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Is Kazakhstan vulnerable to natural resource curse?

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Abstract

This study utilizes panel data from 14 provinces of Kazakhstan and investigates the link between the point-source resources (oil and gas) and economic growth via institutional quality. Labour force migration from manufacturing to non-traded sector occurs as a result of wage increase in the manufacturing sector while its production price is determined and pinned down by the world market. On top of that, the manufacturing sector costs increase even more as a consequence of the price increase of non-traded goods used as inputs in the manufacturing sector. Although, the impact of interaction terms of diffuse resource (wheat) production and institutional quality is not observed, diffuse resources deteriorate the economic growth through wheat price volatility. The wheat price spikes lead to institutional inefficiencies. Moreover, rent-seeking activities of intermediaries in agricultural sector further undermine the economic growth.

Keywords: energy production, Kazakhstan, point-source, diffuse resources
JEL classification: E02, Q17, Q18, Q27

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1 Introduction

Most of the countries of the Commonwealth of Independent States (CIS), and especially Central Asian (CA), countries are distinguished by an autocracy system mixed with Soviet regime (Starr 2006). An autocracy regime that highly depends on the natural resource revenues opens a floor for new regime called rentier rulers regime (Franke et al. 2009). The high dependency on natural resources can be disastrous for the country when world primary goods markets become very volatile. Moreover, several studies indicate that revenues generated from the natural resource exports do not contribute to sound reforms and strengthen existing institutions rather often lead to corruption and seizure of control on natural resources (Auty 2006).

Kazakhstan is one of the five resource-dependent countries in CA that is rich in oil, coal, and natural gas. During the Soviet rule, the country was a leading energy producer and still remains one of the few energy exporters to the CIS. The energy sector accounts for 42 per cent of total output and 30 per cent of GDP in Kazakhstan. Over 50 per cent of export revenues come from petroleum production. Kazakhstan's natural gas reserves are estimated to be in the range of 65–100 trillion cubic feet (EIA 2007).

Table 1 shows the sectoral composition of GDP per capita growth rate averages; it can be noticed that two main sectors largely contribute to it. These are energy and other services sectors which employ 2.5 per cent and 1 per cent of the overall labour force, respectively. The agricultural sector growth is the lowest while roughly 30 per cent of the labour force is concentrated in this sector. The energy sector growth is mainly associated with the decline of the agricultural sector and the expansion of the service sector. It can be also observed that following the growth in the energy sector, there was an immediate boost in construction and other services sectors' growth rates. However, the service and construction sectors dramatically contracted in 2008–09 due to the financial crisis.

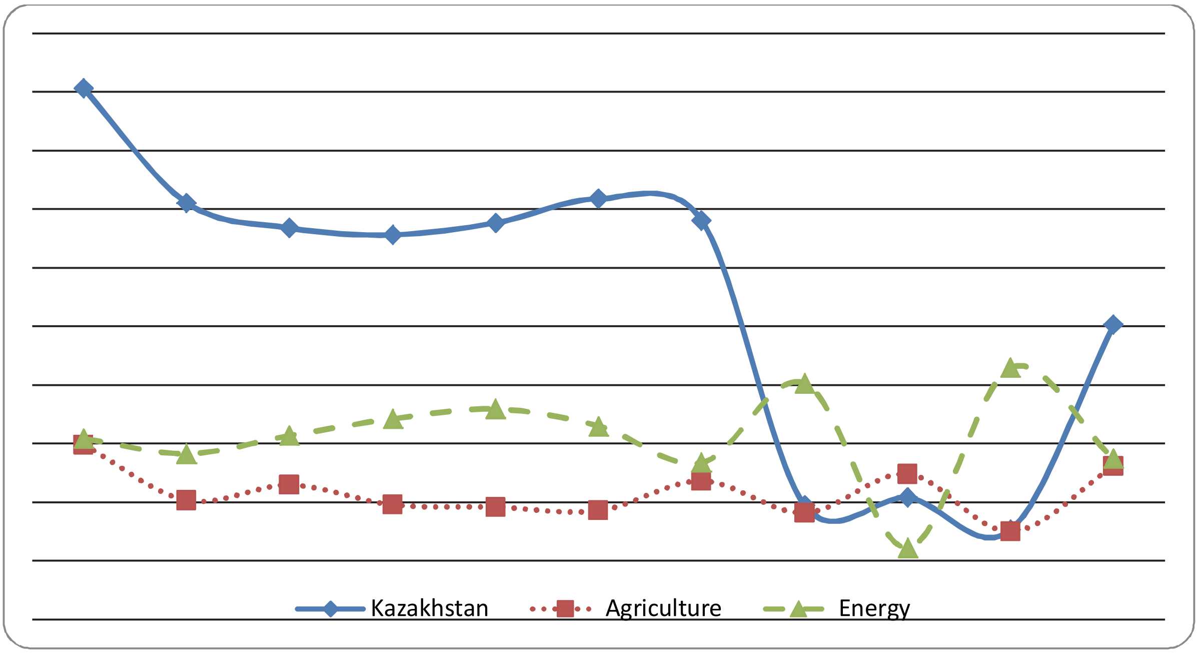
Table 1: Sectoral composition of growth rates by major sectors of economy (%)

