

Output and Employment Performance of Primary Sector: Evidence from Post-Soviet Kazakhstan

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Abstract

The paper evaluates the performance of primary sector of Kazakhstan economy from output and employment perspective since independence. To evaluate the economic performance of primary sector average growth rate (AGR), average annual growth rate (AAGR) and compound annual growth rate (CAGR) have been calculated at decadal end points and for whole period of 28 years. The primary sector of Kazakhstan has played an important role in its growth trajectory but its contribution to both output and employment has declined over the years. Primary sector output share has declined from 9.59% in 1991 to 5.07% in 2018, while the share of primary sector employment has declined from 41.50% in 1991 to 17.90% in 2018, thus showing a decline of 23.60%. A major decline in employment contribution of primary sector has taken place in the last two decades and can be attributed to economic diversification and structural transformation that has taken place over the period of time.

Keywords: Kazakhstan Economy, Decadal Output, Decadal Performance, Primary Sector

An Overview of the Economy of Kazakhstan

Kazakhstan achieved the status of an independent sovereign country in the year 1991 after the collapse of socialism and subsequent disintegration of the former Soviet Union also known as Union of Soviet Socialist Republics (U.S.S.R.) – the world's largest socialist country. In fact, the dissolution of the Soviet Union gave birth to 15 independent countries of which Kazakhstan stands the largest next only to Russian Federation. Geographically Kazakhstan is the largest country in Central Asia, and ninth largest in the world with an area of 2.725 million sq. km. Despite its huge size the population of Kazakhstan is only 18.25 million, making it one of the world's least populous country with a population density of 7 per sq. km (Sinor, 2022).

During the first half of the decade following its disintegration from the centrally planned system, Kazakhstan economy suffered a huge setback due to severe supply shocks. The GDP per capita contracted by more than 36% between 1990 and 1995 owing mainly to transitional recession as the country switched over from rigidly governed socialist system to free-market economy (Capannelli et al., 2018). However, after the transitional recession was over, the economy began to bounce back and registered positive growth rates. During the second decade after its independence from 2000 to 2007, the

GDP per capita growth rates varied between a minimum of 8.9% and a maximum of 13.5%. By virtue of this extra-ordinary growth, the economy was able to restore the GDP per capita to its pre-shock levels. However, this growth momentum subdued during 2008 and 2009, because of global financial crisis (World Bank, 2021). After recovering from this shock, the economy again began to revive before it again showed the symptoms of recession from the year 2014 onwards.

Another major area of concern of Kazakhstan economy has been untamed inflation. Earlier under the socialist system prices of commodities used to be artificially determined without any relation to the demand and supply conditions and were strictly administered and controlled by the government. As a result of this socialist economies suffered from hidden inflation. As soon as price liberalization measures were implemented as a pre-condition for transition to market economy, the nation was gripped by severe hyperinflation. During the first phase of transition from 1991 to 1995 the annual inflation (measured as consumer price index) rose by more than 1000% (International Monetary Fund, 2000). However, due to macro-economic stabilization measures the country was able to manage inflationary pressures to a great extent. Still, despite all these efforts the inflation by and large has remained in double digits throughout the entire period thereupon.

A very low unemployment rate close to about 1% during the initial few years after the independence from the former Soviet Union was in fact a manifestation and legacy of the centrally planned socialist system with public ownership of the means of production. Socialist economies' fundamental objective was to provide employment opportunities to all its labour force. Owing to this reason centrally planned socialist economic systems very often were characterized by the problem of over-staffing (Depersio, 2021). This is in contrast to capitalist economies that at times used to experience chronic unemployment episodes exceeding the natural rate of unemployment. As Kazakhstan began to dismantle central planning structures in its mission of transition to market economy, unemployment began to emerge. Privatization and restructuring of state-owned enterprises (SOEs) to meet the requirements of market economy necessitated the surplus workers to be laid off to make these enterprises competitive and efficient (Lee, 2020). As a result of these measures coupled with dislocation and disarray of productive resources due to switch over to market economy, the unemployment rate in Kazakhstan began to increase continuously from 1993 to 1998 registering the highest figure of 13.46%. Once the phase of transition was over the unemployment rate, especially from 2000 onwards, consistently began to decline year after year reaching to the level of 4.80% in 2018, which is consistent with natural rate of unemployment (Doskeyeva, 2019).

