

Energy sector notes № 4.1

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Genuine saving as macroeconomic indicator of sustainable economic development of Kazakhstan

Genuine saving, newly introduced by the World Bank, aims at measuring sustainability of economic development. Despite that real GDP grows up, there has been recently a strong tendency of negative genuine savings in Kazakhstan. It is closely related to the depletion of natural resources, characterized by insufficient investments of the natural rents in renewing the main production assets and human capital and the protection of environment. High cost of natural resources extracting and a difference between world prices and export prices for raw materials show that foreign oil-producing companies withdraw a part of natural rent which is not invested into the economy of Kazakhstan.

The indicator “genuine saving” (known also as adjusted net saving) is introduced by the World Bank for measuring sustainability of economic development. By sustainable development one understands an economic process, in which national wealth, constituted by physical, natural, human and social capital, does not decrease with time. In other words, consumption by present generation might not lead to worsening in the possibilities for the future generations to satisfy their own needs.

Traditionally, national wealth is measured by gross saving however, the latter does not take into account depletion of natural resources, capital depreciation, environmental degradation and damages to population health.

Genuine saving is the true rate of saving after deducting investments in human capital, depletion of natural resources and damages caused by pollution. Calculating genuine saving can be used for assessing economic growth, efficiency of extraction, welfare of population, and long term sustainable economic development.

The World Bank published a concept of genuine saving¹ and therefore, calculates its value² for more than 140 countries, including Kazakhstan based on the following variables:

$$\begin{aligned} \text{Genuine saving} &= \text{Gross national saving} \\ &+ \text{Education expenditure} \\ &- \text{Consumption of fixed capital} \\ &- \text{Depletion of energy resources} \\ &- \text{Depletion of minerals} \\ &- \text{Net depletion of forests} \\ &- \text{Particulate pollution damages, including CO}_2 \text{ damages} \end{aligned}$$

¹ World Bank, 2006 Where is the Wealth of Nations? Washington, DC: The World Bank.

² In World Development Indicators (WDI).

I. Calculating genuine saving for Kazakhstan (WB)

Gross national saving is calculated as the difference between the gross national income³ (GNI) and the sum of public and private consumption including net current transfers. All figures are given as percentage of GNI. Below we present the indicators of genuine saving for Kazakhstan calculated by the specialists of the World Bank.

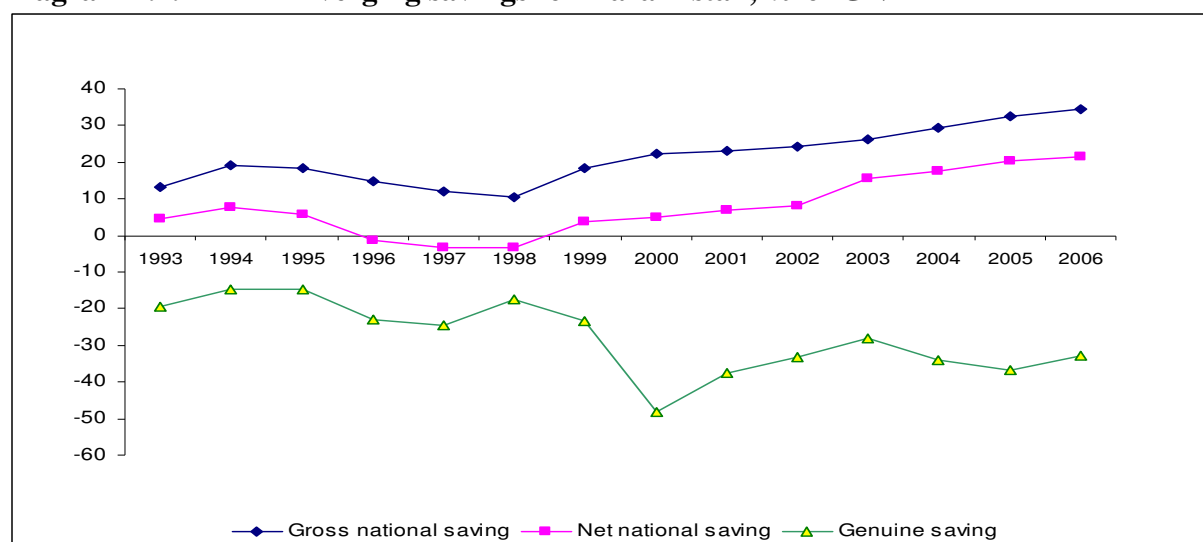
Table 4.1.1 Genuine savings for Kazakhstan, % of GNI