	2004	2005	2006	2007	2008	2009	Average
Energy sector	2.84	3.17	2.60	1.34	4.05	-1.56	2.07
Agriculture	-0.09	-0.17	-0.30	0.72	-0.37	0.95	0.12
Construction sector	0.62	3.19	3.64	0.51	-1.22	-0.21	1.09
Trade	2.07	0.39	0.65	2.29	-0.22	-0.05	0.86
Transport and communication services	0.43	1.08	0.82	1.07	-0.59	-0.01	0.47
Other services	3.24	1.87	2.94	3.66	-1.76	1.03	1.83
GDP per capita growth rate	9.12	9.53	10.35	9.60	-0.11	0.15	6.44

Source: authors' calculations on the basis of the statistical database of the Republic of Kazakhstan.

Figure 1 depicts even more interesting evidence regarding economic growth and its two composites, such as energy sector and agricultural sector performance. It shows smoothed series of sectoral composition growth rates. Surprisingly, the energy sector growth is not associated with economic growth in the years 2002–11. The collapse of growth performance is even more astonishing when the energy sector, in fact, demonstrated tremendous growth in 2008. By contrast, economic growth (stagnation) has coincided with agriculture sector growth (stagnation) since 2007. On top of that, the volatile nature of economic growth performance is spotted from 2007 to 2011. This is the implication of the vulnerability of economic performance to shocks and volatility, in spite of the rapid growth in the energy sector.

Figure 1: Sectoral composition of real GDP per capita growth rates, 2001–11



Source: authors' calculations on the basis of the statistical database of the Republic of Kazakhstan.

In addition, the service sector is as important as the energy sector taken altogether in terms of their share in GDP (Table 2). For instance, on average from 2004 to 2009, the share of other services (banking and insurance) and the share of the energy sector in GDP accounted for 32.3 per cent and 30, respectively. However, the share of the agricultural sector is minimal for the same period.

Table 2: Share of major sectors production in GDP (%)

	2004	2005	2006	2007	2008	2009	Average
Energy sector	29.29	29.79	29.55	28.29	32.16	30.54	29.94
Agriculture	7.12	6.37	5.50	5.66	5.32	6.15	6.02
Construction sector	6.06	7.84	9.80	9.44	8.09	7.89	8.19
Trade	12.46	11.83	11.40	12.36	12.25	12.21	12.08
Transport and communication services	11.78	11.81	11.54	11.53	11.02	11.02	11.45
Other services	33.29	32.36	32.20	32.72	31.17	32.19	32.32

Source: authors' calculations on the basis of the statistical database of the Republic of Kazakhstan.

The objective of the study against this background is to investigate the potential natural resource curse channels and answer the following questions. How do the point-source resources (i.e., oil and gas) impact on the production of non-point-source resources (agriculture)? And, why is this crucial for institutional performance?

2 Literature review

Several studies in the literature show that resource-rich countries suffer from the Dutch Disease problem. Domestic and foreign investments crowd out from the manufacturing sector to resource-rich sectors and this has a devastating influence on manufacturing industries (Egert and Leonard 2008). The agricultural sector also gets affected by the Dutch Disease and all these are regarded as one of the main causes of the natural resource problem (Egert and Leonard 2008). This stems from the fact that oil resource-rich countries' domestic currencies tend to appreciate as a result of windfall gains, and fall in the economic competitiveness of the country (Murshed 2004).

Tornell and Lane (1999) explain the natural resource curse problem via institutional quality. They argue that revenues coming from the export of natural resources may undermine economic growth because of existing weak institutions. Mehlum et al. (2006a; 2006b) state that a resource boom depending on the quality of institutions either generates or hinders economic growth. In the existence of grabber-friendly institutions, natural resource-abundance triggers rent-seeking activities at the cost of economic growth. On the other hand, producer-friendly institutions combined with natural resource production boosts the economy of the country. Wick and Bulte (2006) and Hodler (2006) focus on institutional quality within rent-seeking and political conflict framework. They claim that natural resource production and windfall of gains that are associated with them increase conflicts or rent-seeking between powerful groups. Elite groups often attempt to capture the wealth and this causes a 'voracity effect'. It leads to an increase in fiscal redistribution and poor economic performance and also resource rents generated from natural resource change the incentives of policy makers (Caselli and Cunningham 2009). The policies taken by them can foster growth and sometimes bear adverse effects on the economic performance. Ross (1999) criticizes the short-sightedness of government policies and stresses that natural resource abundance countries often concentrate on mineral resource exports which according to Stevens (2003) leads to deindustrialization and less diversified economies. Baland and Francois (2000) assert that there is a double impact of the natural resource boom on economic growth. The initial effect is the boom in the number of domestic entrepreneurship. The second effect is the parallel increase in rent-seeking activities along with domestic entrepreneurship. Torvik (2001) emphasizes that rent-seeking activities generate non-efficient entrepreneurship. Auty (1997), Woolcock et al. (2001), and Isham et al. (2005) find that the resource type is fundamental in understanding the resource curse and show that point-source resources are more problematic than diffuse resources in determining the quality of institutions. The point-source resources are easy to extract and generate windfall of gains (Oskenbayev et al. 2013) which make the elite groups tempted to get control over them.

