Republic of Kazakhstan

Country Economic Memorandum

Getting Competitive, Staying Competitive:
The Challenge of Managing Kazakhstan's Oil Boom*

Background Paper No. 3:

Selected Issues on The Management Of Oil Windfalls

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World Bank Note

THE MANAGEMENT OF OIL WINDFALLS

1. Three strategic questions frame the challenge that Kazakhstan faces in managing its oil windfall: (1) How large is the oil wealth? (2) How much oil revenue should the GOK save and spend every year? (3) What are the complementary policy and institutional measures required to maximize the benefits of the spending and minimize its risks? Below we sketch answers for these three questions based on the tools discussed during the mission. All calculations should be considered preliminary, as they will be updated based on the information received during the mission and the fine-tuning of key parameters in the models.

i. How large is the oil-related wealth[1] in Kazakhstan?

2. The estimates of Kazakhstan's oil wealth range from US$ 27 billion to US$ 96 billion, depending on the specific path of key variables over the next 20-30 years including, among others, oil prices, total economic reserves and extraction profile, cost of extraction, pace of company-level investments, and the rate of return on the assets in which oil-related wealth is maintained (Table 1).[2] Converted in per capita terms, this wealth ranges from US$ 1800 to US$ 6490, depending on the path for the same set of variables.

3. The wealth per capita can be placed in context by means of two simplistic scenarios:

- Kazakhstan's income per capita could be increased from its current level of US$ 1,800 by an additional US$ 6490 for **one year**, as long as the most optimistic assumptions for key variables materialize. This hypothetical scenario would require the conversion of the future stream of revenues into cash by either borrowing against it, or by selling it.

- Alternatively, if the government were to adopt the principle of distributing oil-related wealth equally across time and generations in perpetuity, Kazakhstan's income per capita could be increased by US$ 72 per person in the most conservative of all scenarios in Table 1, or by up to US$ 260 every year in the best of all scenarios.

4. These simple calculations illustrate two fundamental features of Kazakhstan's oil-related wealth, which are well known by Kazak policy makers:

- Oil wealth is subject to **high levels of uncertainty** given that its level changes significantly with relatively minor changes in key parameters (a three-dollar change in the Brent crude oil price, say from US$ 16 to US$ 19 per barrel, changes the net wealth by at least $ 12 billion but up to $ 28 billion in the high

[1] Defined as the net present value of oil-related fiscal revenue flowing into either the budget or the National Fund of the Republic of Kazakhstan (NFRK), plus the current level of assets in the Central Bank and the NFRK, and minus the public and public guaranteed debt.

[2] This work builds on the WB/IMF oil-fiscal model, as well as on the IMF work presented in the 2003 Article IV Consultation and Selected Issues Papers.

case for reserves). The choice of oil prices is explained in the notes for Table 1.

- Oil wealth will have a **relatively small** impact on the population's level of overall consumption per capita over the medium term regardless of the principle that is used for its consumption (i.e., whether it is spread equally across time and generations, or if consumed all in one year).[3]

5. These two properties of Kazakhstan's oil wealth suggest that it cannot be a sustainable source of overall growth and improvement of living conditions. Certainly, the simple calculations made strongly validate the authorities' current efforts to formulate and implement a sound economic platform for the growth of the non-oil economy. In a fundamental way, it will the growth and productivity of non-oil sectors that will ultimately determine Kazakhstan's medium- and long-term welfare levels.

Table 1: Kazakhstan's end-2002 Net Wealth Under Alternative Outcomes for Total Exploitable Oil Reserves, and Oil Prices

Constant US$ million

Total Oil Reserves[1]	Oil price (Brent), US$/bbl[3]	Net oil wealth	Net oil wealth per capita	Annuity Per capita[4]
High Case: 7.4 bln tons or 53.9 bln barrels	21	**96058**	**6490**	**260**
	19	75576	5107	204
	16	47716	3224	129
Base Case[2]: 4.8 bln tons or 35.2 bln barrels	21	67012	4528	181
	19	52012	3514	141
	16	33543	2266	91
Low Case: 4.1 bln tons or 29.6 bln barrels	21	47160	3186	127
	19	38631	2610	104
	16	**26640**	**1800**	**72**

Note: All simulations are illustrative at this point. In addition to the assumptions on oil prices and exploitable oil reserves, the results depend on the profile of the extraction, the pace of investments, and financial and operational decisions of the operators that may change the path of revenue that the government receives from oil operations.

