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SELECTED ISSUES

July 18, 2013

Approved By
Middle East and Central Asia Department

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CONTENTS

LEVERAGING OIL WEALTH FOR DEVELOPMENT IN KAZAKHSTAN: OPPORTUNITIES AND CHALLENGES [1]

Using its oil wealth to speed up development and diversification is a key long term goal for the Kazakhstani authorities. Ambitious public investment programs may help to boost growth but the cost may be high in terms of adverse macroeconomic outcomes. This chapter reviews the record of management of oil wealth in Kazakhstan and utilizes a structural model to analyze macroeconomic implications of alternative scenarios for scaling up public investment.

A. Introduction

1. Kazakhstan is among the world's top 20 oil producers with estimated reserves of 40 billion barrels, and about 2 percent share in global oil production. The oil sector in Kazakhstan expanded rapidly after independence due to new discoveries, development of transport infrastructure to new markets and – since 2003 – favorable prices. Oil production is expected to increase in the next 15 years and remain significant in the medium and long term, most notably due to Kashagan oil field, which was discovered in 2000 and has been the largest new field found in the world during the past 30 years. In the meantime, Kazakhstan's dependence on oil has grown as manifested by a large share of oil in exports, budget revenues and the economy. Leveraging its resource wealth to accelerate development and become a diversified emerging market economy is the key long term goal of the Kazakhstani authorities.

2. Kazakhstan's record of managing its oil wealth has been good by a number of metrics. By saving most of the tax revenues collected from the oil sector in an off-budget oil fund Kazakhstan has been relatively successful in ensuring that government revenue volatility does not translate into spending volatility. During the 2008-09 crisis oil fund savings were used to fund a large stimulus package that helped alleviate the economic downturn. After the crisis the stimulus was unwound and the nonoil deficit has been declining albeit at a slower pace than initially planned. At the same time, Kazakhstan accumulated a substantial buffer in the oil fund that reached 29 percent of GDP as of end 2012.

3. The record is less straightforward when looking beyond fiscal accounts. The quasifiscal sector, that includes public enterprises in the oil and gas industry, is systemic in Kazakhstan. During the crisis the quasifiscal sector played an important role in the government's stimulus program while currently it is actively involved in the country's long term development strategy. This suggests that looking only at management of tax revenues collected from the oil sector may not be sufficient for assessing Kazakhstan's management of its oil wealth. Further, authorities' policy decisions regarding management of the countries' oil wealth affect the rest of the economy through various channels.

[1] Prepared by Gohar Minasyan (MCD) and Susan Yang (RES).

There is therefore a case for a more comprehensive approach, especially in light of the authorities' development and diversification strategy.

4. In this chapter we propose a structural model that can help assess policy decisions on management of oil wealth. The model allows for public investment to positively affect growth; however it also incorporates public investment inefficiencies and absorptive capacity constraints that increase the economic cost of building up public capital. We use the model, calibrated for the Kazakhstani economy, to study the macroeconomic implications of different choices regarding the magnitude of public investment. Simulation results suggest that while ambitious public investment programs can help boost growth, they can also lead to adverse macroeconomic outcomes, in particular by negatively affecting the competitiveness of the nonoil tradable sector (Dutch disease), thereby defeating the purpose of diversification. Aggressive public spending can also risk wearing down the accumulated buffers, or alternatively, piling up costly external debt.

5. The chapter is organized as follows. Section B discusses Kazakhstan's record of managing its oil wealth, including as regards fiscal and broader macroeconomic and structural outcomes. Section C describes briefly the structural model. Section D presents and discusses the results of model simulations for two alternative oil price scenarios. Section E summarizes the main conclusions and policy recommendations.

B. The Record of Management of Oil Wealth

6. The criteria to assess a record of management of oil wealth are not straightforward. The literature looks at various characteristics of oil-rich economies, ranging from issues of energy efficiency to rent-seeking. In this chapter we focus primarily on issues related to managing the volatility stemming from oil prices and/or production; ensuring fiscal sustainability and intergenerational equity; and government's strategies of turning subsoil assets into productive assets to ensure sustainable growth after oil resources are depleted. Related to these, we also look at possible symptoms of Dutch disease. This section discusses the performance in Kazakhstan on these aspects, starting with the scope of government's involvement in the oil sector of the country.

7. The government's role in the oil sector in Kazakhstan has evolved since independence in 1991. During the first decade after independence that was also a period of low oil prices, Kazakhstan's strategy was characterized by large-scale privatizations in the oil sector to foreign investors. According to most analysts, contracts signed during this period were skewed in favor of multinationals with residual shares in projects allocated to KMG, the national oil and gas company.[2] While the current ownership structure in the oil industry is still characterized by an extensive involvement of multinationals, in the second decade after independence the government has been successful in gaining larger control and re-negotiating some of the contracts, in particular to get

[2] See Esanov and Kuralbayeva (2011).

preemptive purchase rights in energy projects shared under sale.[3] In addition, various tax reforms were implemented in 2004, 2005 and 2008 to ensure tougher tax regimes for oil sector companies that gradually shifted the burden of taxation more on the oil sector. As a result of these reforms tax revenues from the oil sector currently account for about 43% of total oil sector revenues and about 55% of total tax revenues.

