



REPUBLIC OF KAZAKHSTAN

SELECTED ISSUES

August 2014

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REPUBLIC OF KAZAKHSTAN

July 2, 2014

SELECTED ISSUES

Approved By
**Middle East and
Central Asia
Department**

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CONTENTS

ASSESSMENT OF INCLUSIVE GROWTH	3
A. Income Inequality	3
B. Employment	5
C. Conclusion	10
FIGURES	
1. Income and Income Inequality	3
2. Growth Incidence Curve	3
3. Rural and Urban Poverty	4
4. Rural Poverty Gap	4
5. Regional Income Distribution	4
6. Unemployment	5
7. Female Labor Force Participation	6
8. Unemployment and Inequality	6
9. Vulnerable Employment Rate	6
10. Unemployment Rate and Self-Employment	6
11. Employment and Growth	7
12. Employment by Sectors	7
13. Unemployment Rate Projections	8
REFERENCES	11
EXTERNAL SECTOR ASSESSMENT	12
A. Assessing Reserve Adequacy	12
B. External Debt Sustainability Assessment	13

FIGURES

1. Comparison of Central Bank Reserve Adequacies _____	12
2. Reserves as Percent of ARA Metric _____	13
3. External Debt Sustainability: Bound Tests _____	14

TABLE

1. External Debt Sustainability Framework, 2009–19 _____	15
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REFERENCES _____	16
-------------------------	----

TOWARD INFLATION TARGETING _____ **17**

A. Introduction _____	17
B. Is the Interest Rate Effective in Controlling Inflation? _____	18
C. Is Monetary Policy Forward-Looking? _____	20
D. Does Dollarization Hinder the Move Toward Inflation Targeting? _____	22
E. Conclusion and Policy Recommendations _____	26

FIGURES

1. Money Market Interest Rate _____	18
2. Response to Generalized One S.D. Innovations _____	19
3. Financial Dollarization in Kazakhstan _____	23
4. Dollarization in Selected Countries _____	23
5. Contributions to Deposit Dollarization _____	24

REFERENCES _____	28
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EXCHANGE RATE AND THE TRADE BALANCE _____ **30****FIGURES**

1. Export and Import Shares of Kazakhstan’s Trade Partners _____	30
2. Plot of Cumulative Sum of Recursive Residuals _____	33
3. Plot of Cumulative Sum of Squares of Recursive Residuals _____	33

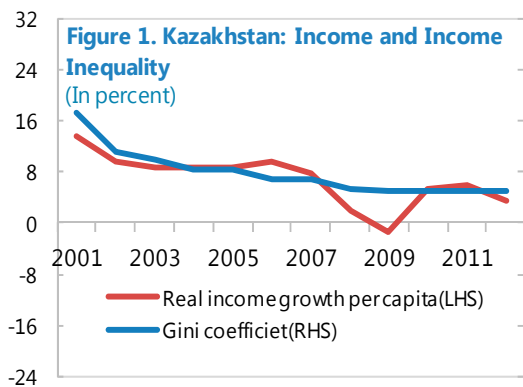
REFERENCES _____	35
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ASSESSMENT OF INCLUSIVE GROWTH¹

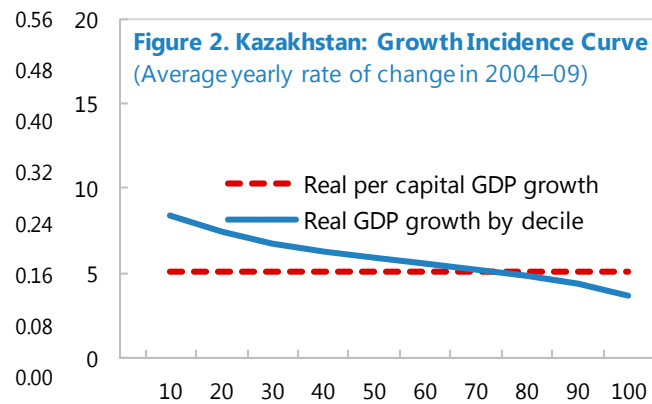
1. Inclusive growth is not only important for social cohesion, but also for macroeconomic stability. This chapter analyzes whether Kazakhstan has made progress in achieving a more equal income distribution, lower poverty, and a higher level of employment.

A. Income Inequality

2. Kazakhstan has made strides in economic development, which have contributed to boosting income and reducing income inequality. Kazakhstan has enjoyed robust GDP growth since 2000—averaging 8 percent. The rapid pace of growth contributed to a sharp rise in per capita income (Figure 1). An improvement of policy frameworks and institutions, as well as robust balance sheets associated with the country's natural resource wealth, has delivered relative macroeconomic stability. The growth incidence curve² for Kazakhstan between 2004 and 2009 suggests a decrease in inequality (Figure 2). Real GDP growth rates for the groups in the middle and lower parts of the income distribution have been higher than rates for those in the upper part of the distribution. This has led to a reduction in the income gap, in relative terms, between the poor and the rich.



Sources: WEO and WDI.



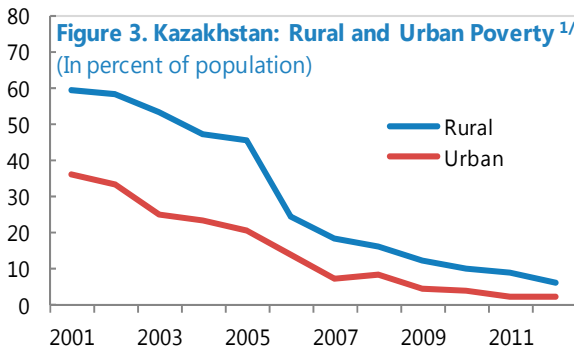
Source: IMF staff estimates.

3. Poverty has considerably declined over the past decade, but rural poverty is still higher than in poorer countries in the region. Poverty declined from 47 percent in 2001 to 4 percent in 2012. Notably, rural poverty dropped from 59 percent to 6 percent for the same period, while urban poverty fell from 36 percent to 2 percent (Figure 3). Despite significant improvement in

¹ Prepared by SeokHyun Yoon.

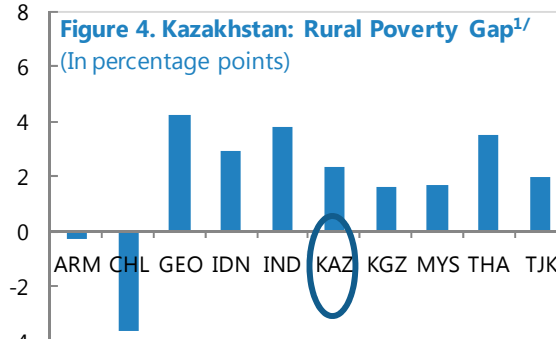
² Growth incidence curves identify the extent to which each decile of households ranged by their income level benefits from growth.

reducing rural poverty, however, the rural poverty gap³ is wider than in neighboring countries such as Armenia, Kyrgyz Republic, and Tajikistan (Figure 4).



Source: WDI.

1/ Rural(urban) poverty rate is the percentage of the rural (urban) population living below the national rural(urban) poverty line.

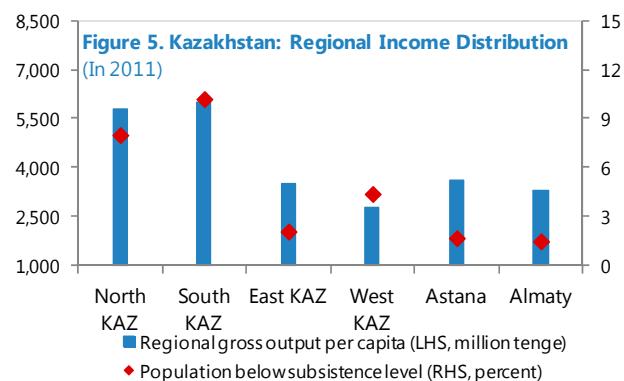


Source: WDI.

1/ Defined by rural poverty rate in percentage of the rural population less national poverty rate in percentage of the nation's population.

4. There remain substantial regional disparities in the concentration of poverty across the country. The share of people with income below the subsistence minimum varies widely across regions, from 1.7 percent in Astana to over 10 percent in south Kazakhstan (Figure 5).

Ethnic migrants often choose to live in southern and western regions, where Kazakh is more widely spoken and the culture is more familiar. However, these regions suffer from an over-supply of labor, while the population of the northern regions is shrinking. High poverty rates are observed in both non-oil and oil-rich regions. This reflects the fact that the oil sector works as an enclave: it is capital intensive and does not generate many jobs, and thus does not create significant economic spillover effects.



Source: Country Economic Memorandum, World Bank.

5. The authorities have taken measures to address the geographical income inequalities. Fiscal redistribution, by its nature, involves transferring resources from higher-income households through taxes and transfers. Cash transfers to poor households are usually superior to indirect methods such as price subsidies. Keeping this principle in mind, in 2013 the government increased the tax burden on real estate and properties and raised tax rates on luxury goods by amending the tax code; these changes came into effect in January 2014. As a medium-term objective, the authorities intend to strengthen the progressivity of the income tax. On the expenditure front, the government provided cash transfers to migrants to settle in target areas, particularly north Kazakhstan, for the purpose of spreading growth more evenly and reducing the gap between

³ Defined by rural poverty rate, in percentage of the rural population, less national poverty rate, in percentage of the nation's population.

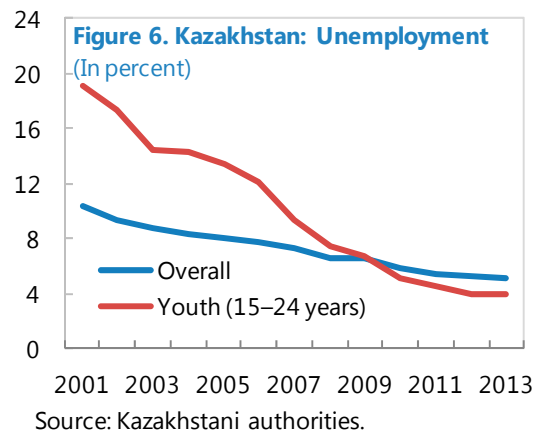
regions. Also the authorities increased the social orientation of the national budget, centering on improving access to education and health for low-income families. The plan includes eliminating the shortage of space in schools by 2017, providing free preschool education by 2020, and introducing a compulsory health insurance system in the medium term.

6. The government is mindful of maintaining fiscal sustainability, while aiming for effective redistribution policy. Redistributive fiscal policy should be consistent with fiscal sustainability, which can support economic growth and the capacity to finance higher spending on redistribution over the longer term. Better targeting of transfers reduces their fiscal cost and tax levels required to finance them, thus achieving distributional objectives in a more efficient manner.

