VA_{ppf} - z_{fa} * CVA_f \quad (6)$$

212 Where  $VAPPf$  is the value added of the food industry at producer prices,  $z_{fa}$  is the value of the  
 213 inputs supplied by the food industry to the agricultural sector and  $CVA_f$  is the value-added  
 214 coefficient of the food industry.

## 215 216 **Results**

217 In order to obtain an accurate figure for the changes in the size of agricultural businesses in Iran,  
 218 the value added of each of the activities of the three groups was calculated at current prices using  
 219 different input-output tables for the years 1986, 1991, 2001 and 2016. The results are presented in  
 220 Table 2.

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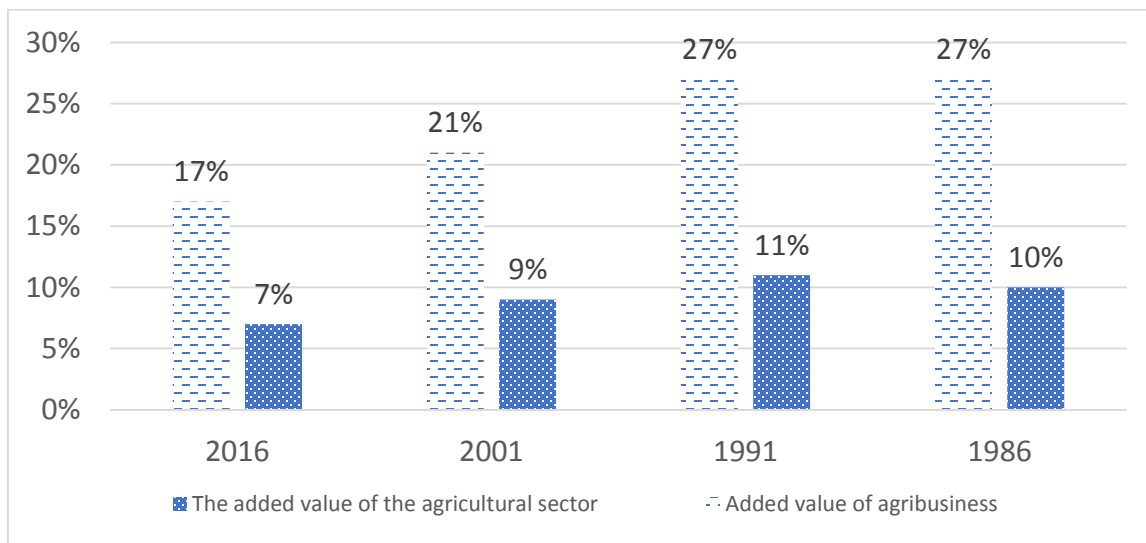


222 **Table 2.** Comparison of gross domestic product and value added of agribusinesses at current prices  
 223 by three groups for the period 1986-2016.

	1986	1991	2001	2016	Growth rate
Agribusiness value added □	1305	5228	60033	759599	23.8
Agribusiness value added □□	1735	7350	71091	1176841	24.27
Agribusiness value added □□□	435	748	6330	138345	21.19
Value added of all agribusinesses	3474	13326	137454	2104785	23.81
Gross Domestic Product	12795	49598	642823	12074549	25.62

224 Due to the inflationary nature of the Iran's economy and the compilation of input-output tables  
 225 based on current prices, the values in Table 2 have grown rapidly. In order to provide a clear picture  
 226 of the changes in the value added of the agricultural sector, agribusinesses and its components as  
 227 well as its share in GDP are calculated for the period under review and the results are presented in  
 228 Figure 1.  
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231 **Figure 1.** Share of the agricultural sector and agribusiness value added in Iran's GDP for the period  
 232 1986-2016.  
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234 Figure 1 highlights several key points. First, as expected, the share of agribusinesses in GDP is  
 235 much higher than the corresponding figure for the agricultural sector. Therefore, the share of  
 236 agriculture in GDP does not fully reflect the importance of the sector and should be complemented  
 237 by the share of agribusinesses to establish its position in the national economy. Based on the  
 238 results, the share of the value added of the agribusinesses is on average 2.5 times higher than the  
 239 agriculture sector value added in the period under review. This ratio is the smallest value reported  
 240 by Xianhui & Yingheng (2010), Kamińska & Nawrocka (2016) and Cruz (2022). Moreover, the  
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242 share of agribusiness in GDP has fallen sharply from 27.2% in 1986 to 17% in 2016. This result  
 243 is comparable to Khaledi et al. (2019), who estimated the share of agribusinesses in the Iran's  
 244 economy as a constant. The share of the agricultural sector in GDP has declined at a similar pace,  
 245 but with a different trend. Both of the above findings are consistent with the results of studies  
 246 conducted in different regions of the world.

