Kazakhstan's Accession to the WTO: A Quantitive Assessment

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ABSTRACT

IN LIGHT OF Kazakhstan's interest to join the World Trade Organization (WTO), this paper investigates the impact of the WTO accession on trade flows by using a standard gravity model. It argues that accession to the WTO involves a short run benefit from further reducing tariff and non-tariff barriers, and a long-term strategy that involves institutional reforms. The results indicate that, although Kazakhstan's trade policy with its major partners is well in place, it still has weak market institutions, and gains from accession to the WTO will work best with complementary institutional reforms.

1. INTRODUCTION*

TRANSITION FROM A planned economy to a market economy entails major changes in institutions and, probably, changes in the direction of trade flows. According to recent studies (Kurkharchuk & Maurel, 2004, Rose, 2005) improving the quality of institutions or belonging to a trading bloc can have substantial positive effects on trade. The objective of this chapter is to evaluate the potential benefit of Kazakhstan's accession to the World Trade Organization (WTO). The idea is that accession to the WTO involves a short run benefit from further reducing tariff and non-tariff barriers, and a long-term strategy that involves institutional reforms.

Economic reform in Kazakhstan began in the 1990s, and its endeavours to shift from a transition economy to a market economy have been substantial. It is argued in this paper that although Kazakhstan's trade policy with its major partners is well in place, it still has weak market institutions. So Kazakhstan's accession to the WTO will work best with complementary institutional reforms. This result is in line with the recent study carried out by Jensen & Tarr (2007) on Kazakhstan's accession to the WTO. Indeed, Jensen and Tarr employ a computable, general equilibrium model of the Kazakh economy and find that gains from tariff reform and market access amount to very little compared to large gains derived from removing barriers on foreign direct investment in services.

To provide estimates of the impact of institutional reform on Kazakhstan's potential trade, this chapter uses conventional empirical methodology and standard data sets. The empirical model chosen is the basic gravity model that is augmented to investigate the impact of institutions on trade and to provide estimates of Kazakhstan's trade flows with its major trading partners. The aim of the study is not to provide any new theory or methodology, but rather to use existing models to provide results for Kazakhstan's economic integration. The rest of the chapter is structured as follows. Sections 2 and 3 present the gravity model, the econometric methodology used to determine the results and the data set. The empirical results are discussed in Section 4 and finally, the chapter concludes in Section 5.

2. ECONOMETRIC METHODOLOGY

To ESTIMATE THE effects of trade policy reform and institutions on potential trade, the quantitative analysis relies on the standard gravity model of bilateral trade. In its simplest from, the gravity equation states that bilateral trade between two countries is an increasing function of the incomes of the two trading entities and a decreasing function of the distance between them. The gravity equation has performed extremely well empirically and provides a natural benchmark to which a number of other explanatory variables can in turn be added.[1] This study follows the recent work of Babetskaia-Kurkharchuk & Maurel (2004) on Russia's accession to the WTO, and augments the basic gravity model with two sets of variables. These include: indexes for institutions (e g, trade policy, a measure of tariff and non-tariff barriers) and a set of dummy variables indicating Kazakhstan's trade partners (e g, trade flows from Kazakhstan to the European Union).

The exact specification of the gravity model to be estimated is as follow

$$\ln X_{ij} = \alpha_0 + \alpha_1 \ln Y_j + \alpha_2 \ln Y_j + \alpha_3 \ln D_{ij}$$

$$+ \alpha_4 \, Trade \, Policy_j + \alpha_5 \, Foreign \, Investment_j + \alpha_6 \, Financial \, Services_i$$

$$+ \alpha_7 \, Corruption_{ij} + \sum_k \gamma_k \, DUM_k + \varepsilon_{ij}$$

THE SUBSCRIPTS INDICATE trade flows from the exporting country *(i)* to the destination county *(j)*. The dependent variable X_{ij} denotes the value of real exports from country *i* to country *j*. Explanatory variables Y_i and Y_j denote respectively the level of real GDP in countries *i* and *j*. They are expected to have a positive sign, because they capture the idea that higher income countries will tend to trade more with each other. The variable D_{ij} denotes the geographical distance from the capital of country *i* to the capital of country *j* and is used as proxy for transportation costs. Distance is expected to have a negative impact on bilateral trade.

