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MAKROIQTISODIYOT

THE GRAVITY TRADE MODEL FOR UZBEKISTAN

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Abstract. The generalized gravity model is used to analyze the trade between Uzbekistan and its main trading partners using the panel data estimate technique, and an attempt is made to establish a theoretical rationale for its use in the analysis of bilateral trade. The gravity model of commerce (the total of exports and imports), the gravity model of export, and the gravity model of import have all been estimated. Our findings indicate that the size of the economies, differences in per capita GNP, and openness of the trading nations all favorably influence trade with Uzbekistan. Uzbekistan’s exports are mostly determined by the exchange rate, overall import demand from partners, and Uzbekistan’s economic openness. Positive effects on Uzbekistan’s exports are caused by all three elements. Contrarily, the exchange rate has no bearing on Uzbekistan’s imports, which are instead influenced by the inflation rates, disparities in per capita income, and trade openness of the participating nations. It has been discovered that the cost of transportation significantly affects Uzbekistan’s trade negatively. The border between Uzbekistan and Kazakstan is also proven to have a significant impact on imports into Uzbekistan. The country-specific impacts demonstrate that Uzbekistan would prosper more if it increased trade with its neighbors. Factors associated with multilateral barriers favorably impact Uzbekistan’s exports and trade.

Keywords. Gravity Model, Export model, Import model, Panel Data, Uzbekistan’s Trade.

O‘ZBEKISTON UCHUN GRAVITATSION SAVDO MODELI

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Annotatsiya. Umumlashtirilgan gravitatsiya modeli O‘zbekiston va uning asosiy savdo hamkorlari o‘rtasidagi tovar ayirboshlashni panel ma’lumotlar smetasi texnikasidan foydalangan holda tahlil qilish uchun qo‘llaniladi va ikki tomonlama savdoni tahlil qilishda undan foydalanishning nazariy asoslarini yaratishga harakat qilinadi. Savdoning gravitatsion modeli (eksport va importning umumiy hajmi), eksportning tortish modeli va importning tortishish modeli hisoblangan. Bizning xulosalarimiz shuni ko‘rsatadiki, iqtisodiyotlarning kattaligi, aholi jon boshiga to‘g‘ri keladigan yalpi ichki mahsulotdagi farqlar va savdo qiluvchi mamlakatlarning ochiqligi O‘zbekiston bilan savdoga ijobiy ta’sir ko‘rsatmoqda. O‘zbekiston eksporti asosan valyuta kursi, sheriklarning umumiy import talabi va O‘zbekistonning iqtisodiy ochiqligi bilan belgilanadi. O‘zbekiston eksportiga ijobiy ta’sir ko‘rsatayotgan uch omil ham. Aksincha, valyuta kursining O‘zbekiston importiga ta’siri yo‘q, buning o‘rniga inflyatsiya sur’atlari, aholi jon boshiga to‘g‘ri keladigan daromadlarning nomutanosibligi va ishtirokchi davlatlarning savdo ochiqligi ta’sir ko‘rsatadi. Tashish narxi O‘zbekiston savdosiga sezilarli darajada salbiy ta’sir ko‘rsatishi aniqlangan. O‘zbekiston va Qozog‘iston o‘rtasidagi chegara ham O‘zbekistonga importga sezilarli ta’sir ko‘rsatishi isbotlangan. Mamlakatga xos ta’sirlar shuni ko‘rsatadiki, O‘zbekiston qo‘shnilari bilan savdo aylanmasini oshirsa, yanada gullab-yashnaydi. Ko‘p tomonlama to‘siqlar bilan bog‘liq omillar O‘zbekiston eksporti va savdosiga ijobiy ta’sir ko‘rsatmoqda.

Kalit so‘zlar. Gravitatsiya Modeli, Eksport modeli, Import modeli, Panel Data, O‘zbekistan savdosi

Introduction:

Trade is a crucial component of an economy’s overall national development and progress. This is indeed a key tool for industrialization, whereas sustained economic growth depends on having access to foreign cash. Uzbekistan’s economy is significantly reliant on its foreign commerce sector, however the

nation consistently has a balance of payments deficit. There are no encouraging signs in Uzbekistan's commercial connections with other nations, particularly with Developed nations, for the desired contribution to the nation's economic progress. This study uses the panel data estimate technique in an effort to identify the key determinants of Uzbekistan's commerce. For our investigation, we used a generalized gravity model.