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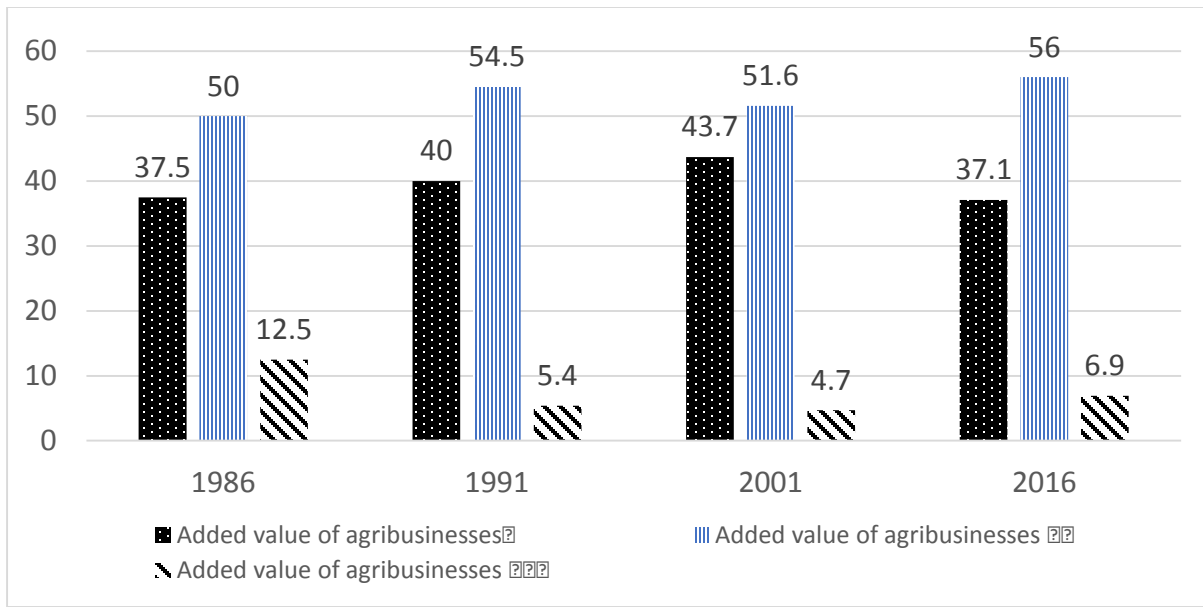


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249 **Figure 2.** Changes in the share of agribusiness components in Iran's GDP: 1986-2016.

250 The changes in the share of agribusiness components in the Iran's economy (Figure 2) imply that  
 251 the food industry and agricultural services are the largest and smallest components of agribusiness  
 252 in Iran, respectively. Also, the share of all three components of agribusiness decreased during the  
 253 period 1986-95, but the pace of decline and the associated trend were different among the  
 254 components. The changes in the components of agribusinesses can be better understood by looking  
 255 at the share of each of these three stages in agribusinesses (Figure 3). The main points of the above  
 256 figure can be summarized as follows:

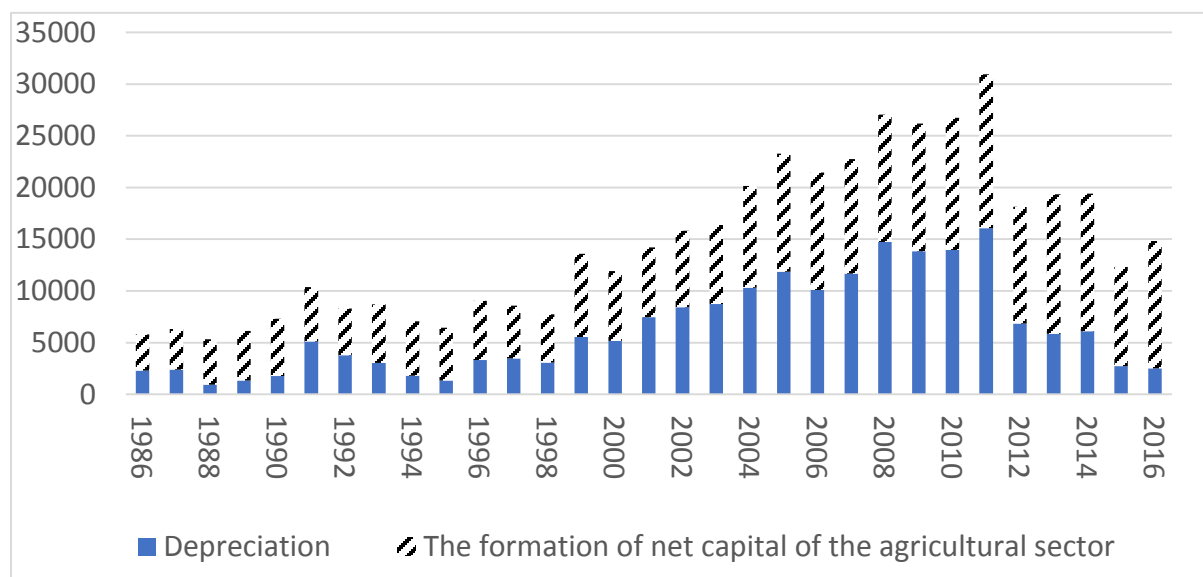
257 1) The share of agricultural production in gross domestic product, consisting of agricultural and  
 258 horticultural products, livestock and poultry products, forestry and fisheries, has experienced a  
 259 sharp decline, falling from 10.3% in 1986 to about 6.5% in 2016. This result seems to be  
 260 completely contrary to the results of Kamińska & Nawrocka (2016) and Kamińska & Bajan (2019).  
 261 This could be attributed to the nature of agricultural production in Iran (agriculture in arid and  
 262 semi-arid regions), insufficient investment, low productivity as well as Dutch disease.