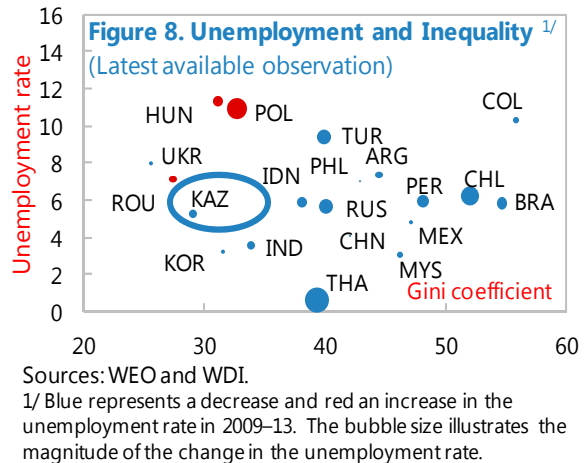
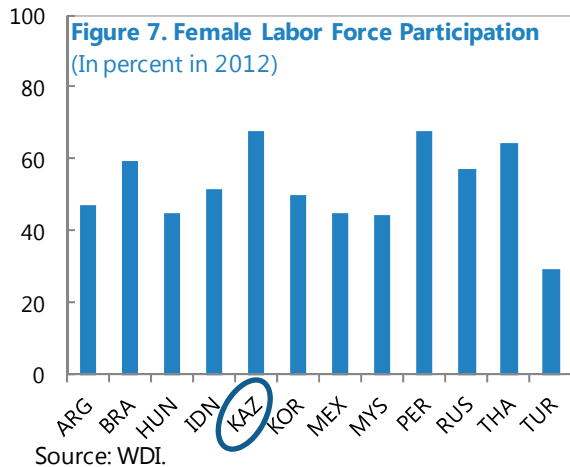
7. Going forward, promoting economic diversification would help further reduce income inequality. The authorities recognize the enormous untapped potential of Kazakhstan's resource-rich economy. Economic diversification requires a structural transformation, as envisaged in the Kazakhstan 2050 Vision. This effort requires sizeable investments in physical, human, and institutional capital. Policies should aim to address shortcomings in these areas by prioritizing investment in infrastructure and enhancing investment efficiency. The government needs to address these challenges through structural reforms and selective financial support.

B. Employment

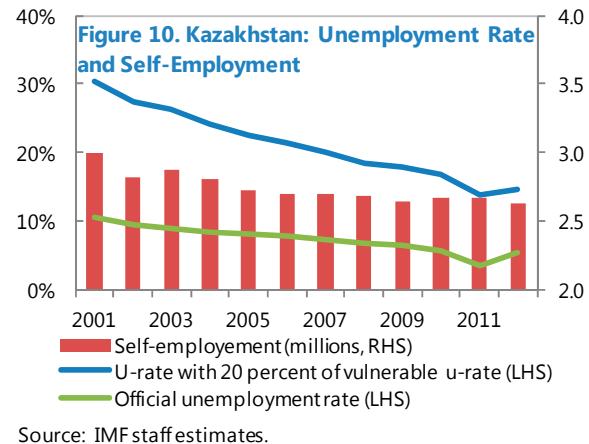
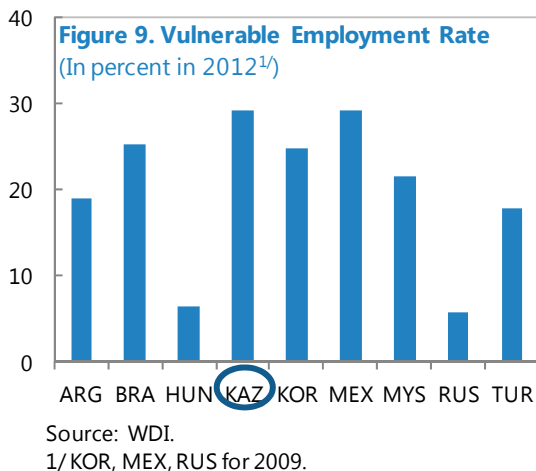
8. Thanks to robust economic growth, the unemployment rate in Kazakhstan has declined rapidly since 2000. The downward trend rate remained intact during the crisis, with the unemployment rate at 5.2 percent in 2013, less than half of its level in the early 2000s (Figure 6). In particular, youth unemployment fell substantially, helped by the government's targeted intervention, e.g., a greatly expanded vocational and training system to create employment opportunities for youth.



9. High female labor force participation (FLFP) is another positive feature of the labor market in Kazakhstan. FLFP in Kazakhstan is reported at 67 percent of the total female labor force in 2012, higher than emerging market countries (Figure 7). High FLFP contributed positively to increasing output growth and reducing income inequality. In general, better opportunities for women to earn income could contribute to broader economic development. As a result, both income inequality and unemployment in Kazakhstan compare favorably to those of its emerging market economy peers (Figure 8).

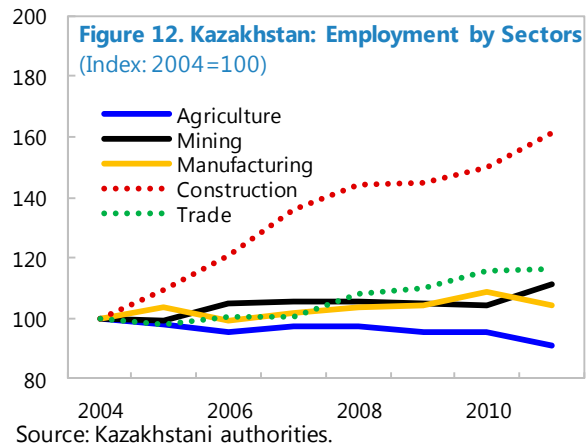
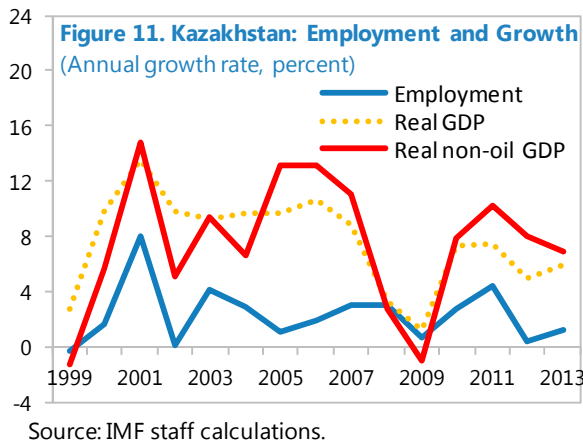


10. Given the high level of self-employment, however, the low recorded level of unemployment needs to be treated with caution. Self-employed workers are those who work on their own account or with one or a few partners. They are less likely to have formal work arrangements, and are therefore more likely to lack decent working conditions, adequate social security, and voice through effective representation by trade unions and similar organizations. Efforts to reduce the share of self-employment in Kazakhstan have been a welcome development, but the labor structure in Kazakhstan is characterized by high vulnerable employment rate, i.e., unpaid family workers and own-account workers as a percentage of total employment (Figure 9). Among employed people, about 30 percent engage in vulnerable employment. If one were to apply the average vulnerable employment rate of emerging market economies (20 percent) to Kazakhstan, the measured unemployment rate would be above 10 percent (Figure 10). In addition, the quality of Kazakhstan’s labor statistics has been criticized, because of its ambiguous treatment of self-employment: a substantial portion of the rural labor force is recorded as self-employed.



11. The relationship between job creation and growth has been weak, particularly since the onset of the global crisis (Figure 11). Job creation in the manufacturing sector is anemic, despite a strong focus on the accelerated industrialization program. Even employment in the agricultural sector has been continuously falling, because of the unproductive farm structure (Figure 12).

This reflects the limited access to commercial credit and lack of long-term investment, and the weak integration of domestic food chains. While agriculture accounts for more than a quarter of total employment in 2011, the sector’s contribution to GDP stands at about 6 percent.⁴



12. The low degree of job creation reflects a capital intensive economy dominated by the oil sector and an underdeveloped private sector.

Cross-comparison results suggest that long-term employment elasticity in Kazakhstan is low relative to its comparators. Several factors have contributed to lower elasticity of employment to GDP.⁵ First, the oil sector, by its nature, is not inclusive. Productivity growth in the oil-extracting regions was fueled by large capital investments associated with oil-extraction activities, while employment creation was limited. Second, the underdeveloped private sector does not contribute to increasing employment.

Kazakhstan has undergone a wave of privatization over the past two decades, but many key economic sectors remain under direct or indirect state control. Moreover, the private sector is still subject to numerous constraints and distortions, and is not growing fast enough to absorb the large number of first-time job seekers. Also, economic diversification is hindered by a difficult business climate. Third, the oversized public sector negatively affects labor market efficiency. The public sector plays an important role as an employer. Among employed people, about 22 percent work in public entities.⁶ The public sector

Text Table 1. Kazakhstan: Long-Term Employment Elasticities

Kazakhstan	0.23
By region	
East Asia and Pacific	0.27
Latin America and the Caribbean	0.16
Caucasus and Central Asia	0.40
Middle East and North Africa	0.08
South Asia	0.99
Western Europe	0.64
By income	
Low-income economies	0.19
Middle-income economies	0.25
High-income economies	0.46

Source: IMF Working Paper (WP/12/218).

⁴ OECD (2013).

⁵ The long-term elasticity of employment to GDP was calculated based on the following equation:

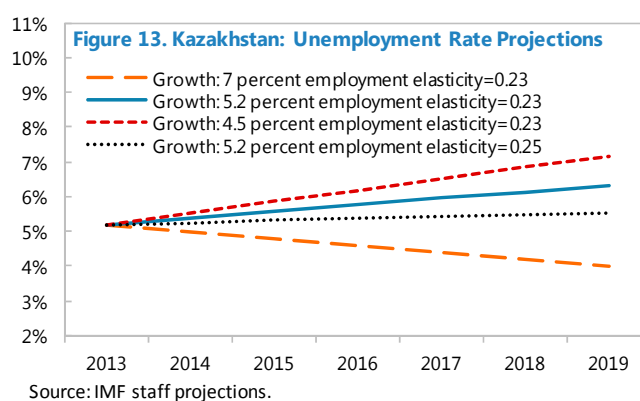
$$\log(E_t) = \alpha + \rho \log(E_{t-1}) + \beta \log(GDP_t)$$

where E is the number of people employed at time t , and β is the long-term elasticity.

⁶ World Bank (2013).

provides employees with higher compensation and benefit packages than the private sector offers. In the long run, high levels of government employment limit economic growth by trapping workers in less productive public-sector jobs and deterring investment in the private sector. Finally, there is excess demand for workers with higher and vocational education and excess supply of workers with general secondary school education and below. Kazakhstan fares poorly when it comes to providing adequately trained workers to the labor market. Only 41 percent of Kazakhstani firms provide formal training, while a significantly larger number of firms in Russia (52 percent), Poland (61 percent), and Malaysia (50 percent) are reported to offer formal training.⁷

13. Under current policies, employment prospects are not likely to improve much. There will be significant challenges in keeping the unemployment low. A youth bulge in the population underscores the need for significant job growth. Taking into account the current demographic structure, about 0.8 million people are estimated to enter the labor force over the next five years, while GDP is projected to grow by 5.2 percent on average for the same period. The unemployment rate is therefore envisaged to continue rising to 6.3 percent in 2019 from 5.2 percent in 2013 (Figure 13). However, the medium-term growth prospects are closely linked to the capital intensive oil sector, i.e., the Kashagan oil field's operation. Therefore, it is hard to rule out the possibility that unemployment could rise above 7 percent.



