Article

Assessing privatization efficiency in CIS countries: financial, non-financial, and GDP-linked indicators

Jun Chen,[1,*] Talgat Yerzhanov,[2] Svetlana Shcheglova,[3] Anar Mirzayev [4]

[1] Sejong University, South Korea

[2] Academy of Public Administration under the President of the Republic of Kazakhstan, Kazakhstan

[3] Transbaikal State University, Russian Federation

[4] Azerbaijan State University of Economics (UNEC), Azerbaijan

Correspondence: junchen5284@gmail.com

Abstract. This study investigates the impact of privatization on the relationship between gross capital accumulation, employment, labor resources, government spending, and gross domestic product (GDP) in Commonwealth of Independent States (CIS) countries. Employing econometric analysis and cointegration evaluation, the study reveals that privatization has had a mixed impact on CIS economies. While privatization has contributed to increased capital accumulation and employment in some countries, it has also led to reduced labor resources and government spending in others. The study also finds that government spending is an indirect indicator of privatization efficiency that significantly influences GDP in Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Russia, Uzbekistan, and Tajikistan.

1. Introduction

The formation of the CIS countries' national economies under the market model provided for the creation of the private sector of the economy. During the 1990s transitional period, the privatization of state-owned enterprises (CEOs) and state property took place in said countries. The major task of the related processes was to increase the efficiency of resource use, intensify economic growth, and improve the citizens' standard of living. Various theoretical models predict a positive relationship between privatization, economic liberalization, and economic development. However, the CIS countries experienced an economic crisis during the period of privatization, which provided specific conditions for its implementation. It is interesting in this context to study the financial and non-financial effects of privatization in the CIS countries under conditions of economic crisis.

The financial effects of privatization, as a rule, provide for changes in the economic indicators of both the activities of directly privatized enterprises and the macroeconomic indicators of the

economy as a whole. First, privatization influences government spending, which is reduced due to the termination of budget funding for SEOs. Furthermore, privatized enterprises receive additional financing for their activities' modernization, which leads to the accumulation of gross capital in the country. In addition, positive effects are a decrease in unemployment and growing wages over a rise in the privatized enterprises' performance. Non-financial performance indicators are much more difficult to determine because of their indirectness. In general, such an indicator of non-financial efficiency at the level of the national economy is the fair distribution of income. By increasing labor productivity, employees can earn higher wages at private enterprises, which leads to an increase in the equity of income distribution. However, the said effects may not always take place since it is necessary to consider the state of the country's economy and the conditions of privatization processes carried out.

The purpose of this study is to identify the impact of privatization on the correlations between gross capital accumulation, employment and the volume of labor resources; government expenditures and the level of gross domestic product in the CIS countries. The initial stage of the study considers the theoretical issues of studying the privatization effectiveness in different countries of the world. The identification of the theoretical basis is followed by the methodology presentation. The results of the study include an analysis of the privatization models' impact on the interrelations between gross capital accumulation, employment and the volume of labor resources, government expenditures and the level of gross domestic product in 9 CIS countries. The discussion presents different points of view on the studied issue. The conclusions summarize the results of the study.

2. Literature review

Researchers consider privatization as a case when there is a process of transferring ownership rights for state-owned enterprises to private individuals. The privatization programs were developed and implemented by governments in many countries. The programs were based on the assumption of the modern neoliberal microeconomic theory. According to this theory, the transition from state ownership to private ownership stimulates more efficient management of available resources and property. At the same time, the practical inability to provide the expected results in some cases and a more objective approach to public administration, proposed by recent studies in the field of management, refute the mentioned assumption. Consequently, some postulates of this theory require a revision (Radić et al., 2021).

Thus, for example, the existing problem of stable electricity supply in Nigeria negatively affected the socio-economic development of the country. This caused the state to make a decision on the privatization of the energy sector. As a result of the research and survey of household and commercial consumers of electricity, it was found that private electric distribution companies have not made significant improvements in electricity supply, the system of settlements and payments, accounting, problems of load management, responding to consumer requests, the formation of healthy competition, and market regulation (Idowu et al., 2020).

Nevertheless, there is also a positive experience of privatization. The study of the privatization impact on economic growth, labor productivity, income inequality and unemployment in 22 European countries in the period from 2004 to 2013 confirms its overall effectiveness. It has been empirically proven that privatization positively affects economic growth. At the same time, a noticeable effect on labor productivity, income distribution and unemployment appears two years after its implementation. In addition, it was also determined that privatization reforms could lead to an increase in labor productivity and a decrease in unemployment, but cause inequality of incomes (Cuadrado-Ballesteros & Peña-Miguel, 2018).

An analysis of the performance of privatized water supply and sewerage companies in England and Wales in 1991-2016 showed that during this period their profits and productivity increased by 4% and 2.5% per year, respectively. A positive contribution to profit growth was made by technical changes, the effects of changes in production volumes and tariff margins, and prices for products and production resources. At the same time, the impact of the change in technical efficiency, although positive, still turned out to be insignificant (Molinos-Senante & Alexandros, 2020).

This section contains a review of current research on privatization in different countries assessing its efficiency, which in the private and public sectors has long been a hot topic in academic research. Findings of a study by the Global Centre for Public Service Excellence (2015) show there is no unambiguous answer to the question of which form of ownership is more efficient, that is, private or public. In most cases, it depends on the specific area. Key issues in comparing the efficiency of public and private ownership models are their range (including hybrid ones) and differences in the efficiency definition.