	1995	1998	2000	2002	2004	2006
Gross national saving	18.4	10.6	22.1	24.2	29.2	34.5
Consumption of fixed capital	12.55	13.96	17.25	16.01	11.51	13.12
Net national saving	5.82	-3.32	4.89	8.22	17.73	21.35
Education expenditure	4.56	4.41	4.41	4.41	4.41	4.41
Depletion of energy resources	19.23	14.34	50.23	39.47	50.50	52.38
Depletion of minerals	1.47	0.94	3.14	2.15	2.97	4.2
Net depletion of forests	0.00	0.00	0.00	0.00	0.00	0.00
Particulate pollution damage, including CO ₂ damages	4.47	3.20	4.18	4.12	2.85	2.05
Genuine saving	-14.80	-17.39	-48.24	-33.11	-34.16	-32.91

Source: WDI for 2007.

Thus, gross national savings tend to grow from 18.4 % in 1995 up to 34.5 % in 2006 whereas the values of genuine saving significantly remain negative during the period. The significant gap between genuine savings and gross national savings is linked, mainly, to the depletion of energy resources (oil, natural gas and coal). The other variables, namely the depletion of minerals (bauxite, copper, lead, nickel, phosphate, zinc, gold) and the expenditure on education and the CO₂ damages have appeared insignificant.

Diagram 4.1.1 Diverging savings for Kazakhstan, % of GNI



Source: WDI for 2007 year.

It should be noted that genuine savings were calculated on the basis of production volume and average world prices for energy resources. Hence, in contrast to gross national

³ GNI is less than GNP on the value of the indirect taxes of non-residents.

saving and net national saving that grow since 1993 up to 2006, genuine savings, on the contrary, decrease during the period by reflecting the depletion of natural resources in Kazakhstan.

Now, we regroup the oil-producing countries following their genuine savings, calculated by the specialists of the World Bank.

Table 2.1.2 **Calculated genuine savings by World Bank, % of GNI**

	1995	1997	1999	2001	2003	2005	2006
Algeria	-3.84	-1.25	0.08	-0.92	3.39	-5.50	n.a.
Azerbaijan	-43.16	-32.08	-24.94	-35.22	-26.16	-35.10	-38.56
Indonesia	17.35	18.22	2.77	12.31	12.70	2.77	2.85
Iran	-4.32	-8.28	-15.99	-35.33	-4.74	-15.51	-22.45
Kazakhstan	-14.80	-24.69	-23.53	-37.53	-27.97	-36.93	-32.91
Malaysia	19.00	22.25	22.00	13.71	16.19	5.15	3.39
Nigeria	-33.32	-25.32	-18.58	-19.17	-28.34	-36.41	-28.87
Norway	6.90	8.49	10.06	10.93	8.48	9.54	9.35
Russia	1.15	-5.08	-9.27	-11.23	-8.35	-11/07	-13.50
Venezuela	-6.21	0.88	7.15	2.73	-7.38	-11.46	-9.49

Source: WDI for 2007.

First of all, we notice that for all countries, except for Norway, a general decline of genuine savings is observed. Such tendency can certainly be explained by the growth of world prices for energy resources, especially for oil since 2002. As we see, Norway, Malaysia and Indonesia keep positive genuine savings during the period. On the contrary, genuine savings for Azerbaijan, Nigeria and Kazakhstan are significantly negative.

II. **Calculating genuine saving for Kazakhstan (Rakurs CEA)**

We will provide our calculations of genuine savings which is based on the data of the Agency of the Republic of Kazakhstan for Statistics (hereafter - ARKS) and of the National Bank of Kazakhstan (hereafter - NBK). We applied two different ways for calculating genuine saving for Kazakhstan.

Namely, the main source of data is entitled as ARKS statistical bulletin “National accounts of the Republic of Kazakhstan for 2003- 2007” and the forms of statistics “Use of goods and services at purchasing prices” with the initial data on net national savings, output and expenditures on extraction of energy and mineral resources and expenditures on education from 2005 to 2007.