**Figure 3.** Shares of the three stages of agribusiness in Iran: 1986-2016

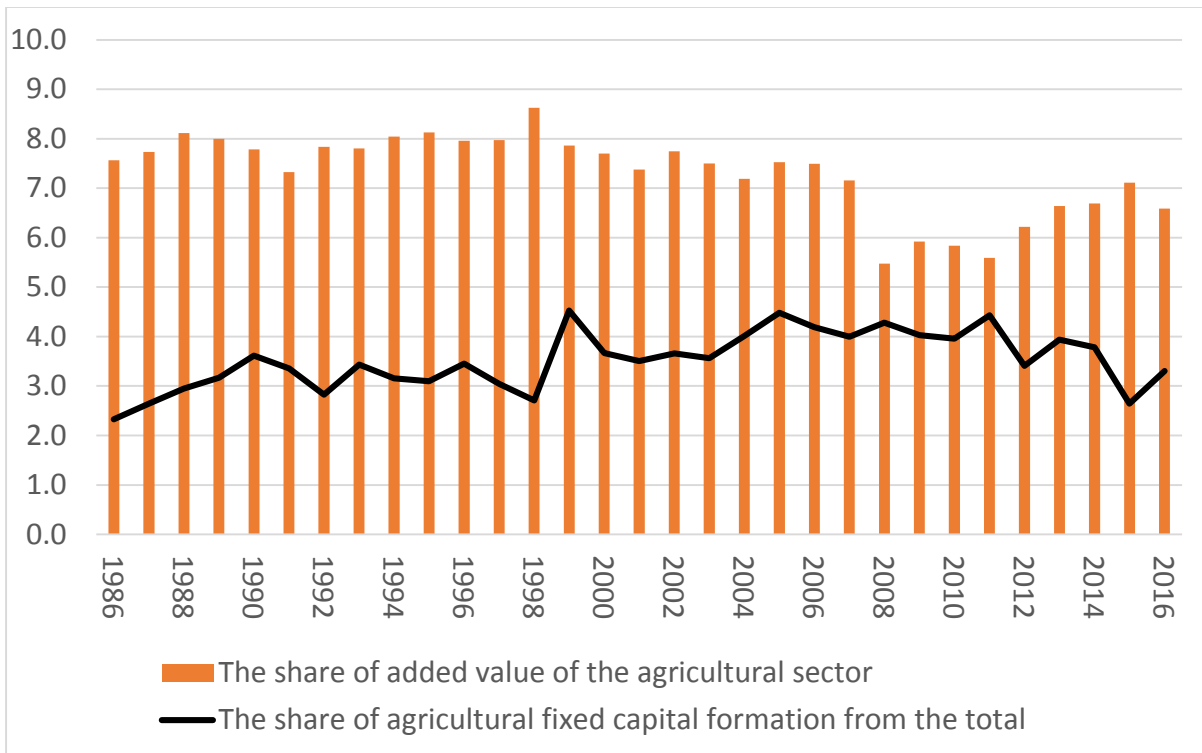
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The slow and inadequate trend of capital formation in Iran's agricultural sector, which has been detected before (Gilanpour, 2013), can be easily verified in Figures 4 and 5. The gross capital formation and the estimation of the sector's net capital formation in Figure 4 clearly show the slow rate of capital formation in the agricultural sector, the pace of which has continued to slow down since 2013. It should be borne in mind that the Rial depreciated against other world currencies during the period under review, and the actual rate of capital formation in the agricultural sector is even slower than that shown in Figure 4. In addition, capital depreciation has also accelerated to a great extent during this period.



273 **Figure 4.** Gross fixed capital formation in the agricultural sector in Iran: 1986-2016 at constant  
 274 2004 prices (billion Rials).  
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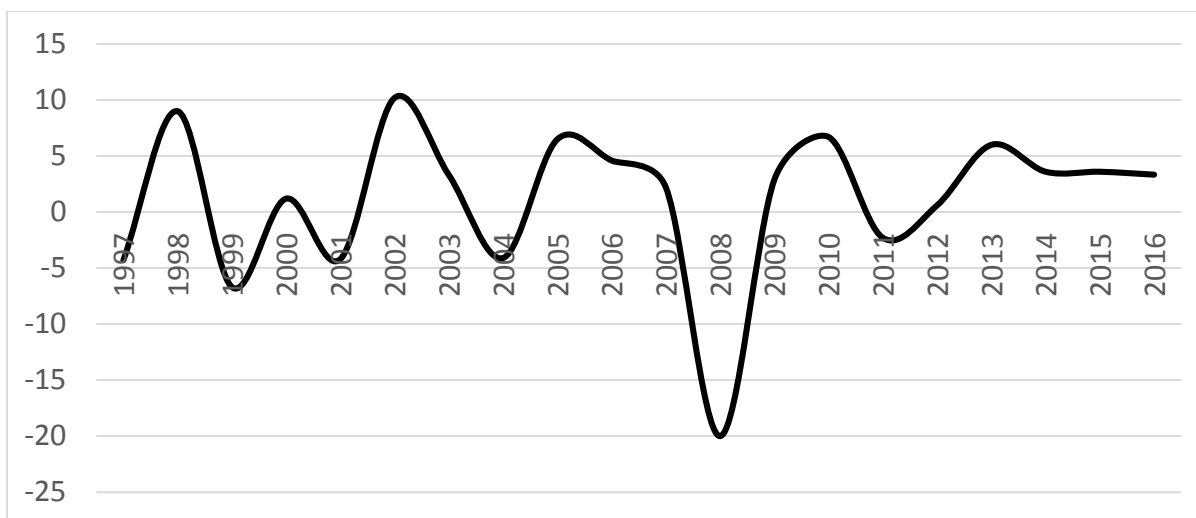
276 Given that the lack of sufficient investment in the Iran's economy is one of the main reasons for  
 277 its slow economic growth, a comparison of the share of the agricultural sector in GDP and gross  
 278 capital formation (Figure 5) reveals that the degree of backwardness of the agricultural sector in  
 279 terms of capital formation is much greater than in other sectors of the Iran's economy. More  
 280 specifically, the share of the agricultural sector in gross capital formation was less than half of its  
 281 share in GDP during the period under review. This feature deters building technological innovation  
 282 capabilities, which is one of the most important driving factors for the development of  
 283 agribusinesses.  
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285  
 286 **Figure 5.** Share of the agricultural sector in gross fixed capital formation and share of the  
 287 agricultural sector in GDP 1986-2016.

