INTERNATIONAL ANALYSES OF NATURAL RESOURCE CURSE AND KAZAKHSTAN'S RELATED ECONOMIC PERFORMANCE WITH SPECIAL ATTENTION TO ITS WHEAT AND ENERGY SECTORS

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ABSTRACT

The bottom line of this study is to examine the role of natural resource endowments for economic growth and institutional quality with special focus on Kazakhstan and CIS countries. It is documented that resource rents share in income has a negative effect on institutional quality and thus undermines economic growth. Comparing two subsamples, during 1990-2000 and 2001-2010, we find evidence that direct resource curse impact may disappear while indirect one (through institutional quality) is persistent for all subsamples implying that resource curse via institutions provides a much more important link between natural resources and economic growth. Our findings suggest that the impact of the resource abundance deteriorates institutional quality, which in turn hampers economic growth.

The other objective of the study is to show that the natural resource abundance is a nonlinear function of the institutional quality. Above a certain threshold the natural resource abundance affects institutional quality adversely implying that excessive or overabundant production of resources are crucial in explaining the resources curse. Interestingly, for instance, diffuse resources such as agricultural resources bear positive externalities at higher levels of production, while at lower levels of production it could have negative impact on institutional quality.This significant adverse impact of the agricultural sector on institutional quality is in contrast to other studies. In addition, analysis of institutional arrangement reveals that the total effect of agricultural value added had a negative impact on institutional quality and economic growth, despite the squared term of agricultural value added exhibiting a positive impact on institutional quality and economic growth. Indeed, this has also been documented in analyses from Kazakhstan and other CIS countries. This is an implication that the agricultural sectors are dominated by state or large agricultural enterprises in these countries, and in this sense the sector can be regarded as a point-source resource sector. The dominance of large agricultural enterprises or state companies has negatively influenced the progress of reforms; for instance, land property rights are not enacted or established in almost all of the CIS countries.

KURZFASSUNG

Die Grundfrage der vorliegenden Studie besteht darin herauszufinden, ob der negative Einfluss des Reichtums an natürlichen Ressourcen auf wirtschaftliches Wachstum über institutionelle Qualität wirkt und nicht über den direkten Ressourceneffekt, den frühere Studien dokumentieren. Es wird belegt, dass der Anteil der Ressourcennutzung am Gesamteinkommen einen negativen Effekt auf institutionelle Qualität hat und dadurch wirtschaftliches Wachstum hemmt. Durch Vergleich der Perioden 1990-2000 und 2001-2012 zeigen wir, dass der direkte Einfluss des Ressourcenfluchs verschwindet während der indirekte (über die Institutionenqualität) Bestand hat für alle untersuchten Untergruppen, was die Bedeutung von Institutionen als wichtiges Verbindungsstück zwischen natürlichen Ressourcen und Wirtschaftswachstum hervorhebt.

Desweiteren ist es Ziel dieser Studie zu zeigen, dass institutionelle Qualität eine nicht-lineare Funktion des Vorkommens natürlicher Ressourcen ist. Der Einfluss verschiedener Arten von Ressourcenreichtum hat einen Schwellenwert, d.h. dass die exzessive bzw. überreiche Produktion der Ressourcen entscheidend zur Erklärung den Ressourcenfluchs beiträgt. Interessanterweise birgt die Produktion diffuser, wie etwa landwirtschaftlicher, Ressourcen positive Externalitäten bei hohem Produktionsniveau, während sie auf niedrigem Niveau nachteilige Wirkungen auf institutionelle Qualität haben kann. Im Gegensatz zu anderen Studien zeigen die Ergebnisse des Modells einen signifikant negativen Effekt des landwirtschaftlichen Sektors auf Institutionenqualität. Sein Einfluss auf die institutionelle Qualität ist dabei größer als der Anteil der Ressourcenrendite am Gesamteinkommen, was dadurch erklärt werden kann, dass der landwirtschaftliche Sektor einen Punktquellenressourcen-Sektor und keinen Sektor diffuser Ressourcenquellen darstellt, da er in GUS-Staaten von landwirtschaftlichen Großproduzenten kontrolliert wird.

Darüber hinaus zeigt die Analyse der institutionellen Ausgestaltung einen negativen Gesamteffekt der landwirtschaftlichen Wertschöpfung auf institutionelle Qualität und Wirtschaftswachstum, wenngleich der quadrierte Term der landwirtschaftlichen Wertschöpfung positiv auf institutionelle Qualität und Wirtschaftswachstum wirkt. Dies wurde auch in Analysen aus Kasachstan und anderen GUS-Staaten dokumentiert und ist eine Folge daraus, dass die landwirtschaftliche Sektoren in diesen Ländern von staatlichen oder Großbetrieben dominiert werden, weswegen diese Sektoren als Punktquellenressourcen-Sektoren verstanden werden können. Die Dominanz landwirtschaftlicher Staats- oder Großbetriebe hat dabei Reformen gebremst; so gibt es etwa in nahezu keinem GUS-Staat beschlossene oder in Kraft getretene Landbesitzrechte.

ACKNOWLEDGEMENTS

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List of Abbreviations

BG - British Gas
CIS – Commonwealth of Independent States
COGS – Cost of Goods Sold
CPT – Corporate Income Tax
ETS – Eurasian Trading System, Commodity Exchange of Kazakhstan
FAO – Food and Agricultural Organization
FAPRI – Food and Agricultural Policy Research Institute
FDI – Foreign Direct Investment
FCC – Food Contract Corporation
FE GMM – Fixed-effects General Method of Moments
GRP – Gross Regional Product
GMM – General Method of Moments
IV – Instrumental Variable
KASE – Kazakhstan Stock Exchange
KCA – Kazakh Contract Agency
KMG – National Holding Company KazMunaiGas
KMG EP – KazMunaiGas Exploration Production, subsidiary company of KMG
KTZ – Kazak TemirZholdar (Kazakhstan Railways)
MINT - Ministry of Industry and New Technology
MOG – Ministry of Oil and Gas
NADLoC - National Agency for Development of Local Content
NCOC - North Caspian Operator Company
OPEC - Organization of the Petroleum Exporting Countries
OGI – Oil and Gas Industry
SARK – Statistical Agency of Republic of Kazakhstan
SOE – State Owned Enterprises
PIT – Personal Income tax
PMG – The Pooled Mean Group
USD – United States Dollar
Two-SLS – Two-Stage Least Squares
VAT - Value Added Tax

1 INTRODUCTION

1.1 Introduction

The natural resource curse, the premise that economies with vast natural resources are associated with slow growth, has been empirically investigated and analyzed in many recent studies. Initial studies (e.g. Sachs and Warner 1995, 1999)[1] of this phenomenon concentrated on the direct impact of natural resource abundance on economic growth. By contrast, more recent studies have emphasized the importance of the quality of institutional channels to the natural resource curse (e.g. Knack and Keefer, 1995; Acemoglu et al., 2002).

However, a number of recent studies (e.g. Stijns, 2005; Brunnschweiler, 2008; Alexeev and Conrad, 2009) have raised some doubts about the resource curse hypothesis, emphasizing the need to reconsider its impact on economic growth. Indeed, not all resource rich countries have failed to make efficient use of those resources and achieved meaningful levels of development; for instance, Norway has proved itself capable of escaping the "Dutch Disease" problem, becoming one of the most developed countries in the world (Gylfason, 2001). Norway invests oil industry funds into foreign securities, thus saving those funds for the next generation. Moreover, Norway invests heavily in education and maintains sound economic policies. However, the country is also notorious for its highly protectionist agricultural policies that are poorly targeted and inefficient (IFPRI, 2008).

"Dutch Disease" explains economic decay associated with resource booms through the combined effect of two factors: first, the real exchange rate appreciation triggered by commodity export booms; and second, the nature of the expanding energy sector to crowd out labor force and capital from the agricultural and manufacturing sectors, thus increasing their production costs (Ross, 1999). Therefore, the overall effects of the resource concentration booms are the contraction of export volumes from the agricultural and manufacturing sectors and increases in the costs of non-tradable goods and services (Corden and Neary, 1982). Thus, the Dutch Disease problem can be summarized as the change in relative prices of non-traded (services and construction) to traded goods, leading to the crowding out of the traded goods sector by the non-

[1] Some earlier studies (Gelb et al., 1988; Auty, 1990) have also revealed that misallocation of resources in resource rich countries might harm economic progress, based upon the experience of countries such as Nigeria and Zambia.

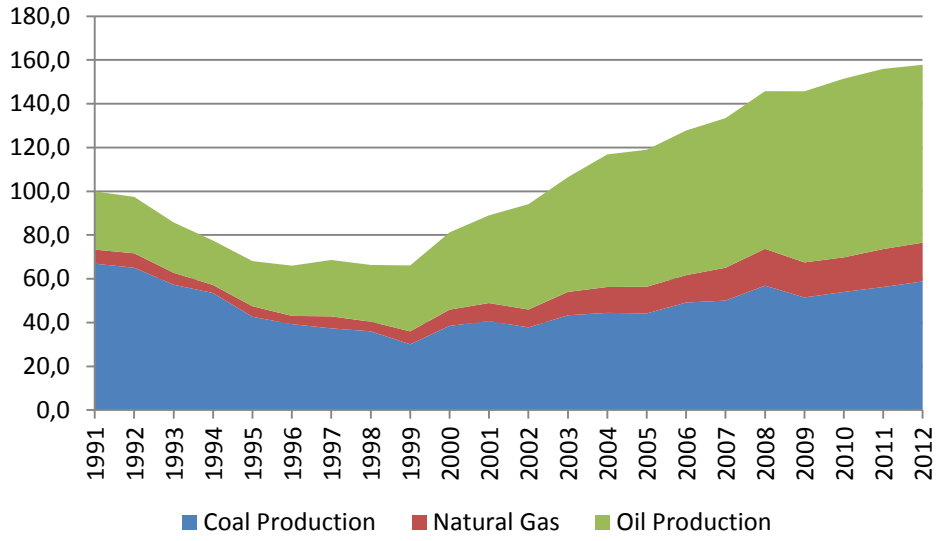
traded goods sector; therefore, real exchange rate appreciation undermines the competitiveness of the traded goods sector.

1.2 Background and Research Problem

Kazakhstan is a source-rich country, particularly in terms of energy resources such as oil, coal, and natural gas. It was a leading energy-producing country among the Soviet Union Republics and remains an important energy exporter. Fuel production comprised 23% of Kazakhstan's GDP in 1994 and the entire energy sector accounted for 42%. In Kazakhstan, 30% of the GDP and over 50% of export revenues are from petroleum production. Kazakhstan's natural gas reserves are estimated to be in the 65–100 trillion cubic feet range (EIA, 2010). As a result of recent global price increases for oil products, accompanied by an enormous increase in energy production in Kazakhstan and particularly in the country's oil sector since 1999 (Figure 1.1), there have been windfall profits and high revenues from the energy sector. However, according to the resource curse hypothesis this could potentially trigger rent-seeking activities and reduce economic performance. Indeed, studies have found that such profits are not used to bring about sound economic policy reforms and 'better institutions,' but rather lead to corruption and the seizure of control over natural resources and their profits by an elite few, especially from petroleum revenues that are the major point-source resource in the country (Auty, 2006).

To determine whether Kazakhstan suffers from a resource curse, it is essential to ascertain the mechanisms that determine the circumstances under which energy resources, as point-source resources, breed economic success rather than failure. The aspects of economic performance that I analyzed are summarized in Table 1.1 and Figure 1.2. The sectoral composition of GDP per capita growth rate averages are presented in Table 1.1. The contribution to the growth rates of each sector was estimated by multiplying each sector's production share of the GDP to their real production per capita growth rates. The analysis results demonstrate that two sectors have contributed most to GDP per capita growth rates: the energy and services sectors (including banking and insurance). By contrast, agricultural growth remains lowest amongst the main sectors of Kazakhstan's economy. This reflects an important fact, because approximately 30% of the labor force belongs to the agriculture sector as opposed to around 2.5% and 1% of the labor force employed in the energy and service sectors, respectively.

Figure 1.1: Energy Production Growth in Kazakhstan, in Millions of metric tons of oil equivalent (Mtoe)



Source: Based on British Petroleum Statistical Review of World Energy, 2010

The proportional energy sector growth is associated with declines in the agriculture sector and expansion in the service sector, with the contributions to income per capita growth from the energy and agriculture sectors moving in opposite directions. Agricultural sector decline largely corresponds to energy sector growth and agricultural sector growth mirrored declines in the energy sector, particularly in 2007 and 2009. Following growth in the energy sector, there were immediate increases in the growth rates of the construction and other services sectors. It is typical among resource-rich countries that the service and construction sectors experience booms as a part of the non-traded goods sector. During boom periods oil revenues are typically spent on education, housing, healthcare, and other services, which can be explained by the Dutch Disease spending effect.[2] Therefore, resource abundance and rental increases prompt price increases among non-traded goods, including construction and other services. However, the services and construction sectors contracted dramatically in 2008–2009.

[2] Enormous foreign currency inflows to resource-rich economies, especially during oil booms, lead to relative price increases of non-tradable goods such as services. Thus, relative price increases in non-tradable good sectors induces real exchange rate appreciation, which in turn deteriorates the competitiveness of the economy.

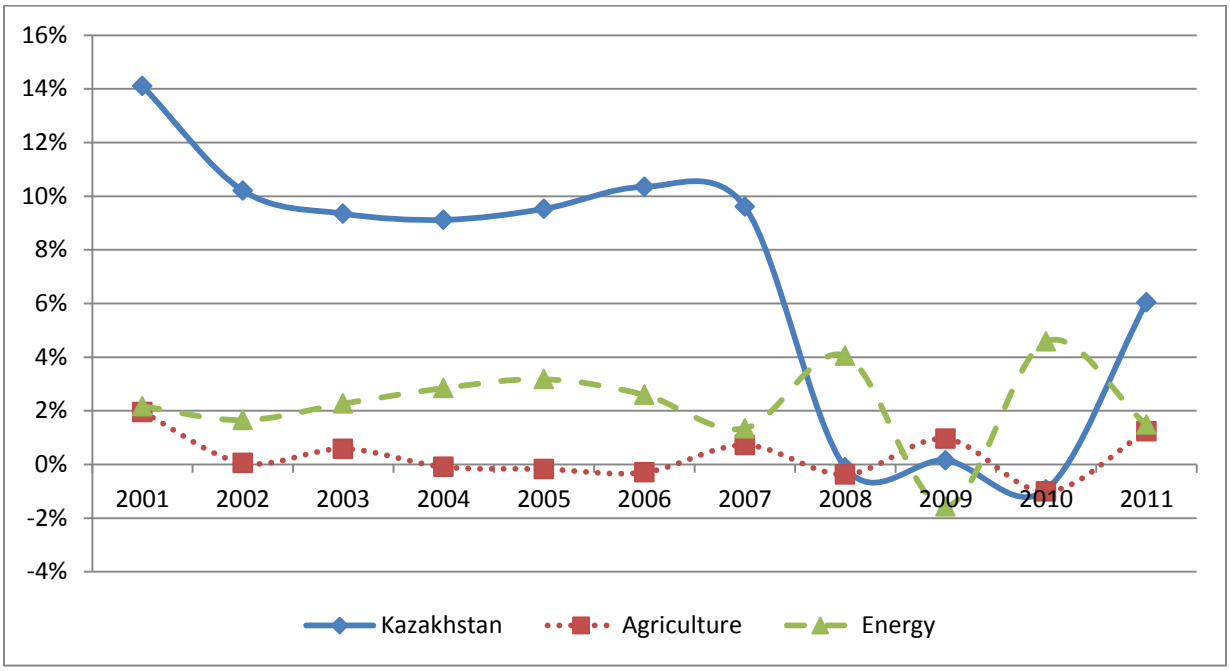
Table 1.1: Growth rate changes (in %) among major sectors of the Kazakhstan economy

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Energy	3.11	3.59	3.51	2.65	0.80	-0.47	1.97	2.18	1.18
Agriculture	0.63	0.56	0.52	0.43	0.11	-0.09	0.26	0.31	0.15
Construction	0.54	0.68	0.93	0.72	0.17	-0.11	0.45	0.39	0.22
Trade	1.10	1.03	1.09	0.95	0.25	-0.18	0.75	0.83	0.53
Transportation and Communications	1.04	1.03	1.10	0.88	0.23	-0.16	0.64	0.57	0.36
Other Services	2.94	2.82	3.07	2.51	0.64	-0.46	1.28	1.47	0.85
GDP per capita growth rate	8.84	8.73	9.54	7.66	2.05	-1.44	5.79	5.97	3.51

Source: Based on data from the Statistical Database of the Republic of Kazakhstan, 2013

Figure 1.2 depicts trends in economic growth and the performance of the energy and agricultural sectors. A smoothed series of sectoral composition growth rates (partly laid out in Table 1.1) are shown in this graph. Surprisingly, energy sector growth was not significantly associated with economy-wide growth, specifically during 2002–2011. The poor growth performance is astonishing considering the modest growth of the energy sector in 2008. In contrast, overall economic stagnation has coincided with stagnation in the agriculture sector since 2007. This might reflect a Dutch Disease problem scenario, because either the agricultural or manufacturing sector is typically squeezed out in resource-abundant countries. Moreover, economic growth performance was volatile from 2007 to 2011, implying vulnerability of economic performance to shocks despite rapid growth in the energy sector.

Figure 1.2: Sectoral Composition of Real GDP per Capita Growth Rates in Kazakhstan, 2001–2011



Source: Based on data from the Statistical Database of the Republic of Kazakhstan, 2013

Furthermore, the service sector was as important as the energy sector in terms of GDP shares (Table 1.2). The average GDP share of other services (banking and insurance) was 32.3% from 2004 to 2009, while the share of the energy sector was 30%. The GDP share of the agricultural sector was minimal. The contraction of the agricultural sector share corresponds with the expansion of the energy sector share, indicating an inverse relationship between the two sectors' contributions to income per capita growth. In addition, the share of agricultural value added to GDP gradually diminished from 2004 to 2009.

Economists have long discussed the tendency of countries with abundant natural resources, particularly energy resources such as oil, to exhibit poor economic performance. Literature on the 'natural resource curse' in Kazakhstan can be divided into two major categories. For instance, Kutan and Wyzan (2005) considered this problem in Kazakhstan from the perspective of the most obvious economic explanation, namely the Dutch Disease effect. Sharp oil price increases were followed by real exchange rate appreciation, which thus had a devastating impact on manufacturing. In contrast to the findings of that study, the latter suggests that exchange rate appreciation occurred in other sectors, particularly among tradable goods.

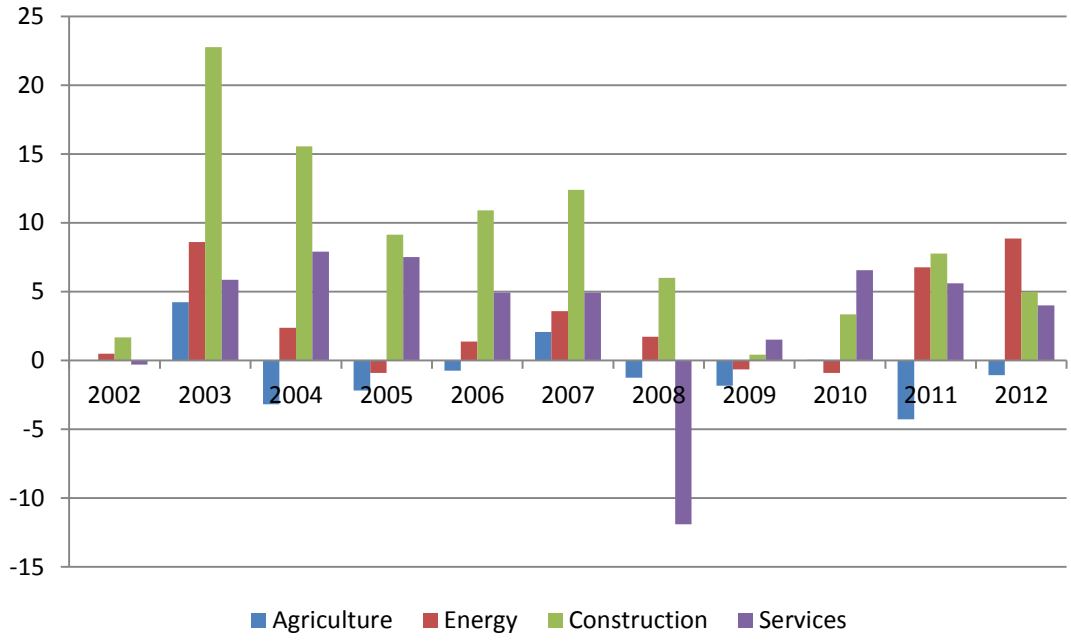
Table 1.2: GDP Shares of Major Economy Sectors in Kazakhstan

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Energy	35.19%	41.12%	36.83%	34.60%	38.81%	32.35%	34.01%	36.56%	33.75%
Agriculture	7.12%	6.37%	5.50%	5.66%	5.32%	6.15%	4.51%	5.11%	4.38%
Construction	6.06%	7.84%	9.80%	9.44%	8.09%	7.89%	7.70%	6.59%	6.31%
Trade	12.46%	11.83%	11.40%	12.36%	12.25%	12.21%	12.99%	13.85%	15.24%
Transportation and Communications	11.78%	11.81%	11.54%	11.53%	11.02%	11.02%	11.12%	9.56%	10.23%
Other Services	33.29%	32.36%	32.20%	32.72%	31.17%	32.19%	22.14%	24.63%	24.28%

Source: Based on data from the Statistical Database of the Republic of Kazakhstan, 2013

Figure 1.3 depicts the trends in employment by sector. Employment in the agricultural sector grew at a considerably slower rate than other sectors from 2002 to 2012, indicating a decline in the total employment share of the agricultural sector. By contrast, employment growth rate in the construction and other service sectors not only exceeded that of agriculture, but also that of the energy sector in almost all years, revealing the relatively increased importance of construction and other services. There was only one substantial decline in the other services sector in 2008.

Figure 1.3: Employment Growth by Sector in Kazakhstan, in Percentage Change From the Previous Year



Source: Based on data from the Statistical Database of the Republic of Kazakhstan, 2013

1.3 Recent Institutional Arrangements in Kazakhstan

Kazakhstan is relatively large in terms of its land area, although it only has 16.6 million inhabitants, and is heavily dependent on energy resources. The country has demonstrated high economic growth since 2000. Although economic growth has been observed in all regions of Kazakhstan, including non-oil producing regions, there is high variability in income per capita, living standards, and poverty indicators (USAID, 2010). For instance, in 2010 the highest GRP per capita documented in the Atyrau region was 5,401 thousand tenge (36,654 USD), while the lowest GRP per capita reported in the Jambyl region was 429 thousand tenge (2,911 USD). The Atyrau region is rich in oil resources, whereas the economy in Jambyl is predominantly agricultural.

1.4 Research Questions and Thesis Structure

Although the observations and statistics provided above do not explicitly indicate that resource abundance fails to sustain growth, they are consistent with a weak natural resource curse hypothesis effect. In other words, the data suggest "relative de-industrialization," which was also found by Oomes and Kalcheva (2007). The increases in the other services and construction sectors in both absolute (Table 1.1) and relative size (Figure 1.3), and the shrinkage of the agricultural sector, reveal a mild case of Dutch Disease. This suggests that the spending effect is crucial, rather than the resource movement effect, to explaining the Dutch Disease effect. Similar findings were made by Westin (2004) and Omes and Kalcheva (2007) in Russia.

Furthermore, the inverse relationship between point source resource production and diffuse resource production is indicated. Indeed, the link between energy and the other sectors of the Kazakhstan economy is identified, particularly with respect to the agricultural and other services sectors. Based on the facts and figures discussed in the previous sections, in this research I investigated the following questions:

1. Is there evidence of the resource curse in modern emerging economies? If so, what

explains this association with natural resource-abundant economies? What are the fundamental channels of the natural resource curse-institutional quality and Dutch Disease?

2. Is there a negative link between resource abundance and income per capita growth? How does the energy and the agricultural sector's production influence on institutional quality?

3. How do institutional arrangements in the energy and agricultural sectors influence development? Are point (e.g. energy) resources different from non-point (e.g. agricultural) resources?

4. How does high energy production impact production in the agricultural sector? What are the linkages between energy production and institutional performance?

The thesis is comprised of four chapters in which I addressed the aforementioned questions. To this end, I evaluated the impact of natural resource endowment on economic growth and potential ways to reap broad benefits from resource wealth. In recent years, there has been revived and growing interest in the investigation of natural resources and their diverse international, regional and intra-regional impacts. Only a handful of studies, however, have considered both the economic and political channels of the resource curse for particular regions, while few, if any, have been investigated within a country. Hence, my major aim in this study was to fill this gap in economic literature. In addition, I sought to provide crucial insight for policymakers concerning the resource wealth impact over the long-term, as well as to suggest potential ways to reduce the negative impacts of resource abundance.

The key hypothesis in my research is that well managed resource endowments have enormous positive potential, particularly within the Commonwealth of Independent States (CIS) region, and thus could play an important role in boosting economic growth. The vast majority of studies at the intra-regional level have concentrated on resource wealth impacts exclusively along economic channels, while ignoring political economy dimensions. In this regard, I investigated resource abundance impacts among the internal regions of Kazakhstan, examining both channels of the potential resource curse problem. This country-specific approach including both channels

could be important for policymakers, because the various channels of resource curse might have distinct impacts on economic growth and therefore greater understanding of such channels.

In Chapter 1 I present the introductory part of the thesis, including the background of the research and the main facts about economic growth and its composites.

In Chapter 2 I present my evaluation of the existence of a natural resource curse in emerging economies, including the fundamental channels of the potential resource curse.

In Chapter 3 I present my analysis of the linkages between resource abundance and economic growth in CIS countries, particularly over the long-term. Furthermore, I also conducted an empirical analysis of the energy sector's impact on the agricultural sector and linkages to institutional quality.

In Chapter 4 I present an analysis of the wheat sector in Kazakhstan, identifying the main actors in the sector. The main objective of this part is to determine the effects of institutional arrangements on the wheat sector development as one of the types of diffuse resources.

In Chapter 5 I discuss natural resource abundance and its causes in Kazakhstan. Following the key actors in the wheat and energy sectors, I investigated the impacts of energy and agricultural resources production, as well as their composition, on economic performance, either directly or via institutional quality.

In Chapter 6 I provide the summary and research conclusions, and discuss further research topics and other suggestions. I also provide bullet point recommendations for policymakers. References and appendices are presented in the final section of the thesis.

My analyses of the resource curse shift from a global to a regional level, using data from CIS countries, and are followed by an internal investigation of this phenomenon based on data from within Kazakhstan. This is a logical sequence in that is consistent with the aforementioned

research. Initially, I investigated evidence of the resource curse worldwide and its pathways using cross-national experiences to reveal the permanent channels of the resource curse effect. Subsequently, I used panel data econometrics to review regional data from CIS countries and for regions within Kazakhstan to gauge the impacts of resource wealth on institutional quality and thus economic performance.

2 THE NATURAL RESOURCE CURSE, INSTITUTIONAL QUALITY, AND ECONOMIC GROWTH IN EMERGING ECONOMIES

2.1 Introduction

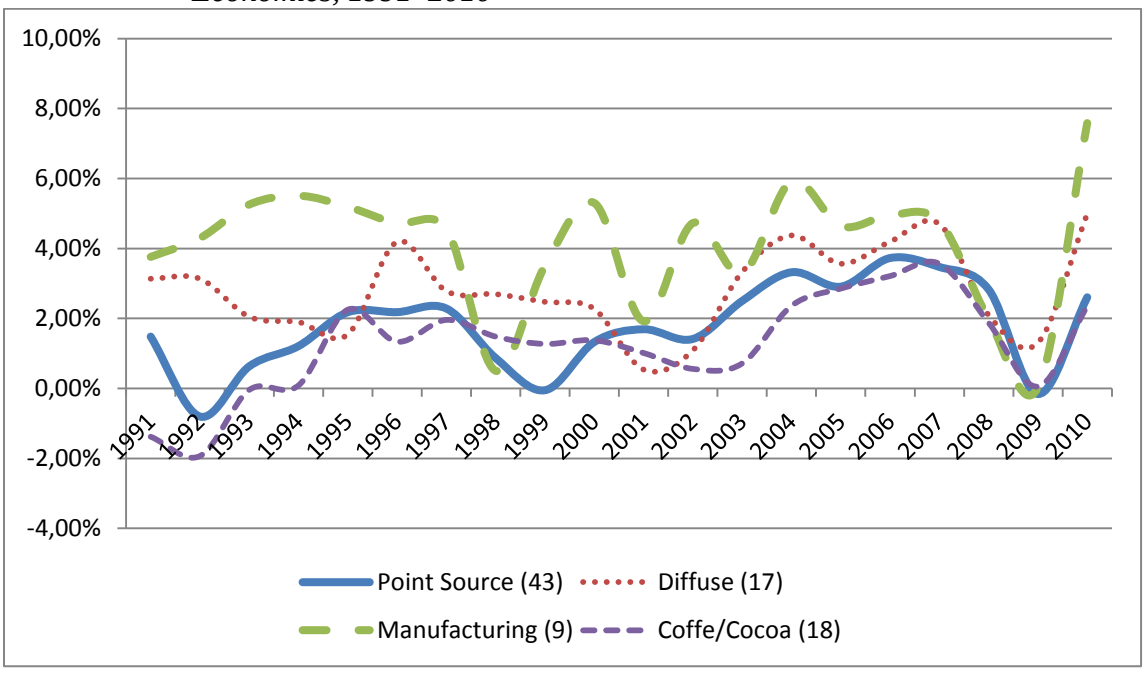
Explaining the variability in economic growth among countries has been a recurrent research question in economics. Differential growth rates are typically explained by investment in physical or human capital, endogenous technological progress, geographical conditions, or institutional factors (Barro and Sala-i-Martin, 2003; Acemoglu and Robinson, 2010). However, recent developments in economic research have revealed that from 1960 to 1990, the economies of resource-poor countries, on average, grew two or three times more than resource-abundant countries (Sachs and Warner, 1995; Auty, 2001).[3]

This situation does not necessarily lead to the conclusion that all resource-abundant economies are cursed by underdevelopment. Literature on the resource curse indicates that there are many examples of strong economic growth among countries with abundant natural resources, such as Australia, Canada, Norway, Botswana, Mauritius and Chile.[4] Figure 2.1 describes the growth performance of 87 developing and emerging economies. Averages of the median values of real income per capita growth rates by groups from 1991 to 2010 for emerging economies were plotted to reveal historic patterns. The data were grouped according to their export structure (Appendix Table 2.1.A) according to the classification suggested by Woolcock et al. (2001) and Isham et al. (2005). Economies were separated into four main categories according to their predominant resource endowments (specifically their first and second most important exports): manufacturing, point source, diffuse, and cacao/coffee based economies. This classification rendered it possible to distinguish the distinct impacts of various resources. Although coffee and cocoa are diffuse agricultural resources, economically they bear characteristics of point source resources, as they are typically controlled by large-scale producers. Therefore, coffee and cocoa are considered as a distinct type of resource, which might have a negative impact on economic growth despite being diffuse resources.

[3] See also Gelb (1988), Lane and Tornell (1996), and Gylfason et al. (1999). Probably the most recent literature overview is provided by Ross (2013).
[4] See Mehlum et al. (2006).

The trends depicted in Figure 2.1 demonstrate that countries that export manufactured goods had the highest average income per capita growth relative to the other three categories, except during economic crises (e.g., 1998, 2007–2009). It was also revealed that countries that concentrate on point source and cacao/coffee products exhibited the slowest growth. The averaged median growth rates during the 2000–2010 period were 4.10%, 2.95%, 2.33%, and 1.81% for countries that concentrate on manufacturing, diffuse, point source, and coffee/cocoa goods, respectively. However, since 2000 the data indicate that resource-rich economies are catching up to manufacturing dominated countries. There was an upward sloping trend among resource-rich countries, especially with respect to point source and diffuse resource based economies. This result is consistent with a World Bank study (1994), which found that the five countries with the most resources out of a total of 82 countries were also among the top 15 leading economies according to income per capita. I examined whether this situation has changed since 2000.