The economy of Uzbekistan is heavily dependent on its sector of foreign trade, although the country continuously experiences a balance of payments deficit. There are no indicators that Uzbekistan would be able to make the needed contribution to the country's economic growth through its trade relations with other countries, notably with the CIS countries. This study use the panel data estimate method in an effort to pinpoint the major factors influencing Uzbekistan's trade. We utilized a generalized gravity model in our study.

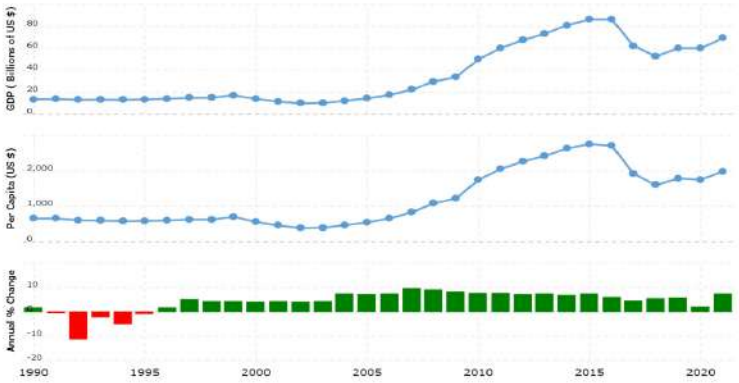

Figure 1: Uzbekistan GDP from 1990 to 2020.
Source: https://data.worldbank.org/indicator/

Real GDP growth increased from 4.5 percent in 2017 to 5.1 percent in 2018 and then to 5.3 percent year-over-year in the first quarter of 2019. These increases were the result of a spike in investment and an uptick in consumption. With the help of market reforms to eliminate production bottlenecks and liberalize the economy, growth is predicted to increase to 6% in 2021. Inflation for the whole year of 2018 averaged 17.5 percent on an annual basis after reaching a peak of 20 percent in January and falling to 14.3 percent by December. By April 2019, the inflation rate for consumer goods had decreased even further, at 13.7%.

Due to (i) the continuous liberalization of administrative pricing, notably those for electricity and water; (ii) enhanced policy financing through state-owned banks to stimulate investment development; and (iii) public salary increases, inflationary pressures are projected to prevail in 2019–20. For inflation to decline by 2021, monetary and credit policies will need to be tightened.The current account deficit in 2018 was increased by imports of consumer goods to satisfy unmet consumer demand as well as imports of technology and equipment to modernize industry. Over the medium term, the deficit is probably going to go less, but it'll still be big. Increased donor funding and a steady rise in foreign direct investment (FDI) inflows are projected to finance the external deficit.

Figure 2: Uzbekistan trade to GDP ratio.
Source: https://data.worldbank.org/indicator/