Many scholars also studied the relation between volatility and economic growth in natural resource abundant countries. They view volatility as a key source for the natural resource curse problem. For instance, Nurkse (1958) and Levin (1960) assert that instability is often transmitted from typically volatile world commodity markets. They find that the price volatility of natural resources undermines economic growth. The literature related to the price volatility impact on economic growth can be argued via economic and political arguments.

The economic arguments regarding price dynamics and economic growth are proposed by several scientists. Prebisch (1950) argues that the relative prices of primary goods to manufacturing goods demonstrate a downward sloping trajectory in the long-run and thus natural resource producing countries grow less than manufacturing goods producing economies. Subsequent studies show that it is volatility rather than trend of prices is a cause of poor economic performance. Turnovsky and Chattopadhyay (2003) and Romero-Avila (2009) argue that macroeconomic instability is a major factor that hampers the economic performance. Macroeconomic instability in turn is triggered by frequent fluctuations in the terms of trade, this happens especially in small open economies. Turnovsky and Chattopadhyay (2003) and Blattman et al. (2007) observe a negative relationship between the volatility of the terms of trade and economic performance. In addition, commodity booms and the windfall of revenues, occurring and leading to an overexpansion of natural resource abundant economies, result in inflationary pressures and exchange rate appreciation, and this deteriorates the non-booming sectors’ competitiveness (Auty 1993; Karl 1997; Davis et al. 2001). Hnatkovska and Loayza (2004) suggest that volatility is a problem in natural resource abundant economies with bad institutional quality in the stage of intermediate financial development. Davis et al. (2001) state that market volatility causes uncertainties and difficulties, especially for resource abundant economies as they essentially depend on the revenues of a single commodity. Relying on the certain revenues of a single commodity undermines efficient utilization of resources for sustainable development and this makes it difficult to carry out fiscal policies and budgetary planning as there is high uncertainty of incomes. Boix (2003) emphasizes that all these can lead to regime change. Acemoglu and Robinson (2001) state that wealth distribution and volatility cause shift from one regime to another, for instance, from democratization to un-democratization. Dunning (2008) states that point-source resources, i.e., mineral extractive resources, can foster both authoritarianism and democracy. Natural resource rents may promote democracy depending on the composition of oil and other natural resources in the country. Smith (2008) argues that it is not only wealth itself but also its source is crucial for institutional quality. Whether the wealth is accumulated from natural resource rents that arrests democratic process or from public goods that foster citizens’ control over government is important in shaping institutions. Ramsay (2011) finds that the oil price increase leads to institutional decay underscoring democracy.

3 Methodology

3.1 The econometric model

As mentioned, this study attempts to investigate how the commodity (wheat) price volatility and resource abundance might hamper economic growth. The study adapts the argument put forward by Ramsay (2011) which suggests that volatility of commodity price has an impact on economic growth via its effect on institutional quality. The econometric model used in this investigation is the extended version of Sachs and Warner (1995) and Brunnschweiler (2008). It has been identified as follows

$$\Delta \log(y_{it}) = \alpha_0 + \alpha_1 GDP_0 + \alpha_2 INST_{it} * R_{it} + \alpha_3 INST_{it} * \sigma_{it}^{wp} + \alpha_4 Z_{it} \quad (1)$$

where GDP_0 is initial income per capita (basic control variable), Z_{it} is a vector of covariates which includes variables such as fixed capital investments, change in the terms of trade and primary exports, and interaction terms between institutional quality and resource abundance. $INST_{it} * R_{it}$ [1] is an interaction term between institutional quality and resource abundance and $INST_{it} * \sigma_{it}^{wp}$ is an interaction term between institutional quality and commodity (wheat) price volatility.