Figure 2.1: Smoothed Median Economic Growth Rates for 87 Developing and Emerging Economies, 1991–2010

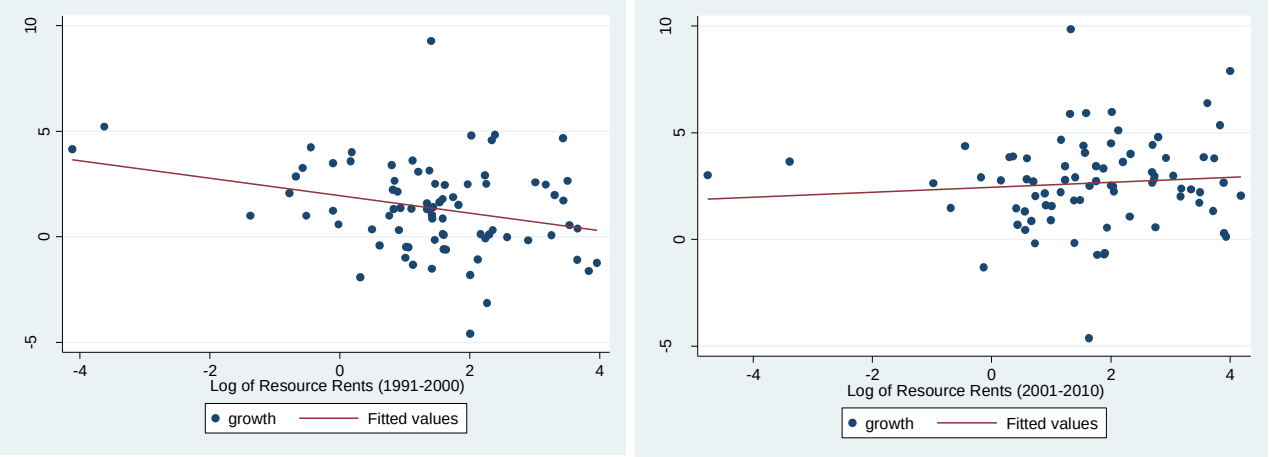


Source: Based on IMF World Economic Outlook Database (2013)

To explain the disparity in economic growth according to export concentration, I focused on the variation in economic growth for the period before and since 2000, especially with respect to

institutional arrangements. The mean annual GDP per capita growth versus the log of Resource Rents (RR) was plotted for 79 of the 87 countries (Figure 2.2)[5] based on data from a World Bank database (2013).[6] The data were divided into two subsamples: panel (a) is the mean annual economic growth from 1991–2000 versus the log of RR (as a percentage of GDP) over that period, and panel (b) is the mean annual economic growth from 2001–2010 versus the log of RR (% of GDP) over that period. A negative correlation of resources and growth was observed in the panel (a) only. Thus, panel (a) provides strong support for the existence of a resource curse, whereas there was not a similar trend in panel (b), which indicates that there is a weak positive or no relationship at all between growth and resource rents.[7]

Figure 2.2: GDP Per Capita Growth and the Log of Resource Rents % in GDP Among Emerging Economies (1991–2001 Versus 2001–2010)



(a) GDP per capita and Log of Resource Rents share of GDP during 1991–2000

(b) GDP per capita and Log of Resource Rents share of GDP during 2001–2010

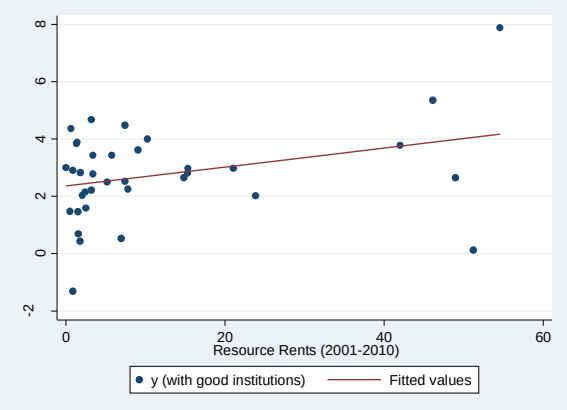
Notes: Based on World Bank data (2013) on resource rents (% of GDP) and GDP per capita growth.

As a further illustration of the way in which resource rents explain economic growth via institutional arrangements during 2001–2010, I divided the data into two groups according to

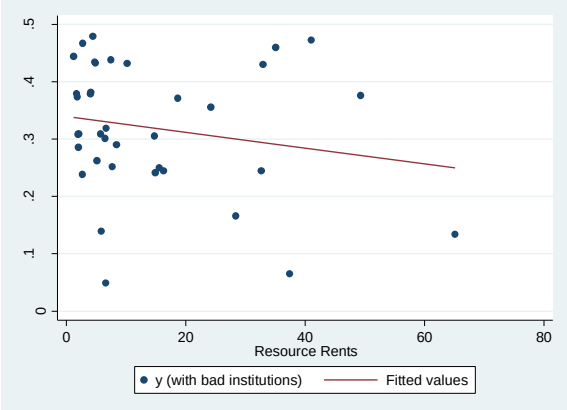
[5] Some of the countries that concentrate on manufacturing goods and non-resource countries were not included.
[6] See the detailed description of a resource share in income measure in subsequent sections.
[7] The earlier explanation of weak support for the Dutch Disease hypothesis could be consistent with these findings.

institutional quality (Figure 2.3).[8] This dataset consists of 73 countries divided into two groups of approximately equal size. Panel (a) consists of 36 countries with high quality institutions, (measured by above-median values of contract-intensive money (CIM),[9] and panel (b) consists of the remaining 37 countries with 'qualitatively ineffective' institutions. The trends depicted in Figure 2.3 demonstrate that the resource curse was evident in countries with low institutional quality, whereas countries with substantial resources and effective institutions demonstrated higher economic performance. However, there was a weak relationship between income per capita and resource rents share of income associated with 'bad' or 'good' institutions. This might be due to the fact that other growth factors are also essential. This relationship between institutional quality and economic growth has also been observed in many earlier empirical and theoretical studies.[10] In particular, the distinction between grabber-friendly and producer-friendly institutions is important because they impact economic growth in different ways. Grabber-friendly institutions are particularly detrimental to economic growth because rent-seeking absorbs entrepreneurial resources that are not available for growth promoting investments or innovations.

Figure 2.3: GDP Per Capita Growth and Log of Resource Rents % in GDP Among Emerging Economies (High Versus Low Quality Institutions, 2001–2010)



(a) With high institutional quality (CIM above median)



(b) With low institutional quality (CIM equal or below median)

Note: Based on World Bank data (2013) of resource rent percentages of GDP and GDP per capita growth.

[8] Following Auty (1997), Woolcock et al. (2001), and Isham et al. (2005) on the importance of natural resource types in defining the quality of institutions.
[9] The Contract-Intensive Money indicator is discussed in detail in the following sections.
[10] See recent studies by Mehlum et al. (2006), Brunnschweiler (2007), and Boschini et al. (2007).

2.2 Research Hypothesis and Data

My main objective in this analysis was to assess the impact of resource rent shares of income per capita through various resource curse channels. I hypothesized that natural resource abundance only encourages economic development in countries with high quality economic institutions. In countries where institutions manage conflicts inefficiently, violence and rent-seeking behaviors, and natural resource abundance are negatively associated with economic growth.

The basic econometric model for the suggested interaction effect of resource endowments and institutional quality on economic growth was defined as follows:

$$G_i = \beta_0 + Z_i\beta_1 + \beta_2 RR_i + \beta_3 Inst_i + \beta_4(RR_i * Inst_i) + \varepsilon_i, \qquad (1)$$

where G_i is the mean annual GDP per capita growth of country i, and Z_i is the vector of control variables such as initial income per capita or direct foreign investment. A brief description of the data used for this analysis is presented in Table 2.1. In Equation (1) the dependent variable is G_i, the mean growth rate of GDP per capita between 1991 and 2000 (first subsample), and between 2001 and 2010 (second subsample). RR_i is the mean share of resource rents in income for the two subsamples — the measure of resource abundance and endowments - and $Inst_i$ is the mean measure of institutional quality for the two subsamples. To test the hypothesis that the resource endowments associated with high quality institutions drive economic growth, the interaction term $RR_i * Inst_i$- was introduced. Consistent with the hypothesis suggested above, I expected a negative sign for the β_2 coefficient, implying the resource curse phenomenon, and a positive sign for the β_3 coefficient (commonly accepted finding), suggesting that high quality institutions determine economic growth, as well as a positive sign for the β_4 coefficient according to the prevailing consensus in the literature (e.g., Boschini et al., 2007; Brunnschweiler, 2007).

Rather than the government indicators used by Kaufman et al. (2010), which are widely used to measure institutional quality, I used CIM in this study as a proxy for institutional quality as proposed by Clague et al. (1999). It has been suggested that societies accumulate potential gains from business activity and that trade is boosted by effective contract enforcement and property

rights. The level of the potential gains that a society can capture could be approximated by the relative amount of money in use. CIM was defined in Clague et al. (1999) as follows:

$$Inst = \frac{(M_2 - C)}{M_2}, \qquad (2)$$

where M_2 is the money supply including currency and deposits, and *C* is the amount of currency in circulation. If *Inst* (CIM) is a good proxy for contract enforcement and property rights in a broad sense, it should also be a good indicator of a government's role in the economy in the following ways: (a) as a third-party enforcer of transactions and trades that cannot be realized otherwise; (b) as an intermediary institution that links breaches of contract; (c) as having the capacity to establish rules and arrangements in a way that allows private actors to form formal groups (e.g., trade associations); and (d) as a guarantor of civil behaviors among parties. The approximation for institutional quality must be carefully chosen. The standard proxy variables that are typically employed in the literature with respect to the resource curse are indices such as ICRG, BERI, BI ratings (pioneered by Knack and Keefer, 1995; Mauro, 1995), and the Worldwide Governance Indicators (WGI) suggested by Kaufmann et al. (2010). However, a potential bias in these indicators may arise from the fact that they are based on the subjective assessments of respondents.[11] For instance, the evaluators may be more likely report that governance in a country is good during times of strong economic performance. The use of CIM also has potential risks if the measure is idiosyncratic and irrelevant to contract enforcement and property rights. Clague et al. (1999) reviewed case studies from several countries and found that CIM is a good measure of institutional quality, though some country examples demonstrate idiosyncratic cases.

Table 2.1 presents descriptions of the relationships among institutional quality variables and other economic indicators of the correlation matrix between *Inst*, the indicators of governance used by Kaufmann et al. (2010), and other macroeconomic variables. All indicators and measures are mean values for the period 2001–2010.[12] The correlation of the WGI, estimated as

[11] See Glaeser et al. (2004).
[12] Almost identical correlation results were found for available data from 1996 to 2000.

a weighted average of its aggregate indicators, and its aggregate indicators of six broad government dimensions—Voice and Accountability (VA), Political Stability and the Absence of Violence (PA), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Control of Corruption (CC)—with CIM, was illustrated to examine the suitability of CIM as an institutional quality variable. Among all indicators, CIM was most correlated with GE, RQ, and RL. It was also highly correlated with other WGI aggregates such as VA, PA, and CC. Finally, CIM also had a strong correlation with WGI. Table 2.2 demonstrates that CIM was positively correlated with GDP per capita growth rate (Y). RR was not correlated with GDP per capita and other macroeconomic indicators, however, RR was negatively correlated with all institutional quality indicators. RR was not correlated with other macroeconomic indicators such as foreign direct investment (FDI) and export share in GDP (Exp).

Table 2.1: Descriptive Statistics of the Main Variables Used in the Regression Models of Economic Performance Among Emerging Economies

Dependent Variable	Definition	Source	During 1991–2000			During 2001–2010		
			Obs.	Mean	Std. Dev.	Obs.	Mean	Std. dev.
G_i	Income per capita growth rate (annual %)	World Bank database	81	1.405	2.145	81	2.662	2.083
Inst	Contract-Intensive Money	World Bank database	81	0.538	0.212	81	0.528	0.222
FDI	Foreign Direct Investment, net inflows (% of GDP)	World Bank database	81	2.640	3.639	81	4.120	4.373
RR	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forestry rents (% of GDP)	World Bank database	81	8.742	11.530	81	12.064	15.369
WGI	Weighted Average of Worldwide Governance Indicators	Kaufmann et al. (2010)	–	–	–	81	–0.370	0.713
GE	One of the six Worldwide Governance Indicators: Government Effectiveness	Kaufmann et al. (2010)	–	–	–		–0.377	0.717
RL	One of the six Worldwide Governance Indicators: Rule of Law	Kaufmann et al. (2010)	–	–	–		–0.477	0.702
ToT	Net barter terms of trade index, (2000=100)	World Bank Database	–	–	–	81	108.51	25.69
lgdpea70	Log of Initial income per capita*	Sachs and Warner (1995)	81	7.878	0.756	81	7.878	0.756
EFrac	Ethnic fractionalization index*	Alesina et al. (2003)	81	0.539	0.246	81	0.539	0.246
Language	Linguistic fractionalization index*	Alesina et al. (2003)	78	0.479	0.317	78	0.479	0.317

*The same data for separate subsamples

Table 2.2: Correlations Between CIM (Kaufmann et al. 2010) and International Institutional Quality Indicators and Macroeconomic Indicators, Mean Values from 2001–2010

	CIM	*VA*	*PS*	*GE*	*RQ*	*RL*	*CC*	*G*	*RR*	*FDI*	*Exp*	*WGI*
CIM	1											
VA	0.48***	1.00										
PS	0.28**	0.52***	1.00									
GE	0.67***	0.57***	0.63***	1.00								
RQ	0.64***	0.62***	0.65***	0.92***	1.00							
RL	0.58***	0.54***	0.73***	0.93***	0.90***	1.00						
CC	0.51***	0.54***	0.70***	0.91***	0.88***	0.93***	1.00					
G	0.23**	0.05	–0.01	0.21*	0.14	0.18	0.13	1.00				
RR	–0.25**	–0.37***	–0.13	–0.24*	–0.25**	–0.23**	–0.24**	0.11	1.00			
FDI	–0.07	0.04	0.18	0.14	0.17	0.17	0.29***	0.23**	0.15	1.00		
Exp	0.28**	0.13	0.42***	0.56***	0.51***	0.50***	0.55***	0.06	0.14	0.52***	1.00	
WGI	0.40***	0.51***	0.53***	0.65***	0.69***	0.67***	0.71***	–0.02	–0.31***	0.12	0.34***	1.00

Note: Based on data from the World Bank (2013); *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level All variables are average estimates of the indicators for the period 2001–2010; there were 81 observations CIM—Contract Intensive Money; 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; *G*-GDP per cap growth; RR-Resource Rents; FDI—Foreign Direct Investment; Exp—Export share in GDP; WGI—Worldwide Governance Indicators Weighted Average Index of Institutional Quality.

2.3 Main Results of the Resource Rents and Income Per Capita Link

2.3.1 Model Results

To examine the hypothesis described in Equation (1) I used a regression model in which the main explanatory variables of economic growth were resource rents, institutional quality, and an interaction term. Additionally, to address the potential change in the resource curse hypothesis before and since 2000, I divided the data into two subsamples for the periods 1991–2000 and 2001–2010. I estimated the regression of Equation (1) using the sample data from 1991–2000 and is presented in Table 2.3. Columns (1) to (4) in Table 2.3 depict the major outcomes of the model for the 1991–2000 period. All signs were consistent with the hypothesis.

The relevant problem in estimating growth theories employing cross-country regressions concerns functional form. In terms of assessing the regression of growth theories, the core issue is that the specification (1) might be a misspecification of the growth process. Bernard and Durlauf (1996) provides an example of a growth model with multiple steady states, which suggests that countries exhibit convergence with similar steady states, thus indicating local convergence. Therefore, a problem arises when some countries' steady states differ and other's are associated with one another, as is evident from the R-squared outcomes presented in Table 2.3. This means that using an OLS method could produce misleading or biased results. Thus, employing an instrumental variable (IV) approach seems to be more appropriate.

The results in columns (3) and (4) demonstrate that resource rent became individually insignificant when the institutional quality variable was introduced into the model, whereas the interaction term was individually insignificant in all cases. In cases where institutional quality was not in the model, the resource rent share of GDP (*RR*) had a significant negative impact on economic growth, supporting the resource curse hypothesis. *RR* and its interaction with institutions term (*RR*Inst*) was not individually and jointly significant[13] in the model when all variables were present (see Column 4). However, they were jointly significant when the institutional quality variable (*Inst*) was omitted from the model (see Column3).[14] The

[13] The joint significance statistic was 0.56 with a p-value of 0.58.
[14] The joint significance statistic was 4.36 with a p-value of 0.02.

impact of the interaction on economic growth did not dominate the direct negative impact of the resource rent share of GDP (*RR*).

Table 2.3: Regression Results for Economic Performance Indicators from Emerging Economies, 1991–2000

Dependent Variable: *GDP per capita growth*	(1)	(2)	(3)	(4)
lgdpea70	0.602**	–0.0505	0.507	–0.0405
	(0.278)	(0.357)	(0.312)	(0.356)
FDI	0.145**	0.0901	0.141**	0.0870
	(0.0646)	(0.0633)	(0.0644)	(0.0637)
RR	–0.0494***	–0.0183	–0.0806**	0.0109
	(0.0170)	(0.0206)	(0.0386)	(0.0472)
Inst		4.257***		4.709***
		(1.228)		(1.202)
*RR*Inst*			0.0776	–0.0645
			(0.0885)	(0.1000)
Constant	–3.291	–0.568	–2.577	–0.871
	(2.205)	(2.408)	(2.437)	(2.488)
Observations	81	81	81	81
R-squared	0.152	0.254	0.160	0.259
F-stat	5.88	7.76	5,23	6.46
(p-value)	(0.001)	(0.000)	(0.000)	(0.000)

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The main results of the other subsample (mean 2001–2010 values) are presented in Table 2.4. These results differed from the results of the first subsample in terms of the signs and the significance of the variables in question in support of the hypothesis. Initial income had a significant negative impact on economic growth, implying income per capita convergence. Foreign direct investment (*FDI*) had a positive significant impact in all cases, which is consistent with the working hypothesis. The resource rent share of income (*RR*) had a significant positive association when the institution term was added to the model (Column 2).

Additionally, the resource rent share of income demonstrated a significant negative effect when it was introduced into the model with the interaction term, inducing the relevant specification of the model (Column 3). Both variables were individually and jointly

significant at the 5% level.[15] The interaction term was significantly greater than the direct negative effect of the resource rent share of income on income per capita growth in the other subsample (1991–2000) results.[16] The signs and significance of variables remained more or less the same when all variables were included in the model (Column 4). It can be concluded that resource rents can lead to economic expansion when institutional quality is high. Thus, the model results confirmed the hypothesis that the role of institutions increases with the appropriation of resources.

Table 2.4: Regression Results for Economic Performance Indicators from Emerging Economies, 2001–2010

Dependent Variable: *GDP per capita growth*	(1)	(2)	(3)	(4)	(5)
lgdpea70	–0.386	–1.138***	–0.674**	–1.144***	–1.188***
	(0.292)	(0.377)	(0.298)	(0.379)	(0.374)
FDI	0.105***	0.117***	0.146***	0.127***	0.128***
	(0.0329)	(0.0335)	(0.0375)	(0.0317)	(0.032)
RR	0.0158	0.0436**	–0.0465*	0.0237	0.007
	(0.0172)	(0.0167)	(0.0251)	(0.0360)	(0.035)
Inst		4.690***		4.233***	4.383***
		(1.256)		(1.419)	(1.435)
*RR*Inst*			0.151***	0.0416	0.041
			(0.0527)	(0.0621)	(0.06)
ToT					0.015
					(0.011)
Constant	5.081**	8.139***	7.096***	8.396***	7.280***
	(2.354)	(2.478)	(2.363)	(2.489)	(2.674)
Observations	81	81	81	81	81
R-squared	0.074	0.241	0.148	0.245	0.26
F-stat (p-value)	3.90	5.31	4.96	4.88	4.36
	(0.01)	(0.000)	(0.001)	(0.000)	(0.000)

Note: Based on data from the World Bank (2013); robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

Though the magnitude of the interaction term exceeded the resource rent share of income direct impact on growth, the simple comparison of magnitudes was not informative. Table 2.5 illustrates the results of the estimation of the different effects of the resource rent share of

[15] Joint significance F-statistic was 4.86 with a p-value of 0.0103.
[16] The results of the model are consistent with the results of Mehlum et al. (2006) and Boschini et al. (2007).

income on economic growth in two different subsamples and the marginal effects of the resource rent share of income standard deviation change impact at various levels of institutional quality.[17]

Table 2.5: Marginal Effects of the Resource Rent Share of Income on Economic Growth Among Emerging Economies for 1991–2000 and 2001–2010

	1991–2000	2001–2010
Qualitatively Ineffective Institutions	–0.880	–0.601
Mean Institutional Values	–0.401	0.476
Values for Institutions One Std. Dev. Above Mean	–0.211	0.991
Qualitatively Effective Institutions	–0.106	1.393

Note: Based on data from the World Bank (2013)

The interpretation of the resource rent share of income on economic growth at mean institutions for the second subsample (2001–2010), is that, *ceteris paribus*, one standard deviation increase in the resource rent share of income would increase income per capita by 0.476%, whereas one standard deviation increase would imply a –0.401% income per capita decrease during 1991–2000. However, the results in both subsamples indicate that the resource rent share of income per capita increase would further encourage economic development with higher institutional quality.[18] Thus, the marginal effects estimation results support the hypothesis that the impact of resource abundance on economic growth is determined by institutional quality. However, the interaction term lost significance in one of the specifications, implying that the support for the hypothesis is rather weak and that the interpretation of institutional quality must be made carefully. By contrast, the direct effect was stable, indicating significance in all models. Thus, the interaction term was not instrumented as it has been in earlier studies (e.g., Boschini et al., 2007).

2.3.2 Instrumenting Institutional Quality

One of the concerns in determining the relationship between economic growth and institutional quality is that the institutional quality variable could be correlated with the error

[17] The marginal effect was estimated as follows: $\Delta y = \left(\widehat{\beta_2} + \widehat{\beta_4} * \overline{Inst}\right) * st.dev.RR$, where $\overline{Inst}$ is the quality level of institutions, $st.dev.RR$ is the standard deviation of the resource rent of income, using the coefficients $\widehat{\beta_2} and \widehat{\beta_4}$ from Column 3 in Table 2.4. For instance, the mean institutional quality value for the 2001−2010 subsample (0.513) was estimated as follows: (−0.0465+0.151*0.513)*15.369=0.476.

[18] Though all signs were negative for the first subsample (1991−2000), the magnitudes were lower with higher institutional quality.

term in Equation (1).[19] To test whether the institutional quality variable was endogenous in the equation I performed a Hausman J Chi^2 test for overidentifying restrictions and the results are demonstrated in Table 2.6 along with additional institutional quality indicators that served as robustness checks. With respect to the endogeneity test, the null hypothesis was not rejected for the second decade, implying that the institutional quality and the resource rent share of income variables were exogenous for that period. However, the null hypothesis was rejected for the measure for 1991–2000 at the 5% level, indicating that both institutional quality and the resource rent share of income are endogenous in this subsample. The Hansen's J values demonstrated in Table 2.6 imply that the suggested instrumental variables are valid for the model because the null hypothesis was not rejected in all models.[20]

Institutional quality was instrumented and is displayed in Table 2.6. In both subsample regression results shown in panels (1) and (2), the magnitudes of the institutional quality variable, *Inst*, were high compared to those estimated using the OLS method. For instance, the 2001–2010 magnitude of *Inst* was over threefold more than for 1991–2000, indicating a potential bias problem related to measurement error in the OLS estimates.[21] To examine the validity of the institutional quality variable (*CIM*), *Inst*, I performed a IV GMM for the 2001–2010 subsample using particular WGIs such as Government Effectiveness (GE), Rule of Law (RL), Control of Corruption (CC), Regulatory Quality (RQ), Political Stability and Absence of Violence (PS), and Voice and Accountability (VA) in panels (3) to (8) of Table 2.6. These results are consistent with the CIM results, although CC, PS, and VA were not significant for the second period.

Though the resource rents share of income (*RR*) might have a positive direct impact (e.g., during 2001–2010), it had a negative impact on economic growth through institutions in all cases (before and after 2000). The results presented in Table 2.6 further indicate which aspects of institutional quality were particularly associated with *RR*: while GE and the RL were only slightly reduced, CC, RQ, PS, and VA can have strong negative relationships with resource rent.

[19] Concerning the endogeneity test for $Inst_i$, initially, the first regression model was performed as follows: $Inst_i = \alpha_0 + Z_i\alpha_1 + \alpha_2 RR_i + X_i\alpha_3 + \omega_i$, where X_i is a set of instrumental variables. The set of instrumental variables is from Alesina et al. (2003). Then, the residual ω_i,, was included in the structural equation and tested for joint significance to address endogeneity.

[20] The null hypothesis is that the instrumental variables are exogenous and equations are identified.

[21] See Ross (2001a, b) for discussions of the potential endogeneity problem of the institutional quality variable.

Table 2.6: Instrumental Variable GMM Results for the Economic Performance of Emerging Economies (Robust Std. Err.)

Second Stage Regression Results

Dependent Variable:	***Instrumented Institutional Quality Indicators:***							
	CIM		*GE*	*RL*	*CC*	*RQ*	*PS*	*VA*
GDP per capita growth rate	1991–2000	2001–2010	2001–2010	2001–2010	2001–2010	2001–2010	2001–2010	2001–2010
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inst	11.56***	6.247**	2.057**	1.874*	2.272	3.256*	–0.921	–32.967
	(3.556)	(2.670)	(1.016)	(1.116)	(1.984)	(1.913)	(1.083)	(212.16)
lgdpea70	–1.198*	–1.378**	–1.499**	–1.129*	–1.404	–1.982*	0.185	10.36
	(0.653)	(0.576)	(0.644)	(0.593)	(0.987)	(1.028)	(0.535)	(68.51)
FDI	–0.00780	0.114***	0.0434	0.0351	–0.0311	–0.005	0.143**	0.420
	(0.0768)	(0.0343)	(0.0591)	(0.0616)	(0.1202)	(0.1043)	(0.063)	(1.985)
RR	0.0332	0.0498**	0.0586**	0.0527*	0.064	0.0832*	–0.001	–0.653
	(0.0330)	(0.0205)	(0.0274)	(0.0295)	(0.0437)	(0.0432)	(0.024)	(4.275)
Constant	4.392	9.194***	14.37***	11.67**	14.06	18.45**	0.090	–84.02
	(3.499)	(3.187)	(5.274)	(5.027)	(8.585)	(8.50)	(4.731)	(568.18)
Observations	78	78	78	78	78	78	78	78
Endog. test (p)	0.02	0.58	0.21	0.27	0.41	0.10	0.42	0.32
Hansen's J chi2 (p)	0.92	0.57	0.75	0.37	0.36	0.78	0.14	0.98

First Stage Regression Results

	CIM		*GE*	*RL*	*CC*	*RQ*	*PS*	*VA*
	1991–2000	2001–2010	2001–2010	2001–2010	2001–2010	2001–2010	2001–2010	2001–2010
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lgdpea70	0.1176***	0.1061***	0.1176***	0.1061***	0.3856***	0.4381***	0.421***	0.327***
	(0.0206)	(0.0313)	(0.0206)	(0.0313)	(0.0948)	(0.1038)	(0.132)	(0.093)
FDI	0.0084*	–0.0016	0.0084*	–0.0016	0.0516**	0.0336	0.040	0.009
	(0.0045)	(0.0029)	(0.0045)	(0.0029)	(0.0243)	(0.0277)	(0.029)	(0.008)
RR	–0.0047***	–0.0036**	–0.0047***	–0.0036**	–0.0168***	–0.0172***	–0.015***	–0.020***
	(0.0017)	(0.0016)	(0.0017)	(0.0016)	(0.0036)	(0.0038)	(0.005)	(0.004)
EFrac	–0.1232	–0.0993	–0.1232	–0.0993	–0.6834	–0.4714	–0.921*	–0.03
	(0.1129)	(0.1151)	(0.1129)	(0.1151)	(0.4194)	(0.3668)	(0.498)	(0.357)
Language	–0.0864	–0.1486*	–0.0864	–0.1486*	0.0932	0.0055	0.414	0.030
	(0.0833)	(0.0864)	(0.0833)	(0.0864)	(0.2817)	(0.2650)	(0.399)	(0.242)
Asia&Oceania	0.1620***	0.1958***	0.1620***	0.1958***	0.0687	0.2676	–0.455**	–0.022
	(0.0484)	(0.0519)	(0.0484)	(0.0519)	(0.1948)	(0.1792)	(0.227)	(0.174)
Constant	–0.2935*	–0.1723	–0.2935*	–0.1723	–3.1566	–3.5212***	–3.429	–2.702
	(0.1679)	(0.2586)	(0.1679)	(0.2586)	(0.7966)	(0.8612)	(1.125)	(0.801)
Observations	78	78	78	78	78	78	78	78
R-squared	0.56	0.52	0.52	0.41	0.45	0.43	026	0.32
Adj. R-squared	0.53	0.47	0.48	0.35	0.40	0.38	0.19	0.26
F-stat. (p)	18.40	16.75	12.64	8.52	7.49	10.36	5.42	9.17
	(0.00)	(0.000)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: Based on data from the World Bank (2013); robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

R-squared values for the second stage regressions are not reported. According to Sribney et al. (2003), this value has no statistical meaning in the IV regression models and is therefore not reported in many studies.

To interpret the impact of a one standard deviation change (increase) in the resource rent share of income per capita growth via institutions during 2001–2010, I initially estimated that one standard deviation increase in resource rents (15.52) would lead to a decrease in

institutional quality by 0.25,[22] the approximate difference between Chile (0.84) and Iran (0.59). To translate this into *RR* impact on growth, a one standard deviation increase in *RR*, *ceteris paribus*, would lower income per capita by 1.56%. In contrast, the direct *RR* effect on economic growth, with a coefficient of 0.0498 indicates that a one standard deviation increase in *RR*, *ceteris paribus*, would lead to a 0.376% increase in income per capita.[23] Thus, the indirect negative effect of *RR* via institutions far exceeds its direct positive impact on economic growth. The net total effect of *RR* on economic growth was 1.19% (1.56–0.376), implying that a one standard deviation increase in *RR* would lead to an income per capita decrease of 1.19%.

2.3.3 The Dutch Disease and the Manufacturing Sector

In contrast to other studies on the resource curse, a direct positive relationship between resource abundance and economic growth was detected for the second decade (2000–2010). One explanation for this result could be the commodity boom that led to increasing commodity prices from 2006 onwards. A positive link has also been observed in some earlier studies (Sachs and Warner, 1999; Murphy et al., 1989) that attribute this to the fact that economies with vast quantities of resources have the capacity to accumulate economic infrastructure and human capital. If non-tradable sectors are characterized by increasing returns to scale (IRS), a resource boom can indeed boost economic growth. However, if IRS occurs in the manufacturing sector, resource concentration can be detrimental to economic growth through the Dutch Disease effect. Thus, the relationship between resource abundance and economic growth depends on whether IRS in production occurs within tradable or non-tradable sectors.

To evaluate the Dutch Disease hypothesis, the link between the resource rent share of income and manufacturing sector growth was examined separately for the two decades (Table 2.7). Manufacturing value added (% of GDP) annual growth rate data were derived from the World Bank database (2013).[24] Resource abundance had a negative impact on economic growth when resource abundance was included as an interaction variable with FDI for the

[22] This figure was calculated as a product of the coefficient and the quotient of its standard deviation divided by the standard deviation of the dependent variable: $\hat{\alpha}_{RR} * (stdev(RR)/stdev(Inst))$. Standard deviations were those of the regression based on 78 observations. Three countries were dropped from the OLS regression due to missing data ($Stdev(RR)$=15.52, $stdev(Inst)$=0.224 and $\hat{\beta}_{RR}$=–0.0036) (Table 2.6, Column 2).

[23] $\hat{\beta}_{RR} * (stdev(RR)/stdev(Growth))$=0.0498*(15.52/2.06)

[24] Annual growth rate for manufacturing value added was based on local currency and in real terms. Manufacturing includes industries determined by ISIC division 15–37.

1991–2000 data (Table 2.7, Columns 1 and 2), which is consistent with the Dutch Disease hypothesis. However, resource abundance had a significant positive impact on the resource rent share of income and its interaction term with FDI for the 2001–2010 data (Table 2.7, Columns 3–5). The results were not significant when resource abundance was included in the model along with its interaction term. The Wald test results indicated that the variables were jointly significant.[25] The findings for the second decade (2000–2010) challenge the Dutch Disease hypothesis because resource abundance does not necessarily lead to de-industrialization. Under circumstances where resource abundance is associated with the flow of FDI in a manner that induces technological transfer, resource abundance may spur the growth of manufacturing sectors. Manufacturing value added for 1990 in constant US dollars for 2000 (*mva90*) was included to evaluate the convergence hypothesis.

Table 2.7: The Relationship Between Resource Abundance and Manufacturing Sector Growth Among Emerging Economies

VARIABLES	Dependent Variable: *Manufacturing Value Added (% GDP) Growth*				
	1991–2000	1991–2000	2001–2010	2001–2010	2001–2010
	(1)	(2)	(3)	(4)	(5)
RR	0.0188	0.0120	0.0629	0.0845*	
	(0.0406)	(0.0441)	(0.0482)	(0.0470)	
FDI	0.474***	0.467***	0.0421	0.308*	
	(0.140)	(0.146)	(0.176)	(0.155)	
*FDI*RR*	–0.0188***	–0.0185***	0.00796	0.00155	0.0127**
	(0.00557)	(0.00568)	(0.00777)	(0.00552)	(0.00544)
mva90		0.000990		0.0403	0.0120
		(0.0743)		(0.0543)	(0.0539)
Constant	3.003***	3.280**	3.202***	1.924*	3.878***
	(0.573)	(1.319)	(0.734)	(1.066)	(0.926)
Observations	73	68	80	73	73
R-squared	0.134	0.148	0.239	0.244	0.188
Joint Significance test of *RR* and *FDI*RR* (p_value)	9.00*** (0.00)	7.59** (0.00)	4.05** (0.02)	3.24** (0.045)	

Note: Based on data from the World Bank (2013); robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

[25] I performed a joint significance test of resource abundance (*RR*) and its interaction term (*RR*FDI*). For instance, the estimated F-statistic was 4.05 (p-value=0.0189), implying that the variables are jointly significant (Table 2.7, Column 3), even though the results of the individual significance test were not significant.