8. The government has had a tradition of relatively conservative management of its oil revenues. During the boom years of 2003-08 most of the windfall was saved or used to repay public debt while government spending remained relatively constant as a share of GDP (Figure 1). Later, accumulated oil savings allowed the authorities to respond to the crisis with a large-scale and timey stimulus, estimated at 7.5 percent of GDP and about USD10 billion out of accumulated oil savings were used to fund the stimulus. After the crisis the stimulus was unwound and the nonoil deficit has been declining, although it is still above the estimated sustainable level of 6 percent of GDP.[4] (Figure 2).

Figure 1: General Government Revenues and Expenditures
(In percent of GDP)

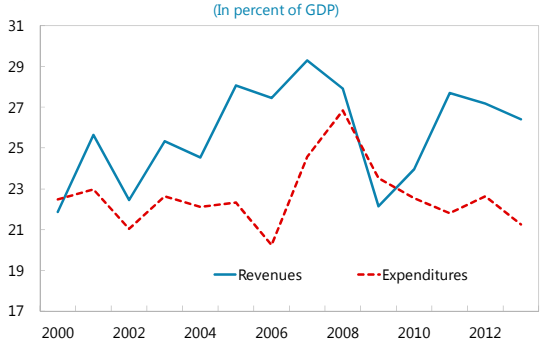
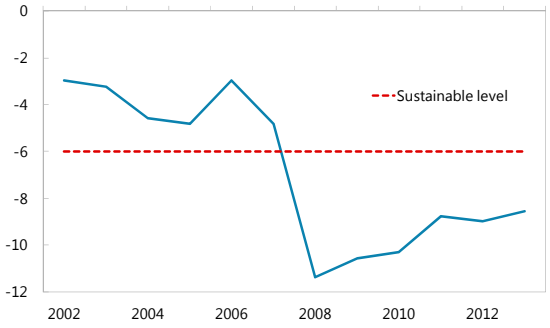


Figure 2: General Government Non-oil Deficit
(In percent of GDP)



9. To a large extent, this record reflects the role played by the National Fund of the Republic of Kazakhstan (NFRK). NFRK, Kazakhstan's oil fund, was established in 2000 as an off-budget fund, with its main goals both to save part of oil income for future generations and to guard the economy from the volatility of oil revenues. All of NFRK assets (managed by the National Bank of Kazakhstan on behalf of the government) are invested abroad.[5] Direct taxes from the oil sector, including corporate income tax, excess profit tax, royalties and the share under production-sharing agreements are the main source of accumulation of funds in the NFRK and accrue directly to the fund. These taxes account for about 90 percent of all taxes from the oil sector, while the remaining 10 percent accrue to the central or local budgets.

[3] Most recently, this right was exercised in July 2013, when the government used its preemptive purchase rights to prevent the sale of ConocoPhillips's 8.4% share in Kashagan to India's ONGC in favor of China's CNPC.

[4] The sustainable level of nonoil deficit was estimated by using a PIH annuity framework.

[5] There was an exception to this rule when, as part of the government's anti-crisis package, NFRK acquired assets of state investment holding companies Samruk Kazyna and KazAgro.

10. The legislative framework governing the use of oil revenues includes several anchors aimed at managing volatility and ensuring sustainability of fiscal policy. In particular, to delink expenditures from volatile oil revenues, annual spending out of NFRK is fixed in nominal terms (at USD8 billion) with limited flexibility to allow for countercyclicality of spending. Legislation also requires that a minimum balance of NFRK be maintained. While the current minimum balance is set to 20% of the current year GDP, it is expected that it will be raised to 30% during the upcoming revisions later this year. Another target is that by 2020 the deficit of the unconsolidated budget net of the transfer from NFRK should not exceed 3% of GDP.[6] . In addition, the legislation on NFRK includes a provision that interest payments on government debt should not exceed interest income earned by NFRK. While there is room for streamlining the various anchors, as has been recommended by the Fund, the frameworks in place point to the authorities' commitment to prudent management of oil wealth.

11. An important caveat to this favorable assessment lies in the fact that in Kazakhstan the public sector extends well beyond the government budget. The public enterprises sector, including most importantly Samruk Kazyna (SK), the systemic state investment holding company, is actively involved in quasifiscal operations. It played a key role in the government's stimulus efforts during the recent crisis and also actively participates in the government's long term development programs. This complicates the assessment of the role of the public sector in the economy and, in particular, the record of management of oil wealth.[7]

12. In recent years the government has taken steps to improve the transparency of quasifiscal operations. In particular, last year a legislative amendment was introduced according to which the costs incurred by SK companies due to their participation in the government's programs of non-commercial nature must be covered from the government budget. Earlier this year, all the main development institutions, most of which were previously part of SK were combined to form a new extra-budgetary entity (Baiterek) - a change that can potentially increase the transparency of quasifiscal operations as it intends to separate the commercial and non-commercial roles of the public enterprise sector. Moreover, the authorities intend to introduce provision in legislation to keep the stock of the broader public sector debt under control, for example by setting ceilings for the total stock of government and quasifiscal debt.

13. As regards strategies of turning oil wealth into productive assets, accelerated development and diversification are the key long term policy priorities for Kazakhstani authorities. The government's recently announced Strategy 2050 outlines Kazakhstan's aspiration to become one of the world's 30 most developed economies by 2050. To achieve this goal the government plans to lay the basis for accelerated diversification of the economy through industrialization. While the strategy includes many components, the Industrialization Map of

[6] This is roughly equivalent to 6% of GDP on consolidated basis.

[7] SK's assets are about the size of half of GDP, the bulk of which are in the natural resources sector.