Objectives of the Study

1. To analyze the changes in volume and composition of output in the primary sector of Kazakhstan Economy.
2. To analyze the changes in volume and composition of employment in the primary sector of Kazakhstan Economy.

Data Sources and Research Techniques

The study is primarily based on the secondary data that is obtained from the following sources:

- World Development Indicators, Data Bank, World Bank

- International Financial Statistics, International Monetary Fund
- International Labor Organization
- Agency for Strategic Planning and Reforms, Republic of Kazakhstan, Bureau of National Statistics
- Central Bank of Kazakhstan

Annual Growth Rate or Simple Growth Rate

The annual growth rates for a series of t annual observations, say $y_1, y_2, y_3, \dots, y_t$ is defined as:

$$a_t = \frac{y_t}{y_{t-1}}$$

Where, y_t refers to the current year's output/employment,
 y_{t-1} refers to the previous year's output/employment

Average Annual Growth Rate

The average growth rate has been calculated with the help of following formula:

$$\text{Average Annual Growth Rate} = \frac{1}{t} \times \ln \left(\frac{Y_t}{Y_i} \right) \times 100$$

Where, t refers to number of times we see increase or decrease over the time period,
 \ln is the natural logarithm,
 Y_t is the variable in final time period,
 Y_i is the variable in initial time period.

Compound Growth Rate

The compound growth rate (CGR) has been calculated with the help of exponential function which is as:

Exponential Function $y = ab^x$

The compound growth rate = $(b - 1) \times 100$

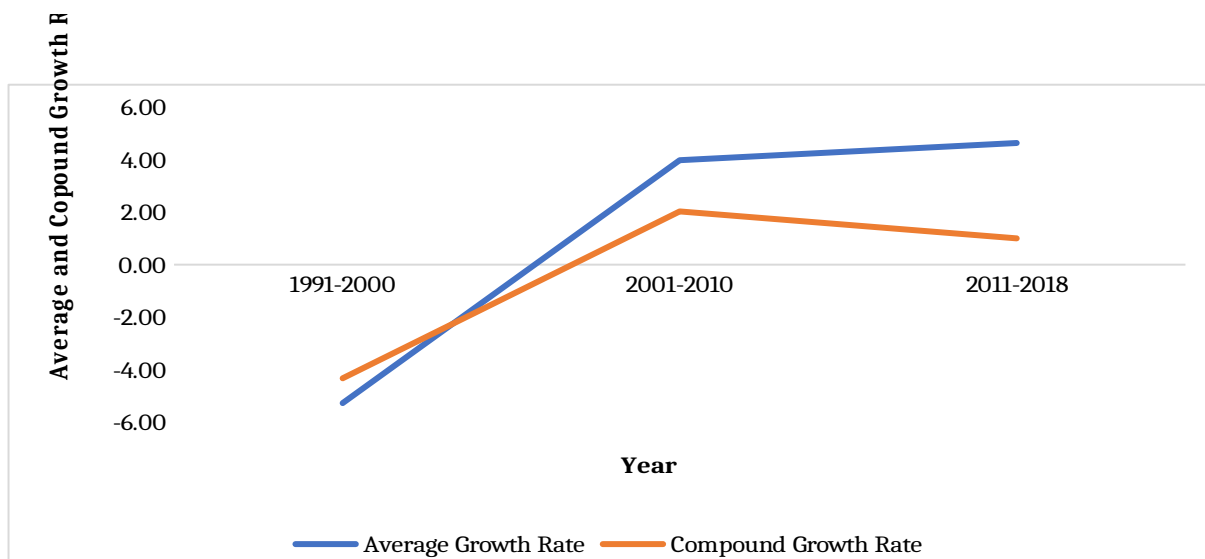
Results and Discussion

The primary sector constitutes an important place in an economy's development trajectory by using available resource bases like land, water, forests, etc. Creating the demand and acting as a raw material source works complementary to develop other allied sectors like manufacturing and the tertiary sector. The primary sector comprises several other sub-sectors, including agriculture, livestock, forestry, logging and fishing. In this paper, an attempt has been made to investigate the changes in volume and composition of output and employment in the primary sector of post-Soviet Kazakhstan.