The next set of variables is used to augment the model in order to investigate the impact of institutions on Kazakhstan's bilateral trade. The institutional variables used in the model are collected from the *Index of Economic Freedom*, which are composed of indexes that influence economic growth. Each index is graded using a scale from 0 to 100, where 100 signifies an environment that is most conductive to economic freedom. Given that more freedom encourages trade, the sign of the index variables on trade are expected to be positive.

The first variable selected is *Trade Policy$_j$*, which indicates trade freedom in the destination country *(j)*. Trade Policy is a measure of the absence of tariff and non-tariff barriers that encourage the free flow of foreign commerce. The second is *Foreign Investment$_j$*, a variable for openness to foreign investment in country *(j)*. This variable is of particular interest, because as mentioned by Jensen & Tarr (2007), Kazakhstan has done more to lower its tariffs than it has to liberalize its barriers to foreign direct investment. The third variable among this group is *Financial Services$_i$*, the exporting country *i*'s banking services and especially their independence from government control. The availability of competent financial institutions plays an important role in increasing the productivity of Kazakh firms and promoting international trade. Finally, a measure of *Corruption$_{ij}$* is included to control for corruption differences between the trading entities. As opposed to the other control variables, the latter is measured in terms of the absolute value of the difference of the two trading partners' freedom of corruption index. Its coefficient is expected to be negative; because the higher the difference in corruption between the countries, the more reluctant they are to trade. The reason for doing so is methodological and it is to reduce multicolliniarity among the institutional variables.

The last variables *DUM$_k$* denote dummy variables, which are configured to identify Kazakhstan's exports to and imports from its major trading partners, namely the European Union (EU-15), the

Central and Eastern European Counties (CEEC), the Commonwealth of Independent States (CIS), China, and the Rest of the World (RoW).[2] Theses variables capture the trade bias with a trading partner. For example, the dummy variable Kazakhstan → CIS is equal to one whenever the exporting country is Kazakhstan and the importing partners the CIS. Thus, CIS → Kazakhstan denotes CIS country exports into Kazakhstan. These dummy variable are created to assess effective trade relative to potential trade.

The gravity equation is estimated using ordinary least squares (OLS) with standard errors that are robust to clustering by country-pairs. A set of year dummies are also included to control for business cycles. Furthermore, the gravity equation is also estimated using generalized least square or random effects (GLS) as a robustness check.

3. KEY DATA

THE TRADE DATA, which covers the period from 1995 to 2006, comes from the IMF's Direction of trade statistics (DOTS) obtained from the Thomson Datastream database. It contains data on the value of exports between each country and all its trading partners. The list of exporting countries and destination countries is included in Table A.1 in the appendix. Total exports are valued free on board (FOB) and are recorded in current American dollars, so the data is deflated using the CPI of each exporting country, using the World Bank's World Development Indicators (WDI 2007). The real GDP data (in constant American dollars) is also obtained from the WDI 2007. Information on distances between trading countries are collected using the CEPII online database <www.cepi.fr> and the institutional indexes come from the Heritage Foundation (2007), *Index of Economic Freedom* that can be found at <www.heritage.org/Index/>. The panel data obtained consists of 34,763 observations, which allows consistent estimation for the chosen explanatory variables.

4. EMPIRICAL FINDINGS

ESTIMATIONS OF THE gravity model, using ordinary least squares (OLS) corrected for heteroskedasticity and generalized least square (GLS or random effects) are respectively reported in column 1 and 2 of Table 1. The good news is that both regressions show that the model works well. Countries that are farther apart trade less, while economically larger and richer countries trade more. These results are interpreted by the sign of the coefficients associated to each variable. For example, according to the OLS specification, the coefficient for the GDP of the destination country (1n real GDP_j) is 0.77, which implies that the larger its GDP the higher its imports. These basic gravity coefficients are not only large but economically very significant and in line with previous research.