Hall (2014) comes to a similar conclusion in his study related to public and private sector efficiency. There is no empirical evidence that the private sector is essentially more efficient. The same results are constantly observed in sectors and services that use outsourcing, such as the telecommunications sector. It is fundamentally important to organize the work of public services in such a way that they effectively fulfill their social objectives. Unlike the private sector, public service providers cannot be unquestioningly guided by financial performance. Public services should include structures that ensure public goals are continually reinforced and monitored through democratic mechanisms of accountability and public participation. Such mechanisms include formal accountability to public bodies such as municipalities or governments; structures for public participation in decision-making, including full transparency of information; and the active participation of representative organizations, for instance, community associations. This means that public and private companies have different performance evaluation criteria, which must be taken into account when assessing the efficiency of privatization processes.

Shi and Sun (2016), studying the impact of privatization on the efficiency and profitability of China-based companies, conclude that this effect is ambiguous. Over the past thirty years, China has undergone a major transformation, resulting in a considerably increased share of private companies. By analyzing data from privatized companies, the authors studied the impact of privatization on employment, wages, profits, and other economic indicators. They found that privatization led to a significant decline in the number of employees and an increase in labor productivity and profitability. Soejono and Heriyanto (2018) studied the economic performance of Indonesia's companies before and after privatization using different methods. The results showed that direct-method privatization

has a positive impact and leads to an increase in asset turnover. Privatization through the capital market also showed a positive effect on the turnover of assets, but there was also a significant decrease in productivity, an increase in debt, and a return on equity. Privatization based on employee buyouts led to a substantial reduction in measuring debt ratio and return on equity performance. Thus, different methods of privatization have different consequences for different economic parameters of enterprises.

The research as regards the impact of privatization on the financial performance of enterprises in Kenya shows a significant improvement in the financial performance of firms privatized (Muthii & Ambrose, 2018). In particular, such indicators as return on turnover, return on assets, as well as return on equity, improved considerably. Such results testify to the positive effect of privatization.

Estrin and Pelletier (2018) examined privatization in developing countries. Privatization involves the transfer of production facilities from the state to private hands. Such transfers are, by their very nature, politically sensitive and may be linked with corruption. The authors consider different options for privatization and the state tasks at each stage of the privatization to maximize the positive effect. At the same time, they regard the following: social and economic side effects; competition side effects; global impact; political side effects; effects on the distribution of income; and effects on fiscal balance. The research findings demonstrate that different effects can differ significantly depending on the state's role in the privatization process, the effectiveness of state institutions, and opportunities for corruption.

Specialists from the Asian Development Bank studied the issue of performance differential between private and state-owned companies (Phi et al., 2019). Using financial performance indicators and various empirical methods, the authors find substantial evidence that state-owned companies have poorer indicators than private ones, as they are less profitable, which is consistent with other similar studies. However, a simple assessment of profitability and consideration of this aspect only can be misleading since many SEOs are established to provide public goods and services and do not necessarily seek to maximize their profits.

Authors of the study on the privatization of state-owned enterprises in India conclude that central government CEOs have increased their profitability, investment and growth since the country transferred to market prices and incentives with stricter contract enforcement (Kim & Panchanatham, 2021). The profitability and efficiency of SEOs in the manufacturing sector are higher than those of private enterprises. However, the efficiency of SEOs in the service sector is lower than that of private ones there. In general, the authors believe it is possible to improve the efficiency of public companies only through their full or partial privatization.

Authors of the study related to privatization and economic growth in Malaysia (Lai et al., 2018), consider privatization as a response to the high costs and poor performance of state-owned enterprises. In terms of macroeconomics, privatization ensured the formation of conditions for international businesses development in the country. Privatized enterprises started to more actively develop international trade and attract foreign investment. Private companies have ensured the economic growth of the Malaysian economy through autonomy in the formation and implementation of strategies in international markets. The globalization of business has made it possible to increase privatized enterprises' revenue and their corporate tax return to the government budget. However,

there are still unresolved problems with the reformation of institutional processes to ensure an appropriate regulatory framework to protect consumers' interests and monitor the performance of privatized enterprises.

A report on the role of privatization in sustainable development in Ethiopia notes that privatization in developing countries is designed to solve the problem of state-owned companies' low performance (Kedir & Bedasso, 2020). The most common reason for privatization in developing countries is to restore macroeconomic balance, which is often destabilized by subsidizing unprofitable SEOs. By reducing inflation via its impact on the budget deficit, privatization helps to amplify the effect of expanding exports through currency devaluation. In turn, improved export performance contributes to debt sustainability by facilitating external debt servicing. Thus, privatization in Ethiopia is a tool for solving the country's macroeconomic problems.

After analyzing current research, it can be concluded that the effects of privatization differ significantly from country to country. The economic conditions in the country amid the privatization period are very important for its efficiency. All analyzed literary sources do not regard the efficiency of privatization in countries that transfer from a planned to a market economy. Thus, this study aims to close the gap in research related to the effects of privatization.

3. Methods and material

Research design

The Cointegrating test Engle–Granger was used to study the impact of privatization on the interrelations between gross capital accumulation, employment and the volume of attracting labor resources, government expenditures and the level of gross domestic product in the CIS countries. This method is used to analyze time series and create a model for rectifying (correcting) errors, in case when short-term changes are corrected depending on the degree of their deviation from long-term dependence. The essence of the Engle–Granger Cointegrating test is that if the remaining parts of this model are non-stationary, that is, they have a single root, then there is no time series cointegration in this case. The null hypothesis is possible when there is no cointegration, that is, the presence of a single root in the model errors (cointegration equation). The statistics of the extended Dickey-Fuller test were additionally applied to test the hypothesis of a single root. The methods of the test procedure were based on the studies by Harris, (1995), Maddala and Kim (1998).

Sample study

Different methods of privatization can differently impact the ownership structure and performance of privatized companies. Moreover, privatization can provoke the emergence of externalities, which directly influence the market environment and the country's economic growth. Privatization contributes to the formation and development of the capital market in the country as well. Therefore, this study will consist of two stages.