Kazakhstan is its key umbrella program. It includes 779 project to be implemented during the course of several years[8] with a total cost KT11 trillion, which is equal to nearly a third of GDP in 2013.

14. The current focus of the authorities' development and diversification strategy on state-led industrialization policies is a cause for concern. As a relatively new oil producer, Kazakhstan can learn from other countries experiences of successes but also many more failures associated with top-down industrialization policies. Focusing instead more on high-quality of public service delivery, including by closing infrastructure gaps, as well as bolstering human capital and institutions – areas where Kazakhstan lags behind successful emerging market economies[9] – could better serve the purpose of long term development. Moreover, instead of boosting private sector lead growth top-down industrialization policies risk further increasing the role of the state in the economy.

15. Further, there is lack of clarity on the scope, timeframe, associated costs, and expected benefits of the government's development and diversification programs. The broader public sector is involved in these programs, while financing mechanisms range from direct budget support, loans or loan guarantees, and subsidized interest rates to equity financing, local content requirements and public-private partnerships. These complex modalities make it difficult to assess the strategy as a whole. Nevertheless, according to the authorities' projections all of the government's development and diversification programs combined are expected to ensure 6.8 percent growth rate in the medium term.

16. Finally, boosting diversification through public spending is a difficult endeavor. While undoubtedly oil wealth is a significant asset that can help Kazakhstan achieve its development and diversification goals, there are many perils ahead. Like other oil-rich countries Kazakhstan is not immune to Dutch disease. Higher public spending can exacerbate this problem, damaging the nonoil tradable sector and thereby defeating the original purpose of the policy. Preliminary evidence suggests that Kazakhstan has some symptoms of Dutch disease (Box 1), which is the principal contributor to the "resource curse", the empirical regularity that resource-rich countries tend to have poor economic performance.

[8] About 20% of the projects are currently being implemented, some started since 2010.

[9] For a cross country comparison of business environment and governance indicators, see the IMF Staff Report of the 2013 Article IV consultation, Annex II. For example, the indicator of corruption control in World Bank's Worldwide Governance Indicators (2012) has a score -1.01, corresponding to 15th percentile among all countries.

Box 1. Does Kazakhstan Have Dutch Disease?

According to the Dutch Disease hypothesis, windfall revenue from natural resources can cause real exchange rate appreciation thus reducing the competiveness of the nonoil tradable sector. In the dynamics of Kazakhstan's real effective exchange rate, other than the spikes related to the Russian crisis in 1998 and the most recent crisis in 2008-2009, an appreciation trend starting 2003 is discernible (Figure). While the timing of the appreciation coincides with the start of the oil boom, it is important to look at the underlying mechanisms for possible causality and to control for other factors to avoid a spurious diagnosis.

Dutch disease can operate through two channels. (i) The factor movement effect occurs when the resource sector attracts labor and capital from other sectors. The resulting contraction of non-resource sectors, referred to as "direct de-industrialization", leads to higher prices of domestic nontradables (while prices of tradables in foreign currency are determined abroad) and thus appreciation of the real exchange rate. (ii) The spending effect occurs when the resource revenue is spent (including, most importantly, through the fiscal channel), increasing aggregate demand in the economy. Higher spending leads to higher prices for domestic nontradables and leads to real exchange rate appreciation. Further, the expanding nontradables sector attracts labor and capital from the tradable sector, causing what is referred to as "indirect de-industrialization". This can damage long term growth prospects as once production in non-resource tradable sectors falls, knowledge and skills can be lost.

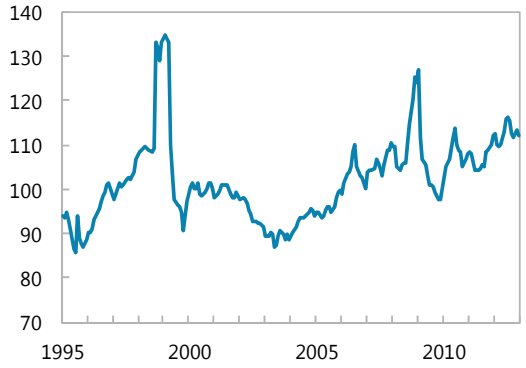
In Kazakhstan the prices of nontradables (as proxied by services in the CPI basket, excluding administratively controlled utility prices) have been consistently growing faster than the prices of tradables (proxied by non-food goods) (Figure). Since nontradable sectors have been expanding rapidly, this price growth cannot be attributed to the factor movement effect but it can be attributed to the spending effect. An alternative explanation is the Balassa-Samuelson effect which arises when productivity grows faster in tradabels than in nontradables sector and this differential is larger than that in trading partners. However, there has been no clear positive productivity differential between tradables and nontradables.

There are some signs of both direct and indirect de-industrialization as tradables have been losing share in both GDP and employment. As in most countries, the mining sector is not a major employer in Kazakhstan and its share in total employment has been relatively constant, however there has been some mobility of labor out of non-resource tradabels into nontradales. Investments and especially FDI have been highly concentrated in the oil and gas and related transport sectors. Investment into real estate and construction has also been substantial, although its dynamics has been dominated by the boom and bust cycle.