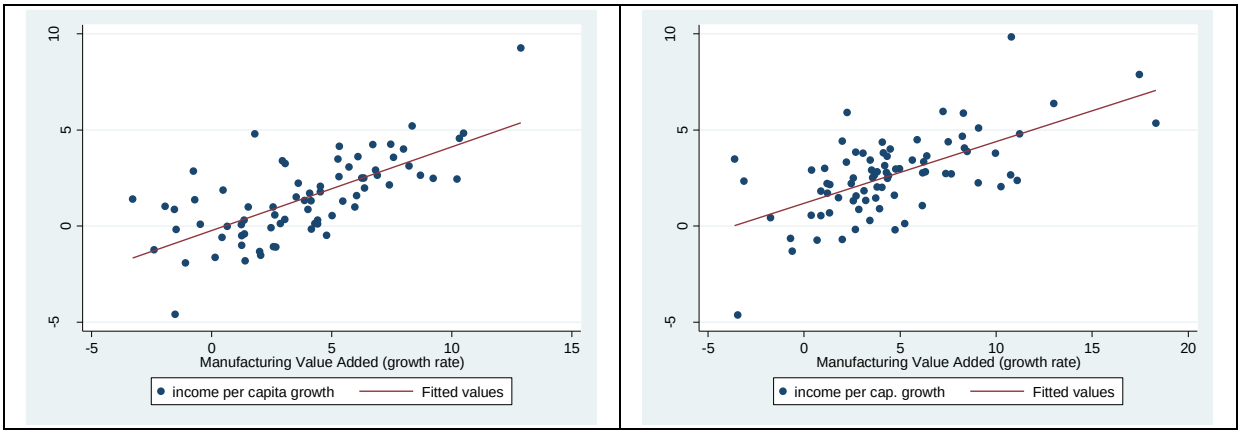
I also examined the resource abundance impact on real per capita manufacturing value added growth to control for population growth (Appendix Table 2.7.A). A new measure of the manufacturing per capita growth rate was estimated as the growth of the ratio of manufacturing value added in real terms (constant US dollars for 2000) to the total population size. The data were retrieved from the World Bank (2013) database. The results (Appendix Table 2.7.A) indicate an identical relationship between resource abundance and manufacturing sector growth (Table 2.7). The resource rent share of income associated with the FDI concentrated in resource-abundant sectors had a negative association with growth in manufacturing sectors during 1991–2000 (Table 2.7.A, Columns 1 and 2). However, the relationship was positive for the second decade, implying that resource abundance may contribute to manufacturing sector growth under certain conditions.

This result is consistent with the findings of certain studies of the link between economic growth and FDI. For instance, Asiedu (2004) found that FDI in resource-rich countries is typically concentrated in natural resource sectors and inhibits positive spillover such as technological transfers and increases in employment that are often generated by the manufacturing sector. Growth in the manufacturing sector had a significant positive relationship with income per capita growth (Figure 2.4). This relationship could potentially explain the negative relationship between resource abundance and manufacturing sector growth for the first decade, 1991–2000 (Figure 2.5). Additionally, Asiedu (2006) found a positive relationship between natural resource abundance and FDI. Following the considerable commodities price increase, FDI has been concentrated in natural resource-abundant sectors in Africa because foreign investors expanded activities in the mining, oil, and gas industries (UNCTAD, 2006).

With respect to the positive link between resource abundance and manufacturing sector growth, which is one of the key theories presented in this study, I conclude that FDI inflow associated with abundant natural resources can be an advantage for resource-rich countries in terms of boosting the manufacturing sector and encouraging economic growth. This idea is borrowed from Borensztein et al. (1998), who found that FDI boosts economic growth when the host country has sufficient human capital to benefit from technology transfer. The authors also suggested that FDI may, in fact, ‘crowd out’ domestic investment. Thus, FDI may adversely impact domestic savings and, in turn, undermine economic growth. This observation may explain the negative impact of the interaction variable (*RR*FDI*) for the first decade, 1991–2000 (Table 2.7, Column 2). Moreover, it explains the positive link indicating

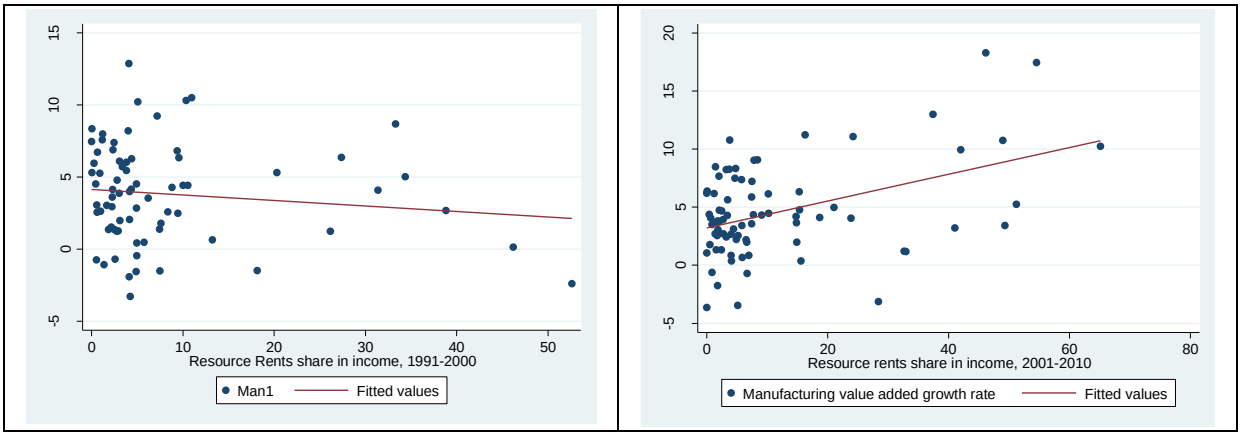
that resource-rich countries can benefit from FDI flow if human capital surpasses a certain threshold.

Figure 2.4: The Link Between Income Per Capita Growth and Manufacturing Sector Growth Among Emerging Economies



(a) for the period 1991–2000 (b) for the period 2001–2010

Figure 2.5: The link between the resource rent share of income and manufacturing sector growth



(a) for the period 1991–2000 (b) for the period 2001–2010

Note: Based on data from the World Bank (2013)

2.4 Conclusion

In this chapter I examined the relationships among natural resource endowments, economic growth, and institutional quality.[26] The results demonstrate that the resource share in income has a negative relationship with institutional quality and thus undermines economic growth. Comparing two temporal subsamples of economic indicator data from emerging economies, I

[26] As observed in two influential papers by Sachs and Warner (1995, 1999)

found that a direct resource curse effect might have existed before 2001 but later disappeared in the subsequent decade (from 2001 to 2010). While the direct effect of resource rents on economic growth varied with volatile commodity prices that where high over the second half of the last decade, the indirect resource curse impact (through institutional quality) was true for all subsamples, implying that a resource curse as a result of institutional quality is a more persistent link between natural resources and economic growth. The resource rents and the ease to extract them, particularly for point-source resources, encourage different groups to seize control of these resources and the subsequent revenues associated with their use. This response, in turn, encourages inefficient institutional activity.

Thus, the relationship between resource abundance and economic growth is indirect as a consequence of institutional quality. The level of resource concentration only undermines growth through its impact on institutional quality. Heavy concentration of resource rents generates 'grabber-friendly' institutions and in turn causes economic failure. Therefore, transparency and political accountability in the management of specific point-source resources (e.g., oil production) are key components and are the main policy recommendation results of this investigation. The lack of transparency causes point-source resources to be appropriable in rent-seeking activity and inefficient utilization. Additionally, complex rules and regulations provide opportunities of certain groups to extract bribes. The lack of transparency is a key issue to be tackled in the management of point-source resources. Transparent business regulation regimes, however, are the key drivers of an economy in which small businesses are motivated to be productive.

Another interesting finding of this study is that natural resource abundance that is associated with resource-initiated FDI may boost growth in manufacturing sectors and, consequently, may have contributed to the economic growth in the second decade of the study from 2001–2010. Contrary to other studies (e.g., Asiedu, 2006), a positive link between natural resource abundance and manufacturing sector growth was established for the second decade (2001–2010). However, I argue that the findings are not completely contradictory to the findings of other studies. The negative relationship between resource abundance and manufacturing sector growth confirms the Dutch Disease theory. The results suggest that, under certain circumstances (e.g., sufficient human capital and technological transfer, but also high commodity prices), natural resources may be an advantage for an economy.

3 LINKAGES BETWEEN INSTITUTIONAL QUALITY AND DUTCH DISEASE IMPACT IN CIS COUNTRIES

3.1 Introduction

Natural resources can be significant drivers of an economy, if they give it the 'big push' needed for development. Rosenstein-Rodan (1943, 1961) and Murphy et al. (1989) suggested that a big-push approach is necessary to boost demand and expand the market, thus providing better opportunities for entrepreneurs. This in turn is expected to boost economic development. However, recent studies of the impacts of a natural resource on economic growth emphasize the adverse links between natural resource abundance and economic growth.[27]

Scientists have traditionally concentrated on total factor productivity, human and physical capital accumulation, technological advancement and innovation, the knowledge creation process and its spillovers, as well as global economic integration to explain the causality of the growth of nations (Helpman, 2004). However, experts have emphasized the importance of governance and institutions in the process of economic growth because they boost incentives to create, accumulate, and accommodate change.[28] In this context, many empirical studies have focused on the political determinants of economic growth (Dellepiane-Avellaneda, 2010). North and Thomas (1973) highlight that the major factors upon which economists have traditionally focused, such as innovation, economies of scale, education, and capital accumulation, are not causes of economic growth but rather growth itself. Thus, they are proximate factors of growth, whereas institutions reflect the fundamental factor of growth.

North (1990) characterizes institutions as "humanly devised constraints that shape human interaction," and suggests distinguishing between the rules of the game (institutions), the set of organizations and individuals as key players of the game, and the way in which the game is played. In this regard, growth economists considered 'good governance' as a pre-requisite for sustained economic performance (Kaufmann et al., 2000; Knack, 2003). In contrast to other studies, Olson (1997) attributes most of the variability in economic development to the efficiency of resource use. In addition, he suggests that waste is commonly observed in economies with a weak institutional framework, within which the rule of law and property

[27] Sachs and Warner (1995, 1997)
[28] Drazen (2000) presents a detailed discussion of the political economy of growth.

rights are underdeveloped. The behavior of organizations is very important for economic growth and technological change. If transformations or technological changes are to be achieved, government is needed to facilitate it because they bear features of public goods; otherwise, a 'free rider' problem is encountered. Transformation cannot be achieved if a free rider problem is widespread. In this regard, interest-group theory sheds light on the importance of the interests of groups of individuals (Eggertsson, 1990). He suggests that the size of the group is a primary factor in explaining the success of the group. In small groups, the contribution of each individual is meaningful and thus is assumed to be important for achieving common objectives, while in large groups the contribution of each individual does not have the same relative impact, implying that free riding is more likely to harm the common objective (Olson, 1965). In a subsequent study Olson (1982) argues that the so-called distributional coalitions harm economic growth by distributing income among their members, which is considered a rent seeking activity within economics.

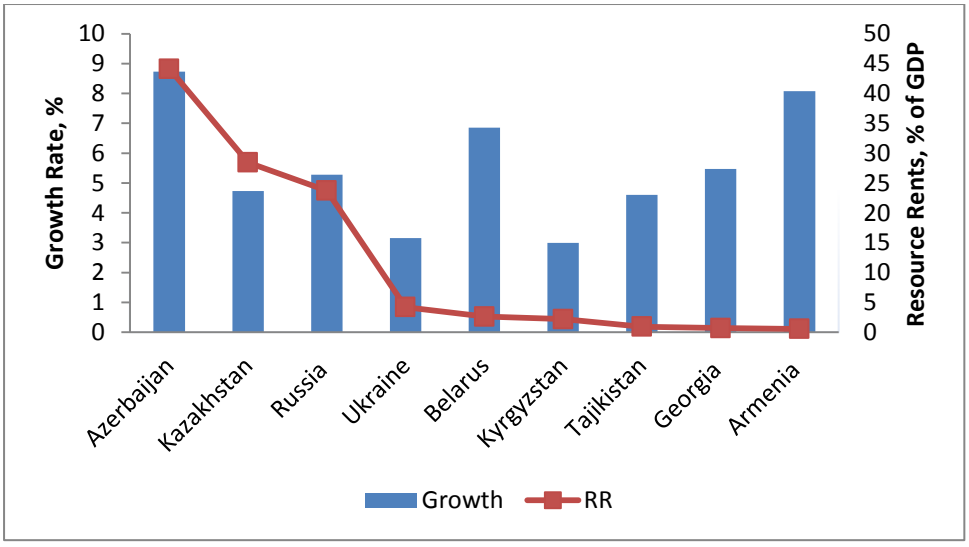
The theory of interest groups has been applied to the investigation of centrally planned economies since the collapse of the Soviet regime (Olson et al., 2000). They suggest that the economic success of Soviet Union from 1950 until 1965 can be explained by the type of the leadership. During this period the Soviet Union was governed by a relatively small group of people. In fact, it is assumed that Stalin operated as the owner of the country. The Soviet regime began to diminish in the Brezhnev era with the emergence of unbalanced structures. Kasper et al. (2012) offer fresh insights into the failure of the Soviet regime, suggesting that the principal-agent problem lies at the core of institutional economics in centrally planned economies. Indeed, progressively structured groups pursuing their own interests flourished during Brezhnev's governance. Ministries and agencies have emerged as the main suppliers of information to the central planning authorities. They acted like distributional coalitions or 'rent-seeking groups' in common economic literature, which triggered institutional decay. It has also been suggested in earlier studies by Shleifer and Vishny (1998) that politicians "try not to maximize social welfare, but rather aims their interests and goals" and in this respect governance can be depicted as a 'grabber hand.' However, there are crucial differences between socialism and capitalism. Under socialism, governments are richer and can dedicate resources to inefficient activities. For instance, the Soviet government could exploit natural resources to expand the militaristic economy.

On the other hand, Friedman (2008) emphasizes the importance of moral codes in the existence of markets and the prosperity of economies. The theory explains market function in

the face of the debt crisis that occurred in Europe. This is a tale of moral hazard, when some European countries pay the bills of other European Union countries, for actions in which they played no role. However, Friedman (2008) suggests that not only is a weak moral code harmful for economies, but also that too much moral code can be detrimental. The case of Soviet Union is of particular interest here. In an attempt to divorce itself from the moral outrages of the market, the Soviet Union appealed to communism and this utopian view of cooperation became an obstacle to growth.

Resource-rich CIS countries can learn some lessons from the experiences of other countries with abundant energy resources. The average per capita GDP growth rates and resource rents[29] of nine CIS countries are depicted in Figure 3.1, followed by their resource rent shares of GDP in descending order (depicted as a red line). Figure 3.1 displays nonlinear relationship (U-shaped pattern) between income per capita growth rate and resource rents share in income. In this respect, it is important to focus on the explanation of resource curse for countries with abundant resources, as well as deriving some lessons from other resource-rich countries.

Figure 3.1: Growth and Resource Rents (% of GDP), Average Values for 1991–2010

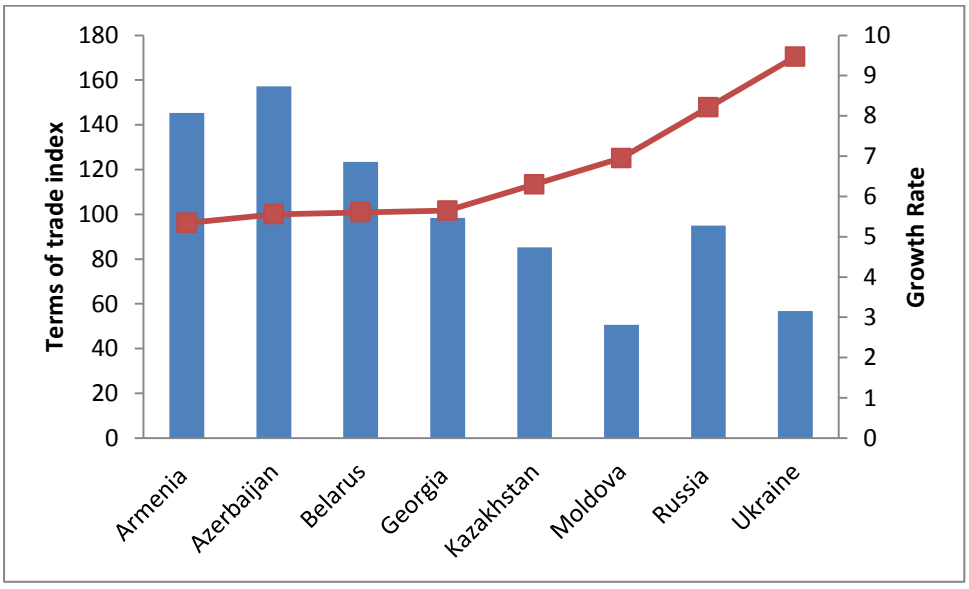


Source: World Bank Database (2013)

[29] Estimated as median GDP per capita growth rates (base year is 2000) and resource rent sharesof GDP for the period from 1991 to 2010.

In addition, the negative relationship between the terms of trade (real exchange rate) and income per capita growth indicates that the real exchange rate could potentially be another channel of the resource curse in CIS countries (Figure 3.2). The main contribution of this analysis is to link the seemingly different channels of the negative effects of natural resources, specifically the Dutch Disease effect, and the deterioration of institutional quality. Thus, it is hypothesized that abundant resources limit agricultural sector production, which might have a positive external effect on economic growth, either directly or indirectly through institutional improvements rather than other types of resources. Isham et al. (2005) found that the abundance of point source resources, as opposed to diffuse resources, is detrimental to institutional quality. In the following analyses natural resource abundance appears to undermine economic growth both directly and indirectly via its impact on institutional quality by limiting agricultural production, which potentially entails positive externalities for economic growth.

Figure 3.2: Growth and Terms of Trade, Average Values for1991–2010



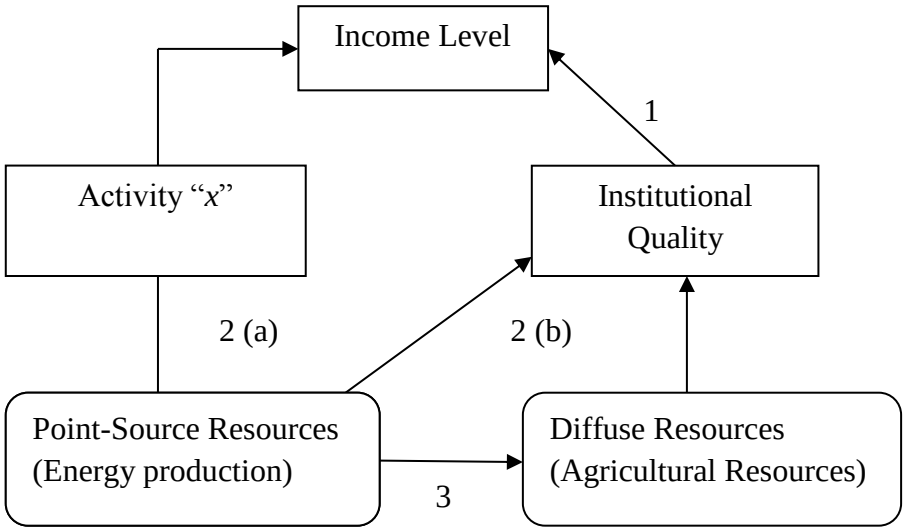
Source: World Bank Database (2013)
Note: The terms of trade for most countries is from 2000 to 2010.

3.2 Research Hypothesis and Data

Unfortunately there is little consensus on natural resource curse theory. Most explanations fall into one of two major groups. The first group concentrates on the institutional quality

dimension, suggesting that natural resources affect economic growth through institutional quality[30] or in association with institutional quality[31] (see arrows 2(a) and 2 (b) in Figure 3.3). The other group falls within the framework of the Dutch Disease phenomenon. The key concept behind the Dutch Disease theory is that the concentration of natural resources crowds out some other activity *x* (arrow 3 in Figure 3.3). This activity, in turn, boosts economic growth. Sachs and Warner (1995, 1999, 2001) define *x* as activities in the manufacturing sector.

Figure 3.3: Conceptual Framework of the Study



In this research I integrated two major channels of the effect of natural resources as a curse: the impact on institutional quality and crowding-out due to the Dutch Disease effect. The former is based on the hypothesis that natural resource abundance crowds out those sectors of the economy whose positive externalities impact economic growth directly or indirectly via institutional quality (arrow 3 in Figure 3.3). To examine this hypothesis I employed the panel VAR method and defined the growth equation as follows:

$$y_{i,t} = \sum_{j=1}^{p} \alpha_j y_{t-j} + \beta'(L)RR_{i,t} + \gamma'(L)Inst_{i,t} + \delta'(L)RR * Inst_{i,t} + \theta'(L)ToT_{i,t} + \eta_i + \varepsilon_{i,t}\,, \quad (1)$$

[30] See Isham et al. (2005)
[31] See Mehlum et al. (2006), Boschini et al. (2007), and Brunnschweiler (2007)

where $y_{i,t}$ is real income per capita growth, $RR_{i,t}$ is a resource rents share in GDP, $Inst_{i,t}$ is an institutional quality variable, $RR * Inst_{i,t}$ is the interaction between resource abundance and institutional quality (to examine the impact of resource abundance on the growth associated with institutional quality), $ToT_{i,t}$ represents the terms of trade, and η_i represents unobserved country-specific and time-invariant effects with E(η_i)= η and Var(η_i)=σ_η^2. $\beta'(L)$, $\gamma'(L)$, $\delta'(L)$ as matrix polynomials in the lag operator L. In the same vein, the equation for institutional quality, using panel VAR, was constructed as follows:

$$Inst_{i,t} = \sum_{j=1}^{p} \alpha_j Inst_{t-j} + \beta'(L)RR_{i,t} + \gamma'(L)RR_{i,t}^2 + \delta'(L)AgriVA_{i,t} + \theta'(L)AgriVA_{i,t}^2 + \rho_i + v_{i,t}\,, \qquad (2)$$

where $AgriVA_{i,t}$ is an agricultural resource production value added share of income and ρ_i represents unobserved country-specific and time-invariant effects with $E(\rho_i) = \rho$ and Var(ρ_i)=σ_ρ^2. The resource abundance variables were split into two major groups, as follows: $RR_{i,t}$ represents point-source natural resource abundance and $AgriVA_{i,t}$ represents the value added share of income from producing agricultural goods, in order to examine whether the composition of natural resources has a causal role in the resource curse for CIS countries.

Natural resource abundance variables were treated as a nonlinear function of institutional quality. Thus, their squared terms are also included in Equation (2). In this regard, examination of whether diffuse resources bear a positive impact on institutional quality is crucial for better understanding of the major determinants of economic growth. The coefficients for $\beta'$and γ' are expected to be negative because point-source resource abundance, as opposed to diffuse resources, reduces institutional quality, while the coefficients for δ' and $\theta'$are expected to be positive. Finally, the impact of resource rents on the contribution to income from value-added agricultural growth was tested to observe whether there is support for the main hypothesis defined above.

The major determinants of economic growth (human and physical capital, innovation and spillover effects, and total factor productivity), are proximate determinants rather than

fundamental drivers of economy, such as institutions and governance. In addition, the proximate determinants of economic growth were omitted due to the short-term nature of the analyses. Lagged variables play an important role in the model. In particular, it has been increasingly popular to use lagged variables in panel data models to predict long-term effects. Thus, initial income bears the same characteristics of fixed effects, within which the lagged dependent variable plays a crucial role through partially correcting growth according to changes in the determinants of growth.

The analyses were conducted using data on growth, resource abundance, and institutional quality for eight of the CIS: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Russia, and Ukraine. The panel dataset is a balanced panel followed over 18 years from 1993 to 2010. The panel data were chosen to include as many years as possible for a reasonable sample of the CIS countries. A general description and the statistics of the data analyzed are shown in Table 3.1.A. (see Appendix part). All of these data are available from the *World Bank World Development Indicators* online database.

3.3 Contract-Intensive Money and Selected CIS Country Case Studies

I used Contract-Intensive Money (CIM) as a proxy for institutional quality, following Clague et al. (1999). The authors suggest that contract enforcement and property rights boost entrepreneurial activities and trade, which in turn increase the potential gains of society from those activities and trade. They calculated CIM as follows:

$$\text{CIM} = \frac{(M_2 - C)}{M_2}$$

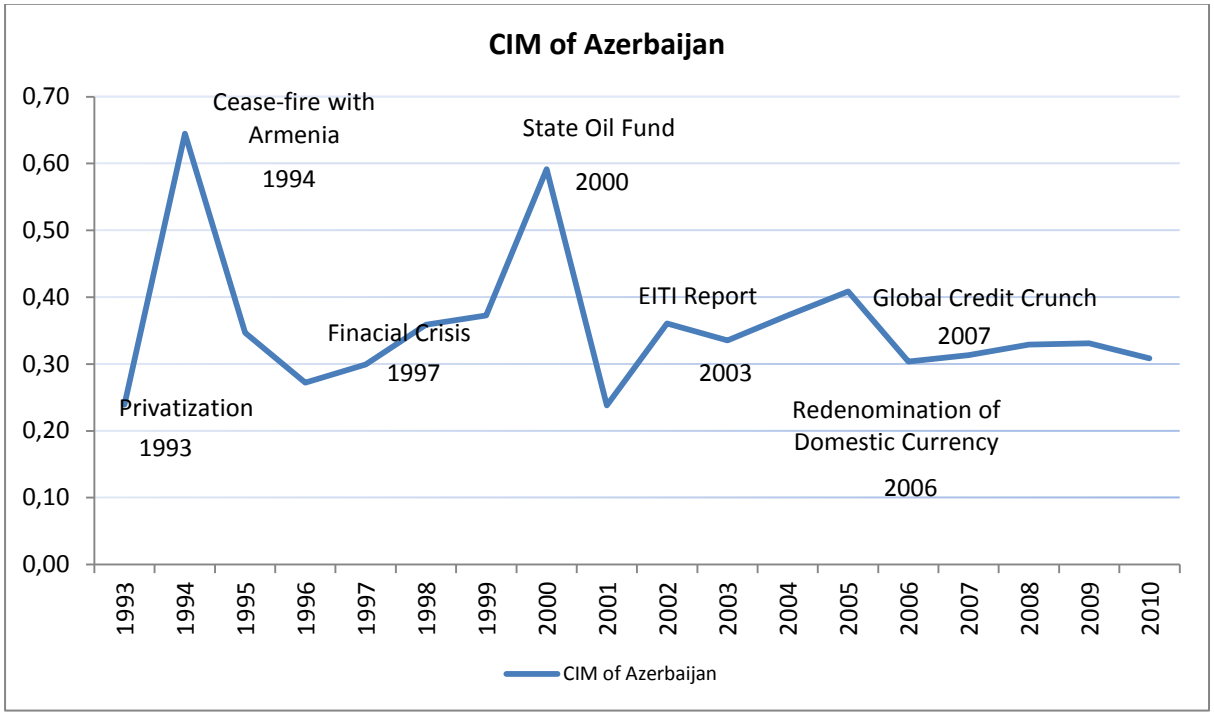
where M_2 is money supply, including currency and deposits, and C is currency in circulation. If CIM is a good proxy for institutional quality, and more specifically for contract enforcement, property rights security, and political regime change, then it should immediately react in response to these changes. The research focused on CIS countries with abundant natural resources, specifically those with concentrated production of energy resources. The CIM data were also retrieved from the *World Bank World Development Indicators* database (see Table 3.1.A in the Appendix).

3.3.1 Azerbaijan

The Nagorno-Karabakh conflict between Azerbaijan and Armenia erupted in 1988 and continued until 1991–1992. The war affected the entire Azerbaijani economy. A cease-fire

between Azerbaijan and Armenia was took effect in 1994 (Yalowitz and Cornell, 2004). There was a substantial increase in CIM from 0.24 in 1993 to 0.64 in 1994 (Figure 3.4). Early in Azerbaijan's independence, strong capital inflows were common, as in many transitional economies, particularly after the end of the war. The foreign investment was particularly significant in its vast and promising natural resource sectors. A privatization law was passed in 1993 and most of the national enterprises were privatized that same year. In 1994 Azerbaijan and a western consortium signed an oil contract worth $7.4 billion (BBC, 2012).[32]

Figure 3.4: CIM Over Time in Azerbaijan, 1993–2010



There were two early stages of reform in Azerbaijan. The first stage occurred from 1991 to 1995, and the second stage is from 1996 onwards. The first stage had some detrimental effects on economic performance, most of which culminated in 1995. In fact, Azerbaijan's economy and social structure were on the verge of a substantial collapse in 1995 due to events over the preceding years, such as coups and conflicts among government representatives.[33] After the presidential election of 1993 there were two attempted coups. In

[32] BBC News Europe, (2012)
[33] See the Government Accountability Project (GAP) Report (2008) for a full discussion of the reforms in the early stages of independence.

spite of political support for the building of a market economy, reforms were often deliberately suspended by the president at the time (World Bank, 2000). The progress made in governance and political reforms were very slow over this period and the increasing burden of regulations and corruption impeded foreign investment and undermined economic growth. The effects of these developments can be seen in Figure 3.4 as a dramatic decline in CIM until 1996. In turn, these policies led to a sharp decrease in production and an increase in unemployment in the country. In 1993 Heydar Aliyev seized power by means of a coup to remove the democratically elected President, Abulfez Elchibey (GAP, 2008).

The second stage of reform from 1996 onwards is known as the period of macroeconomic stability and dynamic development. In 1996 Azerbaijan adopted fiscal and monetary austerity policies under a three-year agreement with the IMF. As a result of these policies the inflation rate fell at the beginning of 1998. Azerbaijan's fiscal and monetary policies in this period also stabilized the currency (IMF, 1998). There was a sharp increase in CIM in 1993 followed by a dramatic decline until 1996 (Figure 3.4). There was a slight recovery in 1997 followed by an abrupt increase from 1999 to 2000. In addition, the State Oil Fund was established at the end of 1999for the efficient management of oil revenues, which succeeded in improving public trust from 1999 to 2000.

However, the National Bank of Azerbaijan declared that it would require all payments to be made in domestic currency as of 2001. In addition, it introduced restrictive measures for the importation of foreign currency, which was considered inappropriate by the IMF, since it was expected to lead to divergent cash and non-cash exchange rates (IMF, 2002). In fact, Azerbaijan did experience a high level of dollarization and a dramatic decline in CIM in 2001 (Feige, 2002).

In 2003 Azerbaijan joined the Extractive Industries Transparency Initiative (EITI) in London by declaring its support for EITI and willingness to become a pilot country for the initiative's implementation. The EITI endeavors to improve governance in resource-rich countries through the publication and verification of company payments and government revenues from oil, gas, and mining. Azerbaijan became the first oil producing country in the world to publish EITI reports that were audited by an independent firm in 2005. The Government of Azerbaijan made substantial progress in economic development (Hasanov, 2011b) and the economy experienced record growth in 2006. At the beginning of 2006 the government also

carried out a currency redenomination, introducing a new manat with a value equivalent to 5,000 of the former manat.

In 2008 the Central Bank of Azerbaijan pegged the value of the manat to the dollar, although later, as a consequence of the depreciation of the dollar against the euro, it switched to the euro-dollar basket. Following the peak of a financial crisis in October 2008 the Central Bank of Azerbaijan effectively dropped the euro from the basket and again pegged its currency to the dollar (BSTDB, 2011). The 2008 crisis indirectly affected the nation's economy. After government intervention by the Central Bank of Azerbaijan and the State Oil Fund reserves, the financial situation of Azerbaijan became stable.CIM remained fairly constant from 2006 to 2009, followed by a slight decline in 2010.

3.3.2 Kazakhstan

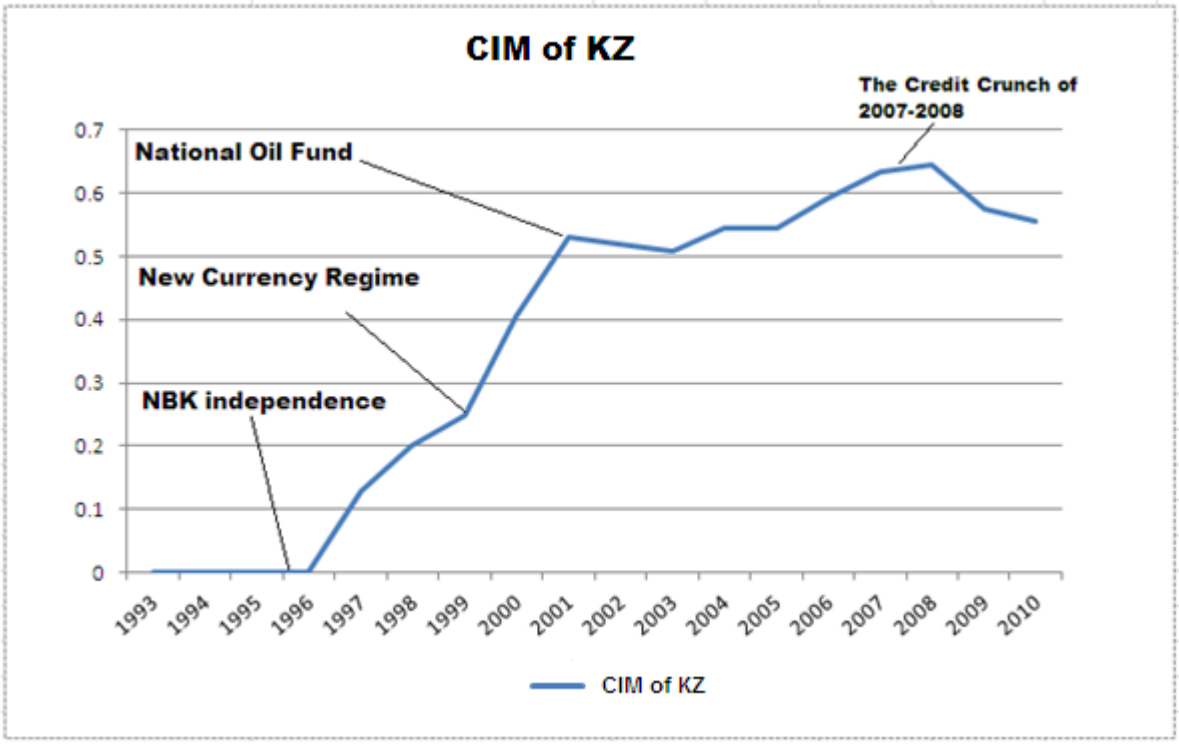
Soon after its independence, economic reforms were implemented to develop a market economy. Many reforms, such as privatization and other state reforms in the financial sector were carried out at this time. The dramatic rise in CIM testifies to the efficiency of the reforms that took place after 1995 (Figure3.5). The new currency of Kazakhstan that replaced the Soviet ruble, the tenge, was introduced in 1993 by the National Bank of the Republic of Kazakhstan (NBK). The monetary policy of the NBK is one of the factors that led to the successful development of the Kazakh economy. Inflation reached 2265% in 1993, while production output declined by nearly 50% from 1991 to 1995 (Akishev, 2008). CIM remained stable from 1993 to 1996 (Figure 3.5). The NBK became independent in 1995 and began to carry out policies independently from the central government. As a result of tight monetary policy the NBK was able to combat inflation, which decreased from 2165% to 60% 1993–1995 (Akishev, 2008).