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 289 The slow and constantly fluctuating trend of total factor productivity (Figure 6) is another  
 290 important factor that can explain the declining share of agricultural activities in Iran's  
 291 agribusinesses (a trend contrary to international experience). It should be noted that in an effort to  
 292 address these constraints and binding opportunities, UNIDO recognizes improving productivity in  
 293 the agricultural sector as the first key driver (out of 7 requirements) to turn challenges into  
 294 opportunities for agribusiness development (Yumkella, et al. 2011).

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**Figure 6.** Total factor productivity growth in Iran's agricultural sector: 1986-2016.

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2) The food industry in agribusinesses has the largest share in GDP (12.35% of GDP on average over the period). This is despite the fact that the share of this sector showed an upward trend (from 13.6% in 1986 to 15% in 1991) before falling to 9.8% in 2016. Although this is completely consistent with the result of Kamińska and Nawrocka (2016) and Kamińska and Bajan (2019), which were conducted for the 24 member states of the European Union and China, respectively, considering the slow pace of economic growth in Iran during the study period, a greater contribution of the food industry to Iran's economy was expected, which did not materialize. As mentioned above, the agricultural sector has also failed to provide sufficient inputs to the agricultural and processing industries. This may explain the unrealized growth of the agricultural and food processing industries. On the other hand, due to the resource-oriented nature of the Iran's economy (dependence on oil and mineral resources), public policies are mostly aimed at supporting related industries. In addition, the small scale of the food industry (of the approximately 11,200 food industry units in the country, about 56% are small-scale) makes access to new technologies to improve productivity virtually impossible. Furthermore, surging inflation in the Iran's economy has dampened the purchasing power of households, reducing per capita consumption, and has led to a steady increase in production costs, reducing competitiveness in export markets. It's worth noting that, according to UNIDO, exploitation of local, regional and global demand is one of the key requirements for strengthening agribusiness.

318 3) The share of agribusiness support services in GDP fell from about 3.4% in 1986 to about 1.2%  
319 in 2016. This is contrary to the findings of Kamińska and Nawrocka (2016) and Kamińska and  
320 Bajan (2019), but it's behaviorally consistent with their findings given the downward trend of the  
321 agricultural sector value added. Kamińska and Nawrocka (2016) show that the share of support  
322 services in agribusinesses has a different trend in European economies. In the leading agricultural  
323 producing countries of Europe, such as France, England, Spain and the Netherlands, this share has  
324 an increasing trend, which is consistent with Kamińska and Bajan (2019) in the case of China.  
325 That is, the activities of the first stage of agribusiness, while dependent on the share of support  
326 services, has stimulated the growth of support services in the agricultural sector.

## 327 328 **Discussion**

329 As shown above, the value added of agribusinesses is on average 2.5 times greater than that of the  
330 agricultural sector. Although this figure is the smallest among previous foreign studies, it indicates  
331 that the value added of the agricultural sector does not fully reflect the sector's position in the  
332 national economy. Therefore, it's necessary to consider the value added of agribusinesses as a  
333 macro-sectoral index in the national accounts.