Variations in Volume of Primary Sector Output (Absolute Growth)

We have calculated the average and compound growth rates of primary sector output to evaluate growth dynamics extensively. Besides, growth rates have also been calculated for the entire data period of 28 years and ten years to understand the traverse of growth at different periods needed for an in-depth introspection. The data analysis shows that the Kazakhstan economy's primary sector gross value figures an average annual growth rate of 0.86% and a compound annual growth rate of 0.83% for the period under study (1991-2018). Based on the decadal average growth rate, the data revealed a rise of 9.26% from the first decade of the study period (1991-2000) to the second decade of the study period (2001-2010) due to a hike of decadal average growth rate from -5.28% during 1991-2000 to 3.98% during 2001-2010. This substantial increment in the contribution of primary sector output could be attributed to the stabilizing efforts of Kazakhstan's economy that have been adopted in the decade following the decade of disintegration from the USSR in 1991. During 2011-2018, the decadal average growth rate further increased to 4.64%, showing an increment of 0.66% over the previous decade. The decadal compound growth rate reported a similar trend for the first two decades. It has risen from -4.33% during 1991-2000 to 2.03% during 2001-2010 and finally reduced to 1.00% during 2010-2018. However, it may be noted that a difference of -0.95, 1.95 and 3.64% have been found between the average and compound decadal growth rate for the period 1991-2000, 2001-2010 and 2011-2018 showing that the former was relatively higher than the latter for the last two decades.

Primary Sector Output Decadal Average and Compound Growth Rate



On the other hand, the behavior of primary sector growth on annual basis is erratic and asymmetric, especially for the first decade of the reference period. An annual growth rate as high as 28.70% was witnessed during 1992 and as low as -24.40 during 1995. During the first decade, the situation of fluctuating growth can be observed as presented in the table below. Again, during the first four years of the final decade, drastic fluctuations in the annual growth rates have been reported. The growth rate went as high as 26.50% in 2011 and suddenly went down to as low as -17.40% in 2012 and again reverted to positive figures of 11.20% in 2013. Finally, during the remaining years (2014-2018), some stability has been observed, and the growth rate hovered around the range of above 3%. This stability can be attributed to the "Strategic Plan for Development of the Republic of Kazakhstan until the Year 2020",

which was approved in 2010 under the heading of "Kazakhstan-2030 Strategy: Prosperity, Security and Improvement of Welfare of the Citizens of Kazakhstan" set out by Government in 1997. The "Strategic Plan" identified the agriculture and food processing industry as important areas of economic heterogeneity along with food security. The figures mentioned above provide a manifestation of widely fluctuating and sluggish growth performance of the primary sector of the said economy during the first decade and early years of the final decade of the study period.

Primary Sector Output Annual Growth Rate

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Growth	-22.6	28.7	-6.9	-21.0	-24.4	-5.00	-0.90	-18.9	21.4	-3.2
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Growth	17.1	3.20	2.20	-0.10	7.10	6.00	8.90	-6.20	13.20	-11.6
Year	2011	2012	2013	2014	2015	2016	2017	2018		
Growth	26.50	-17.4	11.20	1.30	3.50	5.40	3.20	3.40		

[Source: Author’s Calculation; Data retrieved from World Development Indicators Databank]

This performance during the first decade could be attributed to the transitional recession. After the disintegration from the centrally planned erstwhile USSR and the subsequent collapse of socialism, the major problem confronted by Kazakhstan was how to switch over to a new system of a market economy without any blueprint (International Monetary Fund, 2000). The lack of experience on the part of Kazakhstan regarding the system and mechanism of the market economy resulted in wide fluctuations in growth rates and huge inflation rates (World Bank, 2021). The primary sector growth rate was negative, especially during the first few years of independence, primarily the effect of transitional recession. While the economy once stabilized post first decade of independence, the primary sector growth rates stabilized on the positive side, showing an increasing trend. But the fruits of the stabilization did not last long as the global financial crisis of 2008 hit the world hard, and Kazakhstan was no exception to this. The growth rates show an erratic behavior for a few years of the global financial crisis but stabilized soon and followed a stable trend for the rest of the years.