Beyond the basic gravity model, the model reveals that institutions have substantial effects on trade. All intuitional coefficients are statistically different from zero and highly significant. A sound trade policy that lowers tariff and non-tariff barriers and improves market access improves trade. Reduction in barriers against foreign investments will also in return be beneficial to the economy by promoting the free flow of capital. Moreover, improving financial services and their independence from government interference reduces inefficiencies in the credit market and fosters economic growth. Corruption in this model is expressed in terms of the absolute value of the difference of the two trading partners' corruption levels, and it is configured so that a higher value is associated with greater corruption. The coefficient associated to corruption is negative, implying, as hypothesized, that corruption is an obstacle to trade.

TABLE 1: THE GRAVITY EQUATION ESTIMATION

	OLS	GLS
ln real GDP$_i$	1.00*** (0.01)	1.00*** (0.01)
ln real GDP$_j$	0.77*** (0.01)	0.79*** (0.01)
ln D$_j$	-1.06*** (0.03)	-1.05*** (0.01)
Trade Policy$_j$	0.46*** (0.15)	0.58*** (0.08)
Foreign Investment$_j$	0.37*** (0.12)	0.25***(0.07)
Fiancial Services$_i$	0.77*** (0.11)	1.08*** (0.06)
Difference in corruption$_{ij}$	-0.65*** (0.10)	-0.42*** (0.05)
Kazakhstan → EU-15	0.23 (0.32)	0.03 (0.19)
Kazakhstan → CEEC	1.20*** (0.29)	1.32*** (0.20)
Kazakhstan → CIS	2.59*** (0.37)	2.71*** (0.17)
Kazakhstan → RoW	-0.24 (0.24)	-0.27** (0.12)
Kazakhstan → CHINA	2.46*** (0.24)	1.44*** (0.32)
EU-15 → Kazakhstan	0.48 (0.34)	-0.45** (0.22)
CEEC → Kazakhstan	1.03*** (0.18)	0.84**
CIS → Kazakhstan	2.72*** (0.07)	1.53*** (0.40)
RoW → Kazakhstan	-0.83*** (0.29)	-0.83*** (0.18)
CHINA → Kazakhstan	2.27*** (0.28)	1.13 (1.00)
Observations	34,763	34,763
R-squared	0.61	0.61

Notes: Regressand: ln real exports. OLS with year dummies and corrected for heteroskedasticity (intercept not reported). GLS refers to random effects. Robust standard errors in parentheses. The goodness of fit is measured by adjusted R-squared for OLS and overall R-squared for the random effects.
** Denotes significance at 5 % level.
*** Denotes significance at 1 % level.

THE DUMMY VARIABLES, which are designed to distinguish Kazakhstan's exports and imports from its main trading partners, also reveal several interesting points. The dummy coefficients can be used to compute effective trade as a percentage of potential trade to be able to determine if the trade level is above what it would be if it was determined solely by the gravity model. The results of the computation are presented in Table 2. According to the OLS regression, Kazakhstan's exports to the CIS reveals a coefficient of 2.59, which implies that exports to the CIS are 13 times (1,333 percent) more than the gravity equation average.[3] Although the magnitude seems to be astonishing, the result is in line with previous research that has been carried out on trade within the CIS countries (Babetskaia-Kurkharchuk & Maurel, 2004).

TABLE 2: EFFECTIVE TRADE RELATIVE TO POTENTIAL TRADE (IN %)

ECONOMETRIC PROCEDURE	OLS	GLS
Kazakhstan → CIS	1333	1503
Kazakhstan → CHINA	1170	422
Kazakhstan → CEEC	332	374
Kazakhstan → EU-15	100	100
Kazakhstan → RoW	100	76
CIS → Kazakhstan	1518	462
CHINA → Kazakhstan	968	100
CEEC → Kazakhstan	280	232
EU-15 → Kazakhstan	100	64
RoW → Kazakhstan	43	44

Notes: Table 2 shows how Kazakhstan trades with its partners. The values indicate by how much Kazakhstan's imports or exports are above (or below) the normal value. For example, using the OLS estimates, Kazakhstan's exports to the CEEC countries is 3 times (332 %) above its normal level and its imports from the RoW is 43 % below its normal potential. Note that 100 signifies that the coefficient of the variable is not significant, which suggests that the potential increase in trade has still not occurred, thus not much can be deduced.