The research at the first stage will determine in what ways and years privatization took place in the CIS countries. To this end, information on privatization in each CIS country will be examined and applied financial instruments to transfer state-owned enterprises to private ownership will be

determined. Based on the information received, the methods of privatization will be specified. The study will consider the 1995-2020 period during which mass privatization was carried out in the CIS countries while forming a market economy.

The influence of privatization on economic growth in the CIS countries will be determined in the second stage. GDP (dependent variable) will be considered as the resulting indicator. It is assumed that privatization impacts a country's gross capital formation, labor force, employment to population ratio, and government spending. Hence, these parameters are introduced into the research model as independent variables or regressors. The model is formed as such:

$$GDP = \beta_0 + \beta_1 K + \beta_2 G + \beta_4 L + \beta_5 E + e_t ,$$ [1]

where:

GDP – Gross domestic product (current mln US$);

K – Gross capital formation (current US$);

G – General government final consumption expenditure (current US$);

L – Labor force, total;

E – Employment to population ratio, 15+, total (%) (modeled ILO estimate.

This model will be built and tested for each CIS country, as well as determined the impact of privatization on economic growth, which reflects the financial component of the privatization processes' efficiency parameters. To consider privatization, the models will introduce a dummy variable that will indicate the year of privatization in the CIS countries. Model variables are taken from the official statistical database of the (World Bank, 2021). Furthermore, data from the World Bank statistical database for the 1995-2020 period will be used.

Research limitations

The methodological limitation of the study is that GDP was chosen as the main indicator of the financial efficiency of the privatization results, whereas Gross capital formation, General government final consumption expenditure, Labor force, total and Employment to population ratio (15+, total %) were selected as non-financial one. In this case, it was not possible to study the effect of the Gini coefficient and the unemployment rate, since these data were characterized by incomplete filling of the time series.

Statistical analysis. The basic statistical calculations and data analysis were performed in the Microsoft Excel program. Cointegrating test and regression models for CIS countries were calculated in Gretl, a special program for econometric analysis of time series of data.

4. Results

The description of the study results starts with the methods of privatization that were used in the CIS from 1990 to 2001. Privatization in Armenia was launched in 1991 with small-scale privatization,

that is, entities of low value were transferred to private ownership. The majority of the privatization processes took place in 1994-1995 with the help of vouchers, which were also the main instrument of privatization in Azerbaijan where mass privatization took place from 1995 to 1997. In Belarus, privatization was carried out via buying out enterprises by management and employees in 1994. Privatization in Kazakhstan was performed through the direct sale of SEOs to private owners in 1996, which was the main stage of the move, although it was preceded in 1994 by the small-scale privatization using vouchers. In Kyrgyzstan, privatization started as early as 1991 with small-scale privatization followed by the corporatization of SEOs in 1992-1993. The campaign was continued by mass privatization in 1996 through vouchers. Moldova's major stage of privatization with vouchers took place in 1995. The relevant campaign in Russia through vouchers began in 1992 with its key stage observed in 1993. As for Uzbekistan, privatization there was carried out by the management/employee buy-out method with its main stage recorded in 1996.

Therefore, it can be stated that the main method of privatization in the CIS was the campaign through vouchers, which took place mainly in the mid-1990s. This is because in the early 1990s, it was necessary to adopt appropriate laws and create a regulatory framework for the privatization process. In addition, it took time to assess the value of state property subject to privatization.

The following abbreviations were used in the calculations:

GDP (current mln US$) – GDP;

Gross capital formation (current mln US$) – GKF;

General government final consumption expenditure (current mln US$) – GKF;

Labor force (mln total) – LF;

Employment to population ratio, 15+ (total %) (modeled ILO estimate) – EPR.

The impact of privatization on economic growth in each CIS country is to be considered in detail. The model of such impact for Armenia is presented in Table 1.

Table 1. Model of privatization impact on economic growth for Armenia (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−11084.3	2702.25	−4.102	0.0006	***
GKF	0.876482	0.0894350	9.800	4.44e-09	***
GGFCE	5.17675	0.632573	8.184	8.19e-08	***
LF	−5692.24	2680.44	−2.124	0.0464	**
EPR	370.907	89.6572	4.137	0.0005	***
time	152.808	43.0569	3.549	0.0020	***

Mean dependent var	7158.992	S.D. dependent var	4438.313
Sum squared resid	3296096	S.E. of regression	405.9616
R-squared	0.993307	Adjusted R-squared	0.991634
Log-likelihood	−189.6444	Akaike criterion	391.2888
Schwarz criterion	398.8374	Hannan-Quinn	393.4625
rho	0.124387	Durbin-Watson	1.639735

Model 1 data show that privatization had a statistically significant but negative impact on Armenia's GDP. Until 2000, the country experienced a decline in GDP (Appendix 1). The other regressors are also statistically significant. At the same time, privatization had an impact on the

employment level, which has been steadily declining over the past 15 years.

It can be concluded that the first wave of privatization in the country (1991) took place during the economic recession (1990-1993). The next waves of privatization in 1994 and 1995 were in the period of GDP growth. It suggests that the positive dynamics of GDP growth are due to the development of the private sector of the economy. At the same time, a significant reduction in public spending is seen after the first wave of privatization, which is a positive effect on the state budget. Meanwhile, the second and third waves of the campaign failed to influence the reduction in government spending. With reference to the above, the conclusion can be made that the second wave of privatization in Armenia is characterized by lower efficiency and, overall, can be deemed to fail.

The second example under consideration was Azerbaijan. Model 2 data suggest that privatization is not a statistically significant regressor of the country's economic growth over the period under review. But at the same time, government spending is a significant regressor of such growth in terms of statistics. In this case, the growth of government spending affected GDP growth (Table 2).