14. Against this background, the government has designed a “Road Map” to contain sudden rises in unemployment during crises, through the creation of public works. As part of the implementation of the anti-crisis program, the authorities adopted a Regional Employment and Retraining Strategy (Road Map) in a joint effort with the International Labor Organization, in the aftermath of the global crisis. The objectives of the Road Map are: (i) to contain the increase in unemployment through provision of short-term employment and job creation in public works and other social programs; and (ii) to rehabilitate social infrastructure and facilities as a necessary condition for sustainable development. The program covers additional financing of projects in housing and utilities; construction and maintenance of local roads; maintenance of social infrastructure (schools and hospitals); maintenance of social infrastructure outside of main cities; creation of social jobs (including 50 percent co-financing of salaries for selected target groups); and youth internships and vocational training and retraining.

⁷ World Bank (2013).

15. A combination of reforms and higher growth is essential to absorb new entrants to the labor market. To maintain unemployment at the current level (around 5 percent), medium-term GDP growth should be boosted to 6½ percent, 1¼ percentage points higher than envisaged in the staff's macroeconomic projection. Structural reforms may, also, have a significant and positive impact on the responsiveness of employment elasticities. Staff simulations (Figure 13) suggest that making labor demand more elastic by increasing the employment-output elasticity to the middle-income country group average (i.e., 0.25) would support to keep unemployment at the current level without boosting medium-term economic growth.

Text Table 2. Kazakhstan: Medium-Term Outlook for Unemployment 2014–19

2013	
Labor force in 2013 (millions)	9.1
Unemployment rate in 2013 (percent)	5.2%
Unemployed (millions)	0.5
Employed (millions)	8.6
2019	
Projected labor Force in 2019 (millions)	9.9
2013–19	
Projected new entrants to the labor force up to 2019 (millions)	0.8
Total unemployed and new entrants in 2019 (millions)	1.2
Employment elasticity	0.23
Change in employment required to absorb entrants	9.0%
Annual growth in employment required to absorb entrants	1.4%
Required real GDP growth to absorb entrants for 2014–19	6.4%
Average real GDP growth rate, 2003–13	7.1%
Average real GDP growth projected, 2014–19	5.2%

Source: IMF staff estimates and projections.

16. Keeping up the momentum on structural reforms is paramount to tackling key constraints to job creation. Higher growth performance will be necessary but not sufficient to significantly reduce unemployment over the medium term. In the absence of structural reforms aimed at improving the responsiveness of labor market conditions to changes in economic activity, higher economic growth is likely to have only a modest impact on the overall rate of unemployment and negligible effects on youth unemployment. Deepening structural policies aimed at improving the functioning of the labor market will be crucial for fostering the development of labor-intensive sectors that do not depend on exhaustible resources. In particular:

- Reforms aimed at improving the business climate would help energize the private sector by boosting employment over the medium term. Supporting enterprise development by improving infrastructure and promoting small and medium-sized enterprises (SMEs) may have significant effects on employment.
- Reforms aimed at addressing perceived weakness in the education environment would help to reduce skill mismatches between labor supply and demand. Secondary education needs to be better aligned with market needs. In this context, private sector involvement is crucial. Higher-quality education and training should be accompanied with much closer consultations

with the private sector to assess their needs. It is important to strike the right balance between higher education and vocational education training.

- Reforms aimed at strengthening the rule of the law and lowering the role of the state in the economy would help to promote a vigorous private sector.

17. Given the overarching structural challenges for Kazakhstan, the authorities are stepping up efforts to implement various measures. To bolster youth employment and address labor market challenges, the authorities have been revamping a college internship program and a job placement program, which will help to make educated youth competitive in the labor market and to reduce labor market mismatches. The authorities also intend to accelerate the implementation of structural reforms in close cooperation with international development partners (the Asian Development Bank, the European Bank for Reconstruction and Development, and the World Bank), centering on the following priority areas: the financial sector, SMEs, skills, the investment climate, regional development, and institutional reforms.

C. Conclusion

18. The results suggest that Kazakhstan's economic growth has been broadly inclusive, but there is room for further improvement. Both income inequality and unemployment in Kazakhstan compare favorably to peers. That said, poverty rates in rural areas are higher than some poorer regional peers. Furthermore, the recent efforts to further reduce income inequality by promoting faster employment growth have been relatively weak.

19. Fiscal policy could be a useful tool to help reduce income inequality. Better targeting of transfers reduces their fiscal cost and tax levels required to finance them, thus achieving distributional objectives in a more efficient manner. Both tax and expenditure policies need to be carefully designed to balance distributional and efficiency objectives.

20. An ambitious structural reform agenda is paramount to Kazakhstan becoming a dynamic emerging market economy and ensuring sustainable and inclusive growth. Deepening structural policies aimed at improving the functioning of the labor market would be crucial to fostering the development of labor-intensive sectors that do not depend on extractive industries. Key priority areas include strengthening human capital and institutions and lowering the role of the state in a more diversified economy.

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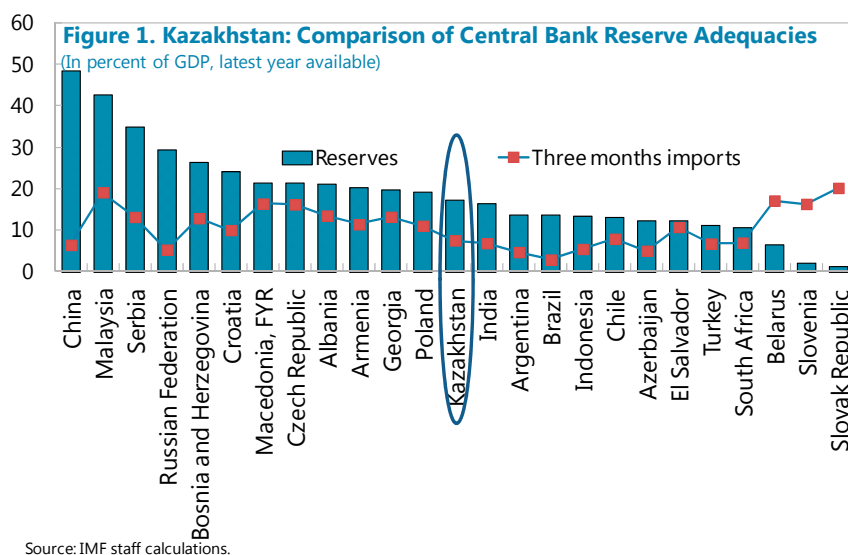
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EXTERNAL SECTOR ASSESSMENT¹

1. This chapter provides an assessment of two aspects of the external sector in Kazakhstan. In Section A, we assess the adequacy of international reserves, and show that official reserves have slightly improved in 2014: Q1 after a temporary decline in 2012–13. Total foreign exchange reserves, including the national oil fund assets, are well above the IMF’s Assessing Reserve Adequacy (ARA) metric. In Section B, we show that external debt sustainability is more sensitive to a real currency depreciation shock than to current account, nominal interest rate, and growth shocks.

A. Assessing Reserve Adequacy

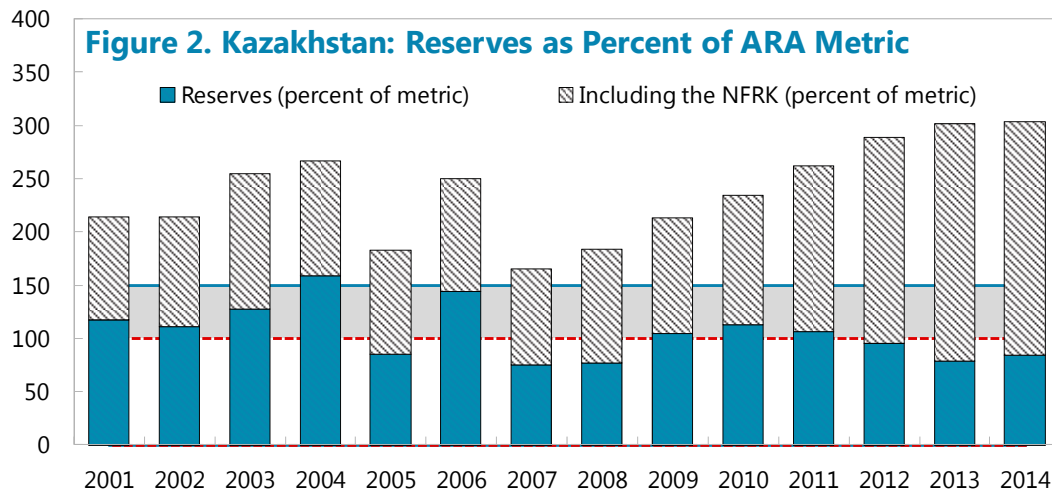
2. Kazakhstan’s international reserve position is satisfactory based on traditional reserve adequacy ratios. The NBK’s official international reserves, as a percent of GDP, compare relatively well with regional and other comparators (see Figure 1). Kazakhstan’s current coverage in months of imports is also adequate relative to other emerging market economies.



3. Official external reserves were below the IMF’s ARA metric in recent years, but including assets of the national oil fund (NFRK) improves the reserve position (see Figure 2). The metric, based on IMF (2011), is designed to measure the vulnerabilities that might arise in an emerging market’s balance of payments if it were subject to exchange market pressure events, including lower export income, volatilities in short- and long-term debt, and resident capital flight. Following a weak external position in 2012 and 2013, Kazakhstan’s official reserves improved slightly

¹ Prepared by Amr Hosny.

in 2014: Q1. At the same time, the combined international reserves and NFRK assets have been on an increasing path and are together way above the ARA metric.²



Source: IMF staff calculations.

Notes: Shaded area represents the Suggested Reserve Adequacy Range (100–150 percent) based on the ARA metric.

B. External Debt Sustainability Assessment

4. Kazakhstan's external debt to GDP ratio remains relatively high, largely because of inter-company loans, but is projected to decrease over the medium term.³ An External Debt Sustainability Analysis (DSA) shows that the external debt to GDP ratio is projected to decline from 73 percent in 2014 to 65 percent in 2019. The decline in external debt is mainly driven by noninterest external current account surpluses and, to a lesser extent, by nondebt creating capital inflows and automatic debt dynamics. Capital inflows are expected to remain stable. An examination of automatic debt dynamics reveals that pressures from the nominal interest rates on the external debt are more than offset by real GDP growth (see Figure 3).