The NBK has pursued strict monetary and fiscal policies. Financial crises in Southeastern Asia and Russia accelerated the depreciation of the tenge and triggered severe exchange rate fluctuations in the foreign exchange market. The NBK has since changed the currency regime, shifting to a free-floating foreign currency exchange rate in 1999. In addition, the transition to a floating exchange rate regime was held in accordance with a financial liberalization program launched at the same time (Oskenbayev, 2002). There was a substantial increase in CIM between 1996 and 2001, followed by a slight decline in 2002 and

2003 (Figure 3.5). CIM was very sensitive to the financial liberalization program carried out during that period.

Additionally, the National Fund of the Republic of Kazakhstan was created in 2000 as a stabilization and sustainable development fund financed from hydrocarbon resource revenues (Kalyuzhnova, 2011). In 2004 there was a slight recovery in CIM, which gradually rose until 2008. Kazakhstan's terms of trade increased by over 40% from 2003 to 2007, before another slight decline in 2008 (IMF, 2010). The state policies to protect the deposits of individuals and legal entities in banks helped the banking system avoid the loss of clients and to extend its sustainability (Akishev, 2008). In 2008, broad money (M2) increased by 84% and the currency in circulation (M0) increased by 73% over the previous year. Because of the new policies and government guarantees on deposits, there was a dramatic rise in bank deposits over 2001–2004 (ibid). The information presented in Figure 3.5 reveals a fairly constant level of CIM over 2001–2003.

Figure 3.5: CIM Over Time in Kazakhstan, 1993–2010



During the crisis period 2007–2009, the state declared a moratorium on the plan to disburse the National Fund in order to maintain the level of 'oil funds' before completely draining

them. Thus, the government could not boost investment to the level needed to provide a sustainable development target through application of the oil fund. Kazakhstan was one of the leading transition economies in capital formation, which accounted for 27% of the GDP before the crisis (Kalyuzhnova, 2011). As Figure 3.5 shows, there was a moderate decline in CIM during 2009 and 2010. In addition, National Fund resources were shifted from a firm level to portfolio assets and in the short term were directed to foreign assets rather than being domestically oriented (ibid). As a result, Kazakhstan exhibited poor economic performance, in particular in 2009 when there was negative growth.

3.3.3 Russian Federation

After the dissolution of the Soviet Union the government launched reforms lifting price controls on consumer and intermediate goods (Vincent and Steven, 1993). To encourage the development of the private sector, fundamental changes were made to the tax system. Large-scale reforms, specifically tax reforms, were implemented to maintain economic stability (Stepanyan, 2003). However, late 1993 until 1994 is considered a lost year for these reforms. The dissolution of the parliament in October 1993 by Yeltsin after the breakup of the Soviet Union seriously halted reform. President Yeltsin blamed the parliament for its "wrong decisions," in reference to the latest reforms in the budgetary system, privatization, and many other areas (The Economist, 1993).[34] The new elections were followed by the approval of a new constitution as a result of a referendum (Gould-Davies and Woods, 1999). In consequence of the delay in reforms and ignorance of monetary and budgetary policies, the monthly rate of inflation skyrocketed from 4% to 15%, leading to a drop in the value of domestic currency by 21% on 'Black Tuesday' in October 1994 (ibid). There was a sharp decline in CIM from 1994 to 1995 (Figure 3.6).

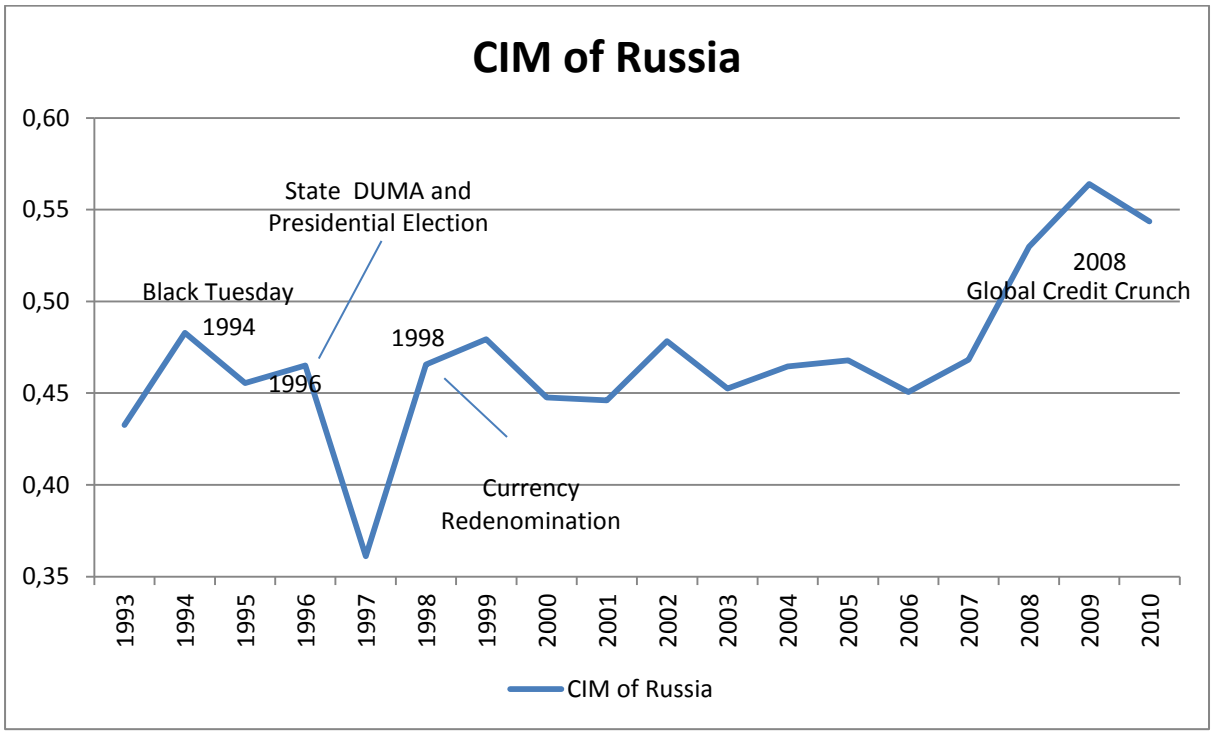
The conflict between policymakers and oligarchs erupted in early 1997 (Gould-Davies and Woods, 1999). In truth, this was a successful period for Russia in terms of economic progress. However, the government established new strategies to encourage institutional arrangements for sustainable long-term development in collaboration with IMF staff, because the macroeconomic stabilization achieved at the time could not provide sustainable development on its own. As the oligarchs in Russia became stronger, the state became increasingly concerned about their avoidance of taxation following intense pressure on the revenue side of the budget. To combat tax delinquency the newly appointed First Deputy

[34] The Economist, 25 September 1993, p. 41.

Prime Minister of Russia Nemtsov, initiated a set of reform programs targeting oligarchs in March 1997, which dealt with natural monopolists, the abolition of insider privatization, and the punishment of tax evaders. In the end, political instability led to an extreme decline in CIM in 1997 (Figure 3.6).

A new political scandal emerged during the financial crisis of 1998 and 1999 that affected many countries, including Russia. The global recession of 1998, which started with the Asian financial crisis in July 1997, exacerbated Russia's economic crisis. As a result of the crisis and a huge budget deficit, the government implemented measures leading to an increase in taxes in 1999, which increased tensions among the oligarchs as well. However, this decision of parliament was sustained by a presidential decree, counteracting constitutional norms (Gould-Davies and Woods, 1999). Although CIM did not decline as precipitously as it had in 1997, it fell during 2000 and 2001 from its 1999 level.

Figure 3.6: CIM Over Time in the Russian Federation, 1993–2010



There was not another significant change in CIM until 2006, even though the economic growth of Russia in real terms reached almost 40% from 2001 to 2006 (Astrov, 2007). World

commodity price volatility, in particular for energy resource products, exposed fiscal management to unexpected challenges. Thus, the government decided to establish an Oil Stabilization Fund (OSF) in early 2004, which was essentially for economic stabilization, accentuating the use of fiscal and monetary policies (e.g., a sterilization policy) in contrast to other CIS countries (IMF, 2006).[35] As a consequence, Russia achieved high budget surpluses of in 2005 and 2006 of 7.5% and 8.6% respectively (Astrov, 2007). A strategic decision was made to convert the OSF assets into foreign assets and corporate bonds in 2006 in order to hedge against the risk of a decrease in oil prices and to diversify assets, grounded in the fact that for some reason other countries would benefit from their domestic securities as a result of oil price declines. This is consistent with Norway's experience, which might have borne fruit in the long term. CIM increased abruptly from 2006 onwards. The policies adopted at the time also helped to achieve stable growth in spite of declining oil prices (Astrov, 2007: 172).

3.4 Linkages Between Resource Abundance and Economic Growth in CIS Countries

I examined IPS (Im et al., 2003) and LLC (Levin et al., 2002) unit root tests, the results of which are reported in Table 3.2. The null hypothesis was rejected for almost all variables, with the sole exception of economic growth, *G*, which is non-stationary at levels with trend. However, the null hypothesis was rejected for all variables on the basis of the LLC test results. Most studies prefer LLC to IPS (Bowman, 1999; Breitung, 2000; Hlouskova and Wagner, 2006) as a more powerful test, and the results indicated that the variables are stationary.[36]

I used the Blundell-Bond system GMM (BBGMM) method to estimate the impact of the main predictors of economic growth in CIS countries. The impacts of resource abundance, institutional quality, and their interaction terms are demonstrated in Table 3.3. Coefficients of the growth predictors in the BBGMM model had the expected signs and are consistent with the findings of previous studies.[37] The impacts of growth predictors over different time lags

[35] For instance, Azerbaijan's and Kazakhstan's use of natural resources to target investment funds to foreign assets.
[36] See also Westerlund, 2010 and for a modified LLC panel unit root test see http://www.nek.lu.se/NEKfng/westerlund.pdf
[37] See Sachs and Warner (1999, 2001)

are also presented in Table 3.3.[38] The significance values of the variables from the BBGMM model with robust standard errors to address heteroscedasticity and autocorrelation problems are also presented in Table 3.3 (Column 2).

Table 3.1: Results of the Unit Root Tests for the Entire Sample

Variable	IPS		LLC	
	Constant	Constant and Trend	Constant	Constant and Trend
G	–4.040***	–0.425	–4.65***	–2.33**
Inst	–4.459***	–4.319***	–3.57***	–4.16***
RR	–1.909**	–4.837***	–3.50***	–9.44***
AgriVA	–2.449***	–2.243**	–5.91***	–3.91***
Δ*G*	–8.602***	–10.687***	–10.50***	–8.89***
Δ*Inst*	–11.085***	–8.264***	–12.94***	–9.46***
Δ*RR*	–8.916***	–7.495***	–7.99***	–8.65***
Δ*AgriVA*	–10.840***	–10.400***	–11.03***	–10.80***

Note: Numbers in parentheses are lag levels determined by the Schwarz Bayesian Criterion,
***Indicates significance at the 1% level.

Before estimating the regression, it was important to determine the number of lag periods. The standard test used to determine the optimal number of lags under the VAR model in the time series data is either the SIC or AIC test. However, in the panel data VAR model the procedure applied to identify the number of lags is different. Two methods are available to determine the number of lags using the panel data VAR model. One of the methods to determine the optimal number of lags used in the literature is the likelihood ratio test suggested by Holtz-Eakin et al. (1988). The other method of optimal lag selection suggested by Arellano and Bond (1991) is based on the absence of autocorrelation in the panel VAR residuals.[39]

[38] Allowing for more lags would violate AR1 and AR2, which are Arellano and Bond (1991) tests for autocorrelation, hence only two lags have been included in the model.
[39] The optimal number of lags is selected until the autocorrelation in panel VAR residuals is no longer present. Thus, in general it is determined by including the lags in the panel VAR model until it is free of serial correlation.

Table 3.2: Regression Results of Economic Growth on Resource Abundance and Institutions, 1993–2010

Variable	Dependent Variable: Growth, *G*			
	(1)	(2)	(3)	(4)
G(–1)	0.501***	0.414***	0.411***	0.112
	(0.0826)	(5.07)	(0.0748)	(0.078)
RR	0.483***	0.369	0.335***	0.457**
	(0.0960)	(0.041)	(0.0739)	(0.204)
RR(–1)	–0.168*		0.0715	–0.1789
	(0.0929)		(0.127)	(0.157)
RR(–2)		–0.192**	–0.187**	
		(0.0902)	(0.0857)	
Inst	–8.514 (6.083)	–8.657 (6.473)	–9.720 (7.618)	–11.607 (9.814)
Inst(–1)	9.922 (9.043)		–0.628 (8.698)	–13.131 (9.065)
Inst(–2)		10.964* (6.063)	12.66*** 4.448)	
*RR*Inst*	–0.412* (0.212)	–0.214* (0.116)	–0.0741 (0.156)	–0.478 (0.322)
*RR*Inst(–1)*	–0.213 (0.190)		–0.257 (0.194)	0.285** (0.118)
*RR*Inst(–2)*		–0.070 (0.199)	–0.0596 (0.157)	
ToT				0.074** (0.034)
ToT(–1)				–0.121***(0.04)
Constant	1.486 (3.539)	2.135 (3.661)	2.206 (3.879)	19.260 (2.719)
Sargan test (p-value)	96.07 (0.89)	119.10 (0.35)	118.16 (0.38)	79.35 (0.68)
AR1 (p-value)	–2.2976 (0.022)	–2.553 (0.01)	–2.44 (0.01)	–2.24 (0.03)
AR2 (p-value)	0.227 (0.82)	–1.183 (0.24)	–1.25 (0.21)	–1.48 (0.14)
Observations	136	128	128	87
Number of id	8	8	8	8

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The regression coefficients were estimated using the Arellano and Bover (1995) and Blundell and Bond (1998) system GMM approaches.[40]
AR1 and AR2 are Arellano and Bond (1991) tests for autocorrelation.

The p-value of the test statistics of serial correlation (for AR1 and AR2 processes) indicated that there is no significant second-order autocorrelation in the BBGMM model, which is crucial for establishing the validity of the instruments.[41] The Sargan test (Arellano and Bond,

[40] The estimation employed the *xtdpdsys* command in Stata. Standard instruments for the first differenced equation include first differences of *RR* and *Inst*, an *interaction term*, and their lags. GMM-type instruments for differenced and level equations are the lagged variable of *Inst* and lagged difference respectively.

[41] The first differenced errors could be auto-correlated by construction when the regression errors are independent and identically distributed. Thus, the GMM moment conditions may be invalid if autocorrelation exists in the first differenced error greater than one.

1991) for over-identifying restrictions determines whether the residuals are correlated with the instruments or not. The model or instruments may be misspecified in cases where the null hypothesis is rejected. The p-value of the Sargan test statistic indicated that the null hypothesis is valid—and subsequently the over-identifying restrictions were not rejected.

The direct effect of resource abundance on economic growth appeared to be positive in the current year, while the direct negative impact of resource abundance was observed in past values of resource abundance, either in *RR(–1)* or *RR(–2)*, and in *RR(–2)* only if both lags were included simultaneously (Column 3 in Table 3.3), implying that the direct impact channel of the resource curse is not observed immediately. The significant positive impact of past values of the institutional quality variable *Inst(–2)* can be interpreted similarly. This implied that the positive effect of institutional quality on economic growth is long-term. High quality institutions provide a certain degree of confidence regarding the enforceability of contracts, an independent judiciary, and the rule of law. The higher the institutional quality, the greater the incentive of a firms to save and increase capital, invest in business, and the higher the economic growth rate. At the same time, the benefits of contract enforcement and property rights are enjoyed in trade and specialization, and this process should be implemented over the long term. This by no means implies that holding noncash assets leads to better economic performance; the hypothesis is rather that the better institutions are, the higher the quality of contract enforcement and property rights and the greater the subsequent gains from trade and specialization. In addition, it should similarly stir up non-currency holdings (Clague et al., 1999). Differences in institutional quality therefore, should imply differences in productivity and economic performance. The estimated coefficient of lagged institutional quality (12.66), *Inst (–2)*, implies that a one standard deviation increase (0.14) in this variable would lead to a 0.189% increase in income per capita growth rate after two years in the eight CIS countries.[42] The long-term coefficient of institutional quality impact was 21.49, implying that a one standard deviation increase in the logged institutional quality variable, *Inst(–2)*, would cause a 0.32% increase in economic growth rate over the long term.[43]

[42] Calculated as a product of the coefficient and standard deviation of the explanatory variable (stdev.*Inst*=0.14) and then divided by the standard deviation of the dependent variable (st. dev. *G* = 9.48), so that the impact was estimated as follows: $Coefficient * (stdev(Inst)/stdev(Growth))$= 12.66*(0.14/9.48).

[43] The long-term coefficient was obtained by dividing the short-term coefficient (12.66) by one minus the lagged variable of the dependent variable.

Although the lagged coefficients of the shares of resource rents of income and institutional quality had the expected signs, the estimation results revealed the negative impact of the interaction term of these variables (Columns 1 and 2 in Table 3.3). However, the sign was reversed when the terms of trade variable was included (Column 4 in Table 3.3). The lagged variable after one year showed a positive significant impact on economic growth, which is consistent with economic theory and the findings of other empirical investigations. This indicates that the resource abundance associated with better institutions and governance improves economic performance. This implies that the 'producer friendly' institutions, in contrast to 'grabber friendly' ones, boost income per capita growth. The significant lagged interaction variable effect signifies that institutions are important in the long term in resource abundant economies.

The next variable of interest is terms of trade (Column 4 in Table 3.3). The terms of trade data for CIS countries are available for a shorter period (2000–2010). Terms of trade—the variable that captures the Dutch Disease impact—indicates that the exchange rate had a significant negative effect on income per capita growth after a lag time of one year. This implies that it takes some time for the real exchange rate to deteriorate the competitiveness of the economy. On the other hand, terms of trade had a significant positive effect on per capita income growth at levels. This indicates that there is an immediate benefit from real exchange appreciation due to price increases of exported goods and price decreases of imported goods. In addition, with the inclusion of the terms of trade the resource abundance associated with institutional quality was important for income per capita growth, implying that institutional quality remains crucial for economic growth.

3.5 Linkages Between Institutional Quality and Resource Abundance in CIS Countries

The relationships between resource abundance and institutional quality for eight CIS countries from 1993 to 2010, including oil energy rich countries, are presented in Figure 3.7 (graphs a to h). Oil-rich countries, including: Azerbaijan, Kazakhstan, and Russia are shown in Figure 1 (graphs f to h). The resource rent shares of income are presented on different scales for different CIS countries to observe the links between institutions and resource abundance.[44] Armenia is among the CIS that depends least on natural resources. However,

[44] The resource rents share of income as a percentage measure was used for Armenia, Belarus, Georgia and Moldova as they have relatively small resource rents shares of their income. The log of the resource rents share

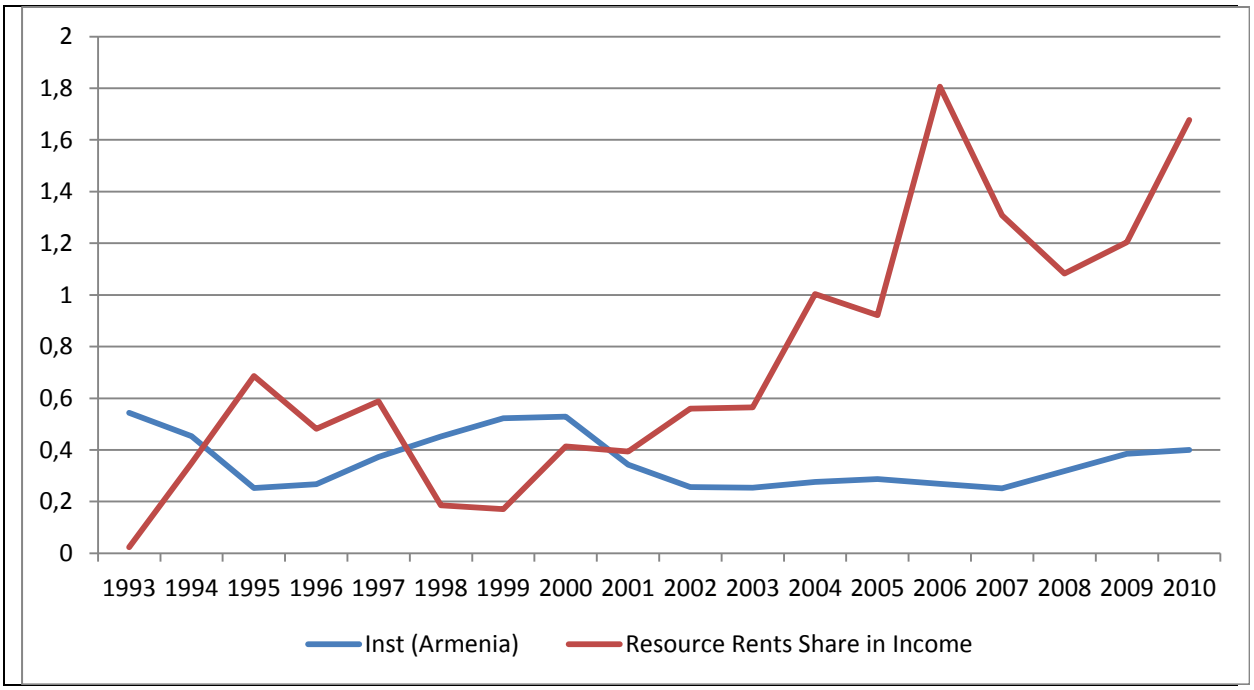
institutional quality is fairly sensitive to changes in resource concentration. It is clear that the increase in the resource rents share of income is associated with a decline in institutional quality from 2000 onward. This negative relationship between resource rents and institutions was observed from 1993 to 2000, and from 1993 to 1995. The sharp increase in the resource rents share of income is linked to low institutional quality. In the period from 1997 to 1999, there was a decline in resource abundance accompanied by an increase in institutional quality.

The downward sloping trend in resource rents is inversely associated with an upward slope in institutional quality from 2000 onward in Belarus, and from 1999 onward in Moldova. From 1993 to 1997, the rapid rise in resource rents in Belarus was clearly related to declining institutional quality. The sharp decline in resource abundance from 1997 to 1998 was associated with rising institutional quality.

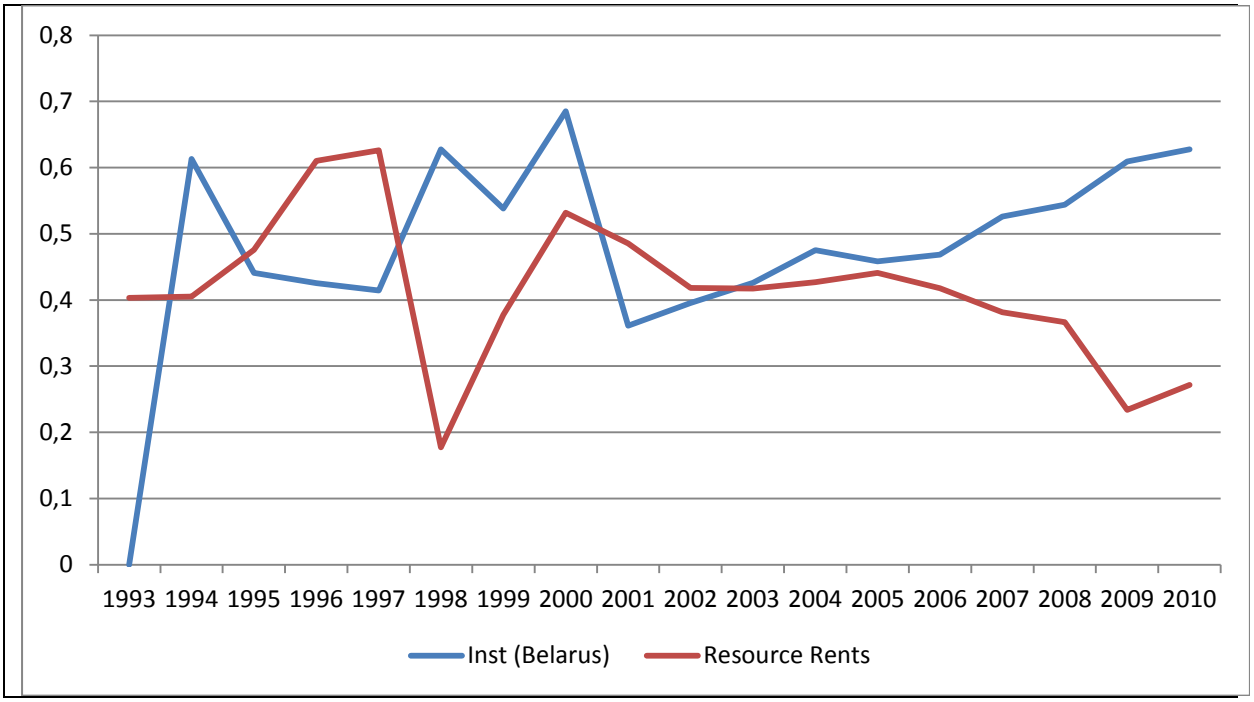
Georgia exhibited a sharp increase in resource abundance in 1999–2000, a decline in institutional quality in the following year, and faced a huge decline in the resource rent share of income immediately after institutional quality improved again. Although the resource rents share of income is demonstrated in log form, its high volatility was clearly evident for the Ukraine (graph e in Figure 3.7). The immediate increase of resource abundance from 1993 to 1997 was linked to the decline in institutional quality during that period. The same pattern of relationships between the variables was observed for 1999–2000. From 2000 onward resource rents declined, which coincides with the rising trend in institutional quality.

of income was taken for Ukraine and the resource rents share of income (as a percentage of GDP) of oil resource rich countries (Azerbaijan, Kazakhstan, and Russia).

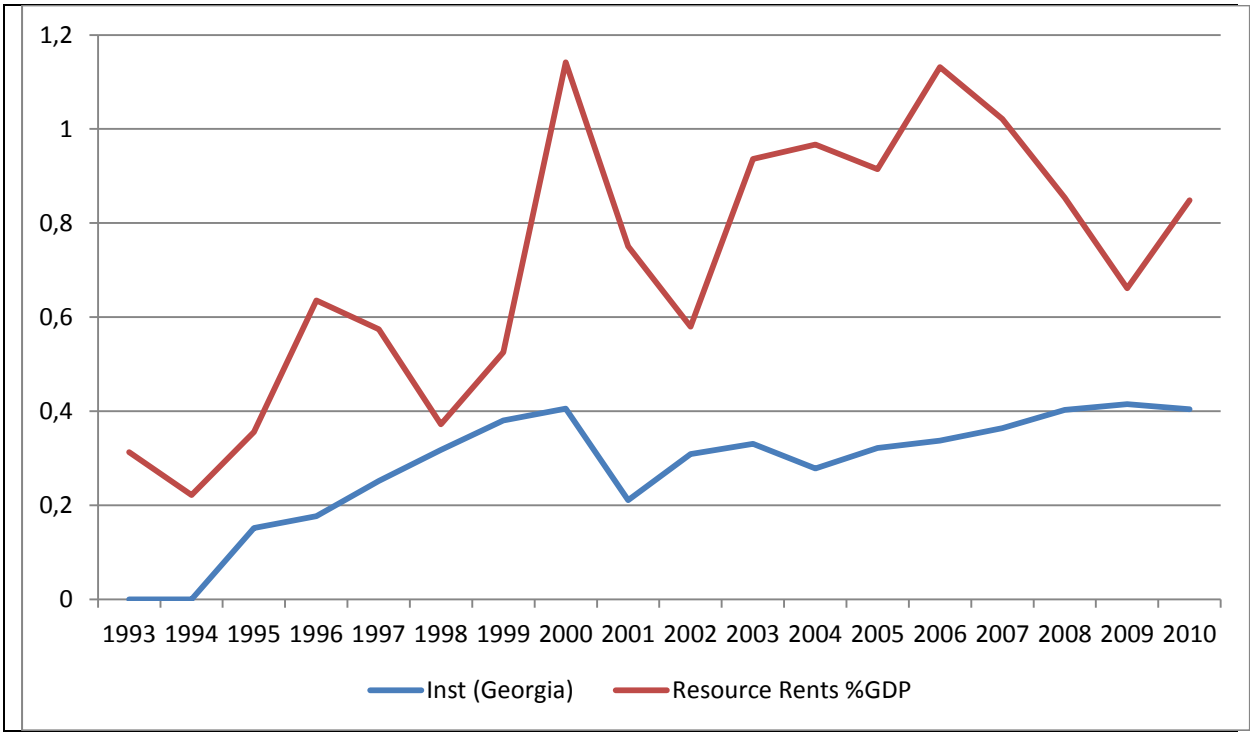
Figure 3.7: Institutional Quality and Resource Abundance in Eight CIS Countries, 1993–2010



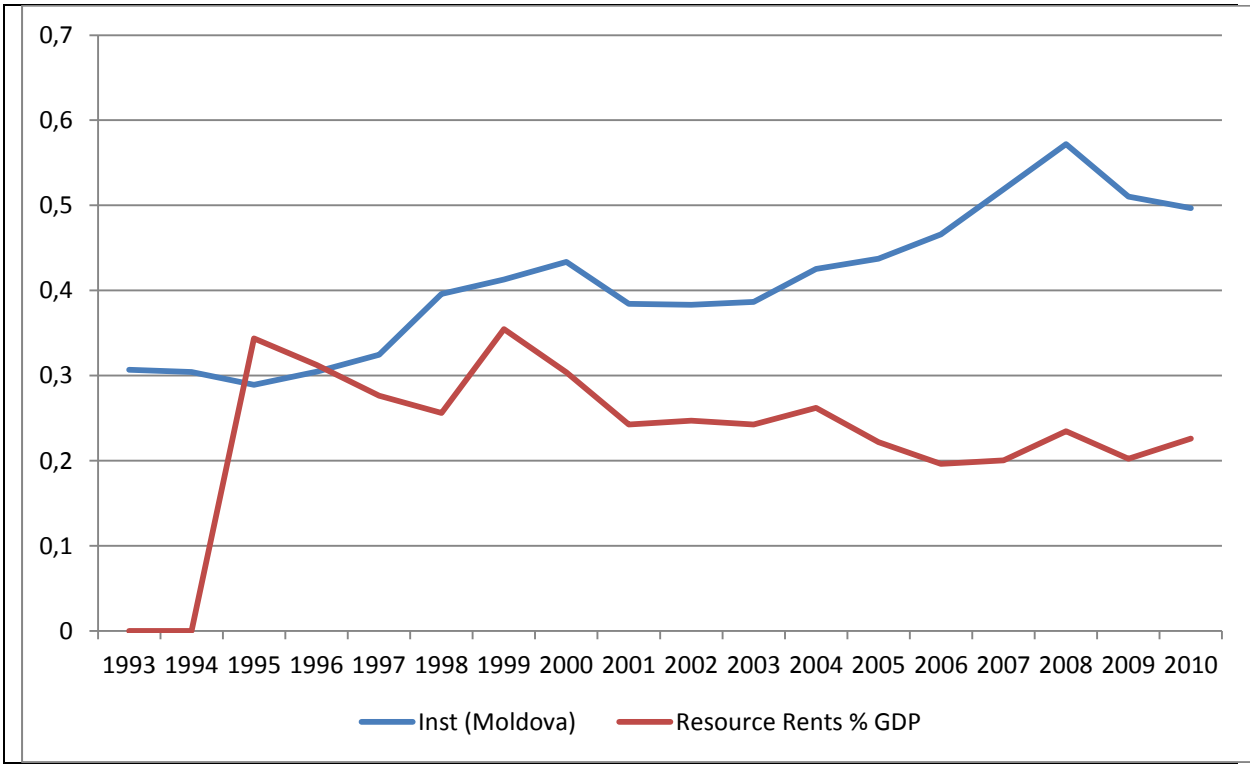
(a) Armenia (Inst=CIM, Resource Rents = % of GDP), 1993–2010