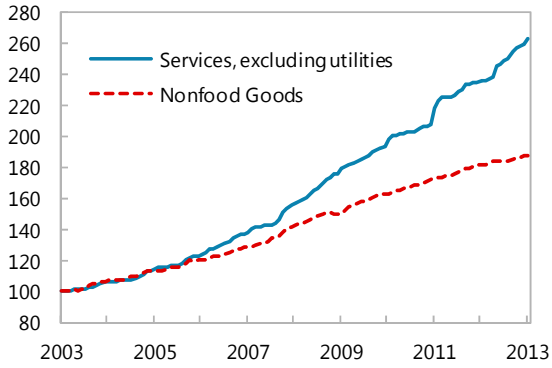
Rapid wage growth, controlling for other determinants and most importantly for productivity, can also be a symptom of Dutch Disease. When compared to productivity, real wage growth in Kazakhstan over the last 12 years has been higher economy-wide and in all main sectors except for construction. (Figure). It is interesting to note that unlike most other emerging market economies productivity in manufacturing does not seem to grow faster than that in services. At the same time unit labor costs (calculated using sectoral deflators) have stayed broadly stable. In case of manufacturing this is due to favorable price dynamics: manufacturing prices grew at an annual average rate of 17 percent correlated with oil prices, which is not surprising given that many industries within manufacturing are closely linked to the oil sector

Box 1. Continued. Does Kazakhstan Have Dutch Disease?

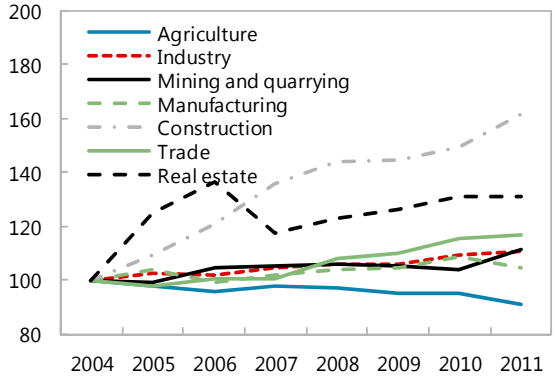
Real Effective Exchange Rate
(December 2000=100)



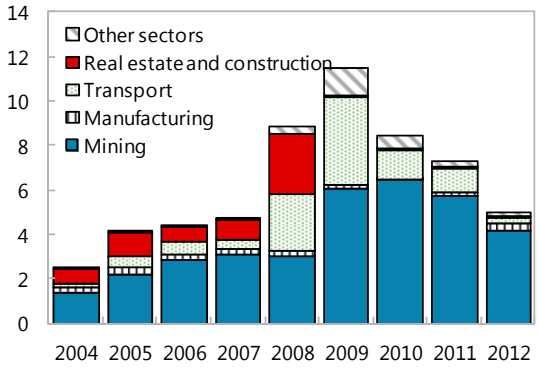
Goods and Services Prices in the CPI
(January 2003=100)



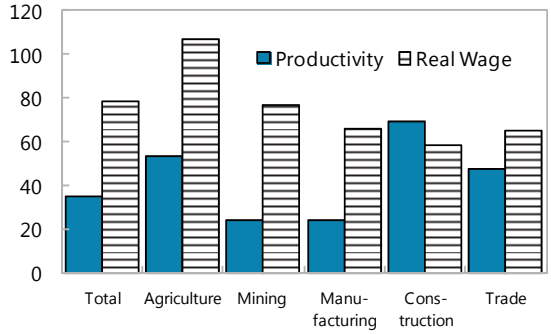
Employment in Main Sectors
(Index: 2004=100)



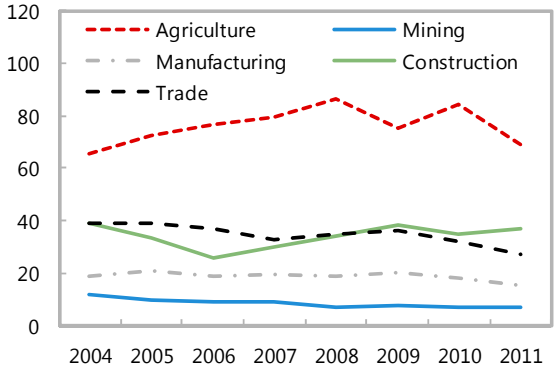
Foreign Financed Investment
(USD Billions)



Labor Productivity and Real Wages
(Cumulative growth 2004-11)



Unit Labor Costs in Main Sectors



Sources: Kazakhstani Authorities; and IMF staff estimates

C. A Model-based Framework for Analyzing Management of Oil Wealth

17. In this section we describe a dynamic stochastic general equilibrium model for an oil producing small open economy. The model combines elements of frameworks developed in Buffie et al (2012), Berg et al. (2013), and Melina et al. (2013). The main difference from Melina et al. (2013) is that the current model abstracts from long run trend growth and the nominal side of the economy. In the interest of space, we present in this section only the key equations of the model.[10]

18. The economy features two types of households. Optimizing households have access to capital and financial markets while rule of thumb households are liquidity constrained and consume all of their disposable income in each period. The presence of rule of thumb households captures a relatively less developed financial market. Optimizing households can acquire domestic government bonds and international bonds with portfolio adjustment costs, which restrict the degree of capital account openness. On its foreign debt the private sector pays a constant premium over the interest rate that the government pays on its external debt. All households consume an aggregate of nontraded good and domestic or imported traded good and supply labor to domestic firms operating in nontraded or (non-oil) traded sectors.