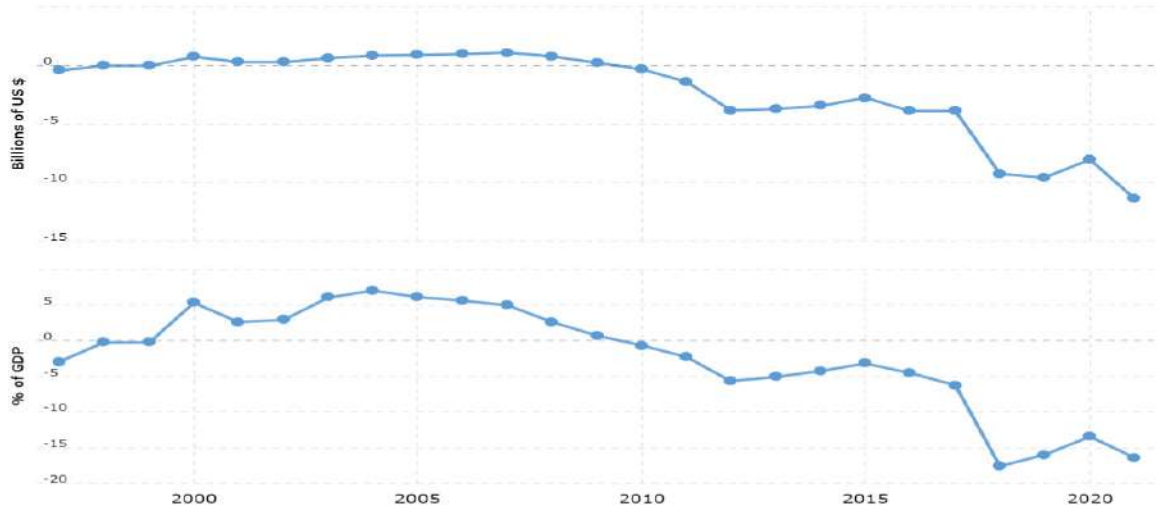

Figure 3: Uzbekistan trade balance
Source: https://data.worldbank.org/indicator/

While net exports' contribution to GDP growth in 2018 was predicted to have slowed it by 7.1 percent, domestic demand still made up 12.2 percent of GDP growth, mostly due to high fixed investment growth. In turn, the latter profited from significant increases in government credit to finance capital expansions, mostly through SOEs. On the supply side, economic activity increased in the manufacturing and construction industries (by 10.4% and 9.9%, respectively), while it slowed down in agriculture (mostly cotton and wheat) to 0.3 percent.

Literature Review:

The origins of the gravity model of global commerce date back to Dutch economist Tinbergen in 1962. Together with Ragnar Frisch, Jan Tinbergen received the first Nobel Prize in Economics for their contributions to the creation and use of dynamic models for the understanding of economic processes later in 1969. Poyhonen (1963), who conducted the study independently of Tinbergen, employed an analogous method to explain the bilateral trade in products between nations. A significant analysis of the original gravity equation was later the subject of Linnemann's and Linder's (1961 and 1966, respectively) PhD theses.

Bussière et al. (2005) used the gravity model to assess the evolution of multilateral trade among the nations of Central and Eastern Europe since 1980. They were able to determine which nations have well-advanced trade integration with the euro area and which still have a lot of room for it with the use of a rather basic gravity model. Following the addition of five new variables to the fundamental model linking trade flows and economic size, such as shared language, free trade agreements, or common border, they emphasized the importance of a very rigorous assessment of the model's fixed effects for a valid interpretation of the findings.

A popular method for estimating the effects of different regional trade agreements, public export guarantees, trade obstacles, and other trade-related factors is the gravity model. Even though it has been used for years, there are still a lot of doubts. Choosing the best econometric estimating technique is a basic difficulty.

Herrera (2010) offers a very thorough summary of research using several techniques to estimate the gravity equation. She created a lengthy list of the most recent research articles on this issue by outlining the majority of the approach that has been used in recent years in basic terms.

Others, such as Burger et al. (2009), Westerlund and Wilhelmsson (2011), Martin and Pham (2008), Martnez-Zarzoso et al. (2007), or Siliverstovs and Schumacher (2008), have compared several ways to estimate the gravity model and come to differing conclusions. The “Log of Gravity” by Silva and Tenreyro (2006) appears to be the most important publication since Anderson and van Wincoop (2003) first proposed their micro-founded gravity model. Nearly every publication on gravity published

after 2006 makes reference to their work and, if not directly applicable, at least mentions or examines the estimate method—the Poisson Pseudo Maximum Likelihood method—that the authors suggest is the most appropriate. The study by Arvis and Shepherd (2013), which emphasized the advantageous characteristics of PPML in comparison to conventional loglinearized OLS estimation, is an example of the validation of Silva and Tenreyro's findings.

Methodology:

During our study, we gathered information from the IMF and other associated organizations' websites, working papers, and the WorldBank, which includes data from 1992 to 2022. This aided in estimating variables and providing clear findings while making judgments. We computed some of the data. We investigated the econometric model using tools such as Stata, R, and Python.

Data includes Nominal GDP, Inflation rate (CPI), Interest rate, Export Import and Official exchange rate of main trading countries namely, Russia, China, Kazakstan and Uzbekistan from the year 1995 to 2021.

Our research includes 17 nations. The nations were picked based on the importance of their commercial relationship with Uzbekistan and the availability of necessary data. CIS includes ten nations (9 member states and 1 associate state): Uzbekistan, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, and Turkmenistan. We were unable to add Armenia and the Moldova because they lacked data for the majority of the years in our sample period. Our sample also includes China, Turkey, South Korea, Ukraine, Germany, India for the examination of Uzbekistan's commerce.