In accordance with the methodology of World Bank the rent for each type of energy and mineral resources is calculated by subtracting extracting expenditures from resource output cost. However, unlike the energy resources, the available data on extraction of coal, of crude oil and natural gas, the mineral resources is aggregated as the extraction of iron ores, ores of nonferrous metals and other branches of mining industry.

Expenditures on extracting natural resources include intermediate consumption - all forms of services and intermediate goods which were used by enterprises of the extractive

sector (including import of goods) at purchasing prices⁴, and also the payment for labor and the consumption of fixed assets.

The sum of the rents of all energy resource gives a factual depletion of energy resources. The results of the aggregated rent from energy and mineral resources are represented in the table 4.1.5 in the Appendix.

It has to be noticed that according to the ARKS data, for example in 2006, the cost of oil production (with 65 mln. ton of production and extracting expenditures of 21163 mln.\$) is \$326 per ton or \$44.42 per barrel. In fact, extracting costs of two large oil companies "KazMunaiGaz" (hereafter - KMG) and «TengizChevrOil» compose \$15-18 and \$10-12 per barrel including transport expenses for oil delivery to the international ports⁵.

Unlike the World Bank approach to education, it would be relevant if we take into account not only budget expenditures, but also expenditures of private sector in the sphere of education. For this purpose, we will use the data on expenses for education from the national accounts, resulted in intermediate consumption, payment of labor and consumption of fixed capital by educational institutions with the various forms of ownership.

Since the territory of Kazakhstan has no greater forest covers, depletion of forests in Kazakhstan, similarly to the World Bank estimation, is supposed equal to zero for the period.

The damages of CO₂ emissions were calculated on the basis of ASRK data on the volumes of emissions of liquid and gaseous substances⁶. Thus, similarly to the World Bank approach the price of CO₂ emissions is put \$20 per ton at prices of 1995, adjusted by the deflator of USA GDP till 2007. In result, the calculated losses from CO₂ emissions are considerably less than the corresponding estimation by the World Bank.

The second approach to the estimation of genuine savings is linked to analyzing the balance of payment, namely the income of FDI, net income of the national company KMG and the revenues of direct taxes from enterprises of the oil sector at National Fund (hereafter - NF) of the Republic of Kazakhstan.

Table 4.1.3 **Income of the Kazakhstan's mining industry, mln. \$**

	2005	2006	2007	2008
1) Income of FDI including mining industry	4633	7644 6454	11304 9545*	16567 13988*
2) Net income of KMG	na	972	1282	2000
3) Direct taxes of petroleum enterprises at NF	na	5330	8463	14135
4) Total, (1)+(2)+(3)	na	12756	19289	30123
5) Aggregated rent by the data of ARKS	7307	10500	12738	na
Difference (5)-(4)	na	-2257	-6551	na

Sources: NBK, KMG, MF, ARKS and Rakurs CEA calculation.

*it is assumed that the share 0.85 remains as for 2006.

⁴ Consumer price is understood as the sum paid by consumer for the delivery of goods and service, which consists of the price of goods and service, commercial transportation price increases and taxes on goods.

⁵ <http://www.reuters.com/article/rbssEnergyNews/idUSLS12407420090728>

⁶ It has to be noted that ARKS gives in the aggregated form while the specialists of the World Bank separately calculate losses from the emissions of CO₂ and particular matter.

The balance of payment, composed by the NBK in 2008, contains the income of FDI with the negative sign that characterizes the outflows of capital. Moreover, the balance of payment for 2006 has a sector structure of FDI incomes where the aggregated income is amounted by 6454 mln.\$ that corresponds to 85% of the gross income from FDI.

As can be seen from table 4.1.3, the value, obtained from the sum of FDI income in mining, net income of KMG and direct taxes from petroleum enterprises at NF is considerably higher than the rents in 2006-2008. Thus, this value grows more than in one and a half times annually beginning with 12756 mln.\$ in 2006 to 30123 mln. \$ in 2008. While the aggregated rent grows moderately from 7307 mln. \$ in 2005 to 12738 mln.\$ in 2007.

This comparison clearly demonstrates an excessive overestimation of expenditures on extracting natural resources and respectively, high cost of production according to the data of ARKS.