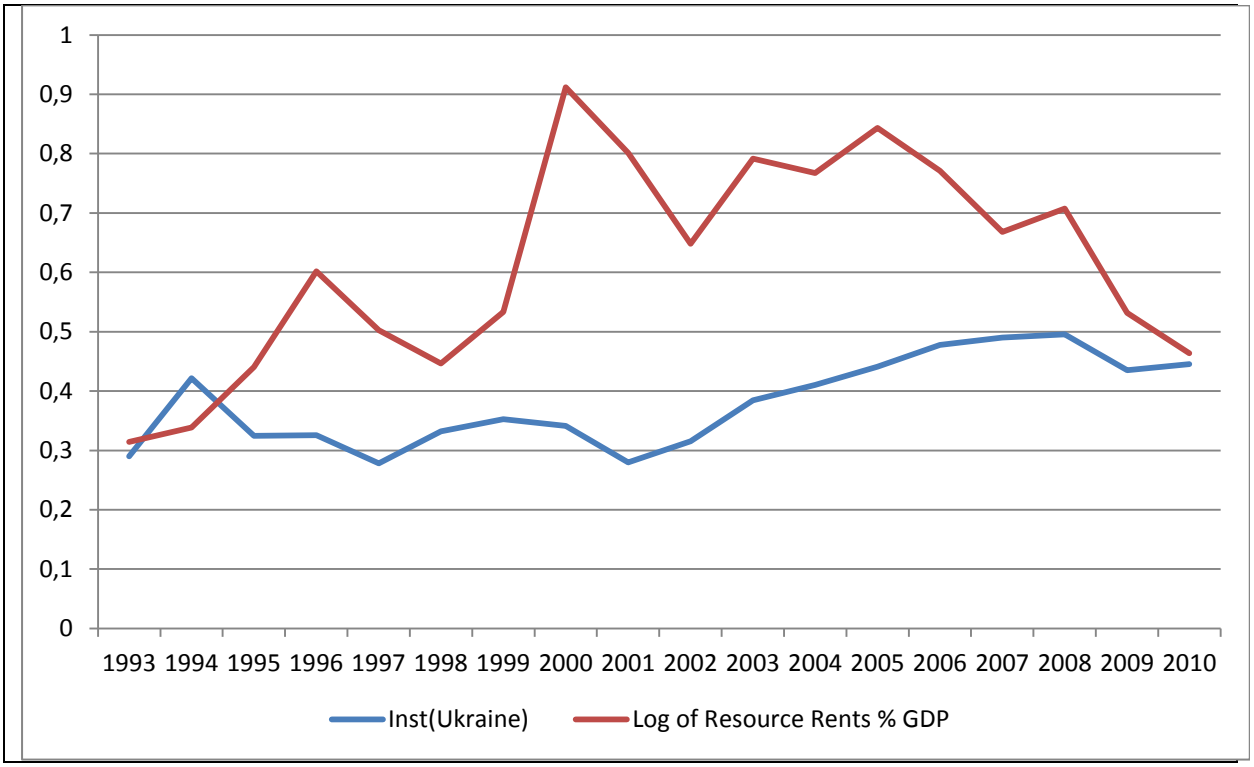
(b) Belarus (Inst=CIM, Resource Rents = % of GDP), 1993–2010



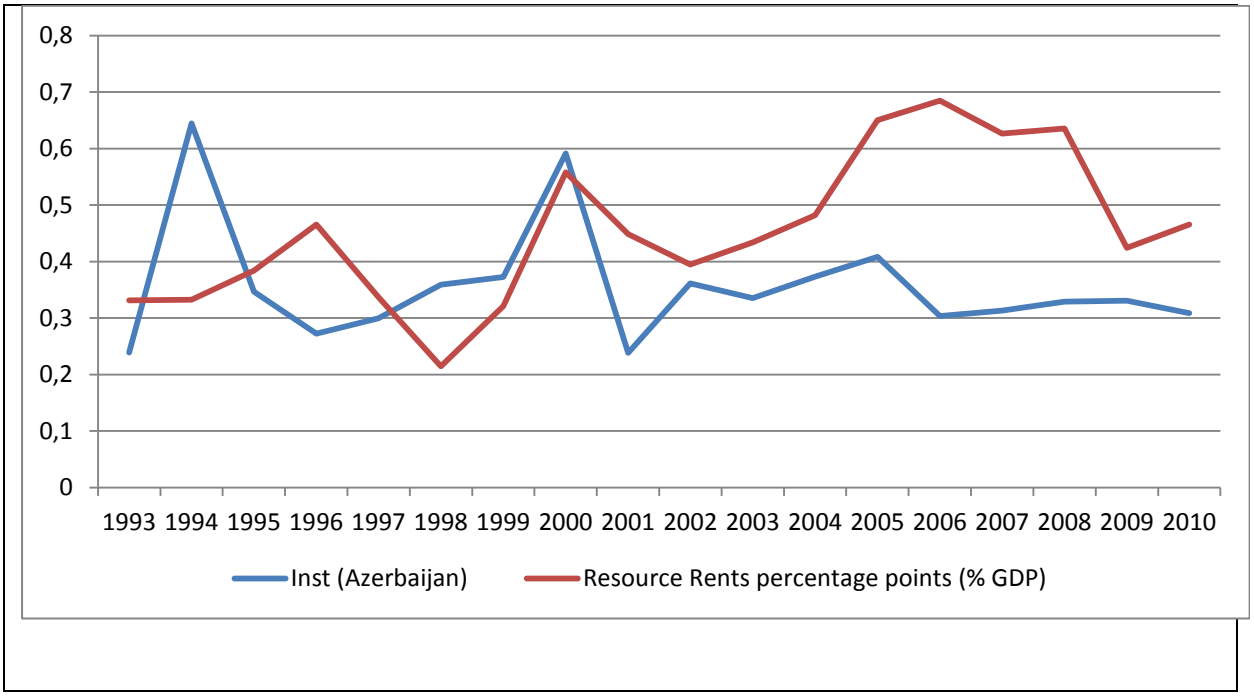
(c) Georgia (Inst=CIM, Resource Rents = % of GDP), 1993–2010



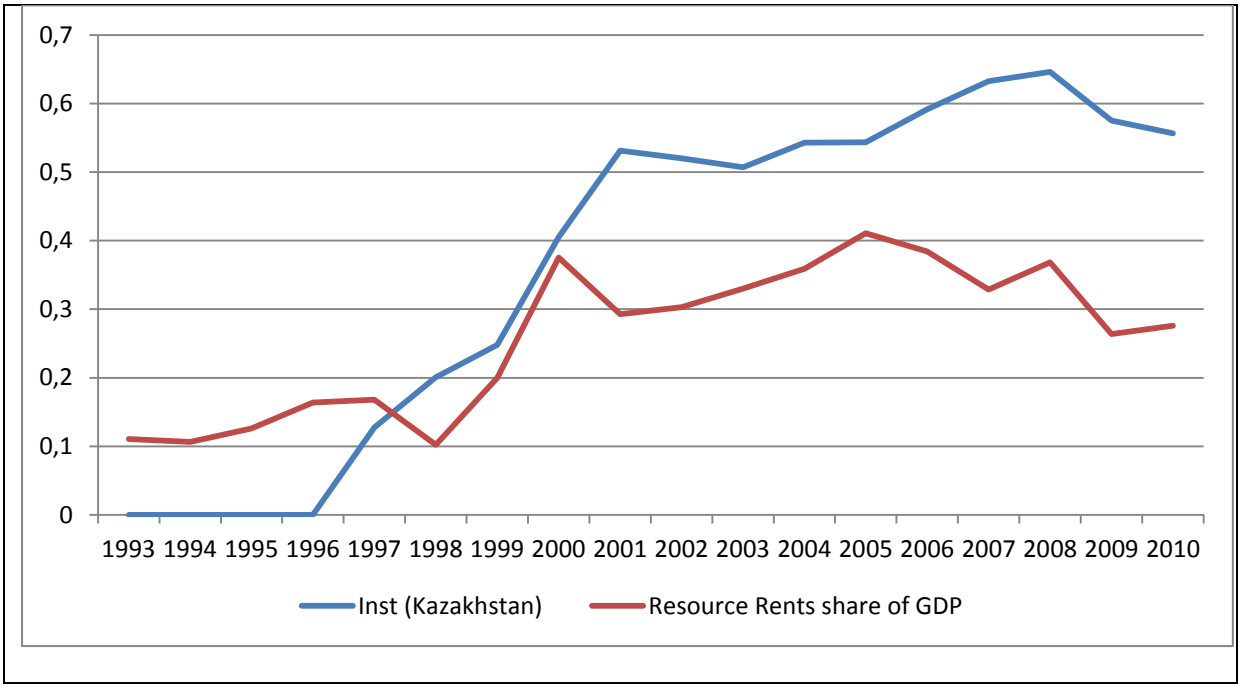
(d) Moldova (Inst=CIM, Resource Rents = % of GDP), 1993–2010



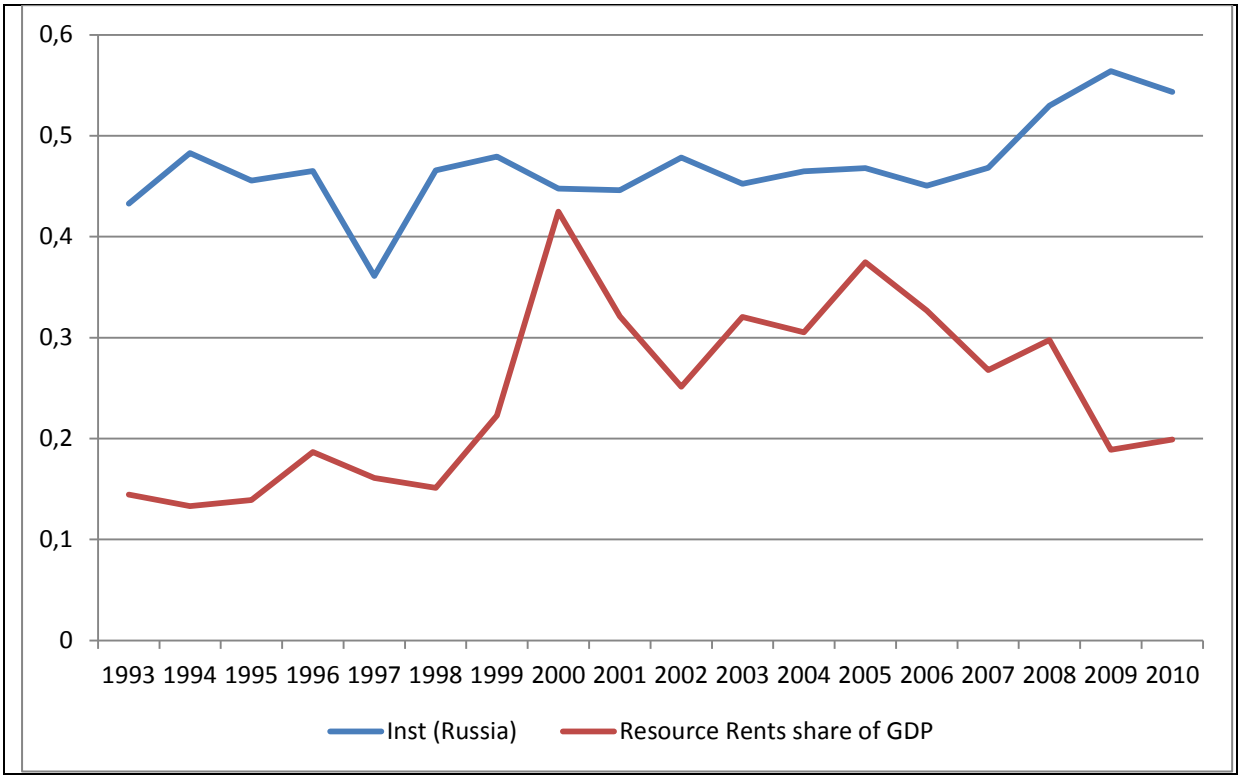
(e) Ukraine (Inst=CIM, Resource Rents = log [% of GDP]), 1993–2010



(f) Azerbaijan (Inst=CIM, Resource Rents = % of GDP), 1993–2010



(g) Kazakhstan (Inst=CIM, Resource Rents = % of GDP), 1993–2010



(h) Russia (Inst=CIM, Resource Rents = % of GDP), 1993–2010

Oil rich countries such as Azerbaijan, Kazakhstan, and Russia experienced similar relationships between the resource rents share of income and institutional quality as depicted in last three graphs of Figure 3.7. Azerbaijan confronted low institutional quality following

sharp increases in resource rents in 1998 and 1999, and this rising trend continued from 2000 onwards. This inverse relationship was observed in preceding years as well. The resource rents share of GDP increased from 33% to 47% over the period 1993–1996 and was associated with a substantial decrease in institutional quality from 64 to 27, which represents a 2.64 standard deviation from the mean. Institutional quality began to improve again as a consequence of a decline in resource rents from 1996 to 1998.

The same pattern was observed in Kazakhstan and Russia, in particular from 2005 onwards in Kazakhstan and from 2006 onwards in Russia, when declines in resource rents were accompanied by improvements in institutional quality. Thus, the inverse link between the resource rents share of and institutional quality was documented for eight CIS countries from 1993 to 2010, implying the potential existence of abundant energy resources (as a point source resource), in particular oil extraction and exportation, and an adverse impact on economic growth via institutions.

To reveal the link between institutional quality and resource abundance, I applied the BBGMM dynamic panel data model using the panel data for the eight CIS countries from 1993 to 2010. The results of the regression model are presented in Table 3.4.[45] The variables used in the model are the institutional quality variable, *Inst*,[46] and two explanatory variables of institutional quality, such as the resource rents share of GDP and the agricultural value-added share of GDP from 1993 to 2010. All data were retrieved from the World Bank World Development indicators online database. Two types of natural resources, the resource rents share of income representing point-source resources and the agricultural value-added share of income representing diffuse resources,[47] were included in the model to examine whether the composition of resources is important for institutional quality in the CIS region. The results of the Arellano and Bond (1991) tests for autocorrelation, AR1 and AR2, indicated an optimal lag length in the panel VAR model of one.

There was a significant negative effect of the lagged variables of resource rents and agricultural value-added shares of income, as well institutional quality, in both models, including the agricultural value added from diffuse natural resources (Table 3.5). However,

[45] The method applied to determine the optimal number of lags followed Arellano and Bond (1991), (i.e., the same as was employed in the model in the previous section discussed above).
[46] The proxy used for the institutional quality indicator, Contract-Intensive Money, was measured as follows: CIM=(M2-M0)/M2, where M2 is broad money and M0 is currency in circulation.
[47] Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.

the only difference in the second specification (Column 2 in Table 3.5) is that it included squared terms and indicated that the lagged squared term of agricultural value-added share of income had a positive impact on institutional quality. The model results indicated that the composition of the resource is crucial for explaining the impact of natural resources on institutional quality.[48]

Table 3.3: Institutional Quality (CIM) and Resource Abundance Among CIS Nations

	Dependent Variable: *Inst*	
VARIABLES	(1)	(2)
Inst(–1)	0.362*** (0.166)	0.330** (0.134)
RR(–1)	–0.0024*** (0.0009)	0.00211 (0.00249)
RR_sq(–1)		–6.88e–05** (2.84e–05)
AgriVA(–1)	–0.0045** (0.0018)	–0.0116*** (0.00304)
AgriVA_sq(–1)		0.000142*** (4.45e–05)
Constant	0.367*** (0.097)	0.416*** (0.0836)
Sargan test (p-value)	101.94	97.58
	(0.80)	(0.88)
AR1 (p-value)	–2.269	–1.97
	(0.023)	(0.05)
AR2 (p-value)	1.183	1.39
	(0.237)	(0.16)
Observations	136	136
Number of id	8	8

Notes: Robust standard errors in parentheses.*** p<0.01, ** p<0.05.
The regression coefficients were estimated using the Arellano and Bover (1995) and Blundell and Bond (1998) system GMM approaches.
AR1 and AR2 are the Arellano and Bond (1991) tests for autocorrelation.

I obtained the short-term and long-term coefficients using the panel dynamic model outcomes presented in Table 3.5. The lagged resource rents variable, *RR(–1)*, the short-term coefficient in specification (1) was –0.0024, implying that a one standard deviation increase in the resource rents share of income (17.20) would lead to a reduction of institutional quality by 0.29[49] after one year, which is relatively huge. The long-term coefficient (–0.0038) indicates that a one standard deviation increase in the resource rents share of income would cause a

[48] Following Auty (1997), Woolcock et al. (2001), and Isham et al. (2005).
[49] Calculated as a product of the coefficient and standard deviation of the explanatory variable (stdev. *RR*= 17.20*)* and then divided by the standard deviation of the dependent variable (st. dev.*Inst*=0.14), so that the impact was estimated as follows: $Coefficient * (stdev(LogRR)/stdev(Inst))$= -0.0024*(17.20/0.14)=-0.29.

decline in institutional quality of 0.47. Thus, the impact of the long-term coefficient was significantly greater than the short-term impact on institutional quality.

Table 3.4: Short-term and Long-term Coefficient Estimates from Table 3.4.[50]

	Dependent Variable: *Inst*	
VARIABLES	(1)	(2)
	Short-term coefficients:	
RR(–1)	–0.0024	0.00211
RR_sq(–1)		–0.0000688
AgriVA(–1)	–0.0045	–0.0116
AgriVA_sq(–1)		0.000142
	Long-term coefficients:	
RR(–1)	–0.0038	0.003
RR_sq(–1)		–0.001
AgriVA(–1)	–0.007	–0.017
AgriVA_sq(–1)		0.002

The lagged agricultural value added variable, *AgriVA(–1)* had a significant negative impact on institutional quality, which in turn limits economic growth. This negative effect of agricultural value added on institutional quality was almost double that of the resource rents share of income in terms of magnitude. In reality, the agricultural sector was not typically liberalized or reformed in CIS countries, particularly Central Asian countries. Land tenure regulations prohibit private land ownership in Central Asian nations other than Kyrgyzstan and Kazakhstan.[51] In addition, agricultural sectors in the region are often highly subject to government interventions, export bans, and restrictions.

Although land tenure laws in Kazakhstan permit private ownership of agricultural land, land ownership transfer and property rights enforcement in the agricultural sector has been a slow process in the country. The 'On Land' law states that land cultivated by agricultural enterprises should be divided into "conditional land shares." These shares are to be allocated on a permanent tenure basis but are not land owned by the farmers that cultivate crops on them (Dudwick et al., 2007). According to a presidential decree issued in 2003, farmers must either operate their own business or invest their land shares in a larger agricultural enterprise, or otherwise they will lose their conditional land share rights. As a result, small farmers

[50] Short-term coefficients were obtained directly from the reported results in Table 3.4. The long-term coefficient was obtained by dividing the short-term coefficients by one minus the lagged variable of the dependent variable.

[51] From the "Land Tenure and Property rights regional report volume 2.8 Central Asia," USAID, July 2007.

possess a relatively small portion of arable land, while the share of arable land controlled by large agricultural producers continues to grow. These land tenure and property right constraints in Central Asia are serious barriers to agricultural investment and the expansion of agricultural production (OECD, 2011).

In this respect, the agricultural sectors in CIS countries can be considered as point-source resources rather than diffuse, which contradicts what has been suggested by Isham et al. (2005). Thus, different economic development trajectories can be explained by the types of natural resources concentrated within each country. In contrast to diffuse natural resources, point-source natural resources are often more likely to negatively influence economic development via institutional quality.[52]

3.6 Dutch Disease Explanation of the Natural Resource Curse

I examined whether the increased resource rents share of income affected the wheat yields of CIS countries, since wheat is a major crop in many of them. I used wheat yield as the dependent variable rather than agricultural value added for a couple of reasons. First, an increase in agricultural added value might reflect commodities price changes rather than real production growth. Second, agricultural value added and resource rents shares of income move in opposite directions because both are estimated as GDP shares. In this respect, wheat yield is a more direct and less 'polluted' measure of real agricultural sector growth.

To examine the linkages between resource abundance and agricultural sector growth, wheat yield data—in hectograms/hectare (Hg/Ha)—were obtained from a FAO statistical database (2013). I transformed the wheat production data into log form, and used the resource rents share of GDP as a measure of resource abundance. To examine the impact of resource abundance on economic growth via the Dutch Disease effect channel, I employed a dynamic panel data model, the results of which are presented in Table 3.6. The regression results support the resource curse hypothesis.[53] The lagged variable of wheat production captured partial effects of other determinants of real wheat production. The resource rents share of income had a significant negative impact on the log value of wheat yields. In cases where the agricultural sector is a crucial determinant of institutional quality, the impact of the Dutch

[52] There are other channels through which agricultural production resources may be detrimental to economic growth. For instance, Oskenbayev and Karimov (2013) documented that wheat price volatility associated with appropriate institutional quality undermines economic growth.
[53] The regression analysis covers the period from 1992 to 2010 because of wheat yield data availability.

Disease phenomenon explains the negative association of resource abundance with low institutional quality, and thus with poor economic performance.

Table 3.5: Crowding-out Effect of Resource Rents on Agricultural Production and Wheat Production Growth Contributions to GDP, 1992–2010

VARIABLES	Log of Wheat Yield (Hg/Ha) (1)
Log of Wheat Yield (–1)	0.208*** (0.065)
Resource Rents (% of GDP)	–0.0058** (0.0024)
Constant	7.887*** (0.649)
Observations	144
Number of id	8
Sargan test (p-value)	117.52 (0.42)
AR1 (p-value)	–2.29 (0.02)
AR2 (p-value)	0.20 (0.84)

Notes: Standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1.
The regression coefficients in column one are estimated using Arellano and Bover (1995) and Blundell and Bond (1998) system GMM approaches.
AR1 and AR2 are Arellano and Bond (1991) tests for autocorrelation.

As a further illustration of the importance of resource abundance in accounting for poor economic performance among the eight CIS countries, the third column of Table 3.7 is a list of the products of the coefficients estimated in the model specification described in Table 3.6 and the mean resource rents (median from 1991 to 2010), which was intended to capture any crowding out effect of resource abundance. Two facts deserve close attention. One is that countries producing energy resources, such as Azerbaijan, Kazakhstan and Russia, had the highest crowding out effect from resource abundance. Second, the impacts of crowding out in the oil rich countries mentioned above has increased substantially over the second decade, from 2001 to 2010. For instance, the impact of crowding out more than doubled in Kazakhstan and Russia, while it increased by 1.4 in Azerbaijan over the second decade. Russia had the lowest average growth rate (6.13%) of the eight CIS countries covered in the study over the period 2001–2010 (see Table 3.7). The results indicate that the wheat yield was 17% lower due to a greater than twofold increase in natural resource rents share of

income, from 15.01% to 30.15%. Moreover, the same pattern was documented in the other countries.

Table 3.6: Basic Information on Resource Rents and Economic Growth Among Eight CIS Countries

Countries	Period from 1991 to 2000			Period from 2001 to 2010		
	Resource Rents: average 1991 to 2000 (% of GDP)	Real GDP per capita growth rates, average 1991 to 2000 (%)	Regression estimates of resource rents effect[1]	Resource Rents, (% of GDP)	Real GDP per capita growth rates, average 2001 to 2010 (%)	Regression estimates of resource rents effect, average 2001 to 2010[1]
	(1)	(2)	(3)	(4)	(5)	(6)
Armenia	0.27	5.48	–0.157	104	11.72	–0.603
Azerbaijan	33.19	–0.97	–19.25	47.36	9.51	–27.469
Belarus	2.77	0.95	–1.607	2.61	8.44	–1.514
Georgia	0.45	3.15	–0.261	0.88	6.15	–0.51
Kazakhstan	13.01	–2.71	–7.546	32.93	8.78	–19.099
Moldova	0.27	–4.13	–0.157	0.23	7.05	–0.133
Russia	15.01	–4.53	–8.706	30.15	6.13	–17.487
Ukraine	2.78	–8.90	–1.612	5.48	7.14	–3.178

Notes: The third column is a list of the products of resource abundance and the estimated regression coefficients on the variables from specification presented in Table 3.6 (Column 3 =Column 1 *(–0.0058)*100[54] for the first decade, and Column 6 =Column 4*(–0.0058)*100 for the second decade), indicating the impacts of resource abundance on agricultural resource production growth contribution by country. Afterwards, Columns 3 and 6 were multiplied by 100 to obtain percentage changes in wheat yields.

3.7 Conclusion

The literature on the resource curse has identified two channels for the impacts of abundant natural resources on economic growth. Some evidence suggests that the impact of the resource curse is determined by institutional quality, while other evidence suggests that the natural resource curse effect undermines economic growth, crowding out sectors that would otherwise have positive externalities on economic growth. However, most evidence is based on results from analyses of cross-country surveys and thus need to be complemented with time series or panel data to examine the impact of commodity booms on economic performance. It is a potentially crucial point, because it is still undetermined whether the observed negative impact of the resource curse occurs over the long term or is merely a short-term phenomenon stemming from commodity booms and the uncertainties associated with it.

[54] The coefficient was multiplied by 100 because the model is specified as a log-linear function. Thus, the interpretation of the coefficient should be as follows: a one percent increase in the resource rents share of income would lead to a -0.58% ($\hat{\beta} *100$ = (-0.0058)*100) change in wheat yield.

The lack of sufficient data on institutional quality has often constrained investigations that would cover the impact on economic growth of the natural resource curse over the long term. Finding the appropriate measure for institutional quality is a daunting task. The proxies used in the literature that include the temporal dimension needed to conduct the appropriate research are mostly unavailable. In this study I used a measure for institutional quality that could be exploited to examine the resource curse, initially pioneered in an influential paper by Clague et al. (1999). This measure has advantages over the others, not only in the availability of the data, but also many other details discussed above.

The findings indicate that the type of resources is important in accounting for how the resource curse occurs. That is to say, it is not all, but only some resources that are problematic for economic growth. Thus, the greater the likelihood that the resource can be controlled to capture the rents generated by producing it, the higher the possibility that this will lead to rent-seeking and inefficiency. However, the abundance of natural resources and their composition are nonlinear functions of institutional quality. It is believed that there is a threshold point in the impact on institutional quality of different types or levels of abundance of natural resources, implying that excessive or overabundant production of resources is crucial for explaining the resources curse. Interestingly, agricultural resources typically have positive externalities at higher levels of production, while at lower levels of production they could have negative impacts on institutional quality.

In addition, the significant negative impact of the agricultural sector on institutional quality is evident from the model results. Its impact on institutional quality was even greater than resource rents share of income in terms of magnitude, explained by the fact that the agricultural sector is more of a point-source resource rather than diffuse resource because it can be controlled by large agricultural producers in CIS countries. Thus, when the agricultural sector is represented largely by the state or certain groups it causes institutional decay and consequently hinders economic growth. Another finding is that the impact of the Dutch Disease phenomenon was observed through the channel of institutional quality. The empirical results show that natural resource abundance had a significant negative impact on the production growth in the agricultural sector. Therefore, the results suggest that the production of abundant point-source natural resources—in the case of the CIS countries, energy production—squeezes out agricultural sector production and potentially represents another channel of the resource curse.

4 ORGANIZATION AND INSTITUTIONAL EFFICIENCY OF THE WHEAT AND ENERGY SECTORS IN KAZAKHSTAN

4.1 Introduction: General Overview of the Wheat and Energy Sectors

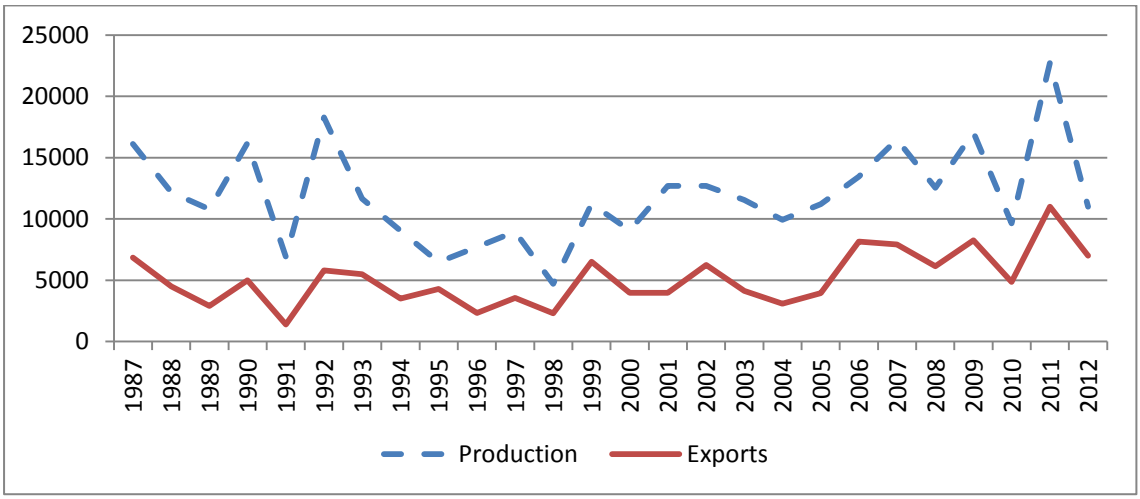
The major objective of the analyses presented in this section was to differentiate between the diverse effects of institutional arrangements among diffuse resource sectors, primarily wheat production, versus point source resource sectors on agricultural sector development. One hypothesis in economics is that the type or appropriateness of resources determines economic performance, as discussed in previous sections. The mainstream view is that point source resources, in contrast to diffuse resources such as wheat production, hinder economic growth by deteriorating institutional quality (e.g., Isham et al., 2005).

The Central and Eastern European (CEE) and CIS countries followed divergent paths regarding market reforms of their agriculture sectors, even though the countries started with a common institutional heritage (Lerman et al. 2004). Indeed, the two groups of countries diverged considerably with respect to land tenure, the transfer of land titles, privatization in agriculture, and the restructuring of farms. Consequently, CEE countries are currently outperforming their counterparts in terms of GDP, agricultural product growth, and the productivity of agricultural labor (Lerman, 2000). In this regard, CIS countries can be described as reluctant reformers, while CEE countries achieved more significant institutional reforms in their agricultural sectors. This divergence in reform paths can largely be explained by the cultural and social differences perpetuated during the Soviet period (Lerman et al., 2004).

In addition, Lerman et al. (2004) suggest that the former socialist system economies inherited a propensity for production maximization rather than profit maximization considerations. Thus, the institutions established during Soviet rule have been persistent and continue to be primarily focused on large-scale agricultural initiatives. Koester and Petrick (2010) found that the emergence of large agricultural holding companies was due to the dominance of patrimonial constitutions in society. As a result, the state inherited patrimonial characteristics combined with power and resources, and subsequently the law was manipulated as a means to lobby for the interests of those in power. Increasing lack of confidence in the state, legal agencies, and institutions undermines the competitiveness of the environment. Consequently, vertically integrated holding enterprises evolved, mirroring the debilities of the legal system.

The agricultural sector in Kazakhstan is a major component of the national economy, employing 30% of the labor force despite the sector's production accounting for only 10% of the GDP. Kazakhstan is the world's fifth largest wheat producer and tenth largest wheat exporter. It is currently the third largest grain exporter among CIS countries after Russia and Ukraine (Pomfret, 2013). Although dramatic decreases in grain and wheat production occurred early in the post-Soviet period during the early 1990s, the wheat sector began to recover in 1999 following the introduction of a price support system that prompted an impressive increase in employment. By 2001 the number of workers employed in the agricultural sector almost doubled from 1999 levels, reaching approximately two million (IMF, 2003).

Figure 4.1: Wheat Production and Exports of Kazakhstan (thousands of metric tons)



Source: Based on data from the SARK database (2013)

The wheat sector is a major non-extractive production and export component of the Kazakhstan economy, with production in recent years having returned to the record levels of the 1980s. Indeed, for the first time since independence Kazakhstan documented exceptional wheat harvests in 2009 and 2011 (Figure 4.1). Kazakhstan has a solid background and significant experience producing, processing and exporting wheat, as well as the potential to further develop this sector. In this regard Kazakhstan should confront challenges and mitigate existing barriers in the wheat sector's supply chain, with suggested approaches including modern retail development, financial support for agribusiness, and building workforce skills (OECD, 2011).

Most wheat is produced in the northern region of Kazakhstan, with the North Kazakhstan, Akmola and Kostanay provinces producing 75–80% of the national total. Wheat exports largely depend on annual wheat production levels, as described in the summary presented in Figure 4.1. However, considering that domestic demand for wheat is not increasing in parallel with wheat production, it can also cause serious problems for the management of new stocks of wheat. For instance, the difference between wheat production and exports in 2011 totaled 11.7 million metric tons, while domestic demand accounted for 2.5–3 million metric tons.

Wheat market has become volatile since 2006. Moreover, wheat production and export volatility are associated with price volatility. For example, the decline of wheat production and exports in 2008 was accompanied by high prices (Figure 4.2). The prolonged rise of wheat prices peaked in 2008 and subsequent policies such as export restrictions and bans led to a decline in wheat exports. Policymakers introduced export restriction measures in an attempt to stabilize and isolate the domestic market from international food price volatility.

Access to financial resources by wheat producers is partly limited by the fact that financial institutions do not accept real estate liens as collateral for loans (Gaisina, 2011). Furthermore wheat production is highly variable, particularly in the provinces of Kostanay, Akmola, and North Kazakhstan where climatic conditions can vary greatly between years. For example, productivity in the early 1990s peaked at 12.2 quintals/ha, yet dropped to 5.0 quintals/ha by 1995 before subsequently rising again to 9.4 quintals/ha in 2000 and 9.7 quintals/ha in 2008 (ATF Bank, 2010). Owing to production variability, agribusiness and particularly the wheat sector in Kazakhstan are considered high-risk investments by credit institutions, which have failed to provide significant support for agricultural sector projects.

It has been suggested that the wheat sector could improve through integration with other sectors of the economy (Meng et al., 2000). Other studies have concentrated on describing the structure of demand, supply, and trade to highlight the competitiveness of specific sectors of the economy (Ahmad and Braslavskaya, 2003). Brosig and Yahshilikov (2005) suggested that openness to world market is a main factor that determines competitiveness, stemming from the fact that transportation costs are very high for landlocked countries such as Kazakhstan.