Several approaches exist to estimate Equation 1. For example, random and fixed effects models are common methods in the estimation of panel data models. The appropriate techniques are 'within' estimator methodology distinguished as the least squares dummy variable (LSDV) model (Greene 2008) and generalized least squares (GLS) approach (Baltagi 2001) for random and fixed effects, respectively. However, fixed and random effects methods are problematic for dynamic panel data models. Serial correlation between right hand side variables, which makes the estimates biased and inconsistent, is of serious concern in fixed and random effects models (Baltagi 2001). Kiviet (1995) suggests to first difference the data. The method is appropriate when the error terms are serially uncorrelated and dependent variables are exogenous. Arellano and Bond (1991) argue the inefficiency of the latter method. It is performed in two steps and carried out deriving additional instruments. Arellano and Bond (1991) and Judson and Owen (1999) suggest employing a one-step GMM model that is more efficient than two steps. Since, the study is also interested in testing symptoms of the Dutch Disease, it can be done by a productivity adjusted labour cost formula (see e.g., Oomes and Kalcheva 2007; Hasanov 2011). A unit labour cost is calculated as follows:

$$\text{Unit Labor Cost} = \frac{W}{Y / L}$$

1 Including both types of resources such as point-source and diffuse.

where W is wage or labour cost, Y/L is productivity of labour.

3.2 Data

The dataset employed in this study is panel data of all 14 provinces of Kazakhstan for an 11-year period from 2000 to 2010 (Table 3).[2] The real income per capita estimates for each province are derived by differencing the log of the current and previous years' real gross regional product (GRP) per capita. It has been converted to real GRP using a regional GRP deflator. A Sachs-Warner (1995) variable of primary exports share in GRP is employed. Primary exports representing the resource concentration is measured as the GRP share of total exports. According to statistical data, 70 per cent of exports constitute of mineral extractive resource exports. In this regard, a total of export is used as a proxy for commodity (primary) exports. Along with the Sachs-Warner variable, fixed capital formation share in GRP (*Fixed inv*) for the different Kazakh provinces as one of the major determinants of economic growth is used as an explanatory variable.

Table 3: Data

Variable	Abbreviation	Definition
Real gross regional product (GRP) per capita growth rate	Growth	Log difference of current and previous years' real GRP per capita (adjusted by deflator)
Institutional quality or performance	Inst	The ratio of number of registered economic crime in the region to number of population (per 1000 people) in
Fixed capital investment	Fixed inv	The share of fixed investment in GRP
Proxy for real exchange rates (Balassa-Samuelson effect	BSE_nontrade	Ratio of unit per labour cost in non-tradables sector to unit per labour cost in extractive resource sector
Sachs-Warner (1995) indicator of primary resource	Prime exports	The share of total exports in GRP
Point-source resource production	Point-source	Extractive and mining sector production share in GRP
Diffuse resource production	Diffuse	Agriculture resource sector production (including livestock and food agriculture products) share in GRP
Commodity price volatility	σ_{it}^{wp}	Monthly wheat price standard deviation

Source: authors' calculation on the basis of Statistical Database of Republic of Kazakhstan.

Two major sectors of natural resource production are considered: (i) *point-source* resource production sector which includes extractive mineral resources production such as oil and gas, coal, uranium, and solid minerals; (ii) *diffusive resource* production sector which includes livestock and crop production in Kazakhstan. Originally, their squared terms were planned to

[2] The time-span was chosen because of data availability. In fact, the initially panel data including 20 years since independence was plannned to cover. However, the data for many important variables are missing.

include into the model to test the impact of overabundance or excessive natural resource production on economic performance. However, they were omitted from the model because of insignificant impact on economic growth. Wheat price volatility is defined as standard deviation of monthly wheat price in US$ per ton.

As reported in Table 4, the descriptive statistics of major variables are exhibited. The maximum values of point-source resource production is 1.70 (Mangistau province) and diffuse resource production is 0.39 (North Kazakhstan province), documented in oil and wheat producing provinces, respectively. By contrast to diffuse resource, point-source resource standard deviation is relatively high implying high volatility of point-source production. This is the reflection of the fact that the increased world market oil price volatility causes instability of income inflow from point-source (oil) production. Interestingly, the documented minimum values of point-source resource is 1.41E-06 (North Kazakshtan province) and diffuse resource production is 0.002157 (Mangystau province) in wheat and oil producing regions of Kazakhstan, respectively. This is just the reverse of what has been observed with maximum values. Thus, the maximum value of point-source production has occurred in the areas where minimum values of diffuse resource production is documented and vice versa.

Table 4: Descriptive statistics

Variable	Obs	Mean	Std. dev	Min	Max
Growth	154	0.0307	0.044	-0.082	0.183
Prime exports	154	0.4332	0.352	0.028	1.425
Fixed inv	154	0.2608	0.196	0.0397	1.115
Point-source	154	0.4053	0.4985	1.41E-06	1.702
Diffuse	154	0.1153	0.0961	0.0022	0.3866
σ_{it}^{wp}	154	11.1729	10.108	0.6452	53.8068
Inst	154	0.70164	0.2677	0.2057	1.7238
$BSE_{nontraded}$	154	2.8610	3.6641	0.0254	14.3545

Source: authors' calculation on the basis of Statistical Database of Republic of Kazakhstan.