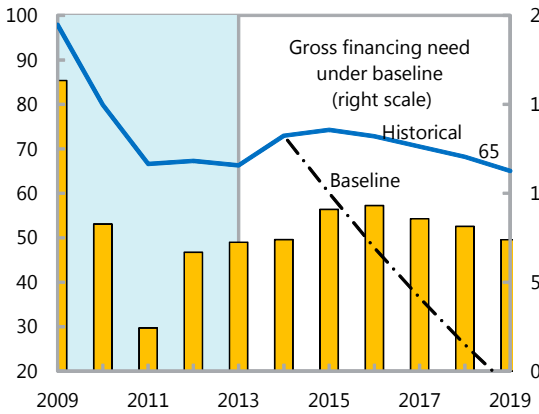
5. External debt sustainability is more sensitive to a real currency depreciation shock than to current account, nominal interest rate, and growth shocks. Based on the Fund's standard DSA template, the external debt ratio is most sensitive to a currency depreciation shock, assumed at a one-time real depreciation of 30 percent in 2015. This shock would increase the external debt to GDP ratio to 97 percent in 2019 versus 65 percent under the baseline scenario. A combined 0.25 standard deviation shock to the interest rate, growth rate and non-interest current account balance would raise the external debt to GDP ratio to 75 percent in 2019.

² It is worth mentioning that the improvements in 2014: Q1 preliminary current account data have helped recover the losses in last year's official reserves.

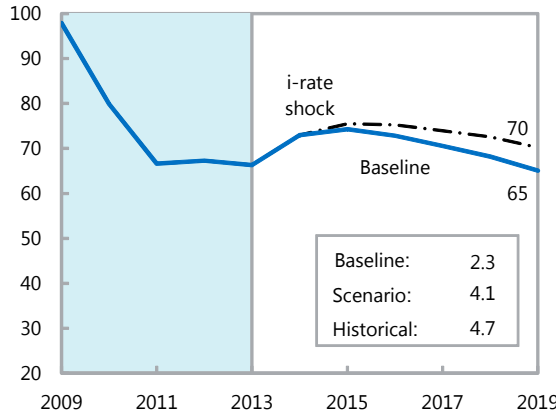
³ Intercompany loans are included in the External DSA.

Figure 3. Kazakhstan: External Debt Sustainability: Bound Tests 1/ 2/
(External debt in percent of GDP)

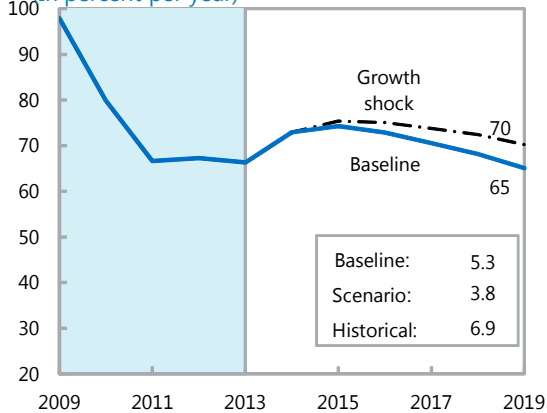
Baseline and Historical Scenarios



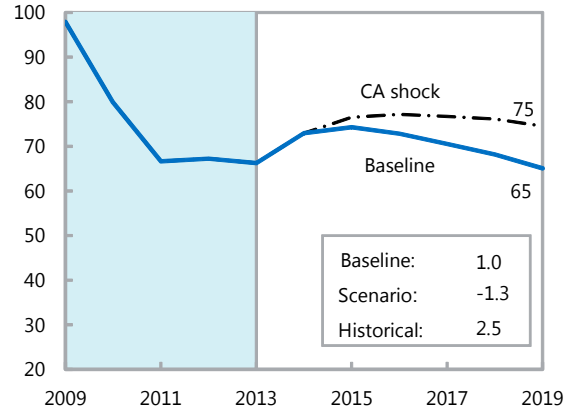
Interest Rate Shock (in percent)



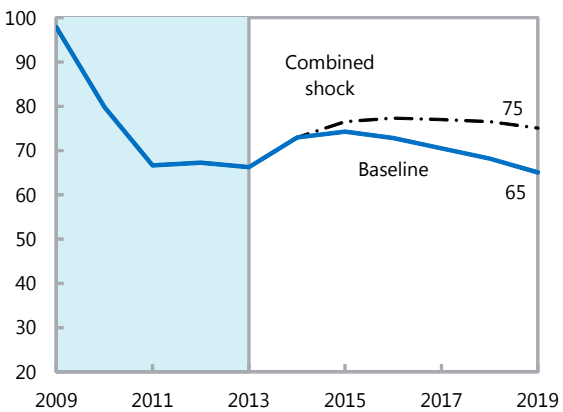
Growth Shock (In percent per year)



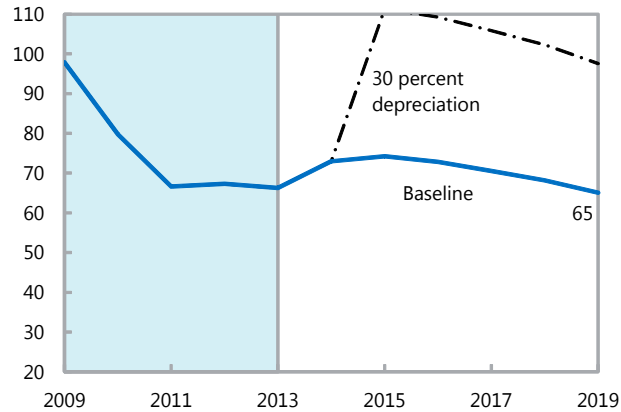
Non-interest Current Account Shock (In percent of GDP)



Combined Shock 3/



Real Depreciation Shock 4/



Sources: International Monetary Fund, country desk data, and staff estimates.

1/ Shaded areas represent actual data. Individual shocks are permanent one-half standard deviation shocks. Figures in the boxes represent average projections for the respective variables in the baseline and scenario being presented. Ten-year historical average for the variable is also shown.

2/ For historical scenarios, the historical averages are calculated over the ten-year period, and the information is used to project debt dynamics five years ahead.

3/ Permanent 1/4 standard deviation shocks applied to real interest rate, growth rate, and current account balance.

4/ One-time real depreciation of 30 percent occurs in 2015.

Table 1. Kazakhstan: External Debt Sustainability Framework, 2009–19
(In percent of GDP, unless otherwise indicated)

	Actual					Projections						Debt-stabilizing non-interest current account 6/ -8.0	
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
1 Baseline: External debt	97.9	79.9	66.6	67.3	66.3	73.0	74.3	72.8	70.5	68.2	65.1		
2 Change in external debt	17.0	-18.0	-13.2	0.6	-1.0	6.7	1.3	-1.4	-2.3	-2.3	-3.1		
3 Identified external debt-creating flows (4+8+9)	7.5	-25.1	-27.0	-11.2	-9.7	-7.4	-6.0	-5.3	-6.0	-5.5	-5.8		
4 Current account deficit, excluding interest payments	1.4	-3.6	-8.2	-3.3	-1.9	-2.5	-1.1	-0.6	-0.9	-1.0	-1.3		
5 Deficit in balance of goods and services	-7.8	-14.4	-20.3	-14.8	-11.9	-12.6	-10.0	-8.3	-7.9	-7.1	-6.9		
6 Exports	41.7	44.2	47.6	45.1	39.5	41.4	38.0	34.8	32.8	30.7	29.1		
7 Imports	33.8	29.9	27.3	30.2	27.6	28.8	28.1	26.5	24.9	23.6	22.2		
8 Net nondebt creating capital inflows (negative)	-8.8	-2.6	-4.6	-5.6	-3.5	-3.6	-3.4	-3.1	-2.8	-2.5	-2.2		
9 Automatic debt dynamics 1/	14.8	-19.0	-14.2	-2.3	-4.4	-1.3	-1.5	-1.6	-2.4	-2.0	-2.3		
10 Contribution from nominal interest rate	2.1	2.6	2.8	2.8	1.9	1.9	1.8	1.6	1.4	1.3	1.2		
11 Contribution from real GDP growth	-1.1	-5.6	-4.7	-3.1	-3.7	-3.2	-3.3	-3.2	-3.8	-3.3	-3.5		
12 Contribution from price and exchange rate changes 2/	13.8	-16.1	-12.3	-2.0	-2.6		
13 Residual, incl. change in gross foreign assets (2-3) 3/	9.5	7.1	13.8	11.8	8.7	14.0	7.3	3.8	3.7	3.1	2.7		
External debt-to-exports ratio (in percent)	235.0	180.5	140.0	149.2	167.7	176.4	195.4	209.0	215.1	222.0	223.9		
Gross external financing need (in billions of U.S. dollars) 4/	18.8	12.2	4.6	13.6	16.3	16.3	21.4	24.2	24.9	26.3	26.7		
In percent of GDP	16.3	8.3	2.4	6.7	7.2	10-Year	10-Year	7.4	9.1	9.3	8.6	8.1	7.4
Scenario with key variables at their historical averages 5/						73.0	60.1	47.7	36.5	26.0	16.3	-9.5	
Key Macroeconomic Assumptions Underlying Baseline						Historical Average	Standard Deviation						
Real GDP growth (in percent)	1.2	7.3	7.5	5.0	6.0	6.9	3.1	4.7	4.8	4.8	5.8	5.2	5.7
GDP deflator in U.S. dollars (change in percent)	-14.6	19.7	18.2	3.1	4.0	14.9	13.4	-6.4	1.8	5.7	5.7	5.7	5.8
Nominal external interest rate (in percent)	2.3	3.4	4.4	4.6	3.1	4.7	3.7	2.9	2.6	2.4	2.2	2.1	2.0
Growth of exports (U.S. dollar terms, in percent)	-37.0	36.4	36.7	2.5	-3.4	22.9	27.5	2.6	-1.9	1.5	5.3	4.2	5.8
Growth of imports (U.S. dollar terms, in percent)	-21.3	13.5	16.0	20.0	0.5	18.1	19.1	2.3	4.0	4.7	5.1	5.3	5.2
Current account balance, excluding interest payments	-1.4	3.6	8.2	3.3	1.9	2.5	4.5	2.5	1.1	0.6	0.9	1.0	1.3
Net nondebt creating capital inflows	8.8	2.6	4.6	5.6	3.5	7.1	3.5	3.6	3.4	3.1	2.8	2.5	2.2

1/ Derived as $[r - g - r(1+g) + ea(1+r)] / (1+g+r+gr)$ times previous period debt stock, with r = nominal effective interest rate on external debt; r = change in domestic GDP deflator in U.S. dollar terms, g = real GDP growth rate,

e = nominal appreciation (increase in dollar value of domestic currency), and a = share of domestic-currency denominated debt in total external debt.

2/ The contribution from price and exchange rate changes is defined as $[-r(1+g) + ea(1+r)] / (1+g+r+gr)$ times previous period debt stock. r increases with an appreciating domestic currency ($e > 0$) and rising inflation (based on GDP deflator).