19. The model has three production sectors: oil production, nontraded goods, and non-oil traded goods. Since the oil sector employs a small and stable fraction of the labor force and a large part of investment in the oil sector is financed by foreign investment, we assume oil production to be an exogenous process[11] described by the following equation:

$$\frac{\tilde{y}_{O,t}}{\tilde{y}_O} = \left(\frac{\tilde{y}_{O,t-1}}{\tilde{y}_O}\right)^{\rho_{yO}} \exp\left(\varepsilon_t^{yO}\right)$$

where $\rho_{yO} \in (0,1)$ is an auto-regressive coefficient and $\varepsilon_t^{yO} \sim iid\ N\left(0, \sigma_{yO}^2\right)$ is the resource production shock. Due to the small open economy assumption the international oil prices as taken as given and evolve according to:

$$\frac{p_{O,t}^*}{p_O^*} = \left(\frac{p_{O,t-1}^*}{p_O^*}\right)^{\rho_{pO}} \exp\left(\varepsilon_t^{pO}\right)$$

where $\rho_{pO} \in (0,1)$ is an auto-regressive coefficient and $\varepsilon_t^{pO} \sim iid\ N\left(0, \sigma_{pO}^2\right)$ is the resource price shock. Variables with no time subscripts indicate their steady-state values.

[10] The full technical appendix is available from the authors upon request.

[11] While a simplification, this assumption is likely reasonable for Kazakhstan. Earlier work by IMF staff found that the direct benefits of stronger oil activity are only shared by a few related sectors such as transportation and communication. See, IMF country Report No. 11/151.

20. Firms in both nontraded and non-oil traded sectors produce according to a Cobb-Douglas production function using labor, private capital and public capital. A representative firm in the nontraded sector produces according to:

$$y_{N,t} = z_N\left(k_{N,t-1}\right)^{1-\alpha_N}\left(L_{N,t}\right)^{\alpha_N}\left(k_{G,t-1}\right)^{\alpha_G}$$

where z_N is a total factor productivity scale parameter, $k_{N,t}$ is the private capital, $k_{G,t}$ is the public capital, α_N is the labor share of sectoral income and α_G is the output elasticity with respect to public capital. A representative firm in the nonoil traded good sector produces according to:

$$y_{T,t} = z_{T,t}\left(\ k_{T,t-1}\right)^{1-\alpha_T}\left(L_{T,t}\right)^{\alpha_T}\left(k_{G,t-1}\right)^{\alpha_G}$$

in the nonoil traded sector total factor productivity is subject to learning by doing externalities and depends positively on the previous period's traded output.

$$\frac{z_{T,t}}{z_T} = \left(\frac{z_{T,t-1}}{z_T}\right)^{\rho_{z_T}} + \left(\frac{y_{T,t-1}}{y_T}\right)^{\rho_{y_T}}$$

where $\rho_{Z_T}, \rho_{y_T} \in [0,1]$ control the degree of the Dutch disease. The intuition is that once traded sector production starts falling, knowledge and skills can be lost.

21. The key growth link of public investment and nonoil output is provided by the presence of public capital in the production functions of firms operating in the non-oil sector. Public capital this provides a positive externality for the private sector. More productive capital also enhances the productivity of private production factors, crowding in more private investment.

22. However, to capture the common problems of public investment the model features absorptive capacity constraints and investment inefficiency **in the public sector**. To reflect this, effective investment is given by:

$$\tilde{g}_t^I = \epsilon(g_t^I)g_t^I$$

where g_t^I is government expenditure on investment, and $0 < \epsilon_t \leq 1$ governs the efficiency of pubic investment. We assume that investment efficiency falls from ϵ to $\bar{\epsilon}$ when the expenditure level exceeds a certain threshold.[12] This captures the idea of rising investment costs due to absorptive capacity constraints. The law of motion of public capital is given by:

$$k_{G,t} = \left(1 - \delta_{G,t}\right)k_{G,t-1} + \tilde{g}_t^I$$

[12] Arestoff and Hurlin (2006) find that investment efficiency in Mexico falls when investment expenditure rises to a certain level.

note that the depreciation rate of capital is time-varying to capture the idea that lack of maintenance can shorten the life of existing capital. This is operationalized by assuming that the depreciation rate increases to the extent that effective investment fails to maintain the existing capital.

23. The fiscal block of the model includes the budget and the oil fund. Government expenditure (consumption and investment) is an aggregate of traded and nontraded goods. To finance its expenditures government uses revenues from taxes on the oil and non-oil sectors, interest income from accumulated oil savings, as well as domestic and foreign borrowing. The latter is subject to a risk premium depending on the deviation of total external public debt to GDP ratio from a steady state level. Every period the budget surplus (excess oil revenues) is saved in the oil fund. If there is a deficit, it is absorbed by a withdrawal from the oil fund, unless the balance of the oil fund falls below a pre-specified level.[13] When the oil fund lower bound constraint binds, fiscal policy has to react to cover the gap either through external borrowing, tax adjustments or adjustments in government expenditures.[14]

D. Analysis of Alternative Public Investment Scaling-up Paths

24. In this section we employ the above described model to illustrate the macroeconomic implications of different public investment paths. The parameters are calibrated using data specific to Kazakhstan where available and values common in the literature for comparable studies where not (Appendix 1). To calibrate the model's initial steady state, in most cases we use medium term averages of the relevant variables. In discussion of simulation results, unless specified otherwise, we refer to deviations from a no scaling-up path. In line with current discussions within the government, the oil fund floor is set to 30% of GDP. When this constraint binds, the government resorts to external borrowing and if external debt becomes unsustainable, it increases the tax rates on labor income or consumption. We assume no shocks to oil production

25. Calibration of a few of the key parameters warrants some discussion. As discussed in section C, the efficiency of public investment, ϵ_t, is a key parameter determining to what extent public investment turns into public capital. We choose a steady state value of 0.6 that is between values used in the literature for developed and developing countries. When absorptive capacity is constrained, we assume that ϵ_t falls to 0.4 for the additional investments above the initial level. For output elasticity with respect to public capital, α_G , we use a value of 0.15 which is between the range 0.05-0.2 used in the literature. It is important to note that these parameters crucially depend on the nature of government's development strategies. In particular, productive investments into infrastructure, institutions or human capital would result in higher public capital. On the other hand,

[13] This is consistent with Kazakhstan's budget framework on a consolidated basis.