Many value chain analyses have been conducted to describe the roles of principal actors, institutions, and intermediaries involved in the value added process. Initially suggested theoretically and applied in development programs, the factors affecting value chain creation

have subsequently been made available for practitioners and scientists. Schmitz (2005) introduced a new method of value chain analysis and demonstrated that the method can be used by practitioners and policy makers. Value chain analysis methods have been employed in many investigations of agricultural products (Fitter and Kaplinsky, 2001). Indeed, they have recently been used to examine specific components of economies and widely employed for case studies (Badiane et al., 2002; Larsen, 2003).

Figure 4.2: Wheat Exports and Domestic Prices in Kazakhstan (USD per metric ton)

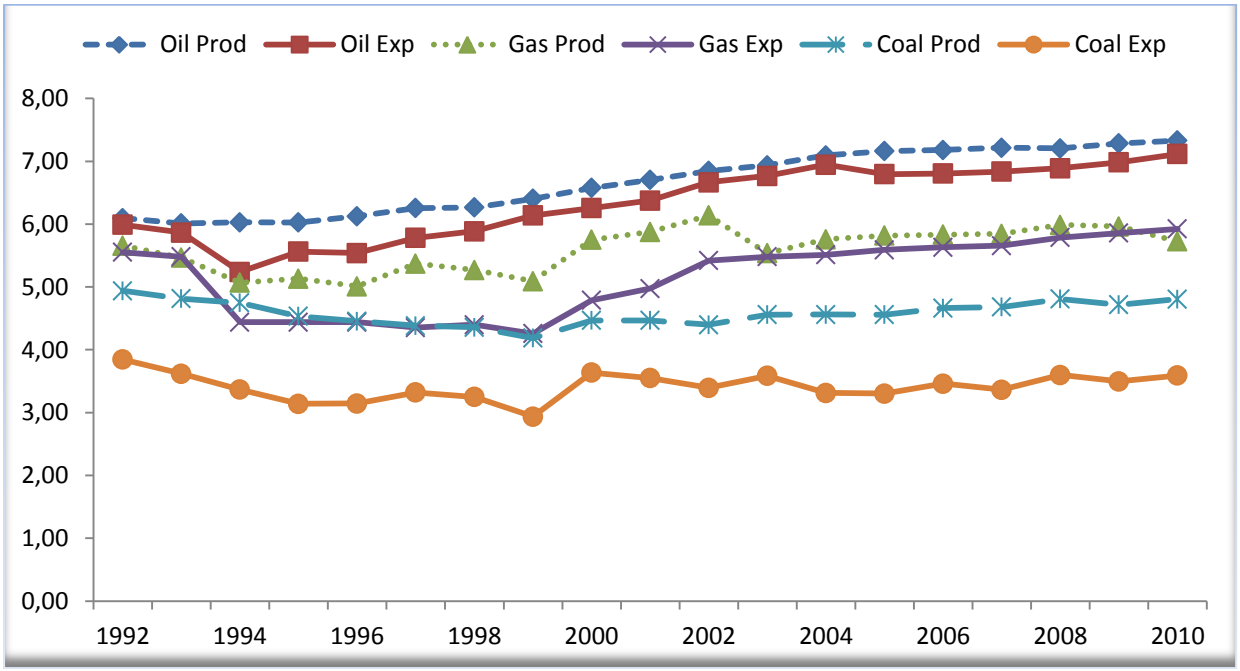
Source: Based on data from the SARK data base (2013)

Kazakhstan's crude oil production and exports were stable for nearly two decades until 2010 (Figure 4.3). Natural gas production and exports have also been stable, especially since 2003, however, there was a huge gap between coal production and export volumes, reflecting that the country is becoming more energy resource dependent, particularly with respect to oil and natural gas. For instance, annually 73% of oil production, 70% of natural gas, and only 31% of coal production were exported on average during the 1992–2010 period. Thus, energy production relatively concentrated on oil and natural gas in contrast to coal exports. Oil production accounted for 28% of the GDP, while the income shares of natural gas and coal production were 0.29% and 2.58% respectively during the 2000–2010 period.

CIS countries are considered to have great growth potential in oil and gas production as energy resource production in these countries is projected to increase at least twofold in the

next 25 years, even though the duration of this growth is unclear (EIA, 2010). However, these countries face two major problems that could undermine such growth: due to being landlocked they are isolated from global markets and the quality of governance and the investment climate (ibid.).

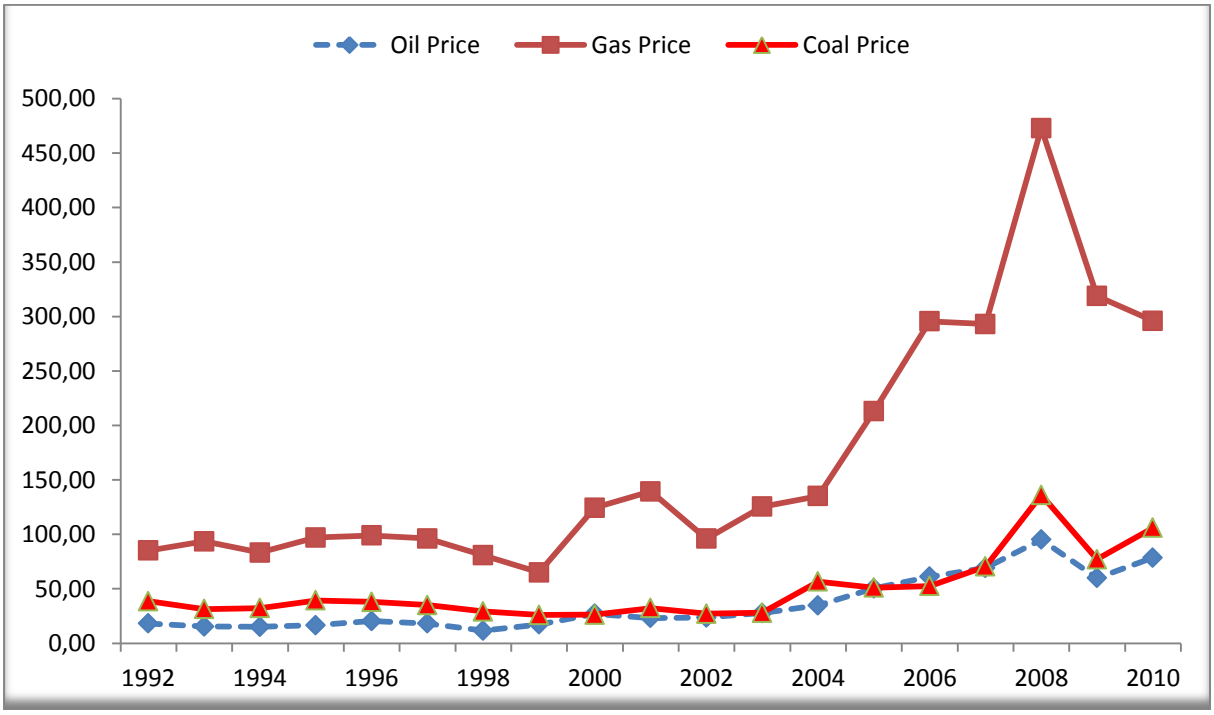
Figure 4.3: Real Production of Energy Resources in Kazakhstan, 1992–2010 (logarithm values)



Source: EIA (2013)
Note: Crude oil production and export in 1000s of barrels per day; Natural gas production and export in billions of cubic feet; Coal production and export in millions of short tons

Kazakhstan's oil and gas industry has recently undergone significant changes through a modification process initiated by politics, however, the seemingly urgent nature of these policies might well lead to failure. There have recently been tremendous commodity price increases, especially for energy product export prices (Figure 4.4), which could potentially favor inefficient activities by weak institutions. Price trends have been identical for all energy resources. Despite incredible volatility in commodity prices, an overall upward trend has occurred over the past decade. The increase in energy prices followed by new institutional arrangements and government policies have caused institutional inefficiencies as discussed below.

Figure 4.4: Energy Resource Export Prices in Kazakhstan (monthly averages)



Source: EIA (2013)
Notes: Crude Oil-CIS Urals MED. USD per bbl; Natural gas in USD per thousands of cubic meters; Coal in USD per metric ton

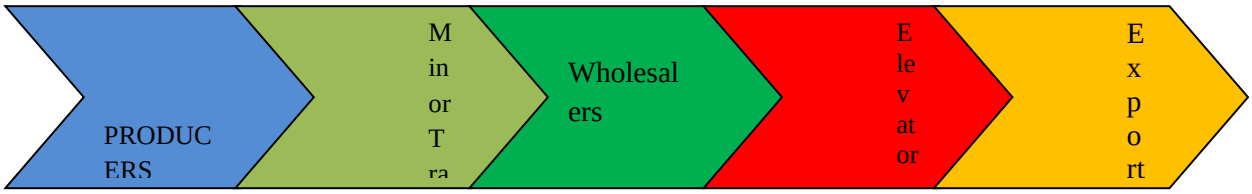
4.2 Data Sources and Major Players of the Wheat Sector in Kazakhstan

This value chain study and empirical research effort was conducted throughout Kazakhstan. Despite almost all regions of the country being involved in wheat production and post-harvest processing, the major wheat producing areas are in northern Kazakhstan. An informal survey was conducted to obtain preliminary information concerning institutions involved in the value added process in the wheat supply chain, as well as their monetary values. Unstructured interviews were conducted with representatives of three out of nine companies that produce bakery and flour confectionary goods. Practitioners and scientists were interviewed to gain insight on particular aspects of the sector. The principal research subjects included the Agro Industry Institute Kazakhstan, various holding companies, wheat producers, scientists at the Agrarian University of Almaty, and representatives of the Eurasian Trade Systems (ETS) (i.e., a commodity exchange). The Statistical Agency of the Republic of Kazakhstan's (SARK) online database was used for the empirical analyses presented in the following sections.

The wheat value chain in Kazakhstan includes producers, grain elevators, and mills. Holding companies and the national holding company KazAgro are considered major actors, not only

in the wheat sector, but also in the broader agricultural sector of Kazakhstan (see Figure 4.5 and Figure 4.6). Most wheat is marketed to domestic holding companies and subsequently exported. Grain is currently marketed through the following chain of main actors in the wheat sector: producers, minor traders (small-scale intermediaries), wholesalers (private holding companies), private or state mills and elevators (private holding companies or the government food corporation), and exporters or domestic market outlets (domestic milling companies, bread plants and bakeries). The fact that the value chain comprises numerous intermediaries contributes to an increase of tradable and consumption goods from this sector (Figure 4.5).

Figure 4.5: Wheat Sector Value Added Chain



Source: Based on interviews with representatives of the Agro Industry Institute Kazakhstan and ETS

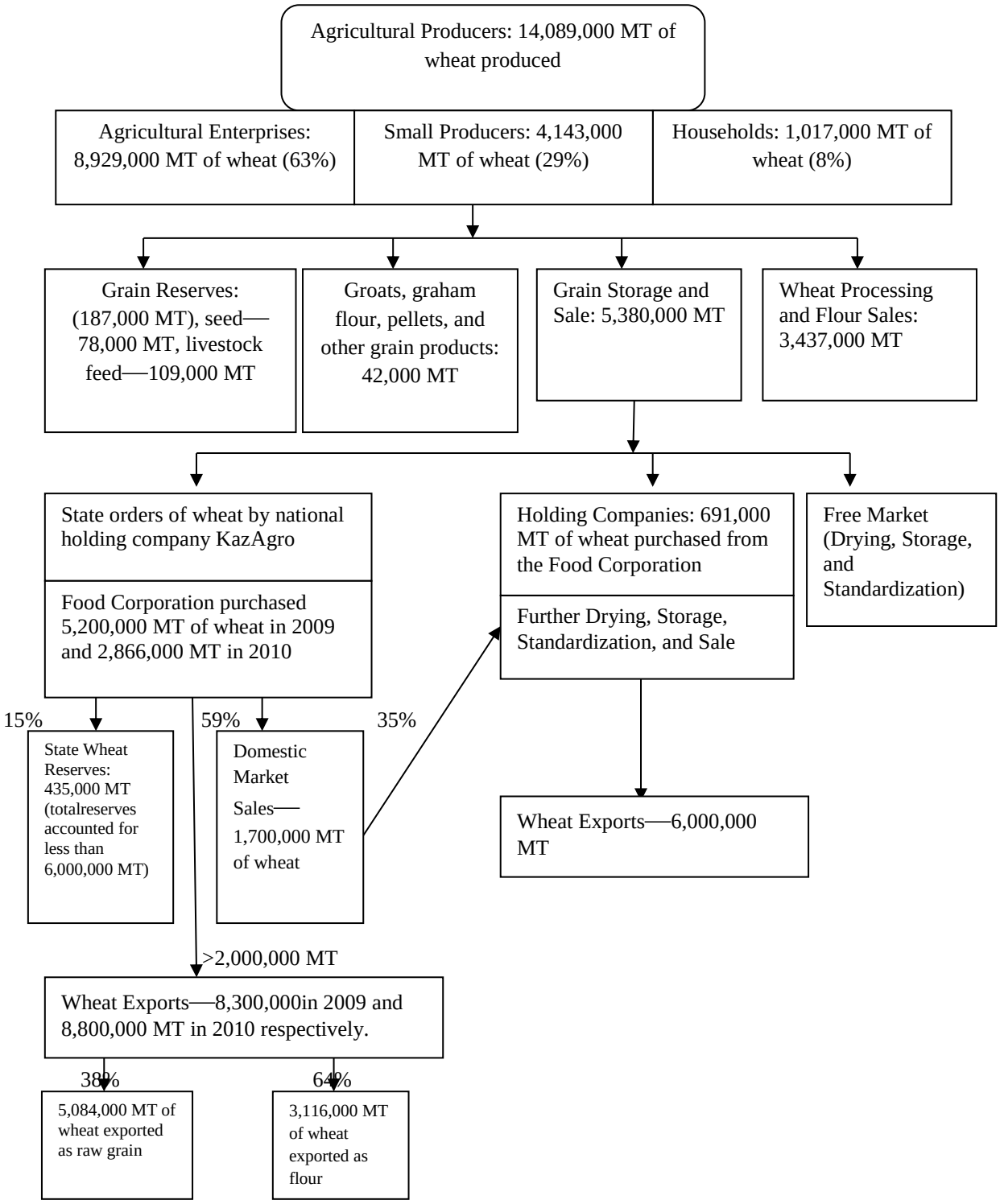
The North Kazakhstan region's share of grain exports accounts for 50%–55% of total grain exports (Figure 4.6). There is an extensive network of grain elevators, mills, and storage facilities in Kazakhstan with the capacity to handle up to 20,900,000 MT of grain. Of the total amount of grain processed and stored, 8,900,000 MT (43%) are processed in elevators, 11,300,000 MT (54%) in mechanical grain warehouses, and the remaining 700,000 MT in adapted non-mechanical warehouses and storage facilities. Statistics from 2007–2010 show that small producers stored half of their grain with holding company warehouses, between 32.6% and 39.7% was held in granaries (granary enterprises) and the remaining 14.6% to 21.6% was sold directly by producers.

Additional grain processing in Kazakhstan is performed by 54 companies that concentrate on the production of flour, cereals, and starch. These companies processed approximately 122,500,000,000 tenge ($816,666,667 USD) of grain products in 2008, including: 3,300,000 MT of whole wheat flour; 644,200 MT of bread; 132,000 MT of pasta, noodles, and other products; 50,800 MT of buckwheat and graham flour; and 21,700 MT of bakery and confectionery goods. Grain processing operations by these companies currently are at 35–

37% of capacity. Approximately 20,000,000 MT of grain were harvested in 2009, of which the government only purchased 3,000,000 MT. Kazakhstan grain exporters have been operating in a difficult environment due to the global financial crisis, increased grain exports by principal competitors and neighbors (Russia and Ukraine), and other unfavorable conditions. Traders practically ceased purchasing grain in 2009 due to dramatically low prices and transportation shortages. The elevators and mills were already completely overstocked and most small- and mid-scale enterprises that normally purchase and market limited amounts of grain (50–100 MT) in neighboring regions of Russia suspended grain trading due to market conditions and licensing terms.

As a result of local market conditions small producers are often compelled to sell grain at low prices—from $53 to $67 USD per metric ton—for third-grade grain, which barely covered production costs in 2009. This has led to significant increases in the debt burdens of agricultural producers, which amount to an estimated total of $246,000,000 USD in Kostanay alone. For instance, in 2009 small producer loans from second-tier banking institutions accounted for $73,000,000 USD, and an additional $86,000,000 USD were borrowed from KazAgro. Of the total agricultural producers' debt, $53,000,000 USD were allocated to the purchase of machines and tools and $38,000,000 USD to the purchase of fuel, herbicides and spare parts. Due to the high costs of drying and storing grain in elevators, wheat milling costs, lease and loan payments to banks and financial organizations (including penalty fees and fines), most small producers have barely been capable of covering operating costs, remaining on the verge of bankruptcy.

Figure 4.6: Wheat Production Value Chain in Kazakhstan, 2010



Source: Based on interviews with representatives of the Agro Industry Institute of Kazakhstan

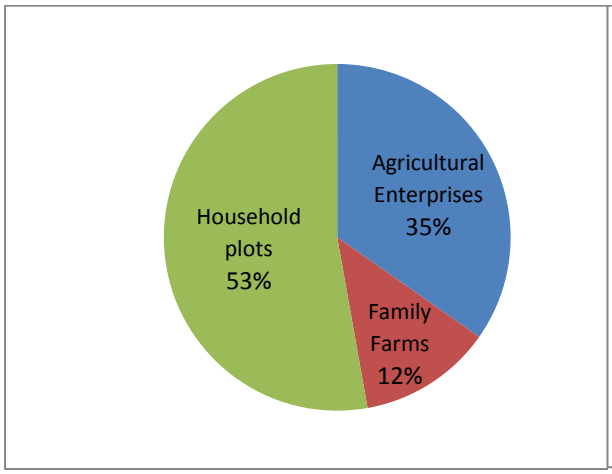
4.2.1 Vertically Integrated Holding Companies

The agricultural sector contribution to GDP in Kazakhstan has dramatically contracted since the 1990s, having nearly collapsed during the first decade of independence due to the state's

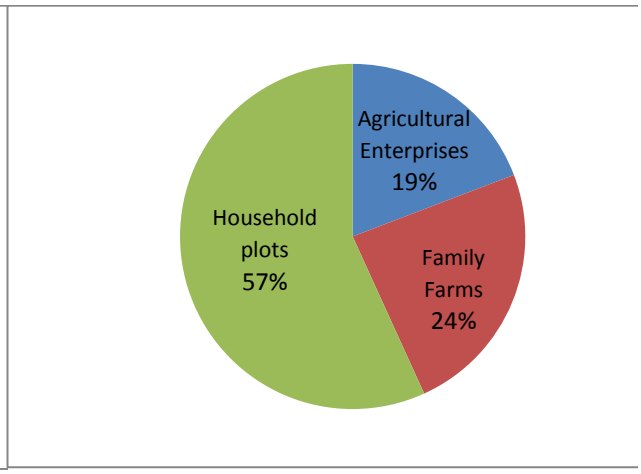
concentration on the oil sector and neglect of the agricultural sector. The agricultural sector share of income declined by 58% over 1992–1998 (World Bank, 2007) and has only begun to revive since 1999, growing on average by 7% annually due to better economic conditions and farm restructuring (World Bank, 2004; 2006). However, the decline of the agricultural sector has not been completely reversed. With the enormous growth of the energy sector, the agriculture sector's share in GDP declined from 34% in 1990 to 5% in 2011 (OECD, 2013). The Ministry of Agriculture launched its Agriculture and Food Program in 2002 in an effort to diversify the economy. The program was motivated by the recovery of the agricultural sector with the reforms and structural changes having led to an increase in the number of farmers, while the driving force was the oil boom in Kazakhstan (Pomfret, 2013). According to statistical database of Kazakhstan (SARK) there were 9,227 agricultural enterprises in 2010 that accounted for 61% of the nation's arable land and 19.2% percent of national output, 192,611 family farms that accounted for 38% of the arable land and 24% of output, and 2,071,129 household plots that accounted for 1% percent of arable land and yet 56.8% of output. The reforms almost doubled the number of farms from 104,621 in 2001 to 213,179 in 2011, of which 12,992 were agricultural enterprises and 200,187 were family farms. Agricultural enterprises dominate the sector in the northern provinces of Kazakhstan, particularly in wheat production.

Most agricultural enterprises were operated by state farm managers during the Soviet era, especially in the wheat producing provinces. Agricultural enterprises account for 35% of the total wheat output of the provinces of Akmola, Kostanay and North Kazakhstan, while family farms produce only 12% (see graphs (a) and (b) in Figure 4.7). In contrast, family farms dominate the producer composition of overall output for all of Kazakhstan. Furthermore, there is considerable variability among the provinces that concentrate on wheat production (Akmola, Kostanay and North Kazakhstan) where agricultural enterprises account for 73% of arable land, versus southern provinces (Almaty, Zhambyl, Kyzylorda and South Kazakhstan), where agricultural enterprises account for only 34% of the arable land (see graphs (c) and (d) in Figure 4.7).

Figure 4.7: Agricultural Production by Farm Type in 2010 (%)

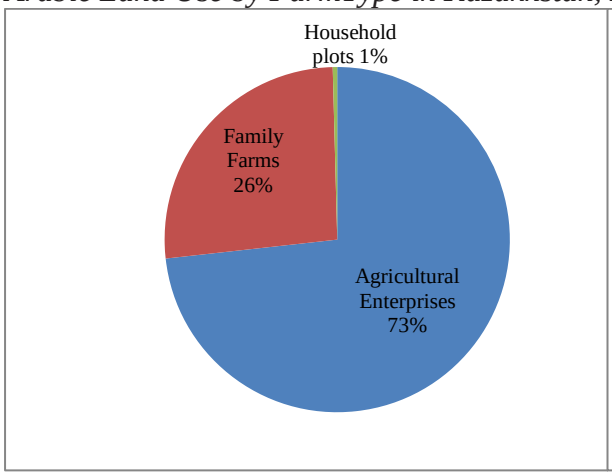


(a) The northern region includes three main wheat producing provinces: Akmola, Kostanai, and North Kazakhstan

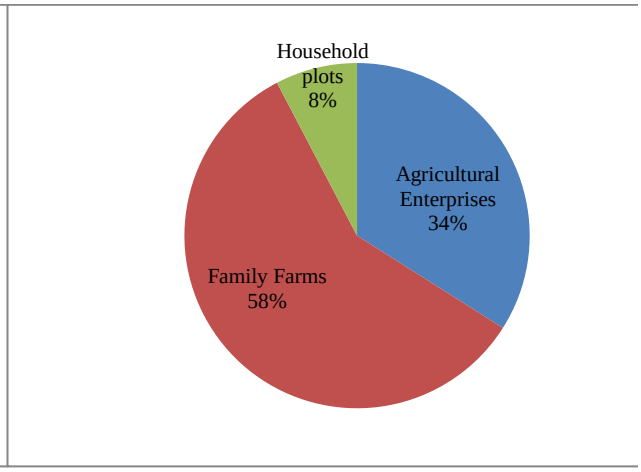


(b) All regions of Kazakhstan

Arable Land Use by FarmType in Kazakhstan, 2010



(c) The northern region includes three main wheat producing provinces: Akmola, Kostanai, and North Kazakhstan



(d) The southern region includes four provinces: Almaty, Zhambyl, South Kazakhstan, and Kyzylorda

Source: Based on SARK data (2013)

Table 4.1: Mean Wheat Production Area by Farm Type, 2007–2011(hectares)

	2007	2008	2009	2010	2011
Agricultural Enterprises	1160	1228.81	1306.11	962.17	710.72
Family Farms	21.72	21.30	23.97	22.10	22.24
Household Plots	0.0061	0.00185	0.00174	0.0018	0.00063

Source: Based on SARK data (2013)

The mean size of wheat production areas for each producer category is shown in Table 4.1. The wheat production area of agricultural enterprises is much greater than family farms and household plots. Do the large-scale agricultural producers benefit from economies of scale relative to mid- or small-scale farmers? Table 4.2 presents the average annual productivity of each of the farm types from 2007 to 2011. Small- (household plots) and mid-scale farmers (family arms) were as productive as large-scale farmers (agricultural enterprises). In 2010 the wheat production shares of agricultural enterprises and family farms were relatively higher than household plots, accounting for 35.4% and 45.1% respectively (Figure 4.2). Holding companies play an important role in wheat production; the four largest agro-holding companies control over 40% of the nation's arable land and own 70% of the grain elevators, while the top 20% of the largest companies control 80% of the arable land in North Kazakhstan.

Table 4.2: Wheat Harvest Yields in Kazakhstan by Farm Type, 2007–2011 (quintals per hectare)

	2007	2008	2009	2010	2011
Kazakhstan (all producer categories)	13.0	9.7	11.9	7.3	16.6
Agricultural Enterprises(Selhozpredpriatya)	12.7	10.0	12.2	7.1	17.6
Family farms (Krestianskieilifermerskiehoziastva)	13.5	9.2	11.4	7.9	14.6
Households Plots (HoziastvaNaselenia)	16.0	5.6	13.9	11.6	20.0

Source: Based on SARK data (2013)

The large-scale or vertically integrated holding companies account for 15% of all companies in wheat sector (Wandel, 2008), including: Agro-Sauda, Kazakexportastyk, Alibi, Batt, Dan, Astyk, Bogvi, Karasu, and Zernovaya Industriya (Grain Industry). It is difficult to define the exact number of agro-holding companies, however, for instance, Akimbekova (2006) accounted for 40 holding companies in the wheat sector. Currently the large holding companies operating in Kazakhstan, including foreign companies, are limited liability partnerships such as: Agrocenter-Astana, Alibi, Ivolga-Holding, Wheat Pool Kazakhstan, Kazexportastyk, Karasu, Tsesna-Astyk, KazGrainInspection, the Wheat Leasing Company, Akzar-Trans, ALAN-AGRO, APK Kunaihlebprodukt, Agro-Star, AltynBiday 2000, SGS Kazakhstan, Bayer CropScience A.G., the closed-type Stock Company BATT, the International Kazakh Agroindustrial Stock Exchange, the Food Contract Corporation, Bisco, JSC Dan, Sungrain S.A., GLENCORE International A.G., and Singenta Agro Services A.G.

The wheat supply chain is restrictive for small entities and individual traders from production to export owing to the high costs of storage, transportation, and marketing. In order to manage these financial challenges traders establish vertically integrated holdings to benefit from economies of scale. The wheat sector in Kazakhstan is currently dominated by seven or eight large-scale holding companies. Despite the lack of exact data the largest agro-holding companies control approximately more than one million hectares of arable land, with the 10 largest agro-holding companies each possessing a minimum of 100,000 ha (OECD, 2013). In addition, according to statistical data provided by the Agency of Statistics of the Republic of Kazakhstan 62.8% of the grain produced in 2012 was from large-scale enterprises, 37% was from family farms, and 0.2% was from household plots. Thus, approximately two-thirds of the nation's grain is produced by large-scale agricultural enterprises.[55] One of these companies, Zernovaya Industrya, exported more than one million metric tons of grain in 2008. While the company's grain production capacity is limited to 100,000 ha, it also maintains storage capacity for over one million metric tons of grain. The company also has another trade advantage, it holds 70% of the stock of the Astrakhan Grain terminal, a company that provides access to the international port of Astrakhan on the Caspian Sea, from which it can export directly to the Middle East and Eastern Europe.

The second leading company is the APK-Invest Corporation, which owns an extensive infrastructure network. Among Kazakhstani companies APK-Invest has the broadest geographical influence in terms of grain exports and is the sole owner of the Azov port elevator located on the Black Sea in Russia, which has storage capacity and facilities for up to one million metric tons of grain. APK-Invest also holds 42% stock in the Ventspils Grain terminal, a joint Kazakhstani-Latvian venture with a capacity of up to 2,500,000 MT of grain. These facilities enable the corporation to export grain to Europe, Asia, and Africa. In contrast with other wheat sector companies this corporation works exclusively in grain trading operations and is not involved in production. Most of the corporation's assets are held abroad where it is mainly dedicated to grain logistics. The corporation marketed thirty eight billion tenge (approximately $25,300,000 USD) of grain from Kazakhstan in 2007.

Another of the major large-scale holding companies in the wheat market is Ivolga-Holding, which is also mostly involved with trading rather than production. This Kazakhstan-based company is also a major actor in the wheat market of the Russian Federation and has the

[55] This is true for all other years based on the statistics of the last decade. The data is available from the Statistical Agency Database (Statistical Yearbook, 2012; page 299).

capacity to store one million metric tons of grain in Kazakhstan and an equal amount in Russia, possessing 11 elevators in different regions of the Russian Federation alone. Although the holding company is primarily a trader, it owns 500,000 ha of production area in both Kazakhstan and Russia, exporting over one million metric tons of grain annually. Compared to private infrastructure the state-owned facilities are relatively limited; there is currently only one grain export terminal in the Caspian Sea controlled by the National Management Holding Company (KazAgro). Thus, only some examples of large-scale agriculture enterprises offer insights into the factors that enable them to benefit from economies of scale.

4.2.2 Institutional Arrangements and the Dominance of Vertically Integrated Agro-holding Companies

Financing and providing credit for wheat production is a major concern in Kazakhstan. Wheat production costs in Kazakhstan are summarized in Table 4.3. Financing and equipment leasing accounted for 20% of total production costs, representing the highest costs of the Food Contract Corporation—National Holding Company in 2010. This fosters the domination of the sector by large-scale producers (agro-holding companies) given their relatively greater access to financial resources. The economic explanation of this fact is that the credit worthiness of agro-holding companies is relatively better than that of smaller farms. However, the institutional arrangements in favor of large producers have enabled their prevalence in the wheat sector (Dudwick et al., 2007). The Land Code passed in 2003 allows farms to use agricultural land as collateral. In contrast to smaller farms agro-holding companies are also able to use other assets as collateral. Moreover, subleasing was outlawed by the Land Code (article 170) implying that small-scale farmers could only obtain land by purchasing it or integrating their production areas with large-scale farms. Article 170 of the Land Code provided three options to those who lease or sublease land: 1) cultivation on land leased from the government, 2) purchase of land, and 3) contributing a share of land to large-scale enterprises. Producers that failed to select one of these options by the deadline of January 1st 2005 were to have their land ownership rights revoked and their plots appropriated by a special state fund. Many farmers were forced to merge their lands with

large agricultural enterprises due to a lack of the financial resources required to purchase and obtain land ownership.[56]

This state policy was intended to prevent the breakup of and support large-scale farms. Therefore, small farmers had to integrate with large-scale agro-holding companies to ensure their access to financial resources and credit. Financial-industrial groups and agro-holding companies are considered identical institutions, given that financial institutions, especially in the grain sector, are formed as holdings in Kazakhstan (Frangulidi, 2006; Ibraev, 2006).

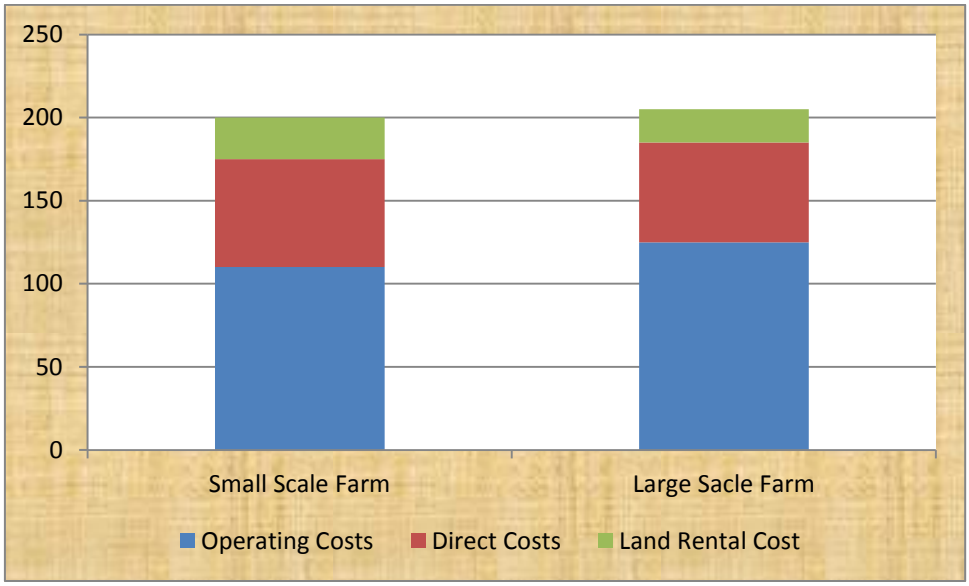
Table 4.3: Mean Annual Wheat Production Costs in Kazakhstan, 2010

Cost categories	Tenge per quintal	Percentage of total cost
Field Preparation, Seeds, and Planting	218.45	16.10%
Labor	175.45	13.00%
Replacement Parts and Maintenance Facilities	138.8	10.30%
Services	89.75	6.75%
Machinery and Equipment	134.05	9.85%
Fertilizers and Chemicals	69.95	5.10%
Energy	8.85	0.65%
Fuel and Lubricants	247.2	18.20%
Irrigation	2.25	0.15%
Financing and Equipment Lease Financing	265.65	19.95%

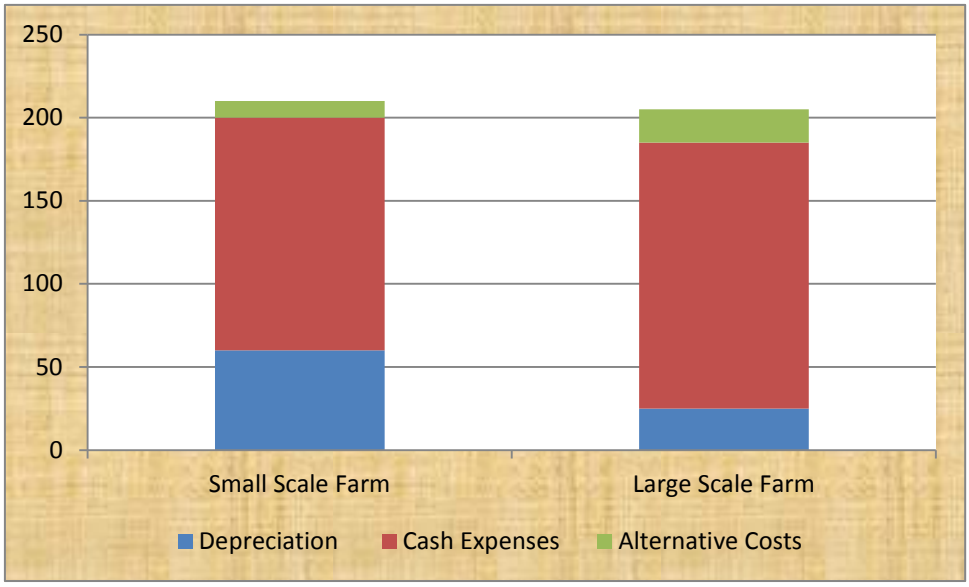
The wheat production and processing costs of large- (mean size 20,000 ha) and small-scale (mean size 6,000 ha) farms are presented in the graphs in Figure 4.8. One cost that is not included in Table 4.3 is land rental cost, which is one of the major costs of wheat production (Figure 4.8). Land rental costs per metric ton of wheat for both large- and small-scale farms were relatively small in comparison to other costs. In contrast with small-scale farms, large-scale farms have lower rental costs, giving them an advantage over small-scale farms.