3/ For projection, line includes the impact of price and exchange rate changes.

4/ Defined as current account deficit, plus amortization on medium- and long-term debt, plus short-term debt at end of previous period.

5/ The key variables include real GDP growth; nominal interest rate; dollar deflator growth; and both non-interest current account and nondebt inflows in percent of GDP.

6/ Long-run, constant balance that stabilizes the debt ratio assuming that key variables (real GDP growth, nominal interest rate, dollar deflator growth, and nondebt inflows in percent of GDP) remain at their levels of the last projection year.

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TOWARD INFLATION TARGETING¹

A. Introduction

1. The National Bank of Kazakhstan (NBK) has recently announced a medium-term commitment to adopt a formal inflation targeting regime. Over the past two decades, inflation targeting (IT) has been a popular monetary policy framework in advanced and emerging market economies. The main feature of an IT regime is the official announcement of a target (range) inflation rate and the explicit recognition that price stability is the main objective of monetary policy. NBK's monetary policy guidelines are already explicit about the primacy of price stability as a primary goal, along with controlling short-term liquidity and smoothing volatilities within a managed exchange rate regime.

2. The literature has highlighted the need for clear monetary policy instruments, a forward-looking monetary policy, and low financial dollarization as initial preconditions for the success of an IT regime. The literature on the pre-requisites for IT is vast. Carare and others (2002) grouped these pre-conditions into four broad categories: (i) a clear mandate and accountability framework for the support of an IT regime; (ii) macroeconomic stability; (iii) developed financial system; and (iv) effective policy implementation tools. In this context, a number of studies, including Roger and Stone (2005), Freedman and Otker-Robe (2009; 2010), and Walsh (2009), have stressed the importance of an effective and clear monetary policy instrument as well as an active forward-looking monetary policy, for the success of an IT regime. Other survey studies, including IMF (2006), highlight the importance of minimizing dollarization of the domestic financial system to strengthen the efficacy of monetary policy and gradually transit towards full-fledged IT regimes.

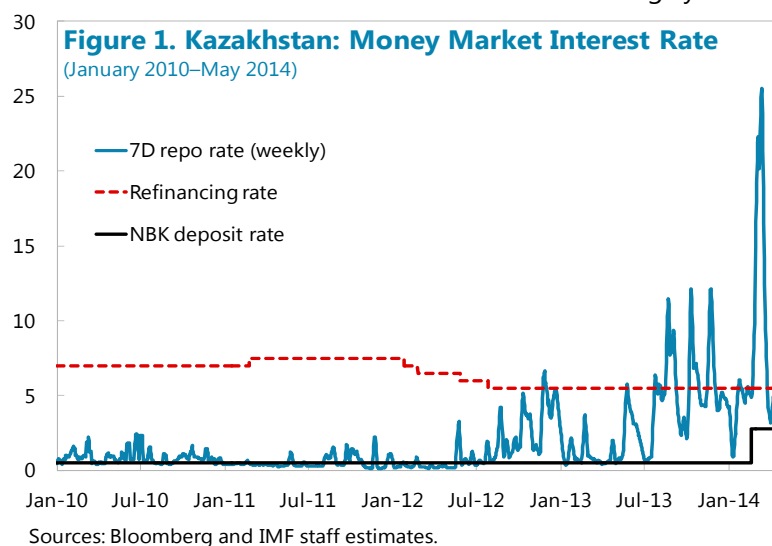
3. This chapter conducts three empirical analyses to examine the readiness of the NBK to adopt an IT regime in the medium term. First, we examine the strength of the NBK's policy interest rate instrument in influencing money market interest rates and inflation. Second, we test whether monetary policy in Kazakhstan has been backward- or forward-looking. And third, we examine the determinants of dollarization in Kazakhstan and discuss successful de-dollarization country experiences. The chapter concludes with a set of policy recommendations.

¹ Prepared by Amr Hosny.

B. Is the Interest Rate Effective in Controlling Inflation?

Current policy framework

4. The NBK uses the refinancing rate as its main policy interest rate. Its refinance rate and deposit rate together form an interest rate corridor, with the former representing a soft ceiling and the latter a floor. Although the policy rate—the rate at which the NBK lends to the banking system in the short-term—has remained unchanged at 5½ percent since August 2012, key money market interest rates have been quite volatile. This illustrates the limited role of the NBK’s policy interest rate in anchoring money market rates, especially in the presence of tight liquidity conditions. See Epstein and Portillo (2014) for a detailed analysis of the monetary policy framework in Kazakhstan.



Empirical model and results

5. This section estimates a multivariate vector autoregressive (VAR) model to examine the relationship (and causality) among the various interest rates and inflation. Our objective is to understand whether/how the policy refinancing rate guides other money market interest rates and achieves its ultimate goal of ensuring price stability. To this end, we specify a simple VAR model of order p for the period 2003: M1–2014: M2:

$$Y_t = \mu + \sum_{i=1}^p \Pi_i \Delta Y_{t-i} + \sum_{j=1}^m \beta_j X_{t-m} + \varepsilon_t \quad (1)$$

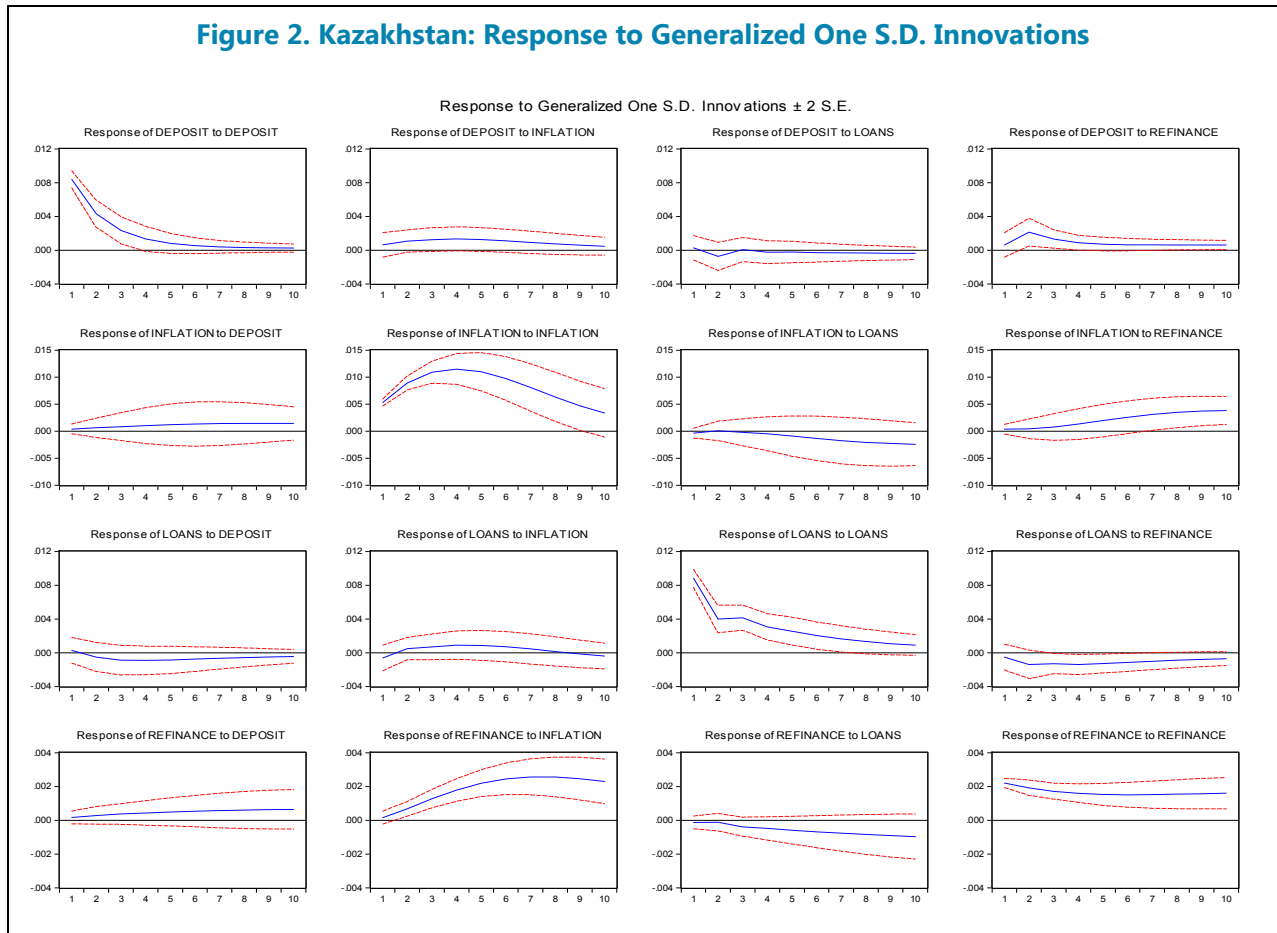
where Y_t is a vector of endogenous variables: the refinance rate, deposit rate, lending rate, and inflation. X_t is a vector of exogenous variables: international food and energy prices, while ε_t is a vector of *iid* error terms. The order of lags is determined by standard lag selection criteria.

6. The results indicate that inflation does not respond to changes in any of the interest rates, while the refinance rate responds to shocks to inflation. Empirical results from the generalized impulse response functions (IRF) below deliver a few important messages.

- First, the NBK policy (refinance) rate does not affect money market interest rates. This is shown from the statistically insignificant response of deposits or lending rates to shocks in the refinance rate.

- Second, changes in the deposit, lending, or refinance rates do not induce any change in the inflation rate, as is evident from the statistically insignificant response of the inflation rate to generalized one standard-deviation shocks in all of these interest rates.

Figure 2. Kazakhstan: Response to Generalized One S.D. Innovations



- Third, IRF results also suggest that the refinance rate responds to shocks in inflation, rather than the other way round. This response is positive and statistically significant, indicating that higher inflation induces the NBK to raise its refinance interest rate. Shocks to the policy rate, however, do not affect inflation.
- These combined results suggest that the current monetary policy instruments used by the NBK are unable to signal the stance of monetary policy and are not effective in ensuring price stability.

7. The results hold under a number of robustness checks. We use generalized IRFs because they are not sensitive to the ordering of the endogenous variables in the VAR system. These results are also robust to using different lags, as suggested by the lag selection criteria. Further analysis suggests that inflation Granger causes the refinance rate confirming our earlier results.

C. Is Monetary Policy Forward-Looking?

8. The backward- or forward-looking nature of monetary policy is another aspect of the readiness of the NBK to move toward IT in the medium term. After studying the relationship between the NBK's refinance rate and inflation in the previous sub-section, we turn to another important and complementary pre-requisite for IT, namely whether monetary policy is backward- or forward-looking.