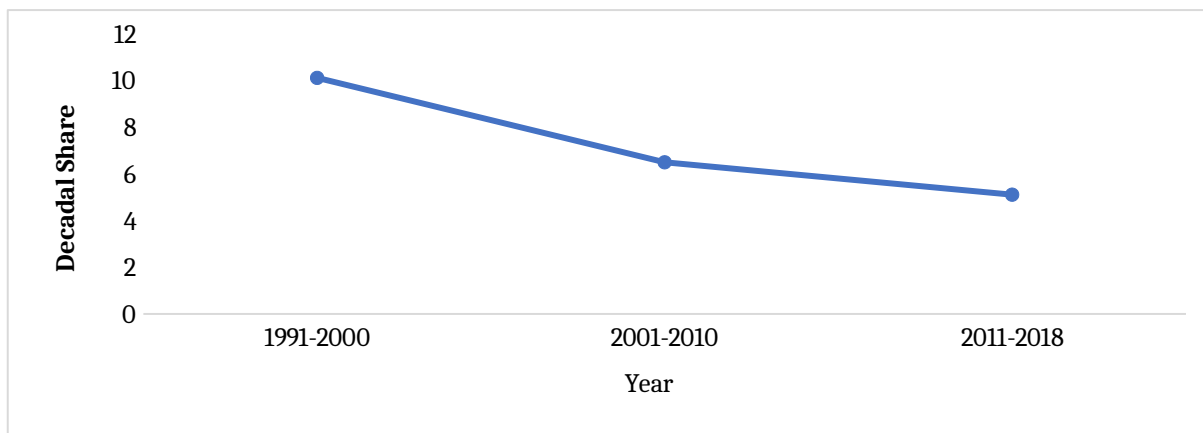
Along with this, the sluggish growth pattern of the primary sector has been ascribed to harsh climatic conditions, scarcity of water, other environmental concerns. Besides, the indisposed unification of local food hierarchy, lack of credit assets & deprived access to the external market to meet the credit requirements has also contributed to this fluctuating & erratic growth pattern. Besides, the poor primary sector performance could be explained from both novel aspects of supply and demand and the relevant dimensions. The reasoning advocated has been proposed by the famous Engel's law. According to this law, as income rises, the proportion of increased income on food expenditure declines, even if the final total expenditure on food rises. In order words, the income elasticity of demand for the primary sector products (which primarily includes food articles) is less than unity. Hence, as the economy progresses, income-per-capita increases, but successively lesser and lesser proportions are spent on primary sector products & consequently, their demand decreases, affecting their supply finally. On the supply side, the agriculture sector is expected to grow slowly due to relatively low productivity under various institutional and environmental factors. Overutilizing chemical fertilizers and groundwater resources

during the Soviet regime also deteriorated soil quality, reducing yield and the Government's least bothering attitude towards the sector. The economy's hyperinflation in 1992-1994 also added to its woes during the decade. However, during the second decade (2001-2010), the primary sector of Kazakhstan's economy has shown a satisfactory performance, as indicated by both AGR and CAGR. After recovering from the early years of transitional recession, the economy began to bounce back.

Variations in Composition of Primary Sector Output (Relative Growth)

The primary sector's contribution, consisting of Agriculture, Forestry and Fishing, to the gross value added of the Kazakhstan economy, declined from 9.59% in 1991 to 5.07% in 2018. Thus, over 28 years, a decline of around 4.52% has been reported, even though the average share of the primary sector to GDP was 7.38% during 1991-2018. An analysis at the decadal endpoints has been made for an in-depth introspection. We observed that the primary sector's GDP share stood at 7.89% at the end of the first decade (2000). It declined subsequently to 5.10% towards the end of the second decade (2010) and finally to a minimum of 5.07% towards the end of the final decade (2018) of the reference period (1991-2018). It implies that the output share declined steeply during 2001-2010 by around 2.79% and only 0.03% during 2010-2018. So far as the average decadal shares are concerned, we witnessed a share of 10.10% in the first decade. Subsequently, it lowered to 6.49% in the second decade and finally to 5.10% in the final decade of the reference period.

Decadal Average Share of Primary Sector Output as a Percentage of GDP



Yearly, an irregular pattern has been found with numerous ups and downs. The highest fall in output share was reported in 1995 by around 2.13%, wherein the share declined from 12.08% in 1994 to 9.95% in 1995. Thus, based on the evidence furnished by the trends of primary sector output contribution to the national gross value-added, we can straightaway figure out that structural transformation has taken place in Kazakhstan economy, for we know that the two most important measures of structural change include the contribution of sectors to total value-added and employment shares therein. There is ample evidence that the primary sector's share of total value-added has declined throughout the analysed data period. Marching ahead, we need to scrutinize the presence of another measure, i.e., the employment share of the primary sector in total employment during the stated period of study, to support the conclusion extracted from the above two sections.