It is documented that wheat price volatility, σ_{it}^{wp}, increased in 2008. For instance, the maximum value of wheat price volatility accounting for 53.81 occurred in Kyzylorda province in 2008. The minimum value of wheat price volatility is evidenced in the same province in 2010 despite the severe drought and low harvesting which have occurred in that year. Standard deviation of the variable in question is relatively high as well.

Table 5: Correlation between *Inst* as an average (median) of 14 regions and worldwide governance indicators weighted average index of institutional quality

	Inst	VA	PS	GE	RQ	RL	CC
Inst	1						
VA	0.32	1					
PS	-0.38	-0.11	1				
GE	-0.86	-0.25	0.63	1			
RQ	-0.96	-0.16	0.52	0.88	1		
RL	-0.78	-0.34	0.72	0.91	0.81	1	
CC	-0.60	-0.08	0.70	0.66	0.72	0.54	1

Note: Worldwide governance indicators such as VA: voice and accountability; PA: political stability and absence of violence; GE: government effectiveness; RQ: regulatory quality; RL: rule of law; CC: control of corruption.

Source: authors' calculation on the basis of Statistical Database of Republic of Kazakhstan.

The number of registered economic crime adjusted by population size is a proxy variable for the institutional quality in this study which has been obtained from Oskenbayev et al. (2013). High correlation between this institutional quality variable and Worldwide Governance Indicators (suggested by Kaufmann et al. 2002) can be observed from Table 5. The study detects high negative correlation between institutional quality variable (*Inst*) and government effectiveness (GE), regulatory quality (RQ), and rule of law (RL) indicating that the proxy is a valid instrumental variable of institutional quality.

4 Results and discussion

The results are reported in Table 6.[3] Arellano-Bond AR1 and AR2 tests p-values indicate that there is no second-order serial correlation which shows the validity of instruments.[4] Additionally, the p-value of Sargan test shows that the null hypothesis is not rejected implying that over-identifying restrictions are valid as well. The results are comforting in that lagged variables of income per capita growth and lagged variable of interaction terms with institutional quality are significant and show expected signs.

[3] Institutional quality and its interaction terms are included into the model as endogenous variables.

[4] Arellano-Bond AR1 and AR2 tests are applied to determine the optimal number of lags. They indicate that one lag is optimal for our model.

Table 6: Dynamic models

VARIABLES	Dependent variable: GRP per capita growth			
	(1)	(2)	(3)	(4)
	System GMM[(a),(b)]	FGLS[(c)]	FGLS[(c)]	Random effects[(c)]
Initial income	-0.238***	-0.224***	-0.173**	-0.224***
	(0.0605)	(0.0690)	(0.0732)	(0.0716)
Inst (-1)	-0.0103	-0.00149		-0.00149
	(0.0210)	(0.0292)		(0.0303)
PS (-1)	-0.0169	-0.0256	0.0154	-0.0256
	(0.0558)	(0.0256)	(0.0128)	(0.0266)
Dif (-1)	-0.0506	-0.130	0.0894*	-0.130
	(0.185)	(0.127)	(0.0487)	(0.132)
Inst*PS (-1)	0.0261	0.0546*		0.0546*
	(0.0306)	(0.0291)		(0.0302)
Inst*Dif (-1)	0.184**	0.212		0.212
	(0.0816)	(0.159)		(0.165)
Inst*σ_{it}^{wp} (-1)	-0.00178***	-0.00173***		-0.00173***
	(0.000534)	(0.000460)		(0.000477)
$BSE_{nontraded}$ (-1)	-0.00618***	-0.00194	-0.0030**	-0.00194
	(0.00178)	(0.00136)	(0.0014)	(0.00141)
Fixed inv (-1)	0.0136	0.0387**	0.0359*	0.0387**
	(0.0272)	(0.0174)	(0.0189)	(0.0181)
Prime exports (-1)			0.03184*	
			(0.0168)	
Constant		0.0355	0.0027	0.0355
		(0.0237)	(0.0118)	(0.0246)
Observations	112	140	140	140
Number of provinces	14	14	14	14

Notes: *** p<0.01, ** p<0.05, * p<0.1

Regressions (1-2): (a) robust standard errors in parentheses ; (b) Stata *xtabond2* command is used suggested by Roodman (2005) with a one-step robust estimator; robust one-step Arellano-Bond system GMM dynamic panel estimation. For the system GMM estimation we treated interaction terms as potentially endogenous, initial income as predetermined and all other variables are weakly exogenous. Regressions (3-4): (c) standard errors in parentheses.

Source: authors' calculation on the basis of Statistical Database of Republic of Kazakhstan.