All observations are made on an annual basis. The World Bank's World Development Indicators (WDI) database is used to gather statistics on GNP, GDP, GNP per capita, GDP per capita, population, inflation rates, total exports, total imports, taxes on international trade (% of current revenue), and CPI. The International Financial Statistics (IFS), a CD-ROM database of the International Monetary Fund (IMF), provides data on exchange rates, index numbers of export and import prices. Data on Uzbekistan's exports of goods and services to all other countries (country j), imports of goods and services from all other countries (country j), and total trade in goods and services (exports plus imports) with all other countries included in the sample are obtained from the IMF's Direction of Trade Statistics Yearbook (various issues). The distance (in kilometers) between Tashkent (Uzbekistan's capital) and other capital cities in nation j (as the crow flies) is collected from an Indonesian website: www.indo.com/distance.

The data was collected from 1992 to 2021 (30 years). We cannot proceed beyond this time period since Uzbekistan gained independence in August, 1991.

We calculate three gravity models of commerce in Uzbekistan using our data set: (a) the gravity model of trade (exports + imports); (b) the gravity model of exports; and (c) the gravity model of imports. We used Frankel (1993), Sharma and Chua (2000), and Hassan (2000, 2001) as our guides for the model (a). The product of GNP/GDP and the product of GNP/GDP per capita have been utilized as independent variables since bilateral trade (the total of exports and imports) between pairs of nations is the dependent variable in the gravity model. Our model now includes a few extra independent variables. In this study, the gravity model of trade is as follows:

$$\log(X_{ijt}) = \alpha_0 + \alpha_1 \log(GNP_{it} * GNP_{jt}) + \alpha_2 \log(PCGNP_{it} * PCGNP_{jt}) + \alpha_3 \log(Tax_{it} * Tax_{jt}) + \alpha_4 \log(Distance_{ij}) + \alpha_5 \log(PCGNPD_{ijt}) + \alpha_6 (TR/GDP_{it}) + \alpha_7 (TR/GDP_{jt)} + \alpha_8 (Border_{ij}) + \alpha_9 (j - CIS) + U_{ijt}$$

Here,

$X_{ij} = X_{ij}$ = Total trade between Uzbekistan (country i) and country jj, $GNP_i(GNP_j) = GNP_i(GNP_j)$ = Gross National Product of country i $(j)(j)$, $PCGNP_i(PCGNP_i(PCGNP_j) = _j) =$ Per capita GNP of Country i (j), $Tax_i(Tax_j) = Tax_i(Tax_j)$ = Trade tax as $\%\%$ of revenue of

country $i(j)i(j)$, Distance $_{ij} = _{ij}$ = Distance between country ii and country jj, PCGNPD $_{ij} = _{ij} =$ Per capita GNP differential between country ii and jj, $TR/GDP_{i(j)} = TR/GDP_{i(j)}$ = Trade- GDP ratio of country $i(j)i(j)$, Border $_{ij} = _{ij}$ = Land border between country ii and jj (dummy variable), $j - CIS = j - CIS$ = Country jj is member of CIS (dummy variable), $U_{ij} = U_{ij}$ = error term; $t = t =$ time period, $\alpha_s = \alpha_s$ = parameters.

We take into consideration the following model for analyzing the gravity model of Uzbekistan's export:

$$lX_{ijt} = \beta_0 + \beta_1 lY_{it} + \beta_2 lY_{jt} + \beta_3 ly_{it} + \beta_4 ly_{jt} + \beta_5 lD_{ijt} + \beta_6 lyd_{ijt} + \beta_7 lER_{ijt} + \beta_8 lIn_{it} + \\ + \beta_9 lIn_{jt} + \beta_{10} lTE_{it} + \beta_{1l} lTI_{jt} + \beta_{12}(IM/Y)_{jt} + \beta_{13}(TR/Y)_{ji} + \beta_{14}(TR/Y)_{jt} + + \sum \delta\_h\, P\_ijht + U\_$$