Background and model specification

9. The main objective of the NBK is to achieve price stability, and keep annual inflation within a 6–8 percent range. The monetary policy guidelines of the NBK explicitly entrust the NBK with the formulation and implementation of monetary policy, with price stability being the de jure primary objective. Specifically, the NBK's goal is to keep inflation within the range of 6–8 percent. To achieve such a target range, a set of forward-looking instruments must be in place. It is thus essential to understand how the NBK conducts monetary policy and how it adjusts its instruments in response to macroeconomic and inflationary developments.

10. We specify a Taylor rule to examine monetary policy in Kazakhstan. Building on Taylor (1993) and Clarida, Galí and Gertler (1998, 2000), among others, we aim to understand the monetary policy stance in Kazakhstan using simple backward and forward-looking Taylor rules. Taylor rules are monetary policy rules that describe how a central bank should adjust its instrument, usually its short-term interest rate, in response to inflation and macroeconomic activity. Orphanides (2007) compares the characteristics of Taylor rules with alternative monetary policy guides. Taylor (1993) first showed that the following equation can explain movements in the U.S. Federal Reserve's federal fund rate quite well:

$$i_t = r^n + \pi_t + 0.5 (\pi_t - \pi_t^*) + 0.5 \tilde{y}_t \quad (1)$$

where i_t is the short-term policy interest rate, r^n is the natural rate of interest, π_t is the inflation rate, π_t^* is the central bank's inflation target, and \tilde{y}_t is the output gap.

11. More recent studies have added the effect of interest rate smoothing and the exchange rate in the basic Taylor rule. Building on the above Taylor rule specification, Moura and Carvalho (2010) and Sack and Wieland (1999), among others, have argued that central banks typically smooth their interest rate changes (see Equation 2 below). Hammond, Kanbur, and Prasad (2009) and Mohanty and Klau (2004) also argued for including exchange rates in the case of small open economies (see Equation 3).

$$i_t = (1-\rho) i_t^* + \rho i_{t-1} + \varepsilon_t \quad (2)$$

$$i_t^* = r^n + \pi_{t+k} + (\beta-1) (\pi_{t+k} - \pi_t^*) + \gamma \tilde{y}_{t+k} + \eta \Delta x_t \quad (3)$$

where i_t^* the central bank's target interest rate is a function of r^n , the natural rate of interest, the inflation target and the Δx_t exchange rate. The ρ coefficient in Equation 2 above reflects the interest rate smoothing parameter. The output gap is calculated as:

$$\tilde{y}_t = GDP_t - \overline{GDP}_t \quad (4)$$

where \tilde{y}_t is the difference between actual GDP and its long-run trend \overline{GDP}_t estimated by the Hodrick-Prescott filter.

12. This specification allows for both a backward and a forward-looking test of the NBK's monetary policy over the 2003: Q1–2013: Q3 period. Inserting Equation 3 into 2 delivers the following equation:

$$i_t = (1-\rho) \alpha + (1-\rho) \beta \pi_{t+k} + (1-\rho) \gamma \tilde{y}_{t+k} + (1-\rho) \eta \Delta x_t + \rho i_{t-1} + \varepsilon_t \quad (5)$$

We allow k in inflation and output gap to take a negative (backward-looking Taylor rule) or positive (forward-looking Taylor rule) value. A number of studies in the literature have argued that central banks are usually more forward-looking under IT regimes than under other monetary policy regimes (see Freedman and Otker-Robe (2009) and Roger and Stone (2005)). We, therefore, test these two versions of the Taylor rule for the case of Kazakhstan. The model to be estimated is as follows:

$$i_t = a + b \pi_{t\pm 1} + c \tilde{y}_{t\pm 1} + d \Delta x_t + \rho i_{t-1} + \varepsilon_t \quad (6)$$

Note that Equation 6 is a simple version of Equation 5 where $k = -1$ for the backward-looking specification and $k = +1$ for the forward-looking specification. A similar backward-looking Taylor rule was adopted by Moura and Carvalho (2010) in the case of seven Latin American countries and Kuzin (2006) for Germany's Bundesbank, while Clarida, Galí and Gertler (1998, 2000), Kim and Nelson (2006), and Kishor (2012) use a similar forward-looking specification in their study of monetary policy in a number of advanced economies.

Empirical methodology and results

13. Estimation is done using a two-step Heckman procedure. Data comes from the IFS, and the time-series properties of the variables tested using the ADF unit root test, are taken into consideration in the estimations.

- While estimation of the backward-looking specification is simply done using OLS, estimation of the forward-looking model is less straightforward because future values of inflation and output gap will be correlated with the error term. Mohanty and Klau (2004) and Clarida, Galí and Gertler (2000) proposed using conventional IV and GMM approaches to correct for this endogeneity problem.
- Here, we follow a more recent approach by Kim (2006) and Kim and Nelson (2006) to correct for endogeneity and produce consistent estimates. Specifically, they suggest following a two-step Heckman (1976) procedure, where one regresses inflation and output gap on a set of instruments in the first step and obtains the residuals. Following Kim and Nelson (2006), we use four lags of inflation, output gap, global commodity prices, and interest rate as our set of instruments. These residuals are then added to the original Taylor rule specification in the

second step to deliver efficient estimates. The forward-looking model can then be estimated using OLS after correcting for endogeneity.

14. Empirical results indicate that monetary policy in Kazakhstan has been backward-looking over the period under consideration.

Results from the backward-looking specification suggest that the refinance rate shows a statistically significant response to past inflation and output gap. Specifically, the NBK appears to raise its refinance rate in the current period in response to higher inflation or overheating in the previous period, indicating a backward-looking monetary policy. The second specification, however, suggests that current interest rates do not respond to future changes in inflation or output gap, as the variables of interest are statistically insignificant. Both specifications show a strong interest rate smoothing effect, and suggest that the NBK does not respond to changes in the exchange rate. Note that these results are consistent with those in section B, which also indicated lack of causality from the policy rate to inflation.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	ρ	Adj R^2
Backward	0.003 (0.004)	0.119 (0.066)*	0.012 (0.005)**	-0.026 (0.018)	0.917 (0.061)***	0.90
Forward	0.001 (0.005)	0.080 (0.067)	-0.002 (0.006)	-0.034 (0.021)	0.961 (0.071)***	0.86

Robust standard errors are in parentheses.
*Significant at 10 percent; **Significant at 5 percent; ***Significant at 1 percent

D. Does Dollarization Hinder the Move Toward Inflation Targeting?

15. We now study the determinants of dollarization in Kazakhstan, and discuss a few de-dollarization measures that may strengthen the efficacy of monetary policy. We have shown that a financial environment characterized by ineffective interest rate instruments and continued volatility in the money market can delay progress toward adopting a more effective monetary policy framework. Rising dollarization ratios may further complicate the conduct of domestic monetary policy. In this context, we first examine the extent of dollarization in Kazakhstan versus other emerging countries and discuss how a dollarized banking system can complicate the management of macroeconomic policy. We then show that inflation volatility and an asymmetric exchange rate policy are the main drivers of dollarization in Kazakhstan, hindering the move toward a more effective monetary policy framework. We conclude with a set of potential de-dollarization measures at the macro and micro levels.

Dollarization and macroeconomic policy

16. Financial dollarization in Kazakhstan is relatively high. The ratios of foreign currency deposits and loans to total in Kazakhstan remain high, despite a gradual fall prior to the recent devaluation. Although Kazakhstan is in a better position relative to a number of regional comparators, it still needs ambitious reforms to reach the dollarization levels of leading emerging markets.

Figure 3. Kazakhstan: Financial Dollarization in Kazakhstan

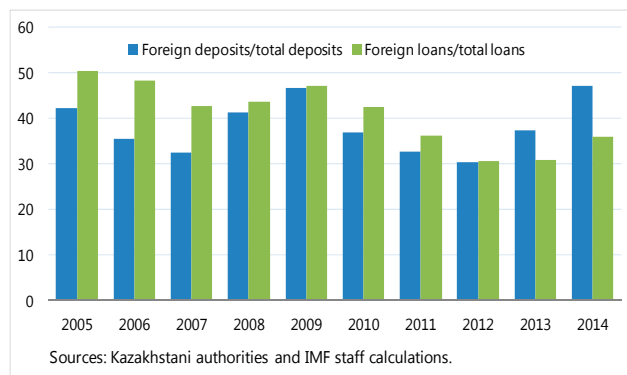
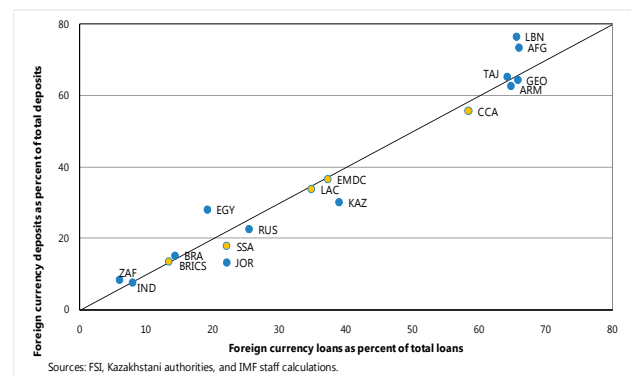


Figure 4. Kazakhstan: Dollarization in Selected Countries (latest year available)



17. Dollarization complicates the management of macroeconomic policy and increases financial risks. It can limit the effectiveness of monetary policy, and increases the likelihood of balance sheet and liquidity risks. These effects may be exacerbated in managed exchange rate regimes.

- Dollarization may affect the autonomy of *monetary policy* and weaken standard transmission mechanisms. See Ize and Yeyati (2005) for a discussion on the ineffectiveness of the interest rate channel when most intermediation is in dollars.
- High dollarization generally calls for extra reserve cushions, and deepens the impact of the *exchange rate* channel on the inflation rate, particularly in managed exchange rate regimes. Ize and Yeyati (2005) argue that dollarization is associated with higher exchange rate pass-throughs, thus limiting the countercyclical capacity of domestic monetary policy and exacerbating the fear of floating in dollarized economies.
- Typical *financial risks* include credit risks that may stem from mismatches between dollar assets and liabilities in banks' balance sheets, solvency risks arising from potential currency mismatches in the event of large depreciations, and/or liquidity risks, which can lead to divergence between onshore and offshore interest rates on dollar deposits (see Kokenyne and others (2010) and Erasmus and others (2009) for details).

Determinants of dollarization in Kazakhstan

18. Drivers of dollarization include a number of macroeconomic and institutional factors. Dollarization typically develops when a country's local currency performs its functions relatively poorly compared to other accessible foreign currencies. A number of macroeconomic and institutional determinants of financial dollarization have been identified in the literature.

- Dollarization is common in countries with *high and volatile inflation rates*. Studies by IMF (2007) and Ize and Yeyati (2005) further argue that high variability in inflation is a more important determinant than high inflation rates per se.
- An *asymmetric exchange rate policy* that allows for depreciation but resists appreciation of the local currency would encourage residents to hold foreign currency deposits as a means of preserving their purchasing power (Rennhack and Nozaki 2006).
- Dollarization also surfaces in *weak financial systems* characterized by financial repression, weak intermediation, and interest rate controls.