[1] Onshore petroleum reserves are estimated at 2.5 bln. tons at least (without taking into account the possible upward revision of Tengiz oil reserves), Kashagan alone stands for 1.7 bln. tons. In addition, the oil recoverable reserves in Kazakhstan's sector of the Caspian Sea are estimated at 4.4 bln. Tons according to the Caspian Sea Development Program. Thus, the working assumption for reserves of the authorities is about 6.9 bln tons, or close to the high case. Of course, whether these reserves are economic or not—particularly those off shore—will depend on oil prices.

[2] The base case (for oil prices at $16 and $21 per barrel) was used for all the graphs presented during the course of the mission. A broader set of simulations is presented here to illustrate the sensitivity of oil wealth to changes in key parameters.

[3] We simulate oil prices to be between $16 and $21 per barrel of Brent over the long term, which is an interval that contains the average and median prices for oil over the last 50 years. Further work could be carried out by World Bank price commodity group to pin down reasonable assumptions for oil prices in the future.

[4] This annuity can be interpreted as the sustainable level of per capita spending (see Table 2).

6. Our findings contradict the commonly held view that Kazakhstan oil windfalls are large, even when we use the highest level of reserves. While it is true that oil production is expected to double from 1 to 2 million barrels per day by the end of this decade, and triple by 2020, followed by a long plateau, only on the basis of on

[3] The impact of oil wealth on overall welfare of the population could be large over the medium term only to the extent it is effectively used to develop the non-oil economic structure.

ongoing investment projects,[4] extraction and transportation in Kazakhstan are very costly (up to $12 dollars on average, or about five times higher than in Saudi Arabia). Because of this consideration (e.g., not because Kazakhstan's capacity for negotiating contracts has been weak), the flow of funds into the budget should be expected to be significantly lower than in other countries even if the production (in mln barrels per day) reaches the same levels.

ii. How much of the oil-related wealth should be spent and how much saved?

7. Because oil extraction results in depletion of this natural resource, spending all the oil revenues today will result in depriving future generations from sharing the benefits from the oil wealth. One useful approach to the question of oil wealth distribution across time is to preserve the principal of the real oil wealth, therefore distributing the oil-related wealth equally across time and generations.

8. *If adopted*, this principle has two implications. First, only the return on the oil-related wealth should be spent, i.e., the overall stock of oil-wealth must be maintained regardless of whether or not it has been extracted. Second, since the peak of oil revenues is expected to come only 10-15 years from now, net borrowing against future revenues will be needed in the initial years to smooth oil revenue spending over time.

9. This point is illustrated for three different sets of assumptions in Table 2. The base case assumes total oil reserves of 4.8 billion tons, and prices fluctuating between US$ 16 and US$ 21 per bbl. As illustrated in Table 1 above, the size of the net wealth is estimated between US$ 33 and US$ 67 billion for this base case. Under these assumptions (and other implicit assumption for extraction profiles and pace of investments), Kazakhstan's budget could use between US$ 1.3 billion and $ 2.7 billion per year (in constant 2002 prices) without depleting the net stock of oil-related wealth. The choice of a particular threshold would depend on the risk that the authorities are prepared to run regarding oil prices and other assumptions. These amounts (which would come from annual oil related revenue or a policy to borrow against future oil revenues) could then be used to finance the so-called non-oil fiscal balance, a concept that we will explain below.

Table 2. Kazakhstan: Illustrative Simulations of Sustainable Levels of Oil Related Spending

Constant 2002 US$

[4] The three major investments are in the Kashagan field in the Caspian sea (operated by ENI), the on-shore Tengiz field (operated by Chevron-Texaco), and the giant Karachaganak oil and gas field in West-Kazakhstan oblast (operated by British Gas). Ongoing exploration in the Caspian sea is likely to add significantly to these projections.

Oil reserves	Oil price (Brent), US$/bbl	Sustainable expenditure	Sustainable expenditure per capita
High Case: 7.4 bln tons or 53.9 bln barrels	21	3842	260
	19	3023	204
	16	1909	129
Base Case: 4.8 bln tons or 35.2 bln barrels	**21**	**2680**	**181**
	19	2080	141
	16	**1342**	**91**
Low Case: 4.1 bln tons or 29.6 bln barrels	21	1886	127
	19	1545	104
	16	1066	72

See notes to Table 1.