It is observed from Table 6 that signs of major variables do not contradict theory. For instance, the lagged variable of income per capita growth has a negative significant effect on economic growth confirming the convergence hypothesis. In addition, the lagged variable of fixed capital formation has a significant positive impact on economic growth when the feasible generalized least squares (FGLS) method is employed (Table 6, Columns 3 and 4).[5] The literature shows that investments promote growth through the manufacturing or service sector rather than the primary sector. For instance, Hirschman (1958) and Kokko (1994) observe that only some sectors are able to benefit from foreign direct investment such as absorbing new technology or causing positive externalities to other sectors. They find a weak linkage of agriculture and extractive mineral resource sectors with the rest of the economy, which in turn might have limited the positive impact of fixed capital formation on economic growth.

It is also documented that institutional quality contributes to economic growth combined with either production of point-source resources or diffuse resources. The results are in line with those of Brunnschweiler (2008) implying that positive impact on economic growth diminishes as institutional quality improves. In this regard, natural resources associated with better institutions constitute negative impact on economic growth indicating a sort of ‘convergence effect.’ Thus, the positive impact of this interaction terms indicate that the economies with abundant natural resources and ‘better institutions’ have experienced less growth than their counterparts. This might be because natural resource abundance has weak contribution to economic growth in the economically prospered and institutionally developed provinces.

The Ballassa Samuelson effect (BSE) determinants of economic growth deserve particular attention. By contrast to other studies such as, Egert and Leonard (2008) and Egert (2009), the negative impact of a new measure for the BSE is documented. The negative impact of the BSE on economic growth is evident in all cases (see Table 6, Columns 1 and 3).[6] The lagged variable of non-traded goods unit labour cost relative to those of traded goods, $BSE_{nontraded}(-1)$, has a significant negative impact on the economic performance. By contrast, the significant negative impact of this variable on economic growth is not observed when interation terms are included under FGLS and random effects model (Column 2 and 4, Table 6). This is the implication of the fact that the Dutch Disease has been primarily sourced by the spending effect rather than the resource movement effect as has been found in other empirical studies (Kuralbayeva et al. 2001). The negative effect is explained by the fact that oil price spikes resulted in spending effect and thus lead to relative unit labour cost increase especially in the non-traded goods sector to traded goods sector.

The evidence of the resource sector boom impact is usually detected in the labour market. High labour demand in the booming resource sector triggers the labour force movement from other sectors to the resource (oil and gas production) sector, and as a result contracts employment and production in the manufacturing and non-tradables sector. However, one should carefully interpret the energy resource sector asymmetric impact on labour migration in two different

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5 We lag all variables by one in order to control for possible endogeneity. The potential enedogeneity problem between economic growth and institutional quality is of a particular concern in our study.

6 The significant negative impact of the Balassa-Samuelson effect is documented in all cases when point source resource abundance is dropped from the model. This might be due to the fact that there is a high correlation (=0.78) between point source resource production and the Balassa-Samuelson effect.

sectors (manufacturing and non-tradables). The labour force migration increases the relative price of the non-traded goods sector to the traded goods sector implying appreciation of real exchange rate and competitiveness loss of the manufacturing sector. As a consequence, this ensures the contraction of the manufacturing sector (direct de-industrialization). Besides, the labour force movement from manufacturing to the traded goods sector occurs because the manufacturing sector price is determined by the world market leading to indirect de-industrialization. Therefore, the non-traded sector does not shrink due to the fact that the price of non-traded goods is not adjusted by the world market price. On the contrary, the non-traded sector production can increase as a result of labour movement from manufacturing to non-traded sector. However, wage increase and further real exchange rate appreciation undermines industrialization which is documented by the negative sign of the lagged variable for relative unit labour cost of non-traded to traded sector.

The study tested the interaction terms of resource abundance and price volatility with institutional quality impact on economic growth. The negative impact is documented in the case of interaction of institutional quality with wheat price volatility. The negative impact is persistent in all models considered above. This goes in line with what has been argued by Ramsay (2011). Although neither the diffusive resource production nor its excess production combined with institutional quality impedes economic growth, the interaction of commodity (wheat) price volatility and institutional quality exhibit significant negative effects on economic growth. Increase in food prices often lead to extreme policies such as export ban and price control measures by policy makers, thus, creating political instability and abrupt changes in political regime. Additionally, commodity price volatility driven largely by speculators (von Braun and Tadesse 2012) combined with weak institutional performance has negative impact on economic growth.

5 Conclusion

The novelty of this study is that two types of essential resources point-source and diffuse natural resources, and commodity price volatility interaction with institutional quality are introduced as a non-linear function of economic growth. The results illustrate that institutions impact on economic growth combined with natural resource abundance. It has been documented that both point-source and diffuse resources, with interaction of institutional quality, impact the economic growth. The positive impact of natural resources associated with good institutions generate a negative effect on economic growth.