[14] In the forward-looking model environment we focus on a model equilibrium where debt sustainability is satisfied in the sense that intertemporal government constraints are satisfied.

top-down industrialization policies of picking winners can hardly be expected to provide a positive externality for the private sector at large.

26. Public investment paths are calibrated to achieve a certain nonoil growth objective. As highlighted section B, good data on the magnitude of public investment scaling up paths are lacking. However, boosting nonoil growth appears to be the overarching objective of almost all of the government's development and diversification programs. In fact, one specific goal stated in various government documents including Strategy Kazakhstan 2050, the most recent document that sets the course of the country's leadership, is to achieve sustainable long term growth rate of 7 percent. Therefore, we calibrate the public investment scaling up scenarios such that a certain nonoil growth objective is achieved. It is important to note that we assume that all the additional public investment is channeled through the budget. This implies that in order to compare our simulation results to the authorities' fiscal plans we would need to appropriately incorporate in the budget all the spending on the development and diversification programs that are implemented through the broader public sector.

27. Two oil price scenarios: baseline and adverse are simulated. Oil prices in the baseline scenario assume the WEO projections until 2018 and are subject to minor fluctuations afterwards. In the adverse scenario oil prices are disturbed by a large negative shock, making the price to fall to $51.7.[15] a barrel in 2016 and recover to $80 in 2019.

28. Model simulations suggest that achieving an average of 0.3%[16] above trend nonoil growth requires increasing public investment to about 6.4% of GDP,[17] which we refer to as the prudent path. Under this path the oil fund floor constraint binds for the first few years, during which the government borrows externally to finance the public investment expenditures. However, external debt sustainability does not come under risk as external debt increases by only 5% of GDP over the current comfortable level in the adverse oil price scenario (and by less in the baseline oil price scenario). After about 5 years in baseline oil price scenario (and about 8 years in the adverse oil price scenario) the oil fund starts to grow again, reaching by 2030 to above 70% of GDP in the baseline oil price scenario (and to about 50% of GDP in the adverse oil price scenario). The difference between interest income earned by the oil fund and the interest paid on public foreign debt – another indicator that the government monitors for efficiency of managing its oil wealth – remains positive throughout the simulation period.

[15] The magnitude of this negative shock is roughly the same as in 2009.

[16] In the adverse oil price scenario growth increases by an average of 0.26% above trend

[17] Capital expenditures of the budget have been around 5% of GDP in the past few years, implying that under the prudent path capital expenditures increase by 1.4% of GDP. However, this assumes that all the increase in public investment under government's development and diversification programs is reflected in the budget.