19. We focus on the determinants of deposit dollarization in Kazakhstan. Building on the models of De Nicolo and others (2005), Neanidis and Savva (2009) and Kokenyne and others (2010), among others, we specify the following model and estimate over the 2000: Q1–2014: Q1 period:

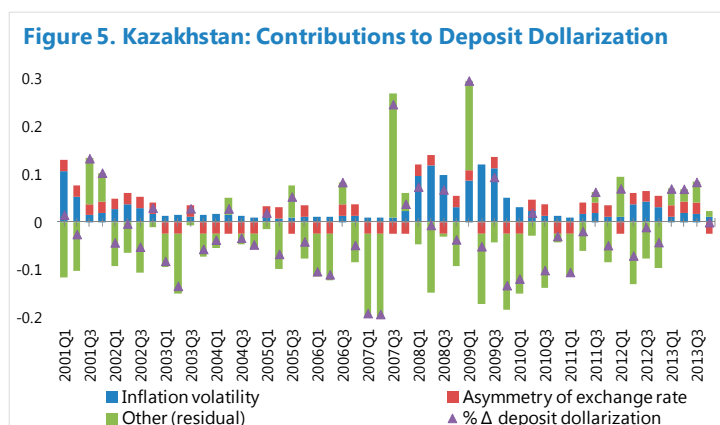
$$\Delta depdollarization_t = \beta_0 + \beta_1 intdiff_{t-1} + \beta_2 \Delta exr_{t-1} + \beta_3 exrvol_{t-1} + \beta_4 inf_{t-1} + \beta_5 infvol_{t-1} + \beta_6 \Delta credit_{t-1} + \beta_7 exrasymmetry_t + \varepsilon_t \quad (1)$$

where $\Delta depdollarization_t$ the dependent variable is the percentage change in deposit dollarization at time t . Independent variables include $intdiff_{t-1}$ the differential between interest rates on the domestic currency versus the interest rate on dollar deposits in Kazakhstan, exr_{t-1} is the exchange rate, $exrvol_{t-1}$ is a measure of exchange rate volatility, inf_{t-1} is the inflation rate, $infvol_{t-1}$ is inflation volatility, and $\Delta credit_{t-1}$ is a measure of financial development proxied by the ratio of credit to the private sector to GDP. Finally, following Rennhack and Nozaki (2006) and Neanidis and Savva (2009), we include $exrasymmetry_t$ a dummy variable that captures asymmetry in the exchange rate policy by taking a value of one in cases of depreciation and zero in appreciation.

20. Estimations are done using simple OLS. Independent variables are all lagged one period to account for possible lag effects. We include all variables in their levels or in first-difference, depending on results from the ADF unit root tests. Estimation is done using OLS with robust standard errors.

21. Empirical findings suggest that inflation volatility and asymmetry of exchange rate policy toward depreciation drive deposit dollarization in Kazakhstan.

This concurs with results from the literature in confirming the importance of higher inflation volatility rather than higher inflation in higher deposit dollarization. Moreover, after controlling for other factors, our results indicate that the asymmetric nature of the exchange rate policy, which allows for depreciations but resists appreciation of the domestic



currency, has been a major incentive for higher dollarization of deposits. Using estimated coefficients from our regression, we show the contribution of these two variables in explaining changes in deposit dollarization in Kazakhstan over the sample period.

De-dollarization policies

22. Successful cross-country de-dollarization experiences suggest a combination of macroeconomic stabilization policies and complementary microeconomic measures. Country experience suggests that gradual market-based de-dollarization policies, especially at the micro level, are more successful than forced de-dollarization measures which may diminish market confidence, increase short-run risks, and more generally affect the credibility of economic policy.

23. At the macro level, country experience suggests that an inflation targeting regime with flexible exchange rates and the absence of fiscal dominance provides the best monetary policy framework for market-driven financial dollarization (see Kokenyne and others (2010)). A study by IMF (2006) stipulates that dollarization is a phenomenon that is largely endogenous to the monetary policy regime, suggesting that a credible and successful macroeconomic policy of disinflation is likely to reduce dollarization over time. Suggested policies at the macro level include:

- Widening exchange rate bands as in Poland in late 1990's, increasing foreign exchange loan interest rates as in Croatia, and raising domestic interest rates for deposits above foreign currency interest rates as in Turkey, Egypt, Hungary, and Poland in the early 1990's.
- Measures aimed at deepening the domestic financial market include introducing local currency-denominated securities with credible indexation systems as in Chile, and Mexico in the 1980's and Bolivia, Israel, and Turkey in the early 2000's. Egypt, Lithuania, and Poland removed administrative controls on interest rates in the early 1990's.
- Unbiased taxation on income earned from foreign currency deposits, bonds or other financial transactions versus local currency taxes.

24. At the micro level, supportive prudential regulations to make the local currency more attractive are necessary. Cayazzo and others (2006) and Kokenyne and others (2010) discuss a set of comprehensive prudential measures including minimum capital requirements for foreign currency-induced credit risk and requesting credit bureaus to provide currency-specific information on all debt. Rennhack and Nozaki (2006) summarize the experiences of a number of Latin American countries. Suggested policies at the micro level include:

- Imposing higher reserve requirements on foreign currency deposits as in Armenia, Belarus, Bolivia, Croatia, Peru, Romania, Serbia, and Turkey in the 2000's (see García-Escribano and Sosa (2011) and Kokenyne and others (2010)).
- Remunerating the reserve requirement on local currency deposits at a higher rate than for the foreign currency deposit reserve requirement. See Kokenyne and others (2010) on the cases of Croatia, Israel, Nicaragua, and Romania in the 2000's.

- Holding reserve requirements for foreign currency deposits in local currency. Examples include Croatia, Haiti, and Serbia in the 2000's.
- Tighter provisioning requirements on foreign currency loans as in Albania, Croatia, and Mozambique in the mid 2000's. Banks may also be required to carry routine evaluations of currency risks, or, alternatively, have to set up reserves as a percentage of foreign currency credit that has not been evaluated (see García-Escribano and Sosa (2011) on the experience of Latin American countries).
- Raising insurance premiums on dollar deposits, see IMF (2007) and García-Escribano (2010) on the Peruvian experience.
- Developing markets for instruments to hedge currency risks as in Peru and Israel.
- Requiring banks to hold liquid assets of certain percentages on their short-term liabilities, with higher requirements for foreign currency than for domestic currency liabilities. See Kokenyne and others (2010) for examples from Angola, Croatia, Cyprus, Egypt, Lebanon, and Turkey in the 1990's and 2000's, and Rennhack and Nozaki (2006) and García-Escribano and Sosa (2011) on the experience of Latin American countries in the early 1990's.

E. Conclusion and Policy Recommendations

25. This chapter has presented evidence that there is still ample room for improvements before the NBK is ready to adopt IT. The current nature and conduct of monetary policy in Kazakhstan, including the ineffectiveness of the policy rate, the dependence on the exchange rate as a dominant monetary policy instrument and extensive dollarization undermine the framework's ability to ensure price stability and counteract domestic and external shocks. We have shown that the NBK's official refinancing rate does not fully signal the stance of monetary policy, as reflected in a weak transmission from the refinance rate to money market interest rates and weak influence on inflation. Furthermore, monetary policy needs to become more forward-looking in order to contain inflationary pressures and anchor expectations. Macroeconomic stabilization policies, including a deeper domestic financial market, along with a number of micro-prudential measures are needed to arrest dollarization and increase confidence in the local currency.

26. There is no rigid or unique formula for running successful monetary policy, but a clear and effective short-term policy interest rate should be an essential element of any strategy.

The results from our three empirical exercises plus successful country experiences suggest that gaining control over short-term interest rates is an essential component of any effective monetary policy regime. In doing so, it is important to recognize that sequencing of reforms is key to success, and that short-term measures can and should be taken in order to ensure a smooth transition to IT in the medium-term. In this context, suggested near-term steps could include:

- Introducing a clear policy rate instrument supported by open market operations to help ensure that key interbank rates are anchored around the NBK's policy rate. If current exchange rate

management policies continue, large foreign exchange interventions will be required, and these will complicate and add to the operational challenge when combined with large open market operations (see Epstein and Portillo (2014)).

- A gradual widening of the exchange rate band.
- Introducing micro prudential measures, including certain capital and reserve requirements, to increase confidence in the domestic currency.
- Ensuring that the multiple objectives of financial or exchange rate stability do not conflict or override its ultimate goal of price stability.
- Enhancing open communication of the NBK's policy intentions and operations to help anchor expectations and ensure a smooth transition to a new policy interest rate.

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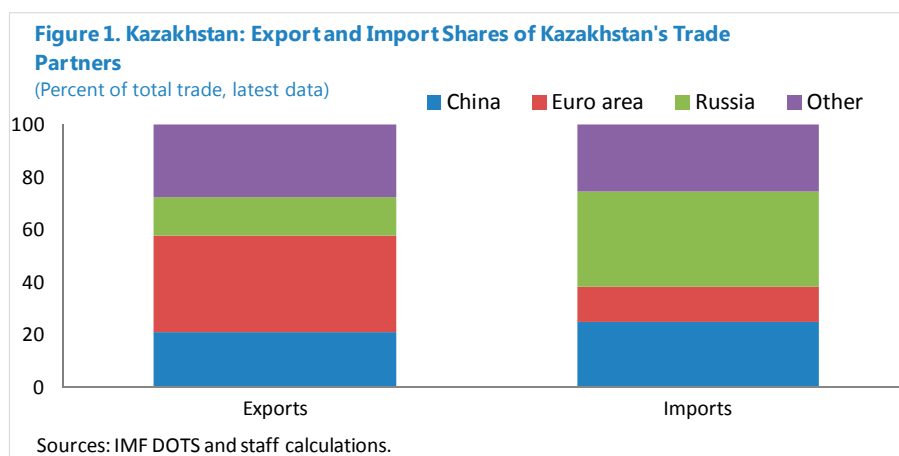
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EXCHANGE RATE AND THE TRADE BALANCE¹

1. In light of the recent devaluation of the Kazakh tenge, this chapter empirically examines the short-run versus long-run effects of devaluation on the trade balance in Kazakhstan over the 2003: Q1–2013: Q3 period, using the traditional J-curve literature. The devaluation of the tenge in February reopened questions about the potential role of the exchange rate in Kazakhstan's external competitiveness. Economic theory suggests that a country's trade balance, following currency devaluation, may at first worsen in the short run because of valuation effects, before improving in the long run due to dominating volume effects, a condition termed the Marshall–Lerner condition. If sketched over time, the dynamics of the trade balance will have a J-shaped curve; hence the J-curve effect. Magee (1973) and Backus and others (1994) provide the theoretical background for this strand of the literature, while Bahmani-Oskooee and Hegerty (2010) provide a recent review of the empirical literature.