Further, we will estimate genuine savings by taking into account the actual income from mining industry using the total income from the extraction of natural resources instead the aggregated rent. The results of the calculations of genuine savings by two methods for each year are designated as A and B (table 4.1.4). All cost values are given in percentage of GNI, calculated earlier by CEA “Rakurs”.

Table 4.1.4 Calculating genuine saving by two methods, % of GNI

	2005		2006		2007	
	A	B	A	B	A	B
Net national savings	16.61	16.61	19.28	19.28	19.12	19.12
Expenditures on education	3.69	3.69	2.96	2.96	4.35	4.35
Depletion of energy resources	13.21	na	13.66	17.84	12.94	21.02
Depletion of minerals	1.00		1.02		0.94	
Net depletion of forests	0.00	0.00	0.00	0.00	0.00	0.00
Particulate pollution damage, including CO ₂ damages	0.12	0.12	0.09	0.09	0.07	0.07
Genuine Savings	5.97	na	7.47	4.31	9.51	2.27

Source: ARKS, WB, calculations of CEA «Rakurs».

Thus, in the first version the genuine savings are positive and moreover, they increase from 5.97% to 9.51% during the period. However, in the second version, the genuine savings remain also positive, but they decrease from 4.31% in 2006 to 2.27% by the end of the period. The existing differences in the indicators of ASRK and World Bank, which are used in direct calculation of genuine savings, are reflected in Table 4.1.6 in the annex. The main difference in the data concerns the depletion of energy (more than 3 times) and of mineral resources (more than 2 times), CO₂ damages (more than 20 times) and GNI.

Hence, there is a significant difference between the calculations of genuine savings based on the data of World Bank and ASRK. Negative genuine savings, calculated by the World Bank, represent a depletion of energy resources. According to the concept of the World Bank, the negative genuine savings currently observed for Kazakhstan, signify the insufficiency of investing natural rent into human capital, the renewal of fixed capital assets and into the protection of environment and consequently, leads to the instability of economic development of the country.

We resume that the genuine savings, obtained in two ways and based on the data of the state bodies of Kazakhstan, are not confirmed by the negative values of genuine saving, calculated by the specialists of World Bank. One of the possible explanations of this result might be the difference between the world prices and the export prices for the Kazakhstan's raw materials. It is also necessary to consider that a significant part of net national savings indeed saved in the form of foreign financial assets (increase in the assets of NF).

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Table 4.1.5 Estimating the depletion of energy and mineral resources

	2005				2006				2007			
	Energy resources			Mineral and other resources	Energy resources			Mineral and other resources	Energy resources			Mineral and other resources
	oil	Natural gas	coal		oil	Natural gas	coal		oil	Natural gas	coal	
Production, mln. ton (natural gas in mln. cub. meter)	61.5	26998	63.5		65.0	26382	96.2		67.1	29562	98.4	
Brent price, \$ per ton	391.35				471.23				521.28			
Output, mln. \$	20804	1289	617	3232	30451	2309	1125	4236	32819	2379	1227	4417
Expenditures on extraction, mln. \$	14568	905	444	2717	21163	2035	919	3504	21425	2148	974	3557
Rents, mln. \$	6236	384	173	515	9288	274	206	732	11394	231	253	861
Total rents, mln. \$	6793			515	9768			732	11878			861
As % of GNI	13.21			1.00	13.66			1.02	12.94			0.94
Net income, net mixed incomes, mln.\$	3989			424	6054			608	7113			719

Source: ARKS data, calculations of CEA «Rakurs».

Table 4.1.6 Data differences in calculating genuine savings, mln. \$

	2005			2006			2007		
	ARKS	WB	Ratio	ARKS	WB	Ratio	ARKS	WB	Ratio
Net national savings	8540	9125	0.94	13785	12631	1.09	17542	na	
Expenditure on education	1898	1969	0.96	2120	2612	0.81	3987	na	
Depletion of energy resources	6793	25180	0.27	9768	30995	0.32	11878	na	
Depelction of minerals	515	1268	0.41	732	2504	0.29	861	na	
CO ₂ damages	55	1253	0.05	56	1396	0.05	57	na	
GNI*	51427	44604	1.15	71512	59175	1.21	91767	78281	1.17

Source: Data of ARKS and WB.

*Data calculated by CEA «Rakurs».