Relative unit labour costs of the non-traded to traded sectors are included into the model to test the presence of the Dutch Disease impact. It is documented that labour force demand increase causes traded sector contraction. Labour force migration from traded to non-traded sector occurs as a result of wage increase in manufacturing while its production price is determined and pinned down by the world market. On top of that, traded sector costs increase even more as a consequence of price increases of non-traded goods used as inputs of the traded sector.

Although, the impact of interaction terms of diffuse resource production and institutional quality is not observed, diffuse resources deteriorate the economic growth through commodity (wheat) price volatility. The commodity (wheat) price spikes lead to institutional inefficiencies that undermine the economic growth. Policies addressing the inefficient activities should be applied in this case as government will have increasing responsibility for the wheat market in future years. Thus government intervention is necessary to address the market failure problem, but with careful consideration of how to do so without enabling rent-seeking and inefficiency. The big companies operate like oligopolies, creating entry barriers for small producers and their influence on the market stimulates higher prices. Therefore, the most straightforward policy would be to modify the market rules and regulations to protect small producers and motivate market competition. Legislation and reforms protecting small producers should be approached in parallel with the market establishment.

References

Acemoglu, D., and J. A. Robinson (2001). 'A Theory of Political Transitions'. *American Economic Review*, 938–63.

Arellano, M., and S. Bond (1991). 'Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations'. *The Review of Economic Studies*, 58(2): 277–97.

Auty, R. M. (1993). *Sustaining Development in Mineral Economies: The Resource Curse Thesis*. London: Routledge.

—— (1997). 'Natural Resource Endowment, the State and Development Strategy'. *Journal of International Development*, 9(4): 651–63.

—— (2006). 'Transition to Mid-income Democracies or to Failed States?', in R. M. Auty and I. de Soysa (eds), *Energy, Wealth and Governance in the Caucasus and Central Asia: Lessons not Learned*. London: Routledge.

Baland, J. M., and P. Francois (2000). 'Rent Seeking and Resource Booms'. *Journal of Development Economics*, 61(2): 527–542.

Baltagi, B. H. (2001). *Econometric Analysis of Panel Data*. Chirchester: John Wiley and Sons.

Blattman, C., J. Hwang, and J. Williamson (2007). 'Winners and Losers in the Commodity Lottery: The Impact of Terms of Trade Growth and Volatility in the Periphery 1870–1939'. *Journal of Development Economics*, 82(1): 156–79.

Boix, C. (2003). *Democracy and Redistribution*. Cambridge: Cambridge University Press.

Brunnschweiler, C. N. (2008). 'Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth'. *World Development*, 36(3): 399–419.

Caselli, F., and T. Cunningham (2009). 'Leader Behavior and the Natural Resource Curse'. *Oxford Economic Papers*, 61(4): 628–50.

Davis, J., R. Ossowski, J. Daniel, and S. Barnett (2001). 'Oil Funds: Problems Posing as Solutions?'. *Finance and Development*, 38(4): 56–59.

Dunning, T. (2008). *Crude Democracy: Natural Resource Wealth and Political Regimes*. Cambridge: Cambridge University Press.

Egert, B., and C. S. Leonard (2008). 'The Dutch Disease in Kazakhstan: Empirical Investigation'. *Open Economies Review*, 19(2):147–65.

Egert, B. (2009). 'Dutch Disease in the former Soviet Union: Witch-hunting?'. BOFIT Discussion Papers 4/2009. Helsinki: BOFIT.

Energy Information Administration (EIA) (2007). 'Kazakhstan Energy Profile'. Available at: http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=KZ (accessed 10 May 2013).

Franke, A., Gawrich, A. and G. Alakbarov (2009). 'Kazakhstan and Azerbaijan as Post-Soviet Rentier States: Resource Incomes and Autocracy as a Double "Curse" in Post-Soviet Regimes'. *Europe Asia Studies*, 61(1): 109–40.

Greene, W. (2009). 'Discrete Choice Modeling', in T. Mills and K. Patterson (eds), *The Handbook of Econometrics, Vol. 2. Applied Econometrics*. London: Palgrave.

Hasanov, F. (2011). 'Dutch Disease and Azerbaijan Economy', EERC Working Paper 11/3. Kiev: EERC.

Hirschman, A. O. (1958). *The Strategy of Economic Growth*. New Haven: New Haven.

Hodler, R. (2006). 'The Curse of Natural Resources in Fractionalized Countries'. *European Economic Review*, 50(6): 1367–86.

Hnatkovska, V., and N. Loayza (2004). *Volatility and Growth*, World Bank Policy Research Working Paper Series 3184. Washington, DC: World Bank.

Isham, J., M. Woolcock, L. Pritchett, and G. Busby (2005). 'The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth'. *World Bank Economic Review* 19(2): 141–74.