10. These thresholds for oil-financed expenditures could be compared with the historical levels of oil-related spending. In 2002, the authorities spent $ 5.3 billion, of which non-oil revenues could finance only $ 4.3 billion. In this case, the authorities incurred a deficit in the non-oil budget of $1 billion (i.e., needed to rely, directly or indirectly, on oil revenues in that same amount). Table 3 below illustrates how the non-oil balance was calculated for 2002 and how it compares with the more conventional definition of fiscal balances (e.g., the state fiscal balance, and the state and NFRK consolidated balance). Table 3 also provides projections for the 2003-06 period. In the Table, the data for 2004 corresponds to the budget submitted to parliament, while data for 2005 and 2006 was taken from the draft Medium-Term Fiscal Framework.

Table 3. Kazakhstan: Calculation of the Non-Oil Deficit and its Financing
In billion Kazak tenge and million US dollars

	2002 actual	2003 est.	2004 proj.	2005 proj.	2006 proj.	2002 actual	2003 est.	2004 proj.	2005 proj.	2006 proj.
	Tenge billion in current prices					US$ million				
Total Revenue, of which	855	1103	1158	1299	1481	5581	7324	7552	8383	9372
Oil revenue, of which	200	325	271	311	335	1302	2157	1766	2003	2117
Oil revenue kept by the Budget 1/	151	203	248	285	304	982	1351	1616	1837	1922
Oil revenue accumulated in the NFRK, o.w.	49	121	23	26	31	320	805	150	166	196
Net transfers from the Budget 2/	13	12	9	9	12	82	83	55	60	76
Direct tax revenue transfers 3/	36	109	15	17	19	237	722	95	106	120
Non-oil revenue	656	778	887	989	1146	4279	5167	5786	6379	7255
Non-oil revenue to the Budget	645	759	870	970	1124	4206	5044	5674	6255	7116
Non-oil revenue to the NFRK 4/	11	19	17	19	22	73	124	111	125	139
Total Expenditure and net lending	808	1064	1210	1309	1459	5273	7068	7895	8446	9237
Overall balance (budget and NFRK), +=surplus	47	39	-53	-10	21	308	256	-343	-63	135
State budget balance, +=surplus	-13	-101	-93	-55	-31	-85	-673	-605	-354	-199
Non-oil balance, +=surplus	-152	-286	-323	-320	-313	-994	-1901	-2109	-2066	-1982
Memo: in constant 2002 US dollars	..	..	..	..	..	-994	-1863	-2027	-1947	-1831
Non-oil balance, financing	152	286	323	320	313	994	1901	2109	2066	1982
Total oil revenue	200	325	271	311	335	1302	2157	1766	2003	2117
Net budget borrowing, of which	-6	101	92	55	31	-41	672	598	354	199
External	-52	..	..	..	..	-339	..	..	..	..
Domestic	46	..	..	..	..	297	..	..	..	..
Total privatization proceeds	68	57	38	33	40	446	378	245	213	253
Privatization proceeds to the Budget	19	0	1	0	0	126	1	7	0	0
Sale of oil shares and transfers to the NFRK	49	57	37	33	40	320	377	239	213	253
Total accumulation in the NFRK (-)	-109	-197	-77	-78	-93	-713	-1306	-500	-504	-587
Oil revenue into the NFRK	-49	-121	-23	-26	-31	-320	-805	-150	-166	-196
Non-oil revenue to the NFRK 4/	-11	-19	-17	-19	-22	-73	-124	-111	-125	-139
Sale of oil shares and transfers to the NFRK	-49	-57	-37	-33	-40	-320	-377	-239	-213	-253
Memorandum items:										
Balance in the NFRK, end of period	299	496	572	650	743	1922	3442	3713	4156	4660

1/ Includes about 46 oil extractive enterprises, net of transfers to the NFRK.

2/ Corresponds to direct savings into the NFRK, and is based on a different set of enterprises.