334 Surveys have shown that the activities of the first group of agribusinesses (agricultural production)  
335 are the most important part of these businesses and act as the driving force for other agribusiness  
336 sectors. However, the agricultural sector in Iran has not been able to fulfil this role for a relatively  
337 long period of time, so that not only the share of agribusinesses has been declining in Iran's  
338 economy, but also the share of agricultural activities in all businesses has been descending. This  
339 phenomenon is partly due to insufficient investment in the agricultural sector. This not only  
340 dampens the share of agricultural value added in the national economy, but also leads to a faster  
341 decline in the share of agribusinesses in Iran's economy.

342 The share of agricultural food industry, the largest sector of Iran's agribusinesses, has been  
343 constantly declining, which is noteworthy for two reasons. First, although this trend is in line with  
344 international evidence, given the slow economic growth in Iran during the period under review, it  
345 was expected that the food and agriculture industries would grow faster than other industries.  
346 However, this has not been the case as the initial activities of agribusinesses (agricultural  
347 production) have not been able to provide the necessary resources. As a result, the lack of  
348 investment in agriculture has further limited the share of agribusiness in Iran's economy.

349 Meanwhile, the failure to join the global value chains of agribusinesses, not to mention the  
350 significant role of sanctions in this scenario. Despite Iran's arid and semi-arid climate and  
351 insufficient investment as two major factors hindering the provision of all inputs for the food and  
352 processing industry, Iran could have taken advantage of its geographical location to participate in  
353 global value chains, which would not only have expanded the size of domestic agribusinesses but  
354 also helped Iran to gain a larger share of the international food trade.

355 It should be noted that, according to Yumkella, et al. (2011), the promotion of value chains  
356 (regional and global) is the second requirement for agribusiness development. The processing of  
357 agricultural raw materials into agricultural and industrial products to supply global, regional and  
358 national value chains will lead to the production of products in compliance with specific standards,  
359 volumes and packaging requirements, at specific times and under precise procurement and timing,  
360 thereby improving agribusinesses while facilitating technology transfer and private-public  
361 cooperation.

362 Changes in the share of support services in Iran's agribusinesses have been a major cause of the  
363 declining trend in Iran's agricultural value added, as well as being affected by this phenomenon.

364 The consequences of underinvestment in the agricultural sector are far deeper than what can be  
365 deduced from the value added of Iran's agriculture and can shrink the value added of the  
366 agricultural sector and its related agribusinesses, thereby jeopardizing Iran's food security.

367 However, this study serves as a first step in redefining the position of the agricultural sector in  
368 Iran's development path. The hypotheses proposed in this article can be challenged by a deeper  
369 look at Iran's economic development. In order to achieve this goal, it is necessary to measure  
370 agribusinesses in more detail.

371 Based on the issues discussed, the following policy recommendations are offered:

372 1- It's necessary to consider the value added of agribusinesses as a macro-sectoral index in  
373 the national accounts.

374 2- This requires a more accurate compilation of national I/O tables, including a more detailed  
375 breakdown of agricultural activities, horticulture, livestock and agricultural industries and,  
376 perhaps more importantly, activities related to domestic and foreign trade in related  
377 products and inputs. In addition, one of the main challenges in estimating agribusinesses  
378 with this methodology is the delayed publication of input-output tables. Agricultural policy  
379 makers could therefore urge statistical centers to publish these tables at regular intervals.



380 3- Lessons from countries such as Brazil, Malaysia and Thailand, which have pursued  
381 sustainable economic development through agribusiness development, imply that policy  
382 options are important to promote economic prosperity through agribusiness development  
383 as well as agricultural and industrial development. To this end, it is necessary to improve  
384 productivity by directing investment towards technology and innovation, expanding the  
385 use of fertilizers, introducing new crop varieties, and acquiring agricultural equipment  
386 consistent with Iran's climate. Promoting agribusiness through participation in national,  
387 regional and global value chains; meeting national, regional and international demand;  
388 strengthening technological innovation capabilities; gaining access to effective and  
389 innovative sources of finance; providing incentives for private sector participation; and  
390 rebuilding infrastructure are also key steps to facilitate agribusiness in Iran.

391

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395

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