where, $X = X =$ exports, $Y = GDP, y = Y = GDP, y =$ per capita GDP, $D = D =$ distance, $yd = yd =$ per capita GDP differential, $ER = ER =$ exchange rate, $In = In =$ inflation rate, $TE = TE =$ total export, $TI = TI =$ total import, $IM/Y = IM/Y =$ Import-GDP ratio, $TR/Y = TR/Y =$ trade-GDP ratio, $P = P =$ preferential dummies. Dummies are: D1 $= j =$ j-Russia, D2=j-China, D3= j-Turkey, D4 = j-Kazakstan, D5= j-Germany, D6 $= j = j$ - others and $D7 = D7 =$ border $_{ij}, l = _{ij}, l =$ natural $\log\log$.

For the gravity model of Uzbekistan's imports, the following model is considered:

$$lM_{ijt} = \beta_0 + \beta_1 lY_{it} + \beta_2 lY_{jt} + \beta_3 ly_{it} + \beta_4 ly_{jt} + \beta_5 lD_{ijt} + \beta_6 lyd_{ijt} + \beta_7 lER_{ijt} + \beta_8 lln_{it} + \beta_9 lln_{jt} + \\ \beta_{10(}EX/Y)_{jt} + \beta_{11}(TR/Y)_{ji} + \beta_{12}(TR/Y)_{jt} + \sum \delta_h P_{ijht} + U_{ijt}$$

Here, $M = M =$ import, $EX/Y = EX/Y =$ export/GDP ratio, and other variables are identical with those in export model.

Analysis And Results:

We have made an effort to determine how multilateral opposition has affected commerce with Uzbekistan. The GDP weighted average of distance from trading partners and the Consumer Price Indices (CPI) of trading partners have been taken into consideration as multilateral resistance variables in accordance with Baier and Bergstrand (2003) and Feenstra (2003) (data on commodity prices or commodity price indices for Uzbekistan are not available). CPI is being included as a multilateral resistance. Re-estimating the gravity model for Uzbekistan trade [equation (a1)] reveals that the variables GNPij and (Trade / GDP)ij are not significant, however CPIij is. The small sample size in this instance may be the cause of the nonsignificant results for the GNPij and (Trade / GDP)j, which were significant in equation 1. There hasn't been information on Uzbekistan's CPI for a very long time.

Table 1

Descriptive Statistics of the Trade Model [Model (a)]

Series	Observation	Mean	Stan Dev	Minimum	Maximum
Ltradeij	177	1.48	0.79	-0.30	3.27
LGNPij	177	9.52	0.78	7.38	11.61
Ldisij	177	3.68	0.31	2.83	4.18
TR/GDPi	177	0.21	0.05	0.09	0.32

TR/GDPj	177	0.72	0.67	0.05	4.39
LPCGNPDij	177	3.49	1.14	0	4.64
ij border	177	0.03	0.17	0	1
J CIS	177	0.12	0.33	0	1

Descriptive Statistics of the Export Model [Model (b)]

Series	Observation(n)	Mean	Standard Deviation	Minimum	Maximum
log(log(UZB's Exp.)	143	0.954022164	0.815302507	-1	3.149527
loglog (dist)	143	3.688857745	0.322530148	2.826075	4.179063
Log(Exc.Rat)	143	0.337231669	0.968771228	-2.32932	2.982994
Log(T.Impi)	143	4.58683031	0.670836758	2.264374	6.095859
(Trade/GDP)i	143	0.21044804	0.054185706	0.090705	0.318445
D1(j-Russia)	143	0.142675159	0.349964251	0	1
D2(j-China)	143	0.142675159	0.349964251	0	1
D3(j-Kazakstan)	143	0.347770701	0.476566427	0	1
D4(j-Turkey)	143	0.107006369	0.309318427	0	1
D5(j-Korea)	143	0.100636943	0.30103919	0	1
D6(j-others)	143	0.159235669	0.366128987	0	1
D7(border)	143	0.03566879	0.18558125	0	1

Descriptive Statistics of the Import Model [Model (c)]