Figure 3. Kazakhstan: Simulation Results

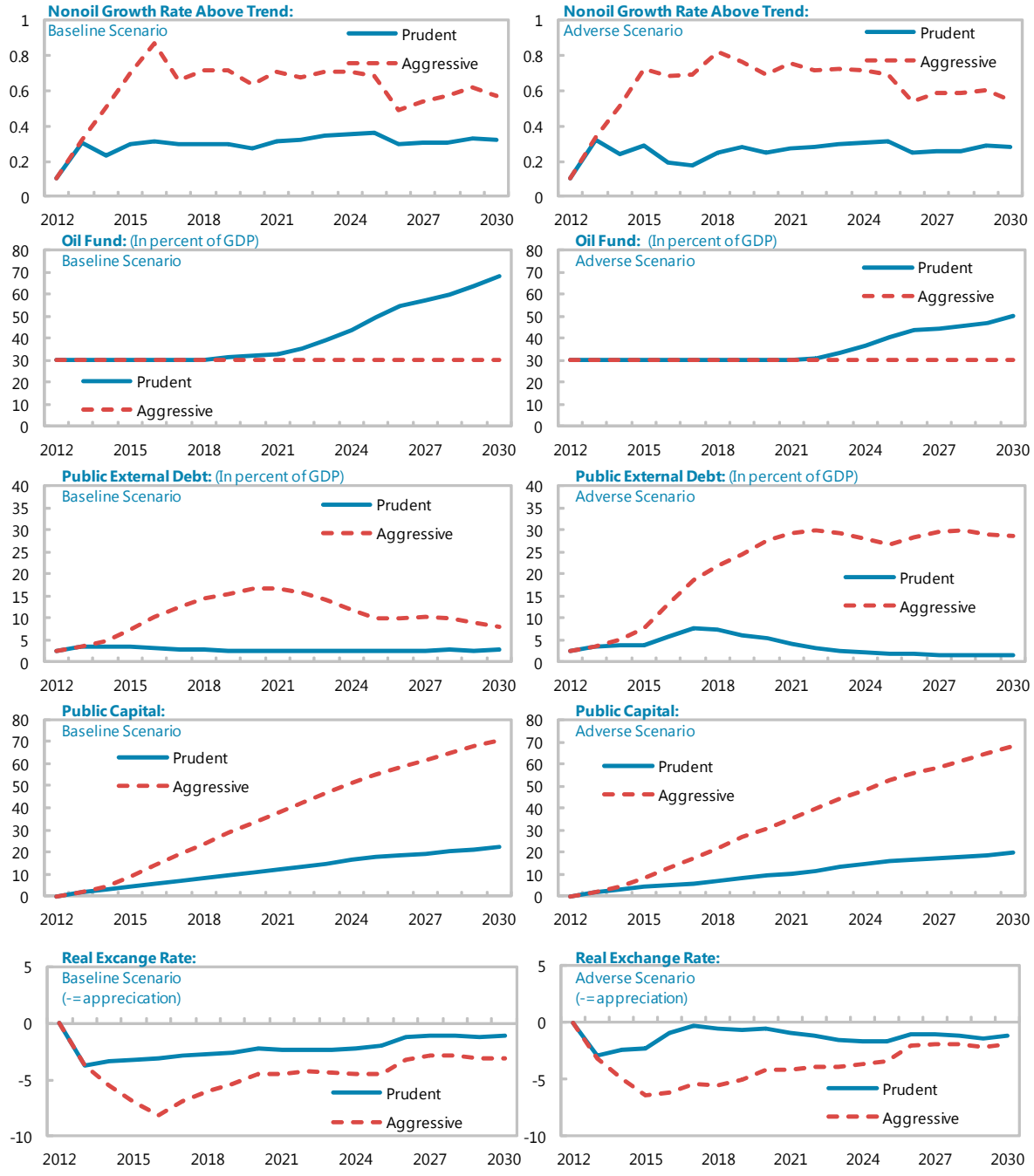
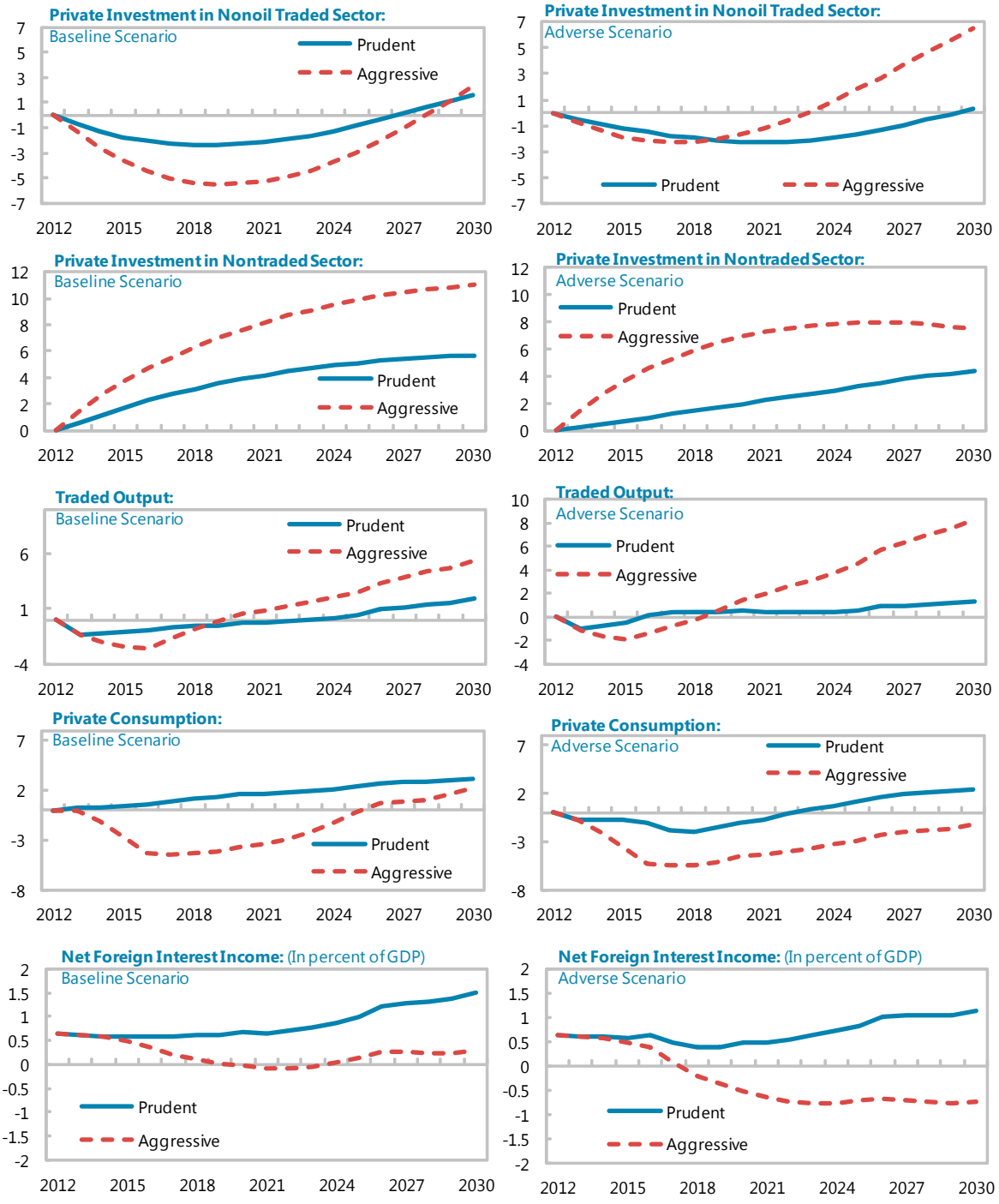