Table 2. Model of privatization impact on economic growth for Azerbaijan (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−1195.76	41467.2	−0.02884	0.9773	
GKF	1.27025	0.583403	2.177	0.0416	**
GGFCE	7.24175	1.45505	4.977	7.25e-05	***
LF	18805.5	20552.1	0.9150	0.3711	
EPR	−1020.69	913.347	−1.118	0.2770	
time	−1486.67	1182.81	−1.257	0.2233	

Mean dependent var	31535.44	S.D. dependent var	25259.12
Sum squared resid	4.98e+08	S.E. of regression	4989.598
R-squared	0.968783	Adjusted R-squared	0.960979
Log-likelihood	−254.874	Akaike criterion	521.7491
Schwarz criterion	529.2977	Hannan-Quinn	523.9228
rho	0.449639	Durbin-Watson	1.070623

At the same time, the relationship between GDP growth and capital accumulation is statistically significant. This is due to the fact that in the process of privatization, the main sectors of the country's economy also received considerable investments, including foreign ones. This resulted in a steady increase of the GDP indicator. However, the negative side of privatization was the reduction of employment due to the restructuring and modernization of industrial enterprises.

Model 2 data suggest that privatization is a statistically significant regressor of the country's economic growth over the period under review. But at the same time, government spending is a significant regressor of such growth in terms of statistics. In this case, the growth of government spending affected GDP growth. The comparison of the GDP dynamics and government spending with the stages of privatization is required for a more detailed analysis.

The data indicate that from 1993 there was a steady downward trend in government spending against a rise in GDP. It can be assumed that during this period, the state started to prepare enterprises for privatization and did not allocate money funds for their operation. After the preparation, privatization took over three years. Yet, the 1992-1993 period is interesting since an increase in government spending was along with GDP growth. At that time, the state met aggregate

demand to support the national economy.

The dynamics above allow the inference that privatization objects were prepared as early as in 2016, and it was due to the growth of privatization in 2017 that the record drop in GDP of previous years was stopped. The first and second waves of privatization in Azerbaijan became the GDP growth pre-determinants. For the first wave, it was the period 1995-1997, while for the second - 2017-2018 (Appendix 1–5).

Table 3 presents the results of the regression of the privatization impact on economic growth for Belarus.

Table 3. Model of privatization impact on economic growth for Belarus (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	59968.6	45727.8	1.311	0.2046	
GKF	1.74925	0.148867	11.75	1.97e-010	***
GGFCE	1.15675	0.601576	1.923	0.0689	*
LF	−3116.88	10649.7	−0.2927	0.7728	
EPR	−917.597	430.109	−2.133	0.0455	***
time	1271.69	243.773	5.217	4.19e-05	**

Mean dependent var	40718.33	S.D. dependent var	22953.38
Sum squared resid	79862900	S.E. of regression	1998.286
R-squared	0.993937	Adjusted R-squared	0.992421
Log-likelihood	−231.0828	Akaike criterion	474.1657
Schwarz criterion	481.7142	Hannan-Quinn	476.3394
rho	0.156440	Durbin-Watson	1.470995

Analysis of Model 3 reveals that gross capital formation and employment to population ratio is a statistically significant regressor of economic growth, having a positive impact. Meanwhile, other regressors are statistically insignificant in this model. Comparing the dynamics of GDP growth, government spending, and privatization stages, it can be stated that privatization failed to bring any considerable positive changes in economic development. Accordingly, in the mid-90s, the state retained control over key economy sectors and the largest enterprises of the country.

Belarus saw a steady downward trend in GDP from 1990. The government tried to stimulate the economy by increasing its spending from 1992, but this yielded no desired result. Even the 1993-1994 privatization did not have the intended effect. The rate of GDP decline halted for the subsequent period of 1995-1998, and then the downward trend resumed. In general, it is expected the equity of income distribution in society declines with a decrease in GDP. The state, by increasing its spending, tried to redistribute resources in the economy to improve the equity of income distribution.

With reference to the above data, one can conclude that none of the variables is significant in the regression model. The outcomes of comparison of GDP growth, government spending, and privatization dynamics point to the fact that in 2017, privatization was the most noteworthy and allowed not only to slow down the rate of GDP decline but also receive a slight growth.

As can be seen from the data given, the second privatization wave was quite effective in terms of GDP growth. However, such a state of affairs was only inherent to the year 2017 and partially 2018. Then, the first wave trend continues. In general, privatization in Belarus can be deemed extremely low.

Table 4 below gives the findings of the regression of the privatization effect on Kazakhstan's

economic growth.

Table 4. Model of privatization impact on economic growth for Kazakhstan (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−156772	238609	−0.6570	0.5187	
GKF	1.99942	0.721287	2.772	0.0118	**
GGFCE	3.92268	1.38921	2.824	0.0105	**
LF	18422.6	17721.7	1.040	0.3110	
EPR	340.784	3840.14	0.08874	0.9302	
time	−1070.37	1058.47	−1.011	0.3240	

Mean dependent var	106179.3	S.D. dependent var	76831.10
Sum squared resid	2.45e+09	S.E. of regression	11072.90
R-squared	0.983384	Adjusted R-squared	0.979229
Log-likelihood	−275.6003	Akaike criterion	563.2006
Schwarz criterion	570.7492	Hannan-Quinn	565.3743
rho	0.221860	Durbin-Watson	1.440469

Model 4 did not reveal statistically significant regressors of Kazakhstan's economic growth, except Gross capital formation and General government final consumption expenditure. Over the study period, Kazakhstan saw a downward trend in GDP. At the same time, there was also a drop in government spending. Noteworthy, during the years of privatization, GDP stopped decreasing, while government spending increased. This trend could be due to the compensation of structural imbalances in the economy by rising government spending. In general, there is no significant effect of privatization on the economic upturn in Kazakhstan.