[56] The major motivation of new the arrangements in Land Code of 2003 was to improve the efficiency of land use in Kazakhstan. According to the old regulations land holders were not in fact land owners and were not subject to taxes in spite of whether they leased or subleased the land.

Figure 4.8 (a): Wheat Production Costs for Large-and Small-Scale Farms, 2010 (USD/MT)



(b): Wheat Production Costs of Large-and Small-Scale Farms, 2010 (USD/MT)



Operating costs were relatively higher for large-scale farms, primarily due to the depreciation of machines and tractors utilized for wheat production. The depreciation costs of large-scale farms were higher than those of small-scale farms due to their greater use of machines and tractors. Direct costs were predominantly for the purchase of seeds, fertilizers, and chemicals. Large-scale farms typically have access to better quality seed than small-scale farms, and

therefore utilize relatively less fertilizers and chemicals, reflected in their lower direct costs. Holding companies are also able to purchase production inputs (chemicals, fertilizers and fuels) at greater volumes and relatively lower prices before re-selling them to subsidiary farms. In addition, parent companies are able to purchase grain at low prices; whereas small-scale farms barely cover their costs with only minimum profits.

4.2.3 Commodity Stock Exchange

During the mid-1990s the commodity stock exchange operated comparatively well and according to the 'Commodity Exchange Law of the Republic of Kazakhstan (1995)' grain products were included into stock exchanges by the state. However, grain trading through the stock exchange has practically ceased, with only 505,000 MT of grain sold in Kazakhstan's stock exchange markets in 2008. The decline of the stock exchange is due to large companies and black market traders in the agricultural sectors that do not share an interest in developing the stock exchange, which would improve the transparency of trade terms such as volumes, prices, and quotations.

The commodity exchange renewed operations again in April 2009 with some amendments and corrections to the existing laws applicable to grain.[57] Accordingly, producers are required to present documentation proving the availability of their wheat (ETS, 2005). Only elevators and mills owned by traders provide these documents to small producers, who must pay for grain storage and drying in the elevators and mills of the large trading companies, which essentially operate as oligopolies. In addition, small producers must pay insurance at 10% of the grain's trading price, therefore small producers are barely able to make a profit due to the high costs of planting and harvesting. Consequently, large-scale agro-holding companies dominate among the 200 companies involved in grain production and the wheat market in Kazakhstan.[58]

4.2.4 Farmers

The Food Corporation reported the purchase of 3,000,000 MT of wheat at a price of $165 USD/MT in 2009. The purchase was completed with significant delay, which had a negative

[57] Law on Grain (2001); Annex to the State's Decree No. 140 of September 14th 2010.
[58] According to EBRD and FAO (EBRD-FAO, 2008) large-scale agro-holding companies account for approximately 80% of the nation's total grain output.

impact on prices. Producers operating with limited financial resources were obliged to sell grain immediately after harvesting at prices that were lower than costs.

According to SARK data (2013) 5,000,000 MT of grain could not be marketed domestically in 2009 as a result of over-supply, which amounted to approximately 20,000,000 MT of grain in total, of which 5,000,000 MT is usually consumed annually in the domestic market. In addition, 1,800,000 MT of grain were stored in elevators and mills. Producers had no option other than to sell grain stocks at prices of $70–$80 USD/MT, suffering huge losses as the quality of grain declines over time. The domestic grain market collapsed in the autumn of 2009 with the grain industry particularly unprofitable for small businesses and producers. As a result of input price increases the costs of grain production are consistently rising, causing a sharp decrease in producer profitability (Table 4.4).

The cost of grain production increased by a factor of 1.8 in 2009 relative to mean cost levels from 2004–2008. The mean rate of cost increase during the 2007–2008 period was 13.8%, leading to lower yields. Grain farming was comparatively profitable for producers during the 2007–2008 period, generating a mean gross profit margin of 38% due to global price increases. The gross profit margin was estimated as the difference between revenue and costs over revenue. Annual gross profit margins have been low (15–25%) for all other years since independence (SARK, 2010).

Table 4.4: Wheat Production Profitability in Kazakhstan Over Time

№		Mean 2004–2006	Mean 2007–2008	2009	Ratio of 2009 values to	
					Mean2004–2006	Mean2007–2008
1.	Industrial Products and Services (Inputs) Price Index (%)	120.3	164.4	–	–	–
2.	Planting Costs (tenge per hectare)	9,953	16,093	18,310	184.0	113.8
3.	Harvest Yields (quintiles per hectare)	9.9	11.6	12.6	127.2	108.6
4.	Production Cost (tenge per ton)	10,083	14,215	14,258	141.4	100.0
5.	Grain Sale Price (tenge per ton)	11,870	23,000	17,030	143.5	74.0
6.	Gross Profit Margin(%)	15	38	16		

Source: Based on SARK data (2013)

Despite better market conditions for Kazakhstan grain producers in 2010 due to reduced production in Russia and dramatic price increases, the situation did not significantly improve for many producers. The domestic wheat market remains very volatile and entirely dependent

on international markets, especially the performance of Russia and Ukraine, resulting in considerable losses for producers and increased consumer prices for bread, bakery products, and livestock feed.

Table 4.5: Comparison of Wheat Prices to Value Added Products in Kazakhstan's Domestic Market

Production Types	2006		2007		2008	
	Tenge*/kg	Ratio to Wheat Price	Tenge*/kg	Ratio to Wheat Price	Tenge*/kg	Ratio to Wheat Price
1. Production (Retail Prices)						
Wheat	13.0	1.0	21.7	1.0	27.2	1.0
Durum Wheat (high protein content)	14.6	1.12	19.7	0.91	31.5	1.18
Soft Wheat (high starch content)	12.9	1.0	21.9	1.01	27.0	0.99
2. Wheat Product Manufacturing Enterprises (Wholesale Prices)						
Fine Flour	24.3	1.98	31.4	1.86	51.8	1.90
Graham Flour	36.3	2.95	42.0	2.5	71.6	263
Wheat Bread	41.1	3.34	50.7	3.02	75.0	2.76
Rye Bread	62.6	5.09	72.6	4.32	91.7	3.37
Bakery	78.9	6.41	97.1	5.78	135.0	4.96
Sweet Cookies	138.5	11.26	154.4	9.34	206.7	7.6
SpiceCake	103.3	8.40	121.4	7.22	158.5	5.87
3. Trade Organizations (Retail Prices)						
Wheat Flour, *Average*	55	4.47	91	5.42	107	3.93
Wheat Bread *Average*	73	5.93	111	6.61	123	4.52
First Grade Wheat	51	4.15	74	4.40	78	2.87
Rye Bread and Rye-Wheat Bread	80	6.50	110	6.55	120	4.45
Noodles	88	7.15	122	7.26	151	5.55
Macaroni	85	6.91	119	7.08	145	5.33
Cookies	169	13.70	212	12.62	253	9.30
SpiceCake	136	11.06	180	10.71	228	8.38

Source: Based on interviews with Agro Industry Institute representatives and informal survey data
Note: * The national currency of Kazakhstan

Despite grain price decreases by nearly half in 2009, consumer prices (both wholesale and retail) for bread and bakery products in most regions of Kazakhstan remained at record high 2007 price levels. In 2007 third-grade wheat sold at prices between 30,000 and 32,000 tenge

($250–$275 USD) per metric ton. During the months of May and June 2007 the wholesale prices of first grade wheat fluctuated among regions, from 28 tenge per kilogram in Ust-Kamenogorsk to 60 tenge per kilogram in Almaty. Consumer prices also varied among regions; wheat bread cost 35 tenge per loaf (650 gm) in Aktobe and 60 tenge in Almaty, while rye bread cost 35 tenge per loaf in Aktobe and 70 tenge in Astana. These wholesale price levels were reflected in higher retail prices at 98 tenge/kg for wheat bread and 103 tenge/kg for rye bread in Almaty, and 82 tenge/kg and 134 tenge/kg in Astana. These retail prices were artificially high in contrast to the low wholesale prices, being at least 1.5 times more than market grain prices (Table 4.5).

4.2.5 The National Management Holding Company 'KazAgro'

KazAgro was established by presidential decree in December 2006. The company is entirely state-owned and its mission is to implement state policy to stimulate the innovative development of the agro-industrial complex based upon the principles of effectiveness, transparency, and corporate governance. KazAgro has several subsidiary companies that work to facilitate the production activities of agricultural producers.

Many producers suffered from the severe drought in 2010, which damaged two-thirds of the planted crops in Kostanay and Akmola. The total area of damaged crops reached 1,800,000 ha, with a $220,000,000 USD loss among the three major wheat producing regions of Kazakhstan. The regions' harvests fell to between two and five quintals per hectare. Under normal conditions harvests of 10 quintals/ha are considered very low. As a result, many producers either failed to generate profits or else went bankrupt. In fact, the prices of grain and other crops were kept at low levels while grain production costs increased (grain prices ranged $80–$100 USD per metric ton and the grain production costs increased from $130–$150 USD per metric ton in 2009 to $180 USD in 2010). The Food Contract Corporation (FCC) set grain prices with the objective of purchasing a target of 2,000,000 MT of grain for the national reserves in 2010 from authorized traders at 26,500 tenge/MT (170 USD) and from small producers at 23,660 tenge/MT ($157 USD).

In contrast, domestic traders and mills purchased grain at 30,000–36,000 tenge/MT depending on grain quality. Furthermore, producers must pay relatively high transportation and elevator costs. Producers using elevators typically reach total returns of 21,000 tenge/MT ($140 USD), which includes a price discount for humidity and predicted waste costs.

Although producers were well informed about the new Grain Law[59] and its requirements, many simply decided to ignore it based on the strong belief that it was not going to be applied. The National Corporation had 5,300,000 MT of tradable grain stocks and a maximum possible export level of 700,000 MT, thus 4,600,000 MT of grain were available as a reserve. Furthermore, the National Corporation sold 1,000,000 MT of grain to the company Alibi in 2010. According to the statistical agency of Kazakhstan the national grain reserves rose from 6,100,000 MT at the beginning of August 2010 to 6,700,000 MT at the beginning of September. The total amount of harvested grain was between 11,000,000–12,000,000 MT in bunker weight, including bread grain, feed grain, seed stock, and carry-over grain stocks exceeding 6,000,000 MT, with an estimated export potential of around 8,000,000 MT of grain in 2010.

Despite calls from wheat producers for the government to help control domestic wheat product prices, these prices are constantly increasing just as domestic gasoline prices are rising every year. Wheat prices have risen in several regions of Kazakhstan, which in turn has increased bread prices. The Ministry of Agriculture decided not to restrict grain exports in 2010, convincing the public and other trading partner countries that Kazakhstan had sufficient grain to supply the domestic as well as export markets.

Producers that own more than 250 ha are obliged to sell some of their harvest to the National Corporation according to the national law "on Grain." They are also obliged to supply the domestic market before marketing grain for export, with the specific amount of this obligation depending on harvest quantity. For instance, due to low harvest levels in 2010 producers were required to sell 125–140 kg/ha of grain to FCC. The Parliament of Kazakhstan defined the most socially important food products in March 2010, ranking wheat and grain products as most important. According to these laws and regulations institutions were required to set price ceilings in order to control the prices of food products.

In order to accomplish this task KazAgro, as representative of the national government, should buy at least 4,000,000–5,000,000 MT of grain annually from producers rather than the usual 1,000,000 MT. It is only possible to control prices if the government stores a significant grain stock. Thus far, the government's execution of interventions intended to reduce market inefficiency remains only a promise. As a result, significant quantities of wheat harvested in

[59] The Grain Law, introduced in 2001, was established to form "state reserves of grain." According to this law wheat producers with more than 250 ha of arable land are obliged to participate in the maintenance of grain reserves.

2009 rotted in storage and under the best-case scenarios producers lost potential revenues due to wheat being dramatically undervalued.

Currently, the government's strategy seems impossible due to the fact that it does not possess sufficient capacity to store the required amount of grain. During the Soviet era the country operated 360 grain elevators, however, only 258 remain functional at present. Furthermore, the government only owns five of the remaining 258 elevators. Aside from these elevators there are granaries with the cumulative capacity to store 8,000,000 MT, however, currently most of them are out of service and those that are operational have the capacity to store 1,000,000–2,000,000 MT at most.

4.3 State Procurement and Price Control Policies in the Wheat Sector

4.3.1 Government Support and Subsidies to the Wheat Sector of Kazakhstan

The Kazakhstan national government implemented a differentiated subsidy system in 2010, placing greater priority upon oil seed production rather than grains within the agricultural sector. The policy implication is that the government is seeking to benefit from water conservation (drought resistant) technologies. At the beginning of June 2010 the Ministry of Agriculture planned to export an additional two to three million metric tons of grain. For this purpose the ministry continued a strategy of subsidizing wheat transportation costs for grain exporters. The ministry planned to allocate ten million tenge (approximately 66000 USD) to subsidize grain transportation to Afganistan, Iran, China, and Central Asia (Table 4.6). Furthermore, the ministry also intended to evaluate other grain export routes to the Middle Eastern and East Asian countries. In 2010 the government's subsidy program was to be implemented by the company Tsentr Trasportnyh Uslug, via its subsidiary company KazTemirTrans. Tsentr Trasportnyh Uslug representatives claim that the government did not inform them of the subsidy program, which contradicts official statements and implies a malfunction in the government.

In November 2009 the Kazakhstan national government decided to subsidize the transportation costs of wheat exporters via the Russian Federation, providing the company 'Center for Transportation Services, Kazakh Temir Zholdari (KTZ)' with $5 billion USD to cover transportation costs. The government offered $20 USD/MT for product transported via the Russian Railways Company (RZD), which was expected to export of 1.7 million metric

tons of wheat. KTZ operates the Kazakhstan transportation campaign for wheat via the Azov, Black, and Baltic Seas. In turn, the exporting company—KTZ—made contracts to further export that grain to world markets with Russian transportation companies such as Rusagrotrans, Technotrans, and LP Trans.

Table 4.6: Planned Agricultural Subsidies by the Kazakhstan National Government in 2010

Subsidy Type	Tenge*
Interest payment coverage of financial leasing operations for the purchase of machines and equipment	40
Wheat purchases for government reserves	11.25
Target current transfers to lower the costs of fuel, lubricants, and other production goods and services in the cities of Astana and Almaty	16.59
Target current transfers to improve the quality and quantity of crop yields in the cities of Astana and Almaty	50.04
Providing financing for all harvesting activities	80
Target current transfers to lower the costs of seed storage in different regions of the cities of Kazakhstan, Astana, and Almaty	20.88
Transportation cost support	$20 USD/MT
Other	72.93

Source: ATF Bank, Kazakhstan (2010)
Note: * in billions, the planned subsidies reached a total of 122,300,000,000 tenge, which was approximately 7.5% of the agricultural sector GDP

There were problems associated with the compensation of the campaign, with a majority of wheat exporters claiming that the campaign actually created additional costs. Financial support was only available to those companies that arranged for transportation through the Center for Transportation Services. While other companies such as KazTransLimited charged transportation costs via the Vladivostok port at a rate of $124 USD/MT the Center for Transportation Services was charging $169 USD/MT for the same service (or $149 USD/MT after the $20 USD/MT subsidy, see Table 4.7). Transportation costs from the port of Yeisk, Russia to the port of Jedda, Saudi Arabia amounted to $141.3 USD/MT. Railroad transportation costs for wheat within the territory of Kazakhstan are $25 USD/MT and $43 USD/MT within the territory of Russia (which together total $68 USD/MT). The final cost of wheat price reached $265.3 USD/MT, including transportation and other costs such as customs duties at the port of Djida. The overall cost of wheat placed in Saudi Arabia was $266.7 USD/MT in 2010, however, traders could sell wheat at prices ranging between $270–300 USD/MT and thus earn high profits from exporting wheat.

Table 4.7: Wheat Transportation and Export Costs from Kazakhstan in 2010

	Wheat $ USD/MT
Third grade wheat value on train	124
Transportation Costs to the port of Eisk,Azov/Black Sea	68
Shipping Costs	17
Freight	55
Insurance (CIF)	1.3
Price of wheat at theport ofDjida, Saudi Arabia	265.3
Government compensation fortransportation costs	20 (since February 2010)
Total price of Kazakhstani wheat after compensation campaign	255.3
Final price of wheat at the port of Djida, Saudi Arabia (via Kazakh Railways)	245 (after compensation)

Source: Kazakh-Zerno (2010)

According to the FAO statistical database (2013), the producer price of wheat in China was $279.5 USD/MT in 2010. Transportation from Kostanay (North Kazakhstan) to the town of Dostyk near the Chinese border cost $46.32 USD/MT, and another $16.8 USD/MT from Dostyk to the city of Alashankou in China. Finally, it cost an additional $67.4 USD/MT to transport wheat from Alashankou to Tianjin or Lianyungang in China. Thus, wheat costs after transportation and customs duties would amount to $254.52 USD/MT from Kazakhstan to the interior of China. Export costs would be lower if state compensation was available.

4.3.2 Government Response to Food Price Volatility

European and Central Asian countries reacted in a variety of ways to the dramatic energy and food price increases in 2007 and 2008. The majority of leading exporters (including Argentina, India, Kazakhstan and Vietnam) launched export restriction policies by mid-2008 (World Bank, 2008). However, such policies had an adverse impact over the long-term because they discouraged producers and exporters. Moreover, such restrictions can be inefficient in the short-term if traders respond by increasing their margins and prices in domestic markets. The predominant policy measures adopted during the 2007–2008 crisis included: food export restrictions by producing countries, VAT rate reductions for food imports, the implementation of government intervention mechanisms to control prices (purchasing food and releasing food reserves), and the direct enforcement of price ceilings and subsequent energy price adjustments. This set of policy measures was exercised again over 2010–2011 (World Bank, 2011).

Price control efforts were unable to protect the poor from the combined negative effects of food and oil price increases. In addition, VAT rate reductions dampen imported good prices and increase budget deficits, whereas consumer prices usually remain unaffected. The

subsidization of energy resources as an input subsidy is driven by rent-seeking activities and also leads to budget deficit increases. Export restrictions and price ceiling measures in the agricultural and energy sectors of the economy also hinder integration with global markets. Policy measures undertaken by the main CIS net exporters (Kazakhstan, Russia, and Ukraine) in response to the food price increases in 2007–2008 are summarized in Table 4.8.

The responses to the food price volatility of Kazakhstan often matched those undertaken in the Russian Federation, such as trade restrictions, consumer subsidies, and increased supply. However, there was some divergence among these countries concerning trade liberalization policy, social protection, and trade restriction. In contrast to Russia and Ukraine, Kazakhstan did not consider a trade liberalization policy owing to its distinct trade patterns. Russian and Ukrainian shares of wheat exports to CIS countries account for only 10% (2007) and 2% (2009), while Kazakhstan exported 43% of its wheat and wheat flour to CIS countries in 2007 (FAO, 2011).

Table 4.8: Government Policy Responses to Food Price Volatility Among CIS Net Wheat Exporters in 2007–2008

Country					
	Trade restrictions	Trade liberalization	Consumer subsidies	Social protections	Supply increases
Kazakhstan	+		+	+	+
Russia	+	+	+		+
Ukraine	+		+	+	

Source: IMF (2012), World Bank (2010), FAO (2010).

As a consequence of drought and fire in Russia and some regions of Kazakhstan, both countries introduced export bans from 2010 until the end of the 2011 harvest. In addition, the National Company of the Food Contract Corporation decided to export wheat by commercial means to some partner countries (Homyak, 2010; USAID, 2010). Export restrictions had adverse effects on producer income. The Single Commodity Transfer (SCT), a policy that uses fiscal tools such as taxes or subsidies to dampen the negative impacts of export restrictions on producers, resulted in negative income effects (–28% in 2007 and –24% in 2008), effectively imposing a tax on wheat producers as a result of fixing domestic prices for wheat and wheat derived products significantly below the international prices (Figure 4.9). In contrast to OECD countries, which subsidized their producers at rates ranging 34–55%,

Russia, Ukraine, and Kazakhstan imposed measures that increased taxes on their producers at rates ranging 16–20% (FAO, 2011). The average annual inflation rate in Kazakhstan was 7.1% in 2010 and subsequently exceeded 8% in 2011 following food price increases, gradually increasing as the country experienced severe weather conditions. In order to control food prices, the government enacted laws imposing essential food item price ceilings (UN ESCAP, 2011).

4.3.3 The Wheat Export Ban in Kazakhstan and its Consequences

The wheat export ban in Kazakhstan was imposed from April to September 2008 in response to inflationary pressure stemming from skyrocketing global prices for wheat and other agricultural products (Lillis, 2008). Several factors such as drought, increased bio-fuel production, and increased food demand caused these price hikes. However, wheat importing neighbors suffered from the export ban due to resulting price increases.

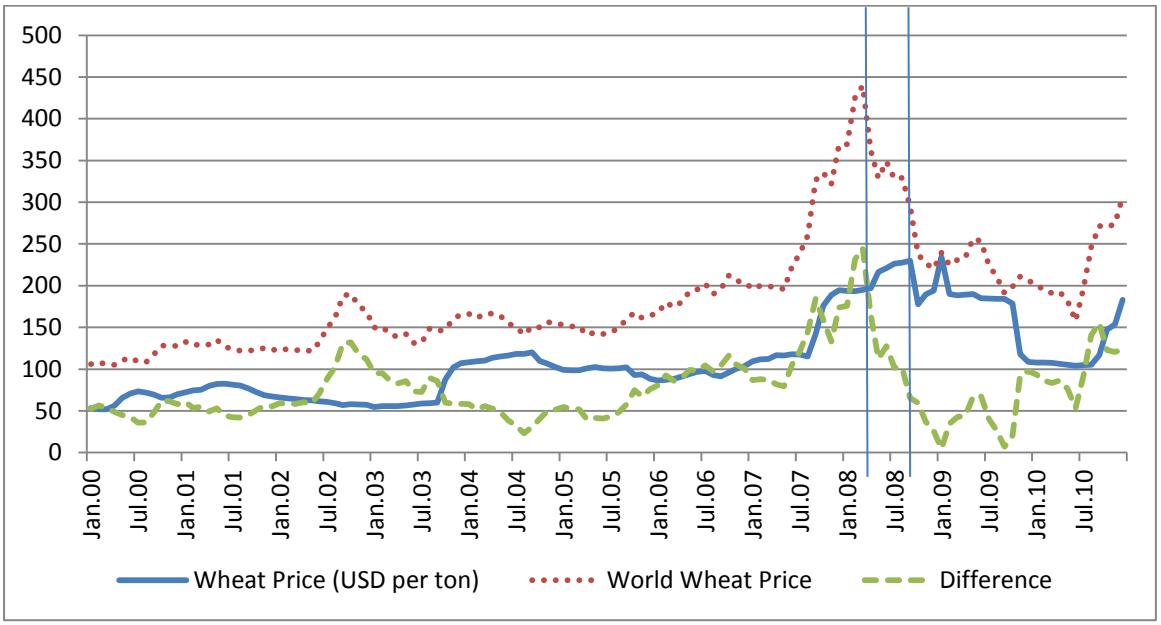
Moreover, wheat exporters were also adversely affected, as all existing contracts with foreign partners were suspended. Such restrictions also harmed relations with international partners. Exporters had to sell their wheat at the low government mandated prices rather than the higher global market prices. Wheat traders earned respectable gains of $2.5 billion USD in 2008, which was 52% ($0.8 billion USD) higher than earnings in 2007 (Investkz, 2009).

Domestic farm-gate and global wheat price behavior from 2000 to 2010 is displayed in Figure 4.9. The difference between global and domestic wheat prices declined dramatically during the export ban, largely due to global price decreases. The export ban did not succeed in reducing domestic wheat prices. Furthermore, the domestic wheat price gradually increased as global wheat prices declined. The wheat price continued increasing and almost reached global price levels by August 2009, when Kazakhstan recorded its highest harvest yields since independence. The difference in prices peaked in March 2008 before subsequently falling to its minimum level in September 2009.

The wheat export ban of 2007–2008 failed to bring domestic prices down in Kazakhstan.[60] The dramatic domestic price increase can be explained by supplementary government response policies. On top of the price-reducing policies, the government decided to increase wheat reserves. The key intermediate actors in the value-added chain such as bakeries and mills benefited from the measures to curb price volatility.

[60] See Gotz et al. (2013), IAMO Policy Brief.

Figure 4.9: Domestic Farm-gate Wheat Prices in Kazakhstan Versus Global Wheat Prices (USD/MT)



Source: Based on data from SARK (2013)

Kazakhstani officials clearly learned from the experiences of Ukraine during 1998–2000, when it faced a deficit in domestic wheat supply while simultaneously enjoying good harvest yields and being a net exporter, and consequently decided to take appropriate policy measures. However, exporters pre-emptively sold wheat fearing that export bans and licensing could take place, stimulating wheat price increases prior to the policies coming into effect. Most wheat was exported, causing a deficit in the domestic market and eventually pushing up the domestic price of wheat in 2008.

On one hand, the price increases provided opportunities for grain and wheat producers, particularly for net wheat exporting countries and regions such as Kazakhstan. On the other hand, the high prices imposed an additional burden on consumers. Since the export ban was lifted wheat market conditions have been reversed. Globally wheat prices have decreased sharply due to strong production. Wheat exports from Kazakhstan have shifted to the southern countries of Central Asia and the Caspian Region. During the period from September 2008 to February 2009, 96% of the wheat exported went to these countries, with Afghanistan being the leading wheat importer (Investkz, 2009).

In August 2007 Kazakhstan introduced a new law regulating grain export licensing that imposed a 10-day review period of all necessary documents before the authorities allow grain

exports. However, grain export licensing was suspended in January 2012 due to pressure from producers and exporters. The new law was introduced to control the prices of wheat and other grains, which were increasing in 2007 despite good harvests and optimistic wheat production forecasts (APK, 2007). The price increases and food security issues in Kazakhstan prompted urgent measures.

The impact of the export licensing requirement has now been reversed. Grain storage companies and refineries in Kazakhstan could barely process wheat and other crops because the export licensing requirement generated overwhelming quantities of wheat and other crops. Moreover, as a result of stricter rules regarding storage, drying, milling, and shipping grain that accompanied the export licensing requirement, 70% of the grain buyers, small businesses, and traders abandoned the market or merged with large-scale farms (Agroacadem, 2012). The majority of the traders were exporting wheat to neighboring regions of Russia in small amounts (50,000–100,000 MT).

This situation was worsened by the fact that most producers borrowed heavily to cover harvest activities, while grain production generated huge losses because producers were unable to export products. Interestingly, prices were relatively high when the export licensing was introduced and for the period immediately thereafter (Zakonkz, 2009). In order to improve food security in the face of the 2007–2008 global food price increases the price for bread was administratively fixed at a moderate level. In the Kostanay region (oblast)—one of three major wheat producing regions of Kazakhstan—a standard loaf of bread cost around 40 tenge, while its minimum production cost would have been closer to 47 tenge due to wheat price increases that reached 72 tenge/kg (Lihogray, 2007).

Wheat prices continued rising as a result of global market price increases. The grain export licensing policy ultimately fueled a spike in domestic wheat prices because exporters quickly exported stocks to avoid the burdens associated with the licensing process. According to officials, the main purpose of the export licensing requirement is to improve the transparency of wheat exporting activities, which facilitates tax collection. However, it was clear in 2007 that exporters were selling almost all of their wheat abroad in anticipation of the new requirements (identically to what had happened in response to similar measures in Russia beforehand). Indeed, official statistics show that 1,000,000 MT of wheat were exported before mid-September 2007, double the amount that had been exported over the same period one year previously (Lihogray, 2007).

The grain stock stabilization fund was formed in 2007 in order to mitigate domestic wheat price spikes. Although it played an important role in preventing bread prices from soaring, it failed due to the absence of a transparent monitoring mechanism that guaranteed that wheat price changes would not be fully passed on to flour prices. In addition, there are plenty of consumer goods that use wheat as an input. Wheat accounts for 75–80% of the cost of pasta production, 30% of bread, 60% of eggs, 20% of beef, and 60% of chicken production, so the twofold increase of wheat prices was transmitted proportionally to many consumer goods.

4.4 Institutional Arrangements in the Energy Sector of Kazakhstan

4.4.1 Overview of the major actors in the energy sector

The major actors and participants in the energy sector value-added chain are described in Figure 4.10. It is notable that the government has occupied an increasing role within this chain. Regarding supporting institutions Kazakhstan has developed its banking sector, which in turn has helped boost construction. In Kazakhstan the energy sector employs only 6% of the labor force and oil production is concentrated within five oblasts (regions). Approximately 68% of the country's oil revenue is directed to the Oil Fund of Kazakhstan, which is evidence of tight fiscal policy.

Kazakhstan has undergone substantial policy changes with regard to the restructuring of institutions that regulate the energy sector, particularly the Ministry of Oil and Gas (MOG) that was established for this purpose. The establishment of this ministry was the first sign reform and served as an indicator of more rigid government policies rather than meaningful reformation of the sector. First, the establishment of such an entity was not necessary from an institutional point of view. Second, the enthusiastically created administrative unit has not yielded any significant results, following the destiny of the 'TaukenSamruk' with high ambitions yet insignificant results (Omarova, 2010). The Tauken-Samruk State Holding Company is a complex for processing the mineral resources of Kazakhstan that has failed to achieve the ambitious goals it was intended for (Abeni, 2010).

The Ministry of Energy and Mineral Resources was transformed into the MOG in March 2010 (Kazakhstanskaya Pravda, 2010). While the old ministry regulated the entire energy sector, the new ministry is only responsible for the oil and gas sector, with other mineral resources being regulated by the Ministry of Industry and New Technology (MINT). Some experts claim that a separate ministry was in fact needed for the electricity and energy

industry given that it lacked a single administrative government agency (Sokolov, 2010). Moreover, the oil and gas industry was already managed to some extent by the KazMunaiGaz and the former Ministry of Energy and Mineral Resources.

The MOG (in cooperation with the MINT) established KazContract (KCA), an agency that monitors local content regulations in Kazakhstan in 2010. KCA is responsible for local content implementation and transparency, and in collaboration with both ministries it has organized the Expert Council, an institution that seeks to guarantee the interests of domestic suppliers and contractors. KCA was re-organized in 2011 as the National Agency for the Development of Local Content (NADLoC) with expanded authority and functions. While the KCA was only responsible for monitoring subsurface resource users, the new agency controls all sectors within the economy, including government entities, national companies, and holding companies that operate within the "Innovative Industrial Development Strategy of Kazakhstan" program (Alibekova, 2010). However, this second step in the institutional reform of the oil and gas industry has created significant challenges. For instance, the core staff of the agency has relocated to the MINT, resulting in the significant loss of human resources at NADLoC. As a new institution NADLoC had to hire additional staff while all experienced personnel remained with the MINT.

The MOG adopted new institutional performance indicators in its 2010–2014 Strategic Plan. Accordingly, the plan set the following objectives for the defined period: oil extraction of 85,000,000 MT (a 120.4% increase over 2008); crude gas production of 54,000,000,000 m^3 (a 61.4% increase over 2008); oil exports of 75,000,000 MT (a 119.4% increase over 2008); 17,000,000 MT of oil refined in Kazakhstan (a 138% increase over 2008), with an additional increase in the oil processing of 87% and achieving the necessary improvements to domestic oil product quality to comply with Euro-3 and Euro-4 standards (Argynov, 2011).
Oil production generated $30,866.8 million USD in 2009 and the oil and gas sector's share of Kazakhstan's GDP increased to 51%. Tax income from international trade and foreign transactions increased by136.4% (100.6 bn tenge) due to changes in import tariffs stemming from the introduction of Common External Tariffs and the re-evaluation of customs tariffs for exported goods resulting from post-customs control of oil.