Judson, R. A. and A. L. Owen (1999). 'Estimating Dynamic Panel Data Models: a Guide for Macroeconomists'. *Economics Letters*, 65(1): 9–15.

Karl, T. (1997). *The Paradox of Plenty: Oil Booms and Petro-States*. Berkeley: University of California Press.

Kaufmann, D., A. Kraay, and P. Zoido-Lobaton (2002). 'Governance Matters II: Updated Indicators for 2000-01'. Policy Research Working Paper 2772. Washington, DC: World Bank.

Kiviet, J. F. (1995). 'On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models'. *Journal of Econometrics*, 68(1): 53–78.

Kokko, A. (1994). 'Technology, Market Characteristics, and Spillovers'. *Journal of Development Economics*, 43(2): 279–93.

Kuralbayeva, K., A. Kutan, and M. Wyzan (2001). 'Is Kazakhstan Vulnerable to Dutch Disease?', ZEI Working Paper B29. Bonn: Zentrum für Europäische Integrationsforschung.

Levin, J. (1960). *The Exports Economies: Their Pattern of Development in Historical Perspective*. Cambridge: Harvard University Press.

Mehlum, H., K. Moene, and R. Torvik (2006a). 'Institutions and the Resource Curse'. *The Economic Journal*, 116(508): 1–20.

Mehlum, H., K. Moene, and R. Torvik (2006b). ‘Cursed by Resources or Institutions?’. *The World Economy*, 29(8): 1117–31.

Murshed, M. S. (2004). ‘When Does Natural Resource Abundance Lead to a Resource Curse?’, Environmental Economic Programme, Discussion Paper 04-01. Hague: IIS.

Nurkse, R. (1958). ‘Trade Fluctuations and Buffer Policies of Low-Income Countries’. *Kyklos*, 11(2):141–54.

Oomes, N., and K. Kalchieva (2007). ‘Diagnosis Dutch Disease: Does Russia Have the Symptoms?’. IMF Working Paper WP/07/102. Washington, DC: IMF

Oskenbayev, Y., M. Yilmaz, and K. Abdulla (2013). ‘Resource Concentration, Institutional Quality and the Natural Resource Curse’. *Economic Systems*, 37 (2):254–70.

Prebisch, R. (1950). *The Economic Development of Latin America and Its Principal Problems*. New York: United Nations Department of Economic Affairs.

Ramsay, K. W. (2011). ‘Revisiting the Resource Curse: Natural Disasters, the Price for Oil and Democracy’. *International Organization*, 65 (03): 507–29.

Romero-Avila, D. (2009). ‘Multiple Breaks, Terms of Trade Shocks and the Unit-root Hypothesis for African per Capita Real GDP’. *World Development*, 37(6): 1051–68.

Roodman, D. M. (2005). ‘Xtabond2: Stata Module to Extend Xtabond Dynamic Panel Data Estimator’. Washington, DC: Center for Global Development.

Ross, M. L. (1999). ‘The Political Economy of the Resource Curse’. *World Politics*, 51 (2): 297–322.

Sachs, J. D. and A. M. Warner (1995). ‘Natural Resource Abundance and Economic Growth’, NBER Working Paper 5398. Cambridge, MA: NBER.

Smith, N. (2008). *Uneven Development: Nature, Capital, and the Production of Space*. Athens: University of Georgia Press.

Starr, S. F. (2006). *Clans, Authoritarian Rulers, and Parliaments in Central Asia, Politics*. Washington, DC: Johns Hopkins University-SAIS.

Statistical Database of Republic of Kazakhstan (n.y.). Available at: www.stat.kz

Stevens, P. (2003). ‘Resource Impact: Curse or Blessing? A Literature Survey’, *Journal of Energy Literature*, 9 (1): 1–42.

Tornell, A., and P. R. Lane (1999). ‘The Voracity Effect’. *American Economic Review*, 89(1): 22–46.

Torvik, R. (2001). ‘Learning by Doing and the Dutch Disease’. *European Economic Review*, 45(2): 285–306.

Turnovsky, S., and P. Chattopahyay (2003). ‘Volatility and Growth in Developing Economies: Some Numerical Results and Empirical, Evidence’. *Journal of International Economics*, 59(2): 267–95.

von Braun, J., and G. Tadesse (2012). ‘Global Price Volatility and Spikes: An Overview of Costs, Causes and Solutions’. ZEF-Discussion Paper on Development Policy 161. Bonn: Zentrum für Entwicklungsforschung.

Wick, K., and Bulte, E. H. (2006). 'Contesting Resources–Rent Seeking, Conflict and the Natural Resource Curse'. *Public Choice*, 128(3–4), 457–76.

Woolcock, M., L. Pritchett, and J. Isham (2001). 'The Social Foundations of Poor Economic Growth in Resource Rich Economies', in R. M. Auty (ed.), *Resource Abundance and Economic Development*, New York: Oxford University Press.