Series	Observation	Mean	Standard Deviation	Minimum	Maximum
Log(UZB's Imp.)	151	1.184799	0.907615396	-1	3.07144
$\log(PCGDPdiff)$	151	3.488645	1.148262107	0	4.9
log(Distance)	151	3.678608	0.305172855	2.826075	4.179063
Log(Infl Ratei)	151	0.831362	0.501990989	-0.54216	1.872019
Log(Infl Ratej)	151	0.781474	0.457576706	-1.16277	2.211678
(Trade/GDP)i	151	0.208188	0.053123643	0.090705	0.318445
(Trade/GDP)j	151	0.705687	0.651019471	0.050221	4.390288
D1(j-Russia)	151	0.124583	0.330429158	0	1
D2 (j-China)	151	0.152392	0.35960006	0	1
D3 (j-Kazak.)	151	0.319244	0.46644307	0	1
D4 (j Turkey)	151	0.093437	0.291206077	0	1
D5 (j-Korea)	151	0.171301	0.376981886	0	1
D6 (j-others)	151	0.139043	0.346184383	0	1
D7(border)	151	0.031146	0.173808127	0	1

The gravity model for Uzbekistan export has also been updated, with the addition of the CPI of trade partners as a multilateral resistance variable. Although two additional factors, the total import of country j and the trade-GDP ratio of country i, are determined to be unimportant, multilateral resistance variables are also shown to be significant in this instance. The tiny sample size mentioned above may be the cause of these two variables' lack of significance.

The distance variable has an expected negative sign and is significant even at the 1% level, indicating that Uzbekistan prefers to trade more with its close neighbors. The coefficient value is -1.23, meaning that the bilateral commerce between Uzbekistan and nation j reduces by 1.23% as the distance between the two countries rises by 1%.

Only the variables exchange rate, total import of nation j, and the trade-to-GDP ratio of Uzbekistan are shown to be highly significant (even at the 1% level) for our export model.The positive coefficient of exchange suggests that Uzbekistan's exports are dependent on the depreciation of its currency. It is clear

from the projected findings that 1% currency depreciation results in 0.34% more exports to j nations, all things being equal.

The target country effect may be regarded as the total imports of nation j. This variable's coefficient value is discovered to be high and has the expected positive sign. According to the anticipated results, Uzbekistan's exports grow somewhat faster than proportionally when nation j's overall import demand rises. (The correlation factor is 1.01).

Table 2

Multicollinearity Test.

a) Trade Model:

Original $R^2 = 0.52 R^2 = 0.52$ (from OLS)

When log (GNPi* GNP $))$ is the dependent variable, $R^2 = 0.48 R^2 = 0.48$

When log $(\mathrm{PCGNPD}_i)(\mathrm{PCGNPD}_i)$ is the dependent variable, $R^2 = 0.43 R^2 = 0.43$

When (Trade/GDP), is the dependent variable, $R^2 = 0.18 R^2 = 0.18$

When (Trade/GDP), is the dependent variable, $R^2 = 0.27 R^2 = 0.27$

(b) Exp. Model:

Original $R^2 = 0.44 R^2 = 0.44$ (from OLS)

When $\log(E_{1j})\log(E_{1j})$ is the dependent Variable, $R^2 = 0.01 R^2 = 0.01$

When $\log(TI_j)\log(TI_j)$ is the dependent Variable, $R^2 = 0.07 R^2 = 0.07$

When (Trade/GDP) is the dependent Variable, $R^2 = 0.07 R^2 = 0.07$

(c) Imp. Model:

Original $R^2 = 0.26 R^2 = 0.26$ (from OLS)

When $\log(\mathrm{PCGDPD}_{ij})\log(\mathrm{PCGDPD}_{ij})$ is the dependent variable, $R^2 = .09 R^2 = .09$

When $\log(\mathrm{InfI_i})\log(\mathrm{InfI_i})$ is the dependent variable, $\mathrm{R}^2 = 0.18 \mathrm{R}^2 = 0.18$

When $\log(\mathrm{lnfl}|_j)\log(\mathrm{lnfl}|_j)$ is the dependent variable, $R^2 = 0.14 R^2 = 0.14$

When (Trade/GDP), is the dependent variable, $R^2 = 0.27 R^2 = 0.27$

The model's R^2 and F values for goodness of fit are 0.79 and 87.37, respectively. Additionally, there are no issues with multicollinearity among the explanatory factors. The results from the autocorrelated error structured model are likewise very comparable in terms of magnitudes and signs. Despite giving the anticipated negative sign, inflation in nation j is now negligible. At a 5% level, only the border dummy is determined to be significant. The coefficient value is 1.68, which means that merely because of their shared border, Uzbekistan and Kazakstan's import commerce is 5.37 times greater [exp(1.68) = 5.37].