The second wave of privatization also did not lead to GDP growth, which is clearly illustrated by the data for 2014-2016, in which the drop in GDP was much more significant compared to 2017-2020. Hence, one can confidently state that the second privatization wave had no consequences for GDP, precisely like the first one.

Table 5 provides an assessment of the privatization impact on the economic progress of Kyrgyzstan.

Table 5. Model of privatization impact on economic growth for Kyrgyzstan (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−1144.62	1922.08	−0.5955	0.5582	
GKF	0.774563	0.170451	4.544	0.0002	***
GGFCE	3.07567	0.428049	7.185	5.88e-07	***
LF	−904.219	902.643	−1.002	0.3284	
EPR	49.8195	50.2811	0.9908	0.3336	
time	93.5590	49.9372	1.874	0.0757	*

Mean dependent var	4393.349	S.D. dependent var	2657.590
Sum squared resid	721239.0	S.E. of regression	189.8998
R-squared	0.995915	Adjusted R-squared	0.994894
Log-likelihood	−169.8906	Akaike criterion	351.7812
Schwarz criterion	359.3297	Hannan-Quinn	353.9549
rho	−0.105485	Durbin-Watson	2.200404

An analysis of the Model 5 results indicates that Gross capital formation (p-value < 0.01) and the General government final consumption expenditure (p-value < 0.01) constitute statistically

significant GDP regressors in Kyrgyzstan. If the increase in the unemployment rate led to a drop in GDP, privatization caused a rise in GDP. At the same time, the country's economy was related to a decrease in GDP over the period under review.

The privatization campaign carried out from 1991 to 1993 could not prevent the reduction in GDP. However, the positive effect in this regard was a decrease in government spending on financing state-owned enterprises. This freed up a resource to support the economy, which is evidenced by growing government spending in 1998-2000 in response to the decline in GDP during this period.

Proceeding from the outcomes obtained for Model 5, an inference can be drawn about the critical importance of government spending for GDP indicators. As illustrated above, the period from 2017 to 2019 is characterized by growth of GDP and public expenditures, and their further relative stabilization. Nevertheless, the second wave of privatization also does not have any impact on the GDP.

An analysis of the privatization impact on economic progress in Moldova is given in Table 6.

Table 6. Model of privatization impact on economic growth for Moldova (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−7849.40	3522.12	−2.229	0.0375	**
GKF	1.09992	0.468599	2.347	0.0293	**
GGFCE	3.51802	0.845027	4.163	0.0005	***
LF	2602.31	5104.56	0.5098	0.6158	
EPR	61.7894	88.8680	0.6953	0.4949	
time	209.314	43.9672	4.761	0.0001	***

Mean dependent var	5516.545	S.D. dependent var	3773.360	
Sum squared resid	5983981	S.E. of regression	546.9909	
R-squared	0.983189	Adjusted R-squared	0.978986	
Log-likelihood	−197.3969	Akaike criterion	406.7938	
Schwarz criterion	414.3424	Hannan-Quinn	408.9675	
rho	0.608817	Durbin-Watson	0.751981	

The only statistically significant GDP regressor in Model 6 is gross capital formation and general government final consumption expenditure, which ensures GDP growth. In this case, it can be assumed that privatization had an indirect effect on GDP through government spending. Examining the dynamics of GDP, public spending, and privatization in Moldova provides a more detailed analysis.

Privatization in Moldova took place in 1995, and in the subsequent period, there was a decrease in both GDP and public spending from 1997. Immediately after privatization in 1996-1997, the country enjoyed a short-term increase in GDP, which was not due to the campaign, as the results of Model 6 show.

The second wave of privatization in Moldova began in 2014 and was rather uneven. Though, from 2018 to 2020, this indicator rose. Furthermore, it is from 2018, a stable GDP growth with a slight advancement in public spending occurred, which enables the forecast that in 2021-2022 the state will boost the pace of privatization as well.

Analysis of the privatization effect on the economic development of Russia is presented in Table 7.

Table 7. Model of privatization impact on economic growth for Russia (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−600769	436122	−1.378	0.1836	
GKF	1.85731	0.326408	5.690	1.44e-05	***
GGFCE	2.81819	0.446157	6.317	3.64e-06	***
LF	14039.7	7933.77	1.770	0.0920	*
EPR	−7053.66	9912.80	−0.7116	0.4849	
time	2798.26	2436.23	1.149	0.2643	

Mean dependent var	1104403	S.D. dependent var	689272.8	
Sum squared resid	2.79e+10	S.E. of regression	37320.93	
R-squared	0.997655	Adjusted R-squared	0.997068	
Log-likelihood	−307.1917	Akaike criterion	626.3834	
Schwarz criterion	633.9320	Hannan-Quinn	628.5571	
rho	0.159398	Durbin-Watson	1.478000	

The data show that statistically significant regressors of economic growth are gross capital formation and general government final consumption expenditure, which increases GDP. Although privatization itself is not directly statistically significant, public spending is a function of privatization in terms of reducing the amount of state support for enterprises.

Analyzing the dynamics of Russia's GDP and government spending, one can conclude that privatization at the first stage failed to have the desired effect and GDP continued to fall. Against this background, government spending grew, which stabilized only a year after the initial stage of the campaign. The privatization of 1994-1995 also had no positive effect on economic development, and the country experienced a decline in GDP from 1997 due to the onset of the crisis. The collected data show that the statistically significant regressors of economic growth are unemployment, which explains the fall in GDP and government spending. Although the privatization process in Russia took place in 2016, the most considerable GDP drop was recorded in 2015–2016, which suggests that the second wave of privatization did not actually occur.

As for Tajikistan and Uzbekistan, the models of the privatization impact on economic growth there showed the absence of statistically significant regressors (Table 8 and 9, respectively).