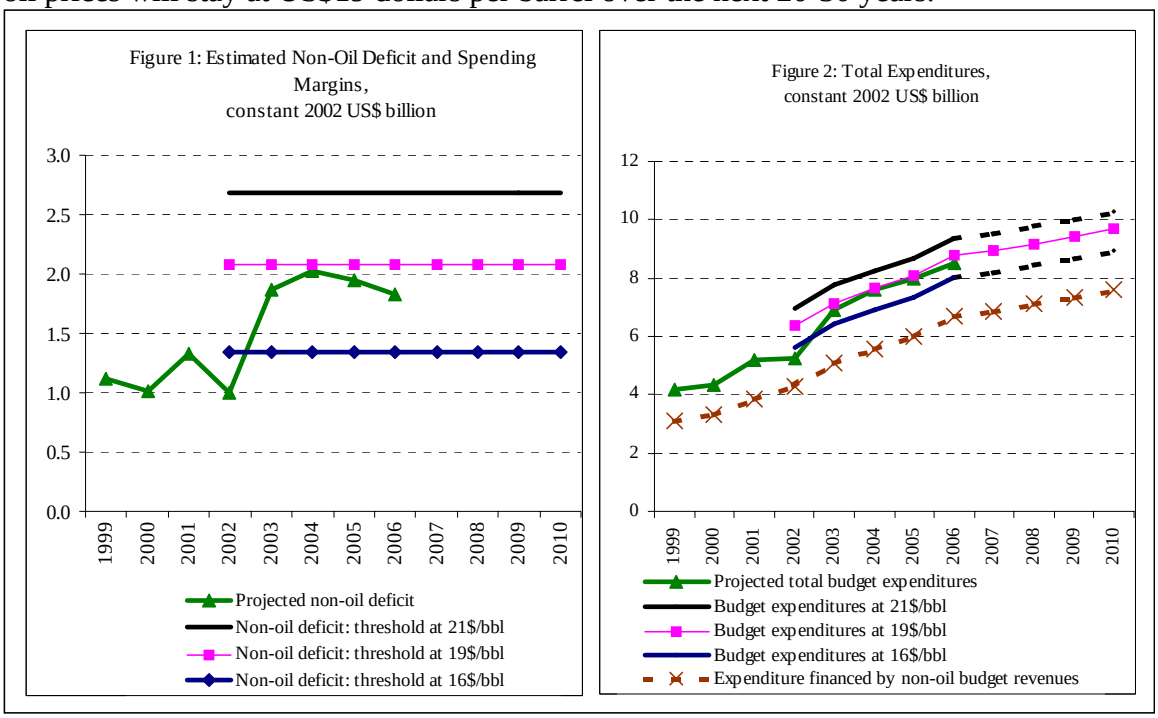
3/ Corresponds to the direct revenues (CIT, bonuses, royalties and PSA share) from the NFRK set of enterprises that are above the estimates of US$19 per barrel.

4/ Non-oil revenue transferred to the NFRK (the set of NFRK enterprises includes some non-oil companies) and net investment income.

Source: World Bank staff estimates based on information provided by the authorities.

11. The non-oil balance is a useful concept for oil rich economies as it summarizes the total amount that has been "taken from or borrowed against" the oil wealth by the fiscal authorities in a given particular year. The optimal levels of spending presented in Table 2 are comparable to this concept. In particular, Figure 1 below illustrates the actual path of the non-oil deficit for the 1999-02 period, and the expected path for 2003 and beyond. The Figure also shows the allowable oil financing to the budget coming from the low case for total oil reserves presented in Table 2 (for three different price levels).

12. Figure 1 illustrates that the fiscal authorities have used about $1 billion a year of oil-related revenues in 1999, 2000 and 2002. This was a conservative stance, i.e., as it was well below the lowest threshold for oil-related spending which has been derived by assuming that oil prices will remain at US$16 dollars per barrel over the next 20-30 years. In 2003 and 2004, the reliance on oil revenues for spending is expected to increase to around US$2 billion, i.e., around the threshold defined by assuming that oil prices will stay at US$19 dollars per barrel over the next 20-30 years.



Note: projections for the 2004-06 period correspond to the medium term framework. We assume that non-oil growth will not grow as fast thereafter.