Primary Sector Output Annual Percentage Share of GDP

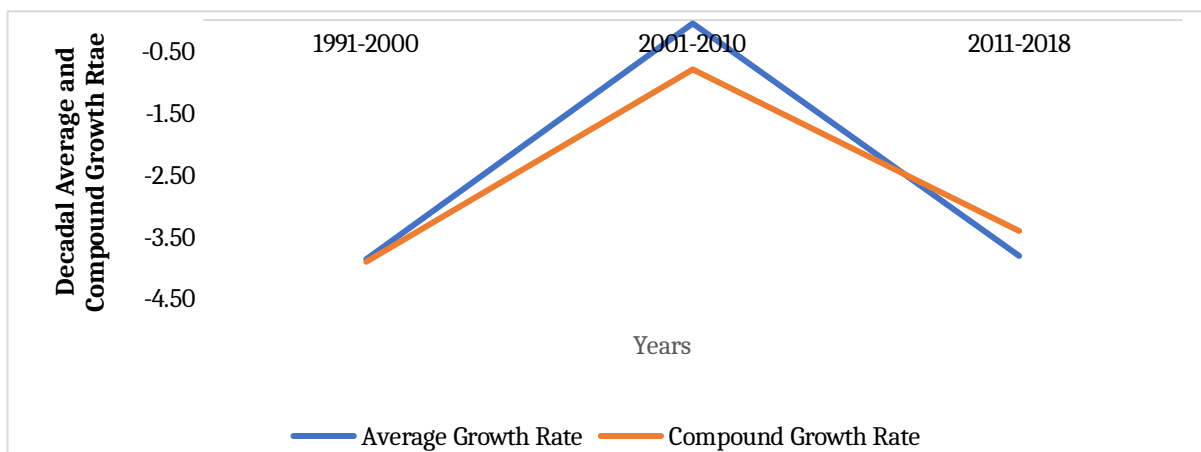
Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Share	9.59	13.03	13.36	12.08	9.95	9.4	9.16	7.57	8.95	7.89
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Share	8.14	7.65	7.16	6.52	6.37	6.1	6.1	5.54	6.19	5.1
Year	2011	2012	2013	2014	2015	2016	2017	2018		
Share	6.01	4.74	4.97	4.83	4.94	5.15	5.11	5.07		

[Source: Data retrieved from World Development Indicators Databank]

Variations in Volume of Primary Sector Employment (Absolute Growth)

Analyzing the employment data for the period under study, we found that employment in the primary sector stood at around 4.60 million in 1991, accounting for 41.50% of total employment. This figure steadily declined to 2.22 million approximately, accounting for 17.19% of total employment in 2018. However, to arrive at a sounder reasoning and conclusion, we have calculated the average annual growth rate, five-year average and compound growth rates, and decadal average and compound growth rates of the primary sector employment to get a more vivid picture. The data analysis shows that the Kazakhstan economy's primary sector employment experienced an average annual growth rate of -2.49% and a compound annual growth rate of -2.58% for the period under study (1991-2018). The employment in the primary sector of the economy of Kazakhstan witnessed a negative average and compound growth rate of -3.87 and -3.91% for the first decade of independence. This negative growth trend continued for the second decade, and the sector registered average and compound growth rate of -0.05% and -0.80%; however, the magnitude was much lower than what we saw in the previous decade. Again, for the final decade of the reference period, the sector registered a negative average and compound decadal growth rate of -3.82 and -3.53%.

Primary Sector Employment Decadal Average and Compound Growth Rate



The first decade was the decade of transitional recession, and the figures witnessed during the first decade reflect a declining trend in primary sector employment, the probable reasons being the post-independence volatility and the indebtedness that the primary sector had to face along with other sectors and the pressures of the farm restructuring and reforms. However, the primary sector employment

witnessed a slow and steady decrease in the second decade instead of the government's better economic conditions and holistic efforts viz concessional credit access to agriculture and allied sectors, input subsidies, crop subsidies, tax concessions, etc. and other agricultural support. Besides, since 2003 the government has been vocal and practical regarding agro-industry development, though the average impact of the second decade was a fall proportional to only -0.05%. In the third decade, we witnessed a consistent decline in the employment avenues in the primary sector from 2010 to 2018, which peaked in 2014, and the later years increased. The extent of the decrease during the third decade was much greater than what we witnessed during the second decade, which is questionable and exciting. The economic conditions were better because the country saw a steady increase in per capita incomes. Still, the primary sector was much less of a contributor, indicating the structural shifts in the primary sector employment. If the working-age group is not drawing its bread and butter from the primary sector, then, indeed it is being employed in other sectors and that too in the more lucrative ones. There is sufficient evidence regarding the increase in per capita incomes, the transition of Kazakhstan's economy from lower middle income to an upper-middle-income country in 2006, and the bulging middle class.