Table 8. Model of privatization impact on economic growth for Tajikistan (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	8611.16	3513.46	2.451	0.0236	**
GKF	0.511033	0.163823	3.119	0.0054	***
GGFCE	4.95175	0.379964	13.03	3.12e-011	***
LF	−3735.40	5720.11	−0.6530	0.5212	
EPR	−90.5712	198.724	−0.4558	0.6535	
time	243.725	255.885	0.9525	0.3522	

Mean dependent var	4452.267	S.D. dependent var	3074.223	
Sum squared resid	1532333	S.E. of regression	276.7971	
R-squared	0.993515	Adjusted R-squared	0.991893	
Log-likelihood	−179.6871	Akaike criterion	371.3741	
Schwarz criterion	378.9227	Hannan-Quinn	373.5479	
rho	−0.144394	Durbin-Watson	2.169878	

Table 9. Model of privatization impact on economic growth for Uzbekistan (Cointegrating regression - OLS, using observations 1995-2020, T = 26, Dependent variable: GDP)

	Coefficient	Std. Error	t-ratio	p-value	
Const	−260396	32326.5	−8.055	1.05e-07	***
GKF	−0.407366	0.428596	−0.9505	0.3532	
GGFCE	6.87642	0.695594	9.886	3.84e-09	***
LF	37988.4	4008.45	9.477	7.75e-09	***
EPR	−1692.66	536.726	−3.154	0.0050	***
time	−6733.35	833.194	−8.081	9.97e-08	***

Mean dependent var	37948.17	S.D. dependent var	27228.46
Sum squared resid	1.24e+08	S.E. of regression	2494.506
R-squared	0.993286	Adjusted R-squared	0.991607
Log-likelihood	−236.8497	Akaike criterion	485.6993
Schwarz criterion	493.2479	Hannan-Quinn	487.8730
rho	−0.418214	Durbin-Watson	2.703464

The data show statistically significant regressors of economic growth are gross capital formation and general government final consumption expenditure. At the same time, in case of Uzbekistan, there is a statistically significant relationship with almost all regressors, with the exception of the gross capital formation.

Privatization in 1990 in Tajikistan had an insignificant effect on economic growth in the country, and there was a rapid decline in GDP from 1992 and government spending from 1993. The 1996 privatization did not influence the economic development of Uzbekistan. From 1995, there was an upward trend in GDP, which continued until 1999 inclusive. The privatization of 1996 did not affect this trend in any way. The cut in public spending had been trending since 1992, and it saw a sharp reduction in 1996. This may be due to privatization in the same year.

Close study of the models developed for the second privatization wave in Tajikistan and Uzbekistan enables the deduction that in the case of Tajikistan, the most significant variable favorably affecting GDP was gross capital formation and general government final consumption expenditure.

In Uzbekistan, however, the second wave of privatization had no impact on economic growth, as did the first. Since 2017, the country's GDP has fallen seriously, while government spending has increased.

The obtained outcomes provide enough data for all the analyzed countries to be conditionally divided according to the criteria of efficiency and success of the first and second privatization waves (Table 10).

Table 10. Countries' grouping by privatization efficiency

Group	Countries
Poor efficiency of the first and second privatization waves	Belarus, Russian Federation, Kyrgyz Republic, Uzbekistan
First privatization wave was more efficient than the second wave	Armenia
The first and second waves of privatization were equally efficient	Azerbaijan, Moldova, Tajikistan, Kazakhstan

Thus, in addition to the fact that Belarus and Russia have failed both waves of privatization, they were marked by highly negative dynamics in income distribution. Theoretically, privatization is aimed at improving the efficiency of previously state-owned companies through their transition to private corporate governance. However, in practice there are a number of side effects that can influence the

effectiveness of privatization. Subsequently, they lead to a decrease in the employment level and in wages, a restriction of internal competition, monopoly on political power and economic wealth, an increase in income inequality and other factors.

5. Discussion

Relevant literary sources discuss various effects of privatization on the economy, which is not only a direct effect on economic growth or other financial indicators but also an indirect effect on the economy through institutional transformations. Examining the effect of privatization on corruption, the authors (Reinsberg et al., 2020) note that it significantly reduces the level of control over corruption. This conclusion can be interpreted as evidence that privatization creates highly concentrated rents that increase corruption risks while creating incentives among rent-seeking elites to weaken state capacity. This leads to the weakening of institutions and corruption growth. In this regard, such an effect of privatization can be interpreted as non-financial consequences, which may not be entirely desirable in the economies of developing countries. This conclusion is also relevant for the CIS countries. In the 1990s, the shadow sector of the economy was actively formed during the privatization there over the emergence of corruption schemes in the privatization process.

In turn, Kant (2018) studied the relationship between privatization and economic growth by the example of ex-socialist countries with economies in transition. The author believes that the economic growth in such countries is associated not so much with the privatization of state property, but with the implementation of institutional reforms. The transition from a planned to a market model for national economic development was carried out through the transformation of state institutions. The privatization of state property and the reduction of the latter's share in the economy was one of the elements of said transformation. But it was the institutional changes and certain ex-socialist countries joining the EU in 2004 that had a key effect on economic growth. The findings of this research paper also prove the low impact of privatization on the CIS countries' economic growth.

A study on the impact of privatization on employment and income indicates that there is no evidence of its significant negative effect on them (Earle & Shpak, 2019). Such conclusions are made based on the analysis of the privatization process in Hungary, Romania, Russia, and Ukraine. It has been found that there are three channels through which privatization can have an impact on workers: productivity-improvement, cost-reduction, and scale-expansion effects. External privatization has a greater effect that is when state-owned enterprises become the property of foreign companies, which results in an increase in productivity and wages of workers compared to enterprises that were privatized by domestic firms.