Table 3

Three models with the Gravity variables

Variables	Tr.Model	Exp. Model	Imp. Model
GNP	0.72		
GDPi		-0.48	0.50
GDPj		0.71	0.96
Distance	-1.45	-0.73	-1.62
R^2	0.45	0.31	0.44
F	740.30[1, 175)	175.25[2, 140]	349.23[2, 148]
Observation	177	143	151

** denotes significant at 1% level.*

Table 4

Correlation Matrices Correlation Matrix of Trade Model (a)

	tradeij	GNPij	TR/GDPi	TR/GDPj	PCGNPDij
tradeij	1				
GNPij	0.614429	1			
TR/GDPi	0.387645	0.339606	1		
TR/GDPj	0.180924	-0.18243	0.092504	1	
PCGNPDij	0.276294	0.514015	0.086055	0.27775	1

Correlation Matrix of the Export Model (b)

	Log(UZ's Exp.)	Log(Exc. Rate)	$\log(T.Imp_i)$	Trade/GDP)i
Log(Exc. Rate)	0.13346523	1		
$\log(T.Imp_i)$	0.622063324	0.113451808	1	
(Trade/GDP)i	0.384046956	0.057624011	0.25481981	1

Correlation matrix of the Import model(c)

	Uz's Imp	$ydij$	Ini	Inj	$(TRY)I$	$(TRY)j$
Uz's Imp	1			or		
ydij	0.257346	1				
Ini	-0.11033	-0.04383	1			
lnj	−0.43507	−0.18791	0.196763	1	1	
$(TRY)I$	0.310937	0.072005	−0.42834	−0.32898		
$(TRY)j$	0.197346	0.273326	-0.03107	-0.16215	0.061914	1

The openness variable for Uzbekistan, the trade-GDP ratio, exhibits the anticipated positive sign. The huge coefficient of this variable shows that Uzbekistan must greatly reduce its trade restrictions in order to boost exports. If all other factors remain constant, the projected coefficient of 2.27 indicates that Uzbekistan's exports will rise by 9.68% [exp (2.27) = 9.68] for every 1% increase in its trade-to-GDP ratio.

Additionally, there is no issue with multicollinearity among the variables. In terms of coefficient size and sign, the autocorrelated error structured model's findings are quite comparable. It is interesting to note that the distance variable is negligible despite having the anticipated negative value. The imports of Uzbekistan rise by 0.69% for every 1% increase in this variable. The inflation in Uzbekistan and the inflation in country j both have a positive and negative impact on imports from Uzbekistan, respectively.

For Uzbekistan and nation j, the elasticity of import price changes is 0.08 and -0.15, respectively. Uzbekistan's imports are also heavily influenced by the openness characteristics of Uzbekistan and nation j. Both factors are quite important and have a favorable impact on Uzbekistan's imports.

Conclusion:

Because we employed panel data, these results may fluctuate over time and are not always stationary. We utilized annual data and certain variable information from the World Trade Organization's website. We were unable to get statistics data from the Statistics Committee of the Republic of Uzbekistan throughout our investigation.

Because the presence of non-stationary variables in the data may lead to incorrect conclusions, we do the Hausman test. The results of our tests revealed that all variables are stationary. That is, other factors such as administration, political changes, legal actions, and so on may have an impact on variables. Due to a lack of fundamental knowledge of econometrics methodologies, I was unable to test and apply sophisticated models during my study. Nonetheless, according to Engle and Granger (1991), incorporating a stationary variable in the cointegration relationship should have no effect on the other

reaming coefficients. The inclusion of such a variable should have no effect on the critical values of the t-statistics.

The research will aid in identifying the need for reform in important sectors for a country’s growth. It may also assist in addressing issues and identifying potential solutions in areas critical to a country’s economic stability, such as good governance and state-building. It may also be useful for future studies in the coming years. Furthermore, there will be some successful macroeconomic policy conclusions that will be valuable for government policy, and the government will implement research findings. For the following study, we propose using time series modeling and estimating variables using quarterly data.

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