Before skimming through, we will analyse the annual growth rate trend of employment in the primary sector. Starting with the year 1991, we can see that the employment growth rates in the primary sector have by and large remained negative throughout the entire period of study, excepting a few years like 2001, 2002 and 2016 to 2018. The reduction can undoubtedly be attributed to the structural shift in employment from low productivity primary sector to high productivity industrial and services sector, which according to Lewis (1954) is the initial step towards progress and development and is well known by the term structural transformation. Also visible from the cited data is one exciting growth rate of employment in the primary sector at 7.31% witnessed in 2001. The year 2001 also registered the highest GDP growth rate of all times understudy at 13.50%, while the primary sector value-added annual growth rate stood at 17.10%. However, the employment growth rate in the other two sectors of the economy figured at 0.31% in the secondary sector and 0.86% in the tertiary sector. The employment in the primary sector average annual growth rate for the period under study stood at -2.49%.

Primary Sector Employment Annual Growth Rate

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Growth	-0.63	-9.9	-4.2	-10.2	-4.5	3.46	-2.2	-9.2	0.17	-1.3
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Growth	7.31	1.28	-0.5	-4.62	-1.8	-1.1	1.45	-1.1	-0.3	-1.0
Year	2011	2012	2013	2014	2015	2016	2017	2018		
Growth	-4.51	-1.3	-4.3	-13.9	-9.9	1.17	2.2	0.23		

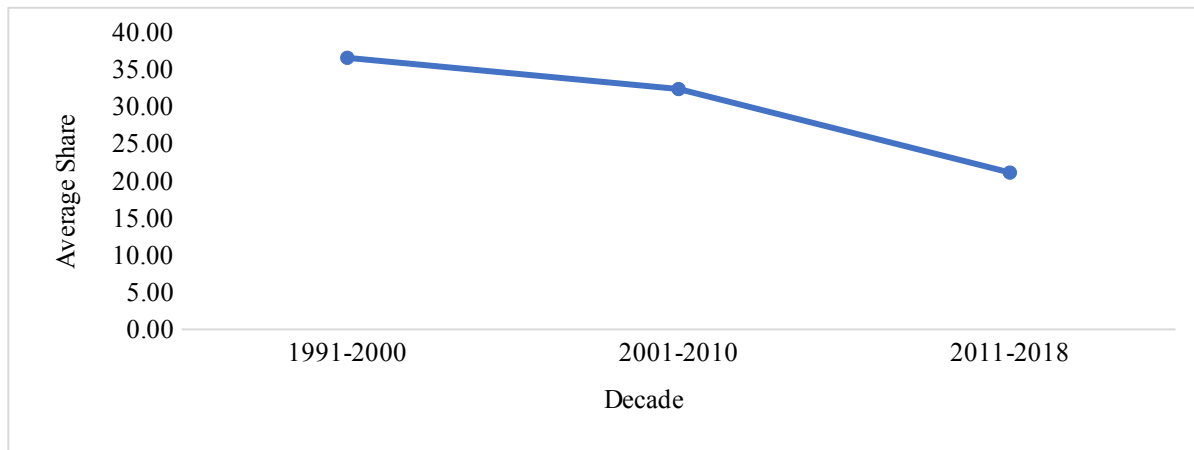
[Source: Author's Calculation; Data retrieved from World Development Indicators Databank]

Variations in Composition of Primary Sector Employment (Relative Growth)