Figure 3. Kazakhstan: Simulation Results, (continued)



29. Under the prudent path, the private sector largely benefits from the higher public capital. Public capital gradually increases by almost 20 percent by 2030 (and by slightly less in the adverse oil price scenario) compared to a no scaling-up, trend growth path. Investment efficiency does not decline much, as absorptive capacity constraints only bind slightly. Since in the baseline oil price scenario external debt sustainably does not come under risk, taxes stay at their current low level and this allows private consumption to grow steadily. In the adverse oil price scenario private consumption has to fall somewhat in the initial stage to make room for higher public investment also reflecting higher taxes. Private investment in the nonoil economy continues to increase benefitting from the positive externality provided by productive public capital.

30. However, private investments in the traded versus nontraded sectors are affected differently. While in the nontraded sector investment is consistently higher compared to a no scaling up case, in the traded sector it is lower. This reflects primarily the Dutch Disease effect of increased public spending, which can be observed in the dynamics of the real exchange rate. The exchange rate appreciates by about 4 percent initially and then gradually returns to the steady state level. The scale of the appreciation is smaller in the adverse oil price scenario, than in the baseline oil price scenario as lower oil revenues limit the pressure on the exchange rate. The exchange rate appreciation negatively affects traded output, which, in the baseline oil price scenario, falls initially below trend for the first 10 or so years.

31. The aggressive path that aims to achieve an average above trend nonoil growth of 0.6% requires increasing public investment to about 12% of GDP. Under the aggressive path the oil fund floor constraint continues to bind over the entire simulation period in both the adverse and baseline oil price scenarios. The government has to resort to large scale external borrowing.[18] At the same time, to keep external debt sustainable, the government needs to increase taxes (labor tax and consumption tax) to finance the gap. The adjustment is especially severe in the adverse oil price scenario, when the external debt increases by considerably more and labor income and consumption tax rates have to almost double in addition to higher taxes on the use of public capital.[19] As a result, private consumption falls substantially and for a long period of time, especially in the adverse oil price scenario. Interest payments on foreign debt net of interest earnings of the oil fund reach about 1 percent of GDP in the adverse oil price scenario

32. Under this path, the growing external debt, exchange rate appreciation and higher taxes caused by aggressive public spending negatively affect the private nonoil sector. Public capital increases by nearly 60 percent above a no scaling up case by 2030, even though public investment efficiency falls substantially from an initial level of 0.6 to 0.4, implying that the higher public capital stock comes at an increasingly high cost. While on one hand the nonoil private sector may benefit from the substantially higher stock of public capital, it also has to face higher borrowing

[18] Note that while government external debt is initially very low, quasifiscal external debt and therefore contingent liabilities to the state can be substantial.

[19] We assume that half of the recurrent costs are covered by taxes on the use of public capital.

costs because the incensing public external debt leads to higher risk premia. The tradable sector also suffers from loss of competitiveness as the exchange rate appreciates. The appreciation of the real exchange rate is much more severe than under the prudent scaling up path – about 6 percent in the adverse oil price scenario and about 8 percent in the baseline oil price scenario. As a result, private investment in the nonoil tradable sector is considerably lower as compared to the prudent path.

E. Conclusion

33. This chapter employs a structural model, calibrated to several features of the Kazakhstani economy, to inform decisions on public investment scaling-up paths. In summary, simulation results show that while ambitious scaling up of public investment can generate higher nonoil growth, the cost of funding this investment can be high. In particular, even though nonoil output can be higher with aggressive public investment, private consumption, and therefore household welfare, would be much lower. With a prudent approach, on the other hand, public investment can give a boost to nonoil growth with a much smaller cost.

34. The analysis in this chapter stresses the benefits of adopting a comprehensive approach to management of oil wealth. In the case of Kazakhstan, given the large role of the quasifiscal sector, it is particularly important to look beyond traditional metrics of fiscal accounts. Quasifiscal operations and contingent liabilities to the state should be appropriately taken into account. Furthermore, to guard against Dutch Disease it is important to be mindful of the impact of policy decisions on the private sector.

35. Finally, this chapter highlights the importance of a careful design of Kazakhstan's development and diversification strategy. While productive investment into high quality public service delivery would ensure that Kazakhstan's oil wealth benefits all, top-down industrialization policies are less likely to provide broad based benefits and carry the risk of further increasing the role of the state in the economy. Furthermore, as emphasized by IMF's recent work on resource rich countries, good public financial management, including careful cost-benefit analysis of various programs, as well as evaluation of outcomes, is key for prudent and effective management of oil wealth.

Appendix 1. Kazakhstan: Calibration of Key Parameters

parameter	values	notes
α_N, α_T : labor income share in nontraded and traded sector	0.5	assumption
α_G: output elasticity with respect to public capital	0.15	falls into the literature range of 0.05 – 0.2
δ_G: steady-state annual depreciation rate of public capital	0.07	Berg et al. (2013)
ρ_{ZT}, ρ_{YT}: learning-by-doing parameter	0.1	Berg et al. (2013), mild externality
ϵ: steady-state efficiency of public investment	0.6	between developed and developing countries, 0.3 – 1
$\bar{\epsilon}$: lower efficiency when absorptive capacity is constrained	0.4	assumption, only for additional investment

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