Regarding exports to China, the magnitude is about the same as Kazakh exports to CIS countries. This again is not surprising, given China's economic growth, its dependency on energy resources, and the fact that it shares a border with Kazakhstan.

According to both the OLS and GLS estimates, Kazakhstan's trade with the EU-15 and the rest of the world (RoW) is depressed. The GLS procedure indicates that exports from Kazakhstan to the RoW are at 76 % of their normal level, while imports from the rest of the world stand only at 44 % and at 64 % with the EU-15. A final remark is to note that Kazakhstan's export profile is stronger than its imports, suggesting that economic reform would probably benefit Kazakhstan's imports more.

To assess the impact of institutions on trade, the rest of the analysis will compare actual trade with a counterfactual situation in which institutions in Kazakhstan had attained the level of quality of the EU-15 institutions. Table 3 reports the scores of institutional variables in both Kazakhstan and the EU-15.

TABLE 3: INSTITUTIONAL SCORES IN KAZAKHSTAN AND THE EU-15

INDEX OF FREEDOM: 2007 SCORES	INSTITUTIONS IN KAZAKHSTAN	INSTITUTIONS IN THE EUROPEAN UNION (AVERAGE SCORE)
Trade Policy	69	85
Foreign Investment	30	77
Financial Services	60	71
Corruption level	26	77

Source: Index of Economic Freedom, The Heritage Foundation.

As can be seen, institutions in the European Union perform better than the institutions in Kazakhstan. So an improvement in institutions should have a positive impact on trade as suggested by the gravity model. The potential increase in trade due to institutional improvements is reported in Table 4.[4]

TABLE 4: IMPACT OF INSTITUTION IMPROVEMENT ON KAZAKHSTAN'S TRADE (IN %)

	POTENTIAL INCREASE IN TRADE
Trade Policy	8
Foreign Investment	19
Financial Services	9
Corruption level	40
TOTAL	**75**

THE MODEL SUGGESTS that if institutions in Kazakhstan attained the level of those in the EU-15, trade would increase by 75 percent. Much of this increase, at 40 percent, is due to improvements in corruption. Theses findings suggest that in the short run, gains to Kazakhstan from joining the WTO are 8 percent due to improvement in trade policy. In the medium to long run, the regulatory and institutional reforms that the WTO accession process entails would bring benefits. The potential trade gains due to institutional reforms could be as high as 68 percent.

5. CONCLUSION

THIS PAPER DEVELOPED an empirical model to examine Kazakhstan's accession to the WTO. A gravity model was used to assess Kazakhstan's trade flows with its major partners and to investigate whether and how institutional improvements facilitate trade growth. The first result from assessing Kazakhstan's imports and exports suggests that further liberalization would benefit Kazakhstan's imports more than its exports. The second result of the quantitative analysis indicates that institutions play an important role in determining trade flows. Higher institutional qualities make trade more attractive and profitable by providing an environment that is conducive to safe exchanges. The largest gains to be made by Kazakhstan from WTO accession are the reduction in corruption and the liberalization of foreign investments, which are long-term objectives. So it should be noted that membership to the WTO is not sufficient to increase trade without complementary institutional reforms.