It is also interesting to compare the findings of studies as regards the privatization impact on economic growth with the example of other countries. So, a study on the impact of privatization on economic development in Ethiopia notes that there is a stable long-run relationship between real GDP growth, privatization, inflation, government consumption, government budget balance, gross private domestic investment due to privatization and foreign direct investment due to privatization (Krishna & Teshome, 2018). The empirical results show that both privatization and foreign direct investment resulting from privatization have a positive effect on economic growth and are

statistically significant in the long and short run. This research paper on the example of the CIS countries shows the opposite result. Perhaps the reason for this is that privatization in the CIS coincided with the economic downturn following the USSR collapse and the economic crises in these countries.

Authors of a study related to the privatization impact on economic growth in Nigeria conclude that there is a considerable relationship between GDP and private sector capital spending, as well as a strong and positive relationship between GDP and public sector capital spending (Udoka & Anyingang, 2012). The combination of private and public sector capital significantly influenced the country's GDP. The study also found that privatization is not a comprehensive solution to the problems of poorly functioning state-owned enterprises.

Another study related to the effect of privatization on the Nigerian economy indicates that privatization increased confidence in the country's economy (Nwali et al., 2019). Privatization not only increased the status and number of investors and shareholders but also improved the performance of the country's stock exchange and GDP growth. Although privatization endangers and diminishes the country's sovereignty status, especially if the economy is dominated by foreign organizations such as the IMF and the World Bank, the benefits can lead to a reorganization of its economy. As a result of privatization, the efficiency of unprofitable state-owned enterprises is increased, while the state budget receives tax revenue.

The research concerning the privatization impact on the economic and social development in Bulgaria found that it benefited the country's economy in the long run (Toromanov, 2016). It was economically necessary and justified. Although GDP is a very aggregated and general indicator giving no details of structural changes, what is important is that it, nevertheless, clearly shows improvement and continued growth. The trend in the unemployment rate in Bulgaria in the post-privatization period is positive, especially after the third wave in 1997-2001. The peaks in unemployment are observed in the first stage, 1990-1995, during the "shadow" privatization through SEOs decapitalization and after the third stage of privatization in 2001. After this period, there is a positive trend. However, considering the impact of privatization on unemployment in the context of the Gini coefficient and the poverty line, it has not made a sufficient contribution to overcoming social inequality, mainly over the low minimum and average wages. The same was observed in the CIS countries during the 1990s privatization period when the Gini coefficient decreased even in the long run.

In general, according to recent studies, it has been found that the corruption detection rate decreases as the number of transactions in the privatization process increases. However, the opposite effect is observed when privatization is more important in terms of annual income. In addition, it has been confirmed that the privatization programs carried out since the early 1980s have not been effective in reducing corruption in certain European countries (Miguel & Cuadrado-Ballesteros, 2019).

6. Conclusions

Privatization in the CIS countries was carried out in the 1990s. Its main methods were voucher privatization, direct privatization and privatization with the purchase of shares by

management/employees. The results of the study showed that the privatization campaign in the CIS had low indicators of financial and non-financial efficiency. The study found that, according to the results of privatization, all regressors of economic growth were statistically significant only in Armenia, as well as in Uzbekistan, with the exception of gross capital accumulation. Considering the reduction of public spending as an indirect positive effect of privatization, it was found that this indicator is statistically significant for Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan and Uzbekistan. The study showed that the factor of capital formation in the process of privatization is a statistically significant regressor in 8 CIS countries out of 9 studied. That is, the effectiveness of privatization depends on the ability of new owners to renew and increase the fixed capital of the business.

The analysis made it possible to divide the countries into three groups according to the degree of privatization impact on their economic development. Thus, Belarus, Russia, Kyrgyzstan and Uzbekistan were included in the group of states with low efficiency of the first and second privatization waves. The group in which the first wave of privatization was more effective than the second was represented only by Armenia. Finally, the group representing countries with equal efficiency of both privatization waves included Azerbaijan, Moldova, Tajikistan and Kazakhstan.

The results obtained differ from the results of studies in other developing countries. This is due to the different initial conditions of privatization. In the CIS countries, privatization was carried out against the background of the economic downturn in the 1990s. Therefore, the positive effects were leveled. In addition, poorly developed state institutions could not prevent the emergence of corruption schemes, which decreased the effectiveness of privatization. Non-financial indicators of the privatization effectiveness tend to decrease in the CIS countries in the long term. These conclusions are useful for further investigation of the reasons for the low efficiency of privatization processes in the CIS countries. They can also be taken into account when developing modern privatization programs for other countries.

References

Alibekov, E., & Ibadoglu, G. (1999). Privatization in Azerbaijan. Warszawa: Center for Social and Economic Research. http://www.case-research.eu/files/?id_plik=2134

Cuadrado-Ballesteros, B., & Peña-Miguel, N. (2018). The Socioeconomic Consequences of Privatization: An Empirical Analysis for Europe. Social Indicators Research, 139, 163-183. https://doi.org/10.1007/s11205-017-1713-2

Earle, J.S., & Shpak, S. (2019). Impact of privatization on employment and earnings. IZA World of Labor. https://doi.org/10.15185/izawol.93.v2

Ermakovich, V., & Pankuv, Y. (1996). Privatization in Kyrgyzstan in 1992-1996. Warszawa: Center for Social and Economic Research. http://www.case-research.eu/files/?id_plik=2379

Ermakovich, V., Kozarzhevsky, P., & Pankuv, Y. (1996). Privatization in the Republic of Kazakhstan. Warszawa: Center for Social and Economic Research. http://www.case-research.eu/upload/publikacja_plik/4886209_085r.pdf

Estrin, S., & Pelletier, A. (2018). Privatization in developing countries: What are the lessons of recent experience? The World Bank Research Observer, 33(1), 65-102. https://doi.org/10.1093/wbro/lkx007

Global Centre for Public Service Excellence. (2015). Is the Private Sector more Efficient? https://www.undp.org/sites/g/files/zskgke326/files/publications/GCPSE_Efficiency.pdf

Hall, D. (2014). Public and Private Sector Efficiency. Public services international research unit. https://www.epsu.org/sites/default/files/article/files/Public%20and%20Private%20Sector%20efficiency%20EN%20fin.pdf

Harris, R.I.D. (1995). Using cointegration analysis is econometric modelling. Edinburg Gate, Harlow. Prentice Hall.