13. Figure 2 provides a more comprehensive picture as it adds the spending levels financed with non-oil revenues. [5] These expenditures are expected to increase in US$ dollars over time due to a growing real GDP and the expected appreciation of the currency over the medium term. In particular, non-oil revenues (and expenditures) are expected to be constant at 18 percent of a rapidly growing GDP as can be derived from the medium term framework up to 2006, but we expect them to fall to 16 percent by 2010. Figure 2, shows that if the non-oil economy expands as forecasted in the Medium-term Framework (and the associated non-oil revenues grow at similar pace), then the spending out of oil will become insignificant. It should be mentioned that an accurate forecasting of non-oil revenues (and the expenditure level they could

[5] The assumption is that the non-oil revenues are equal to non-oil expenditures, i.e., that a balance budget is pursued in the non-oil budget.

support) is crucial for the next medium-term framework, particularly in light of the actual and expected reduction in taxes for the non-oil sectors that are being pursued.

14. The implications of these different paths of spending on the dynamics of the net government debt (net of NFRK assets) are explored in Table 4.[6] For example, the projections derived from the Medium Term Fiscal Framework suggest that the **net** stock of government debt will fall rapidly between 2002 and 2006 (from $2.4 billion to $1.4 billion). Given the targeted path for the accumulation of assets in the NFRK, the **gross** external debt will nonetheless increase, from $4.3 billion to $6.1 billion over the same period (although it will fall as a share of GDP). In other words, the rules of accumulation in the NFRK together with the expected increases in the level of public expenditures will require significant borrowing by the government—to the tune of $600 million per year in 2003 and 2004. Note that public debt is defined as the total of domestic and external debt, and that this latter include public and publicly guaranteed debt.

15. At the bottom of the table is a simulation of a fiscal policy that assumes long-term prices for oil are US$21 per barrel, and adjust total spending accordingly. In this case, the non-oil deficit could be increased from an expected $1.9 billion in 2003 to the equivalent of $2.7 billion in constant dollars in 2004 and beyond. In this case, the overall level of **gross** debt would increase significantly reaching close to US$8.5 billion by 2006.

Table 4. Fiscal policy and net asset position

	2002 actual	2003 est.	2004 proj.	2005 proj.	2006 proj.	2002 actual	2003 est.	2004 proj.	2005 proj.	2006 proj.
	US$ billion in current prices					Share of GDP				
Projections based on the Medium Term Fiscal Framework										
Non-oil deficit	1.0	1.9	2.1	2.1	2.0	4.0	6.5	6.6	5.8	5.0
Stock of debt, net of NFRK assets	2.4	1.5	1.8	1.8	1.4	9.6	5.2	5.8	5.0	3.6
of which:										
- Government and government-garanteed debt	4.3	5.0	5.6	5.9	6.1	17.4	17.0	17.5	16.7	15.4
- NFRK assets	1.9	3.4	3.7	4.2	4.7	7.8	11.8	11.7	11.7	11.7
Projections assuming fiscal policy is based on long run oil prices at 16$/bbl [a]										
Non-oil deficit	1.0	1.9	1.4	1.4	1.5	4.0	6.5	4.4	4.0	3.7
Stock of debt, net of NFRK assets	2.4	1.5	1.1	0.4	-0.4	9.6	5.2	3.5	1.1	-1.1
of which:										
- Government and government-garanteed debt	4.3	5.0	4.8	4.6	4.2	17.4	17.0	15.2	12.9	10.6
- NFRK assets	1.9	3.4	3.7	4.2	4.7	7.8	11.8	11.7	11.7	11.7
Projections assuming fiscal policy is based on long run oil prices at 21$/bbl										
Non-oil deficit	1.0	1.9	2.8	2.8	2.9	4.0	6.5	8.8	8.0	7.3
Stock of debt, net of NFRK assets	2.4	1.5	2.5	3.2	3.8	9.6	5.2	7.9	9.1	9.6
of which:										
- Government and government-garanteed debt	4.3	5.0	6.2	7.4	8.5	17.4	17.0	19.6	20.8	21.3
- NFRK assets	1.9	3.4	3.7	4.2	4.7	7.8	11.8	11.7	11.7	11.7

Source: World Bank staff estimates based on information provided by the authorities.

a Actual oil prices are expected to be higher than $16/bbl in the short term (e.g., during the 2004-06 period), with the difference going int the NFRK