6. APPENDIX

APPENDIX A.
TABLE A1: TRADING ENTITIES IN THE SAMPLE

SAMPLE EXPORTING COUNTRIES		SAMPLE DESTINATION COUNTRIES	
EU-15 COUNTRIES	**ROW COUNTRIES**	AFGHANISTAN I.S. OF	LATVIA
		ALGERIA	LITHUANIA
AUSTRIA	BRAZIL	ARGENTINA	LUXEMBOURG
BELGIUM	CANADA	ARMENIA	MALAYSIA
DENMARK	CHINA	AUSTRALIA	MEXICO
FINLAND	KOREA R.O.	AUSTRIA	MOLDOVA
FRANCE	EGYPT	AZERBAIJAN	MONGOLIA
GERMANY	UNITED STATES	BAHAMAS THE	MOROCCO
GREECE	TURKEY	BANGLADESH	NETHERLANDS
IRELAND	ISRAEL	BELARUS	NEW ZEALAND
ITALY	JAPAN	BELGIUM	NORWAY
LUXEMBOURG	NORWAY	BRAZIL	OMAN
NETHERLANDS	SWITZERLAND	BULGARIA	PAKISTAN
PORTUGAL	THAILAND	CANADA	PANAMA
SPAIN	INDIA	CHINA	PERU
UNITED KINGDOM		COLOMBIA	PHILIPPINES
SWEDEN		CROATIA	POLAND
		CYPRUS	PORTUGAL
CEEC COUNTRIES		CZECH REPUBLIC	ROMANIA
		DENMARK	RUSSIA
BULGARIA		ECUADOR	SAUDI ARABIA
HUNGARY		EGYPT	SINGAPORE
CZECH REPUBLIC		ESTONIA	SLOVAK REPUBLIC
POLAND		FINLAND	SLOVENIA
ROMANIA		FRANCE	SOUTH AFRICA
SLOVAK REPUBLIC		GEORGIA	SPAIN
SLOVENIA		GERMANY	SWEDEN
ESTONIA		GREECE	SWITZERLAND
LATVIA		HONG KONG	SYRIAN ARAB REPUBLIC
LITHUANIA		HUNGARY	TAJIKISTAN
		INDIA	THAILAND
CIS COUNTRIES		INDONESIA	TUNISIA
		IRAN I.R. OF	TURKEY
BELARUS		IRELAND	TURKMENISTAN
KAZAKHSTAN		ISRAEL	UKRAINE
RUSSIA		ITALY	UNITED ARAB EMIRATES
UKRAINE		JAPAN	UNITED KINGDOM
		JORDAN	UNITED STATES
		KAZAKHSTAN	UZBEKISTAN
		KOREA R.O.	VIETNAM
		KYRGYZ REPUBLIC	

APPENDIX B.

COMPUTATIONS REQUIRED FOR TABLE 4

To ASSESS THE potential increase in trade from institutional improvements, the table compares the actual trade to a counterfactual situation in which institutions in Kazakhstan reach the level of institutional quality in the EU-15. For example, an increase in the trade policy index from 69 to 85 (Table 3) would yield an increase in trade that is measured in logarithms a $\triangle \ln X$. To compute this increase it should be noted from equation (1) that:

$$\triangle \ln X = \alpha_4 \left(Trade\ Policy^{EU} - Trade\ Policy^{KZ} \right)$$
$$= 0.46\,(0.85\text{-}0.69)$$

from which it follows that

$$e^{\triangle \ln X} - 1 = e^{0.46(0.85\text{-}0.69)} - 1$$
$$= 8\%$$

The term $e^{\triangle \ln X} - 1$ represents the potential increase in trade implied by an improvement from the initial score 69 to the EU-15 value of 85.

7. REFERENCES

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8. ENDNOTES

1. More discussion of the gravity model can be found in Feenstra (2004) and Anderson & Wincoop (2003).

2. The European Union is split into the EU-15, which refers to the 15 European countries before the enlargement, and the CEEC, which refers to the 10 Central and Eastern European Countries that have joined the EU since 2004. Cyprus and Malta are not included. The reason for splitting the European Union into two blocs is that Kazakhstan tends to trades more with CEEC countries, and furthermore, the data runs from 1996 to 2006, during which time the EU was mainly composed of the 15 original members. The list of all countries is included in the Appendix A..

3. Since the regressand is the natural logarithm of real trade, the ratio of effective trade relative to potential trade is equal to .

4. The computations required to obtain these results are provided in Appendix B.