Idowu, S.S., Ibietan, J., & Olukotun, A. (2020). Privatization of Power Sector in Nigeria: An Evaluation of Ibadan and Ikeja Electricity Distribution Companies Performance (2005-2018). International Journal of Public Administration, 43(16), 1413-1420. https://doi.org/10.1080/01900692.2019.1672183

Institute of Scientific Information on Social Sciences of the Russian Academy of Sciences. (2003). Privatization in Russia and other CIS countries. http://inion.ru/site/assets/files/2601/2003_privatiz_ros_dr_str.pdf

Kant, C. (2018). Privatization and growth: natural experiment of European economies in transition. Munich Personal RePEc Archive. https://doi.org/10.2139/ssrn.3277194

Kedir, A.M., & Bedasso, B. (2020). Privatisation for Sustainable Growth in Ethiopia: a review. International Growth Centre. https://www.theigc.org/wp-content/uploads/2021/05/Kedir-November-2020-Final-Report.pdf

Kim, K., & Panchanatham, N. (2021). Reform and privatization of state-owned enterprises in India. In Reforming State-Owned Enterprises in Asia (pp. 157-168). Singapore: Springer. https://doi.org/10.1007/978-981-15-8574-6_8

Krishna, R.C.V., & Teshome, A. D. (2018). Impact of Privatization on Economic Growth in Ethiopia. LAMBERT Academic Publishing. https://www.researchgate.net/publication/327700937_Impact_of_Privatization_on_Economic_Growth_in_Ethiopia

Lai, F.W., Shad, M.K., Chow, Y.Y., & Wei, C.Y. (2018). Revisiting privatization and economic growth in Malaysia: An Empirical Examination. In SHS Web of Conferences (Vol. 56, p. 05004). EDP Sciences. https://doi.org/10.1051/shsconf/20185605004

Maddala, G.S. & Kim, I.-M. (1998). Unit Roots, Cointegration, and Structural Change. Cambridge University Press. https://doi.org/10.1017/CBO9780511751974

Molinos-Senante, M. & Maziotis, A. (2020), Drivers of profitability and productivity growth in the English and Welsh water industry since privatization. International Journal of Water Resources Development, 37(5), 865-881. https://doi.org/10.1080/07900627.2020.1782851

Muthii, G.J., & Ambrose, J. (2018). The effect of privatization on firm financial performance in Kenya. International Journal of Management and Commerce Innovations, 5(2), 671-680. https://ir-library.ku.ac.ke/bitstream/handle/123456789/20037/The%20Effect%20of%20Privatization...…pdf?sequence=1&isAllowed=y

Nwali, A.C., Johnson, N., & Oganezi, B. (2019). Privatisation of public enterprises in Nigeria: Challenges and prospects on economic development. Mediterranean Journal of Social Sciences, 10(4), 131-131. https://doi.org/10.2478/mjss-2019-0059

Peña Miguel, N., & Cuadrado-Ballesteros, B. (2019). Is privatization related to corruption? An empirical analysis of European countries. Public Management Review, 21, 69 - 95. https://doi.org/10.1080/14719037.2018.1444192

Phi, N.T.M., Taghizadeh-Hesary, F., Chuc, A. T., Yoshino, N., & Kim, C. J. (2019). Performance differential between private and state-owned enterprises: An analysis of profitability and leverage. ADBI Working Paper. https://doi.org/10.2139/ssrn.3470070

Radić, M., Ravasi, D., & Munir, K. (2021). Privatization: Implications of a Shift from State to Private Ownership. Journal of Management, 47(6), 1596-1629. https://doi.org/10.1177/0149206320988356

Rakova, E. (2008). Privatization as a way to finance the trade deficit: Opportunities for Belarus. IPM Research Center. http://www.research.by/webroot/delivery/files/wp2008r09.pdf

Reinsberg, B., Stubbs, T., Kentikelenis, A., & King, L. (2020). Bad governance: How privatization increases corruption in the developing world. Regulation & Governance, 14(4), 698-717. https://doi.org/10.1111/rego.12265

Shi, W., & Sun, J. (2016). The impact of privatization on efficiency and profitability: Evidence from Chinese listed firms, 2001-2010. Economics of Transition, 24(3), 393-420. https://doi.org/10.1111/ecot.12094

Soejono, F., & Heriyanto, F.X. (2018). Privatization method and firm performance: A study of Indonesia's state-owned enterprises. Jurnal Dinamika Manajemen, 9(2), 149-158. https://doi.org/10.15294/jdm.v9i2.14970

Toromanov, P.E. (2016). Social consequences of the privatization in Bulgaria and socio-economic impact of the neo-liberal economic theory on the transition to free market and democracy in the period from 1989 to 2015. de l'Université de Montréal. https://papyrus.bib.umontreal.ca/xmlui/bitstream/handle/1866/19409/Toromanov_Evgueniy_2017_memoire.pdf?sequence=4&isAllowed=y

Udoka, C.O., & Anyingang, R.A. (2012). The effect of privatization on economic growth of Nigeria: 1979-2007 in Retrospect. International Journal of Economic Development Research and Investment, 3(2), 25-35. https://www.researchgate.net/publication/320622920_The_Effect_of_Privatization_on_Economic_Growth_of_Nigeria_1979-2007_in_Retrospect

World Bank (2021). Indicators by Country. https://data.worldbank.org/indicator?tab=all