The primary sector's employment contribution to the total employment of the economy of Kazakhstan declined from 41.50% in 1991 to 17.90% in 2018. Thus, over 28 years, a decline of around 23.60% has been reported. To make an in-depth introspection, an attempt has been made to analyze the composition of primary sector employment to total employment at the decadal endpoints. Further, to make the

analysis more comprehensive, we analyzed the data on five-year intervals and year on year basis. After carefully analyzing data at the decadal endpoints, we observed that the primary sector's employment share stood 34% at the end of the first decade (2000). It declined subsequently to 28.30% towards the end of the second decade (2010) and finally to a minimum of 17.90% towards the end of the final decade (2018) of the reference period (1991-2018). It implies that the employment share declined steeply during 2011-2018 by around 10.40% and by only 5.70% during 2001-2010. So far as the average decadal average shares are concerned, we witnessed an average share of 36.48% in the first decade. Subsequently, it lowered to 32.28% in the second decade and finally to 21.06% in the final decade of the reference period. This pattern coincides with the above way wherein the highest decline in the primary sector output share is observed during 2011-2018 and a lower fall during 2001-2010.

Decadal Average Share of Primary Sector Employment to Total Employment



Yearly, there is an irregular pattern in the primary sector employment with numerous ups and downs of small percentage during the first two decades of the reference period. While for the final decade of the reference period, there is a continuously declining trend in the primary sector employment every year. The highest decline of 5.8% in primary sector employment share is reported for 1993, wherein the share declined from 41.20% in 1992 to 35.40% in 1993. On the one hand, the movement of labor towards more advanced sectors of the economy and the movement of non-Kazakh Russians to their native places after the disintegration of the former USSR could ascertain a possible reason for this decline. In contrast, the lowest decline of 0.20% has been reported for the year 2007.

Primary Sector Annual Employment Share as a Percentage of Total Employment

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Share	41.50	41.20	35.40	34.50	34.80	37.40	37.10	34.20	34.70	34.00
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Share	35.50	35.50	35.20	33.50	32.40	31.50	31.30	30.20	29.40	28.30
Year	2011	2012	2013	2014	2015	2016	2017	2018		
Share	26.40	25.60	24.20	20.40	18.00	17.90	18.10	17.90		

[Source: Data retrieved from World Development Indicators Databank]

It is imperative to highlight some important observations regarding the differences between primary sector output and employment in terms of absolute and relative growth rates. During the entire period of 28 years (1991-2018), the primary sector output grew at an average annual growth rate of 0.82%, while as employment actually experienced a negative growth of -2.49%. On the other hand, relative share of output and employment declined by 4.52% and 23.60% respectively. This argument is in line with the Lewis theory of unlimited supply of labor, which states that economic growth is the outcome of productivity growth, which occurs by transferring disguised unemployed labor from low productivity agriculture to high productivity manufacturing and services without much output loss to primary sector output. Looking at the bigger picture, we can conclude that the two essential measures needed to spot and measure structural transformation- viz value-added or contribution of the sector to total output and employment, do aptly figure in the analysis mentioned above relevant data set. So, it will not be baseless to conclude that the primary sector of Kazakhstan's economy has put the pedestal for the structural transformation to operate in the economy. How far it has succeeded, or the extent to which it has achieved, or the glitches that exist in its way will be analyzed in the following parts of our analysis.

Conclusion

The data analysis shows that in absolute terms, the Kazakhstan economy's primary sector output has grown at an average annual growth rate of 0.86% (and a compound annual growth rate of 0.83%); while as employment actually squeezed at an average annual rate of -2.49% (and a compound annual growth rate of -2.58%) for the period under study (1991-2018), thus showing a huge divergence in primary sector output and employment growth figures. On other hand, the relative share of primary sector output declined from 9.59% in 1991 to 5.07% in 2018, while the relative share of primary sector employment also witnessed a decline from 41.50% to 17.90% during the same period. A major decline in employment contribution of primary sector has taken place in the last two decades and can be attributed to economic diversification and structural transformation that has taken place over the period of time. These figures are indicative of the fact that although there has been huge outflow of resources in the form of men and material from this sector resulting into diminishing importance of the primary sector viz-a-viz the other sub-sectors (which is in accordance with the structural change theory), but the growth rate of this sector *per se* has remained unimpressive. There has been a very little improvement, if at all, in the ratio of output-employment share from 0.23 to just 0.28 during the study period. Needless to mention here that according to standard structural change theory the only change is feasible that maintains this ratio close to the vicinity of unity. Hence, this is an area which calls for the policy intervention. The overall conclusion that can be drawn from these resource movements is that while the primary sector in the process of structural transformation has lost its relative importance in output to a minimum of about 5% but is not supported by an equivalent and proportional fall in the employment share.

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