In billion US dollars

16. The explanation for this behavior is simple. Since the oil related revenues are expected to flow mainly over the medium term (i.e., 10-15 years from now), by expecting high oil prices the GOK will be borrowing against expected future revenues

[6] It should however be mentioned that the principles illustrated in Table 2 and Figures 1 and 2 only determine the net level of assets, as opposed to all stocks. In this regard, a given level of net assets could be reached by different combinations of external and internal stocks of debt as well as assets in the NFRK. Likewise, the return on assets (and the payment on liabilities) does not bear any (economic) relation.

early on in order to smooth expenditure—i.e., to distribute the oil wealth equally across generations. If the expectation of $21 per barrel oil prices were not realized in the future, and the GDP to fall accordingly, the external debt ratios of the country could easily generate important macroeconomic volatility (e.g., periods of sharp real exchange rate appreciation followed by periods of sharp real exchange rate depreciation).

iii. What are the complementary policy and institutional measures required to maximize the benefits of the spending and minimize its risks?

17. The illustrative framework (e.g., the optimal and actual levels for the non-oil deficit) described in section (ii) above offers basic parameters for determining the pace of oil-related spending (and the risk associated with such levels) based on the assumption that the annuity coming from oil wealth could be spent efficiently. This framework is not sufficient in practice to determine the year-to-year spending levels out of oil. Two additional considerations must be taken into account:

i. The effect that this spending would have on the growth of the non-oil sector, via its effect on prices, and the nominal and real exchange rates.

ii. The efficiency of the use of oil-related revenues and other public resources.

18. The World Bank team, in close cooperation with the Ministry of Economy and Budget Planning, are developing a Computer General Equilibrium Framework that could be used to illustrate the effects of fiscal spending on the real exchange rate and non-oil growth[7]. Preliminary results are presented in Table 5 below and were also discussed during the mission.

Table 5. Impact of Fiscal Policy on the Non-Oil Sector

	MTFF scenario	Continued expansion scenario
Non-oil deficit, share of non-oil GDP	6.0%	7.7%
Inflation rate	2.1%	2.2%
Nominal exchange rate appreciation	0.0%	0.9%
Real exchange rate appreciation	2.9%	4.3%
Productivity growth rate	1.3%	1.0%
Size of sterilization, share of non-oil GDP	-0.5%	-0.5%
Capital stock growth rate	4.5%	4.6%
Non-oil value added growth rate	3.4%	3.0%

** annual growth rates unless stated otherwise*
** average 2003-2010*

19. Essentially, a level for the non-oil deficit of about 6 percent of non-oil GDP (i.e., about its current level) could generate an annual real exchange rate appreciation of about 3%—of which part or all could in principle be sterilized by the monetary authorities but at a certain cost to its balance sheet. However, if the fiscal stance becomes more expansionary (increasing the non oil deficit to 7.7%), the pressure on

[7] For simplicity, the model assumes that fiscal expenditures only puts pressure on the real exchange rate to appreciate and the cost of non-tradables to increase—i.e., these expenditures do not significantly contribute to increase the productivity of the non-oil sectors. The model could be expanded to explore further the impact of alternative patterns of public spending on the productivity of the non-oil sector.

the real exchange rate will increase to 4.3%, and the rate of growth in non-oil sector will slow down from 3.4% to 3.0% per year. This occurs through various crowding out effects and due to the pressure on the cost of key non-tradable goods and factors of production.

20. Naturally, a key discussion relates to point ii above, i.e., how much oil-financed public spending contributes to the growth of non-oil sectors (area 2 in Diagram 1)? Unfortunately, measuring the effectiveness of oil-finance spending is equivalent to measuring the effectiveness of total public expenditures, which is on its own a major task, well beyond the current work. More important is the task of defining what would constitute effective/efficient expenditures in the future, which requires outlining in some details the policy framework for a given sector in the future.

21. This work however should start, and could be included in future years of the Joint Economic Research Program—or, like in the agricultural sector, through the preparation of investment operations in support of expenditure wide approaches. A typical Public Expenditure Review (PER) would look at the strategic implications of the composition of public spending, the effectiveness of different categories of spending (e.g., health or transport), or of various public institutions (e.g., local governments). It would also pay careful attention to safeguards and controls for public spending efficiency, including the processes of procurement and financial accountability. Such PER could be part of an overall program to strengthen the Medium-Term Fiscal Framework.