2. We examine exchange rate effects at the bilateral level between Kazakhstan and its top trading partners. A list

of 13 countries are identified as Kazakhstan's top trading partners over the period under investigation, covering more than 80 percent of Kazakhstan's overall trade. Three main destinations cover almost two-thirds of Kazakhstan's total external trade: China, Russia and the Euro area countries (see Figure 1).



3. An Autoregressive Distributed Lag (ARDL) co-integration approach is used to estimate the effects of exchange rate changes on the dynamics of the trade balance in Kazakhstan.

Bahmani-Oskooee (1985) first estimated a reduced-form trade balance model to test for the J-Curve phenomenon by imposing a lag structure on the real exchange rate as a main determinant of the trade balance. With the advancement of time-series econometrics, and taking the integrating properties of the variables into consideration, emphasis has shifted to the application of error-correction techniques to test the short-run effects of depreciation, i.e., the J-Curve hypothesis and co-integration methods, which can capture the long term effects of depreciation on the trade balance.

¹ Prepared by Amr Hosny.

- Following the literature, we adopt the following long term reduced-form trade balance model specification:

$$TB_t^i = \beta_0 + \beta_1 Y_t^{KAZ} + \beta_2 Y_t^i + \beta_3 REX_t^i + \varepsilon_t$$

where TB_t^i , the ratio of exports to imports between Kazakhstan and its major trading partners i at time t , depends on Kazakhstan's real income Y_t^{KAZ} , country i 's income Y_t^i , and REX_t^i real exchange rate (higher values indicate depreciation). We run several versions of the same model; one for each of Kazakhstan's trading partners.

- Because we are interested in studying the co-integration relationship between the exchange rate and the trade balance, we re-write the above equation in a constrained error-correction format. In doing so, we are able to distinguish the long-run from the short-run effects of the exchange rate on the trade balance, holding all else constant. We follow the ARDL specification of Pesaran and others (2001):

$$\begin{aligned} \Delta TB_t^i = & \alpha + \sum_{k=1}^{n1} \omega_{ik} \Delta(TB_{t-k}^i) + \sum_{k=0}^{n2} \eta_{ik} \Delta(Y_{t-k}^{KAZ}) + \sum_{k=0}^{n3} \phi_{ik} \Delta(Y_{t-k}^i) + \sum_{k=0}^{n4} \beta_{ik} \Delta(REX_{t-k}^i) \\ & + \delta_1 (TB_{t-1}^i) + \delta_2 (Y_{t-1}^{KAZ}) + \delta_3 (Y_{t-1}^i) + \delta_4 (REX_{t-1}^i) + \varepsilon_{it} \end{aligned}$$

- In this framework, the short-run coefficients (attached to first-differenced variables) and the long-run coefficients (attached to lagged level variables) are simultaneously estimated by applying Ordinary Least Squares to the above equation. The long-run coefficients are produced by normalizing $\hat{\delta}_2$, $\hat{\delta}_3$, and $\hat{\delta}_4$ by $\hat{\delta}_1$.² The number of optimum lags is determined by standard criteria such as the Akaike Information Criteria (AIC).
- We need to establish co-integration among the variables for the long-run coefficients to be valid. Pesaran and others (2001) propose the standard *F-test* for the joint significance of lagged level variables for the co-integration test, with new non-standard critical values that they tabulate in their paper. Specifically, they report two sets of critical values; an upper bound critical value assuming all variables are $I(1)$, and a lower bound assuming all are $I(0)$. This is why the procedure is usually termed the bounds testing approach to co-integration. If the calculated *F-statistic* is above the upper bound, then the variables are jointly significant indicating long-run co-integration, while there is no co-integration if the calculated statistic is below the lower bound critical value. If, however, the calculated *F-statistic* lies between these two bounds, then

² It is worth noting that the standard error of the ratio of two coefficients is not the ratio of two standard errors. Pesaran and Pesaran (1997, pp. 394–404) illustrate how the standard errors of normalized coefficients are calculated using non-linear least squares and the Delta method. See Bahmani-Oskooee and Tanku (2008) for an example of a step-by-step explanation of the method and normalization procedure. In this model, the RHS variables are assumed to be exogenous.

the results are inconclusive, and we can perform an alternative test by forming a lagged error-correction term in place of the linear combination of lagged level variables in the above equation. Each model is then re-estimated using the same number of optimum lags as follows:

$$\Delta TB_t^i = \alpha + \sum_{k=1}^{n1} \omega_{ik} \Delta TB_{t-k}^i + \sum_{k=0}^{n2} \eta_{ik} \Delta(Y_{t-k}^{KAZ}) + \sum_{k=0}^{n3} \phi_{ik} \Delta(Y_{t-k}^i) + \sum_{k=0}^{n4} \beta_{ik} \Delta(REX_{t-k}^i) + \delta_i ECT_{it-1} + u_{it}$$

where ECT_{it-1} is the lagged error correction term. The novelty of the Pesaran and others (2001) approach lies in the fact that the critical values for the F-test are valid regardless of the order of integration of the variables of the system; i.e., whether they are $I(1)$ or $I(0)$. This helps avoid the trouble of all pre-unit-root testing associated with standard co-integration approaches such as that of Johansen and Juselius (1990), which require that all variables be nonstationary in levels but stationary in first differences.

4. The short-run empirical results suggest mixed effects of currency devaluation on the trade balance with different trading partners.

- In the short-run, empirical findings point to improvements in the trade balance with Austria, France, Romania, and Russia. Total combined trade with these countries represents about 35 percent of Kazakhstan's total external trade. Based on the regression results and the lag selection criteria, the short-run improvement in the trade balance may last from one quarter up to a year. The improvement in the trade balance in these countries likely originates from a reduction in imports, rather than from an expansion in exports as Kazakhstan's exports to these countries are dominated by oil products; Kazakhstan has little influence on the prices of these, which are denominated in dollars.
- Results point to a J-curve (negative short-run) effect in the cases of Canada and Switzerland. This implies that, in the short-run, exchange rate devaluation will worsen the trade balance in these two countries, which together represent about 3 percent of Kazakhstan's total external trade.

5. Currency devaluation appears to have little long-run effects. Our findings indicate evidence of co-integration between the trade balance and its determinants in almost half of Kazakhstan's trading partners. Focusing on the relationship between the exchange rate and the trade balance, we find a statistically significant long-run relationship between the two in only a couple of countries.

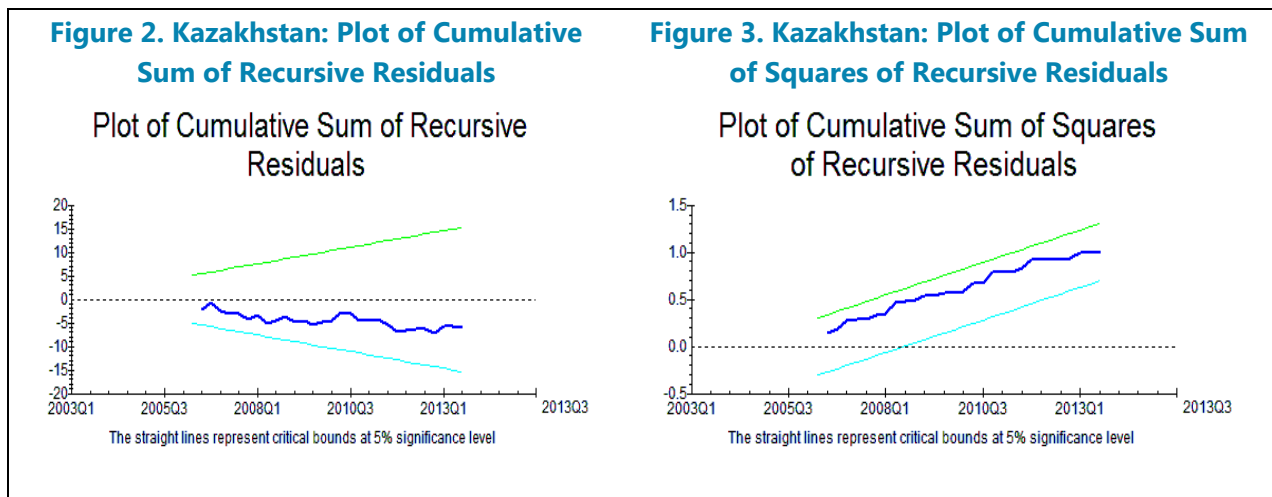
- Following the ARDL bounds testing procedure, we find evidence of co-integration between variables of the model, based on the lagged ECT_{it-1} and F -test results. We calculate half-life estimates which suggest that the trade balance will adjust rather quickly to any changes in the

tenge.³ On average, the trade balance would adjust to exchange rate devaluation within two to three quarters, with the response being fastest for France and Romania (within one quarter) and slowest for Canada (more than six quarters).

- While there is cointegration in a number of countries, results from estimating the long-run models for Kazakhstan’s top trading partners suggest that real exchange rate devaluation, holding all else constant, would have a positive impact on the trade balance with France and Romania only. These two countries represent about 10 percent of Kazakhstan’s total trade. In most other models, the exchange rate coefficients showed the expected positive sign but were statistically insignificant.

6. About 40 percent of Kazakhstan’s external trade is unaffected by currency devaluation. The results for China, Germany, Italy, Japan, Netherlands, Turkey, and the United States indicate neither short- nor long-run devaluation effects on the trade balance, controlling for the effects of domestic and foreign incomes. These countries combined represent around 40 percent of Kazakhstan’s total external trade.

7. The estimation results are robust to a number of diagnostic tests. Our results reveal that the estimated models are mostly free from serial correlation or misspecification as indicated by the Lagrange Multiplier (LM) test and Ramsey’s RESET test. The cumulative sum (CUSUM) and CUSUM of squares (CUSUMSQ) tests of Brown and others (1975) show that parameters of the model are stable (see Figure for an example from the model with France).⁴



³ Half-life is calculated as: $\ln(0.5)/\ln(1-|\hat{\delta}|)$ where $|\hat{\delta}|$ is the absolute value of the coefficient on the lagged error correction term, ECT_{it-1} . Half-life estimates tell how quickly the trade balance adjusts to restore the long-run equilibrium relationship with RHS variables following any short-run disequilibrium or shocks.

⁴ These two statistics are bounded by 5 percent significance level lines. If any point is beyond this level, the null hypothesis of stable parameters is rejected.

8. Given the structure and composition of Kazakhstan’s external trade, these results suggest that the recent devaluation of the tenge may induce some short-run improvements in the trade balance, but have little long-run effects. Kazakhstan’s oil exports constitute around 80 percent of its total exports, so the recent devaluation of the tenge is unlikely to have much effect on the export side of Kazakhstan’s trade balance going forward. Some improvement in the trade balance, however, mostly in the short–run, may be expected from the import side. These results suggest that the exchange rate devaluation, as a tool or policy instrument, may not be so successful in gaining external competitiveness; rather what is needed is a more diversified and competitive export structure.

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