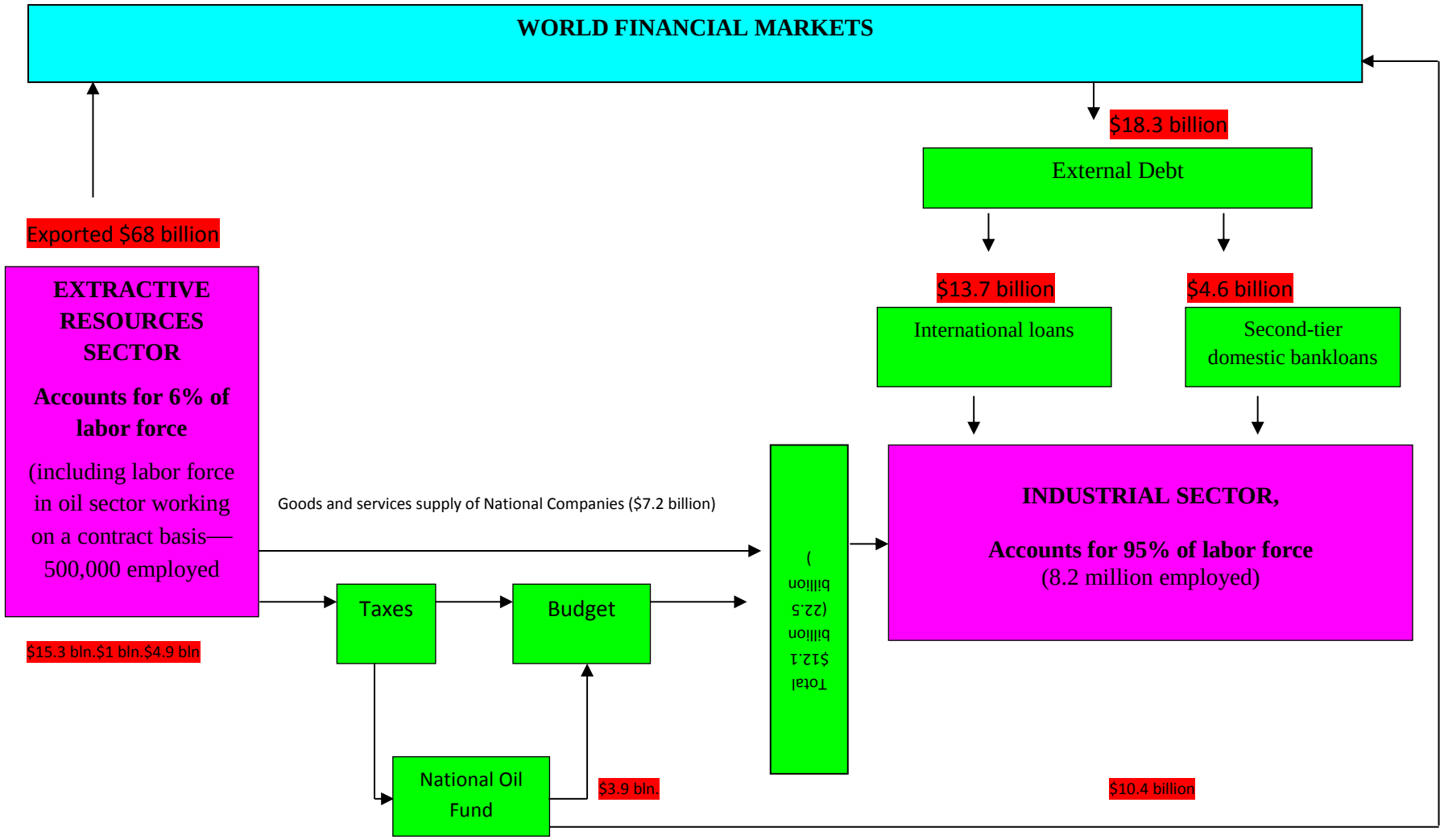


Figure 4.10: Value Added Framework of the Kazakhstan Economy

Note: Amounts in red are in USD

Export tariffs have been re-introduced for oil and oil products at $99.71 USD/MT for light oil products, $66.47 USD/MT for dark oil products, and $40 USD/MT for crude oil. There are plans to boost budget revenues by 60 billion tenge (400 million USD) from new export tariffs in 2014, and by up to 177 billion tenge (1180 million USD) in 2015. Dozens of oil producing companies involved in Production Sharing Contracts are not subject to export taxes according to the Cabinet of Ministers. Minister of Finance Bolat Zhamishev claimed that not all companies are subject to an export duty, although TengizShevroil (one of the major companies operating in the Karachaganak Field) is subject to this requirement (Sergeyeva, 2010). Statements concerning the possibility of terminating contracts with 46 oil and gas companies followed and the MOG subsequently terminated oil development contracts with Tolkynneftgaz and KazPolMunai ahead of schedule. TengizShevroil paid 204 million tenge to settle environmental pollution claims (186.1 m tenge plus an administrative penalty of 17.8 m tenge). Moreover, the inquiry committee of the Agency for Fighting Economic Crimes and Corruption initiated criminal proceedings against TengizShevroil executives. The head of the department for inquiry monitoring at the Atyrau regional prosecutor's office, Nurlan Kulbayev (Sokolov, 2010), reported that TengizShevroil earned revenues of 212.3 million tenge from the Tengiz deposit from oil extracted below the 5,100 m depth limit. This means that over the period from September 1, 2002 to June 1, 2010 TengizShevroil executives were complicit with illegal business activities in breach of licensing terms that resulted in extremely high revenues for the company (Sokolov, 2010).

Taking into account that at least seven suits against TengizShevroil have been rejected over the past decade the recent developments highlight the change in policy, although it is highly likely that the government will reach a settlement with TengizShevroil and Karachganak. The consortium developing the Karachaganak oil field has faced a similar series of lawsuits and Timur Kulibayev (Omarova, 2010) claimed that Kazakhstan had achieved its goal of being amongst the shareholders in the Karachaganak project (currently only 10% are under discussion). Most likely, Italian Eni of BG will concede their shares owing to their plans to reduce participation in the consortium. As has been evident in the past, tight control will probably continue until additional shares are transferred to the Kazakhstan government.

In a similar respect, KazMunaiGaz has succeeded in increasing its share in the North Caspian Project from 8.33% to 16.81% since 2009. This became possible when Agip KCO sold its shares proportionally to each shareholder company. The operator of the consortium is the North Caspian Operator Company (NCOC), which includes KMG Kashagan B.V., Exxon Mobil, and Royal Dutch Shell, while Eni not only lost its single operator status, but also its membership in the project (Paramonov and Strokov, 2011). The other oil field where BG Group PLC and Eni SpA (ENI) operate, Karachaganak, is the only major project that is not under state control, with its stake in the Karachaganak oil field increasing from 5% to 10% in 2011 (Antoncheva, 2011).

4.4.2 Laws Concerning Subsurface Resource Users

The development of legislation concerning subsurface resource use in Kazakhstan can be divided into four phases. The first phase over the 1990–1996 period saw the development of legislation. The 1996–1999 period was marked by enactment of the laws in question. During the 2005–2009 period new laws on the production of sharing contracts were introduced (Ward, 2007). Finally over the period since 2009 or fourth phase the government has enacted new indirect forms of taxation and local content regulations.

4.4.3 Local Content

A number of countries have imposed minimum local content requirements for energy producing sectors. Oil and gas sectors are becoming particular targets of such regulations, including both local content regulation and taxation policies (Hackenbruch and Pluess, 2011). A comparison of policies from three countries is presented in Table 4.9. Brazil has enacted deregulation policies, opening up its energy industry to foreign investment in 1990. Subsequently, foreign companies have majority shares in projects such as Chevron's operations in the Frade Field where minority shares belong to the state-owned company Petrobras. Brazil has undertaken strict measures to monitor foreign subsurface resource users. For instance, IBAMA (the environmental agency of Brazil) fined Chevron 50 million reals ($28 million USD) and imposed further penalties for poor contingency planning that resulted in an oil spill that occurred at the end of 2011 (Bertrand, 2011). Another government institution, the National Petroleum Agency of Brazil (ANP) which is responsible for oil industry monitoring, has shut down one of Chevron's wells and has withdrawn the company's drilling rights. There have been further fines and penalties aside from

those mentioned here. Some experts and foreign companies have claimed that the fines and other regulations have been more ardently imposed on foreign companies (The Economist, 2011).

Table 4.9: Local Content Law Comparison Among Selected Oil Producing Countries

	Kazakhstan	Brazil	Indonesia
Capacity	Kazakhstan possesses the world's largest oil and gas concentration	Brazil is the 11th largest oil producer in the world and is expected to be the 5th by 2020	Ranked 21st among oil producers with 4.2 billion barrels of proven reserves
Local Content Regulation*	"Law of the Republic of Kazakhstan No. 223-IV" passed in 2009 and came into effect in January 2010, regulates local content requirements	Since 2002 Brazil has enacted the law requiring minimum local content on the various fields of offshore of mining industry (offshore and deep water fields included)	BP Migas, the government institution regulating oil and gas industry, imposed minimum requirement rules with regard to local content
Additional recent regulation	Kazmunaigaz is increasing its stake in new fields such as Kashagan and Karachaganak in 2010–2011	In 2010 it approved a law requiring hat newly discovered fields be operated by a state-owned company	State operator BP Migas required Exxon Mobil company to increase oil production in 2012

Source:*Based on Hackenbruch and Pluess (2011)

Brazil has also established regulations that require Petrobras to be the major operator in all newly discovered areas with a minimum 30% stake. This applies to the so-called ultra-deep pre-sal (subsalt) areas, from which royalty payments will be allocated to a national fund to be distributed amongst all states and municipalities. Currently, however, a large proportion of royalties are distributed to Rio and Campos (The Economist, 2011).

Indonesia is an oil-producing country where oil field operations are mostly performed by foreign companies. As of December 2010 the major oil-producing companies operating there are:

Chevron Pacific Indonesia (with a 43% stake), Pertamina (15%), and Petrochina International (8%). The major gas-producing companies include: Total E&P Indonesie (with a 32% stake), Conoco Phillips (15%), and Pertamina (14%). The oil and gas fields in Indonesia are operated under Production Sharing Contracts (Oil and Gas in Indonesia: Investment and Taxation Guide, page 10). A new law passed in 2009 introduced several changes. First, a license-based system (which has been heavily criticized by foreign investors because it offers them less protection) replaced the former contract-based system. Although foreign investors are eligible to hold 100% of concession shares they should divest part of their shares to local companies within five years. In addition, the production phase has been defined as 20 years and extraction areas have been enlarged under the new law. Finally, foreign companies are obliged to use local rather than foreign contractors, facing automatic suspension of their operations for incompliance (Divine, 2009).

A new law regarding the so-called 'Kazakhstan content' or Local Content Policy has been in effect since January 2010. According to this law tender applicants are required to stipulate their proposed obligations to engage with defined percentages of goods, labor, and services originating in Kazakhstan that meet national and international standards. While definitions are given to terms such as 'Kazakhstan manufacturer,' 'of Kazakhstan origin,' and 'Kazakhstan content,' these are too general to resolve the issue of what truly constitutes local content. The aim of the new law is to achieve a 90% supply of local content goods, labor, and services by 2014.

Unfortunately the current local content indicators are very low given that the production level (and as the result the Kazakhstan shares of products and services procured by oil companies) is very limited in comparison to those that are imported. There was an overall decrease in the local content of commodities as of 2010, while there was a substantial increase for labor and services supplied in that same year. Local content commodities accounted for 33.5 billion tenge (9.7%), local content labor accounted for676 billion tenge, and services accounted for 775.4 billion tenge (97.7%), while the overall value of local content was 1.49 trillion tenge (69.7%). Statistics from the first six months of 2011 show that local content accounted for 3.66 trillion tenge, including 7.1% from commodities, 56.7% from labor, and 68.1% from services.

Table 4.10: Trends in Local Content of Oil and Gas Company Procurement in Kazakhstan, 2007–2010

	Commodities		Local Content in %	Services		Local Content in %
	Total production	Local Content		Total production	Local Content	
2010*	345.4	33.5	9.7	820.5	775.4	94.5
2009**	78.17	8.8	11.3	371.91	291.25	78.3
2008**	212.80	18.48	8.7	620.14	493.95	79.7
2007**	109.71	9.22	8.4	107.35	100.16	93.3

Source:* Melnik (2011), ** National Business(2010)
Note: Amounts in billions of tenge

The NADLoC targeted a level of at least 16% local content for commodities in its 2010–2014 strategy plan, although only 3% of oil industry equipment is supplied domestically (Melnik, 2011). NADLoC experts claim that the domestic processing industry has the capacity to provide competitive products for the national market. The food and energy sectors have high potential within the domestic market; however, other sectors are not competitive in both domestic and foreign markets.

Table 4.11: Production, Exports and Imports of Major Categories of Goods in Kazakhstan, 2009

	Production in USD millions	Exports in USD millions	Imports in USD millions	Share of local content on domesticmarket
Machinery	1 915.2	399.7	11 225.2	11.9
Metallurgy	10 249.4	7 216.1	5 783.7	34.4
Chemicals	575	2 218.4	2 307.5	19.9
Light goods	172.9	333.9	363.6	32.21
Food goods	5 366.7	797.7	1 714.5	72.7
Energy	35 431.5	30 027.2	2 834.8	65.6

Source: Based on MINT (2010)

Figure 4.11 presents the results of a SWOT analysis of the local content policy in Kazakhstan, based on responses by professionals in Kazakhstan's oil industry to a questionnaire regarding the industry's strengths, weaknesses, opportunities and threats. A number of barriers are encountered in implementing local content policies, including foreign oil companies' tendency to prefer global suppliers rather than local firms for cost-efficiency reasons (including the lack of suitable infrastructure that limits their ability to conduct business with local firms). Additionally many

local firms do not meet international quality, safety and environmental standards, while the divergence of national and international standards represents additional challenges, increasing costs and decreasing the competitiveness of local companies. Finally, the lack of experience and insufficient quantity of skilled workers and management staff increases labor costs due to workers' increased bargaining power (Domjan, 2004).

Figure 4.11: Results of a SWOT Analysis of Local Content Regulations in Kazakhstan's Oil Industry

Strengths	**Weaknesses**
• Legal framework that assures local participation without compromising standards; • Government role as facilitator and information database provider on local content; • Experience in local content policy application at the state level	• Lack of transparency; • Local content inconsistent with Profit Sharing Contracts; • Oil companies resistance to local content legislation; • The absence of a local engineering base that complies with international standards; • Insufficiency of norms to monitor and control local content development; • The unfriendly character of local content with regards to investment climate
Opportunities	**Threats**
• A transition period in the framework of preferential trade agreements with the WTO; • Further development of legislative framework; • Development of local content ideology; • Generating 'technological leaders' in the sector	• The exclusion of domestic goods from the Preferential Trade Agreement in the framework of the Customs Union and WTO; • The divergence of local standards from international standards which undermines competitiveness in global markets; • Discontinuity of government policy; • Technological advancement of leading countries in renewable energy products and resulting price decrease for particular commodities

Source: * Based on Omarova (2010)

Investments totaling $7.4 billion USD were devoted to local content efforts in 2010, accounting for 44% of all investments within the oil and gas sector. These efforts were conducted in oil

fields such as Tengiz, Kashagan and Karachaganak. The share of commodities procurement from local firms, however, was less than 6% (Melnik, 2011). Naturally international oil companies are unenthusiastic about local content regulations and often ignore such requirements. Thus, the relatively higher prices of imported commodities are associated with greater production costs, reducing the competitiveness of the oil production sector.

Investment in the hydrocarbon production sector accounts for 75% of the total mineral resources investment in Kazakhstan (Djaturayeva, 2010). Furthermore, the majority of commodity procurements are reported as oil production project investments to reduce the tax burden owed to the government by these companies. Indeed, subsurface resource user investments are notable because they are often in the form of sunk costs such as exploration costs or similar investments (Yerkebulanov and Sagynova, 2011). In addition, local firms are not transparent about the value-added process. Local firms apply to the government for contracts, obscuring the decision-making process of the oil companies, which restricts their ability to learn from unsuccessful bidding attempts (Domjan, 2004).

4.4.4 The Tax Regime in Kazakhstan

Based on a comparison of Russia and Kazakhstan, Weinthal and Luong (2001) explored the hypothesis that privatization or state ownership determines the composition of taxes and institutionalization. They found that privatization did not render the expected results in the development of taxation in Kazakhstan. Whereas Kazakhstan has fully privatized its energy sector, other CIS countries such as Azerbaijan, Turkmenistan, and Uzbekistan are examples of the opposite extreme, having opted for full state ownership. On the other hand Russia has taken a middle path by partly privatizing its energy sector. Domestic privatization of the energy sector has prevailed in Russia, in contrast to Kazakhstan where foreign ownership dominates the energy sector. The type of private ownership in these two countries has determined their divergence in the development of taxation and institutionalization (Luong and Weinthal, 2006). I investigated the hypothesis that majority foreign ownership in the energy sector (as in the case of Kazakhstan) is a main factor in the establishment of the tax regime and institutionalization.

Since the establishment of the first tax code of 1995 a newer version was enacted in 2002 that has since been amended in 2006 (Table 4.12). The 2002 tax code imposed new taxes on many

companies, whereas the 2006 amendment was intended to improve taxation for small businesses. Kazakhstan introduced a new tax code in 2009 that took measures to simplify tax procedures for small businesses and organizations. Additionally, the government launched a campaign to reduce tax arrears by cancelling non-paid penalties and fines accrued in 2010. Tax arrears of almost 14.5 billion tenge ($ 98 million USD) were annulled and tax payments totaling almost 3 billion tenge ($20 million USD) were deferred (Caspionet, 2011). Under the new tax code an electronic tax payment system was supposed to be introduced to eliminate tax collection problems and tax arrears. The government of Kazakhstan lowered the social tax in2008 and income taxes in 2009 to improve the business climate by reducing tax burdens (World Bank, 2010). Based on its stated objectives, however, the new tax code was intended to increase the tax burden on natural resource extraction (Markov and Bissengaliyeva, 2009):

- To ease tax burdens, except for natural resource sectors;
- To increase the cash inflow from natural resource sectors;
- To improve the system of tax privileges; and
- To advance the tax administration system.

Under the new tax code corporate income tax was gradually reduced between 2009 and 2011, with advance payments cancelled and tax loss carry-forward period increased from three to 10 years. The VAT regulations were also modified, gradually decreasing from 13% to 12%. VAT payments were abolished for exported goods, internationally shipped goods, and goods produced under subsurface resource use contracts. In contrast, personal income tax remained the same and a flat tax rate was applied for social taxes (Table 4.12).

In addition, since January 2009 mineral resource extraction sector enterprises also pay a Mineral Extraction Tax (MET), an Excess Profit Tax (EPT), signature bonuses, commercial discovery bonuses, and historic costs. Royalty payments were replaced by the MET and Production Sharing Contracts were discontinued (apart from pre-existing contracts as of January 2009). Under the new regulations tax provisions were also cancelled for subsurface resource use contracts originating after January 2009, while pre-existing contracts and PSAs are not subject to this regulation. Kazakhstan introduced an export duty for exported oil, light oil, and dark oil

products on August 15, 2010. The new export duty of $20 USD/MT was expected to lead to additional budget income of 60 billion tenge ($40,816,000 USD) by the end of the 2010.

Table 4.12: Comparison of Tax Regimes in Kazakhstan from 1991–2001 and 2001–2011

Specific Predictions	Actual Findings	
	1991–2001*	2001–2011**
Composition:		
Increasing reliance on PIT across sectors	Maintains progressive structure of PIT (5–30%); PIT accounts for large share of collected taxes and contribution to GDP, but essentially in energy sector	PIT 10% and remained stable over time
Increasing reliance on CPT across sectors	Fluctuating around 60–65: income tax accounts for 30%, social tax was 26%, pension fund was 10%,essentially applied to the energy sector (40% of the budget)	Accounted for 20% in 2009, 17.5% in 2010, and 15% from 2011 onwards; social tax rate is 11% (fluctuating around 13–5% for other years); pension fund payment is 10% of salary; property tax (legal entities)
Decreasing reliance on indirect taxes (VAT + Excise)	Increasing share in GDP since 1992, dominating the energy sector; VAT exemption has been abolished for foreign investors, rising dependence on energy excise taxes	VAT is 12%; under new tax code of 2009 subsurface resource users pay MET, EPT, signature bonuses, commercial discovery bonuses, and historic costs
Decreasing reliance on specific resource sector taxes	Compliance achieved by means of constant tax audit; taxes on excess wages are applied	Oil export duties introduced in August 2010; $143.54 USD/MT of light oil, $95.69 USD/MT of dark oil, and $40 USD/MT of crude oil
Tax regime designed to increase compliance	Compliance achieved by means of constant tax audit; taxes on excess wages are applied	Prudent tax audit; more volatile tax regime system targets the energy sector
Institutionalization:		
Compliance: establishing competent tax institutions to increase tax collection More sound tax regime establishment	Least possible reforms carried out; increasing tax collection rates on foreign investors Stable tax regime	In regard to business start-ups, tax documentation service improvement; abolishment of registration at local tax office; new tax code development programs with international institutions are considered Unstable Tax Regime.

Source: * Adapted from Weinthal and Luong (2001)**

The results of the descriptive analysis of Kazakhstan tax regimes (Table 4.12) suggest that foreign ownership in the oil sector is associated with the instability in the tax regime. New taxes

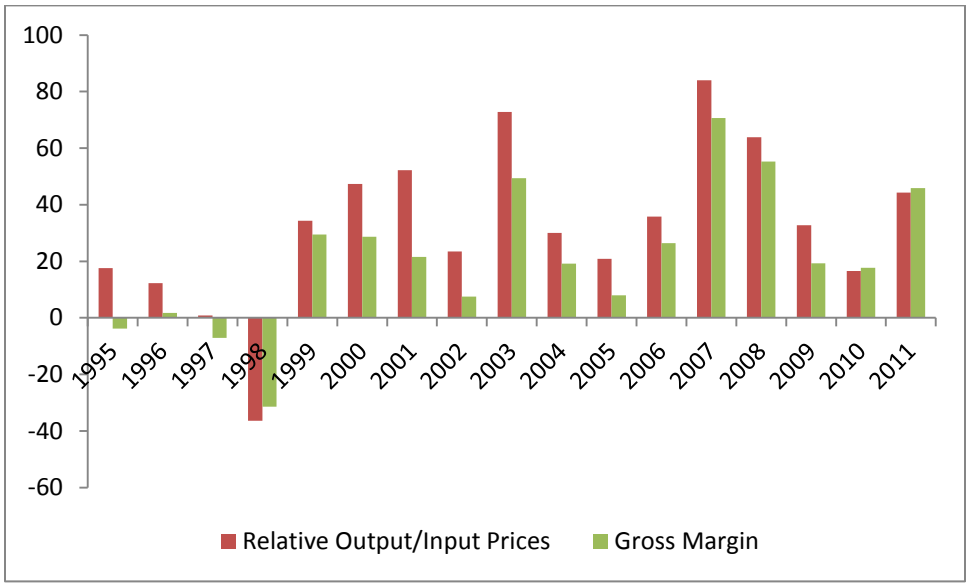
have recently been imposed that are largely concentrated on the extractive resource sectors. This may be due to the fact that foreign owners generally have lower political power relative to domestic owners. As a result of the predominance of foreign ownership the tax regime is less stable in Kazakhstan than other CIS countries.

4.5 Policy Failures and the Role of Institutions in Wheat and Energy Markets of Kazakhstan

4.5.1 Wheat Market Issues in Kazakhstan

The first decade of Kazakhstan's independence was characterized by negligence of the agricultural sector in favor of the energy sector (specifically oil production), which combined with subsidy cuts and price liberalization in the agricultural sector has reduced agricultural output by at least 20%. The situation of the agricultural sector only improved after 1998. First, the devaluation of the domestic currency improved the competitiveness of the sector. Second, the oil price increase and subsequent profits stimulated increased investment in the agricultural sector (Swinnen et al., 2009). The agricultural sector became more lucrative as investments facilitated vertical integration. Institutional arrangements and the government's active role via its holding companies under the auspices of the national holding company 'Samruk-Kazyna' stimulated the growth of vertically integrated holding companies. The difference between the output and input prices of wheat production contracted significantly from 1995 to 1998 (Figure 4.12). Consequently, the gross margins of wheat production declined dramatically over this period. Gross margins reached a minimum level of –31.4% in 1998. Even though gross margins did not decline significantly in other years over the 1995–1998 period it was also negative in 1995 and 1997. The only increase was in 1996 with a moderate positive gross margin. This was due to the fact that the policy enacted in the early years of independence made the input prices for agricultural products skyrocket, while output prices were kept constant by monopsonistic buyers or traders because the majority of the grain elevators and mills were sold to a small number of enterprises that control the wheat market (Pomfret, 2009). As a result agricultural enterprises and family farms have accrued huge losses that have led to an increase in barter based commercial transactions (de Broeck and Kostial, 1998). In this respect, agricultural enterprises and farms are 'squeezed' between upstream and downstream actors in the value chain.

Figure 4.12: Relative Output/Input Prices and Gross Margins of Wheat Producers in Kazakhstan, 1995–2011 (%)



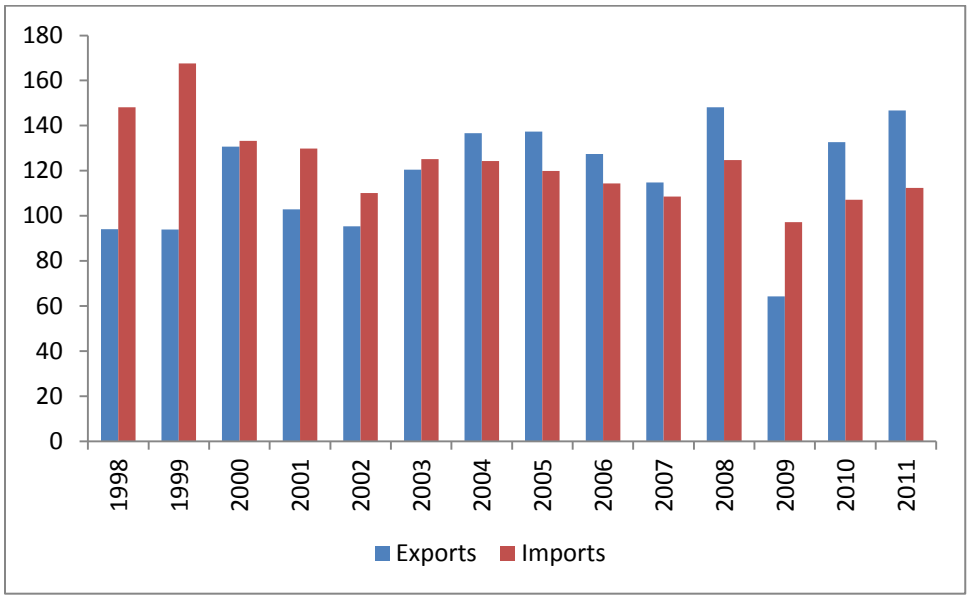
Source: Based on data from SARK (2013)

Countries with transitional economies following the break-up of centrally planned system are often faced with 'hold up' problems, especially in agricultural sectors. Such hold-up problems are associated with disruptions of the old exchange systems under planned economies. While the old supply chains were regulated and controlled by authorities, the transitional economy countries were in the stage of developing contract enforcement and rule of law mechanisms that together cause hold-up problems, which usually stem from non-delivery, non-payment, long delays, and discrepancies (Gow and Swinnen, 1998). Delayed payments in the agricultural sector coupled with hold-up problems caused cash flow problems and reduced the gross margins of wheat producers. Reputation can be an important factor in overcoming hold-up problems; however, this does not play a significant role in monopolistic markets. Therefore, an effective governmental role would be a key factor for third parties in enforcing contracts.

Kazakhstan is isolated from global markets by its landlocked location and poor infrastructure (roads, communication, etc.), and this isolation is the major obstacle to the development of the wheat market. Consequently, small-scale farmers (krestianskoe hoziastvo) are inadequately assisted by the grain traders who dominate the wheat market in Kazakhstan, often leading to

uncompetitive and incomplete markets, and to highly volatile market prices. Indeed, under these circumstances prices decrease sharply during productive harvest seasons and rise dramatically when supply abruptly decreases (e.g., during the drought in 2010). The oligopolistic nature of the market and traders (wheat traders that buy from small-scale farmers), the large supply of wheat that greatly exceeds domestic market needs, and high risks due to the seasonality and uncertainty of wheat production all lower the bargaining power of small-scale farmers, forcing them to accept very low prices for the wheat they produce.

Figure 4.13: Transport Costs of Wheat Exports Versus Imports in Kazakhstan



Source: Based on data from SARK (2013)

There is an asymmetry in the transportation costs of export and import goods. For instance, shipment costs range between $8,500 and $10,500 USD from Europe to Central Asian Republics, compared with $6,000 to $7,000 USD in the opposite direction. Furthermore, transportation costs comprise 20% of the total value of exports and imports (ADB, 2006) due to the fact that Central Asian countries largely export commodities and import manufactured goods. A transportation cost index estimated as the percentage increase from the previous year is presented in Figure 4.13. Indeed, transportation cost index values have been rising at an accelerating rate since 2002, surpassing transportation cost index values for imports since 2004.

The mean transportation price index value for exported goods was 26% from 2004 to 2011, while the transportation price index value for imported goods was 14%. High oil prices largely contributed to the increase in transportation costs (Mitchell, 2008).

Trade barriers have also had an adverse impact on transportation costs. Transportation costs increase with time consuming and unpredictable transportation systems have impeded trade with Europe and the Middle East in favor of CIS countries and East and South Asian countries. The share of wheat exports to CIS countries from Kazakhstan has recently increased (Table 4.13).

Table 4.13: Kazakhstan Wheat Export Destination Composition, 2007–2011

	2007	2008	2009	2010	2011
CIS Countries	63.99%	60.91%	63.15%	66.00%	74.73%
Other Countries	36.01%	39.09%	36.85%	34.00%	25.27%

Source: Based on data from the SARK database (2013)

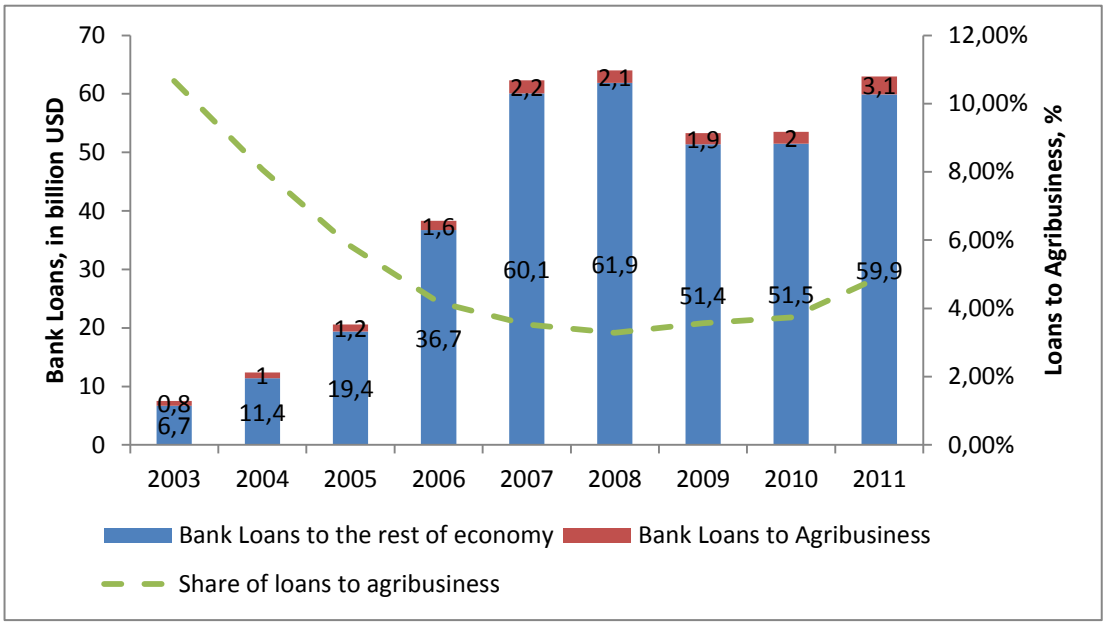
Trade barriers have caused rent-seeking activities often associated with high transaction costs, in turn creating obstacles for wheat production and investment. Transaction costs are high due to unofficial payments at borders as well as burdensome and non-transparent customs procedures (Kourmanova et al., 2008). Nevertheless, with active state intervention wheat producing CIS countries such as Kazakhstan, Russia and Ukraine have adopted trade restriction policies intended to promote sustainable development among agricultural producers.

4.5.2 Policy Challenges

After the worldwide crisis associated with disbelief in market mechanisms and growing state intervention erupted in 2007, especially in natural resource-abundant countries, most countries preferred to reorganize their economies rather than execute quality improving institutional reforms. Following the crisis and failure of the banking system in Kazakhstan the state holding company Samruk-Kazyna was established in October 2008. The major goals of this effort were to diversify the economy and avoid negative Dutch Disease impacts on economic growth. The policy efforts to improve the efficiency of energy (oil) resources were reflected in the agricultural sector. The Ministry of Agriculture had combined institutions under its auspices and

established a state holding company, KazAgro, in December 2006 and consolidating it with its several subsidiary companies to provide support for the agricultural sector. The budget of the Ministry of Agriculture increased to $927 million USD in 2008, 45% of which belonged to KazAgro (Pomfret, 2013). KazAgro not only monitors commodity prices, it also finances and supports the agricultural sector and is responsible for promoting technical change and improvement.

Figure 4.14: Annual Cumulative Bank Loan in Kazakhstan, 2003–2011 (in USD billions)

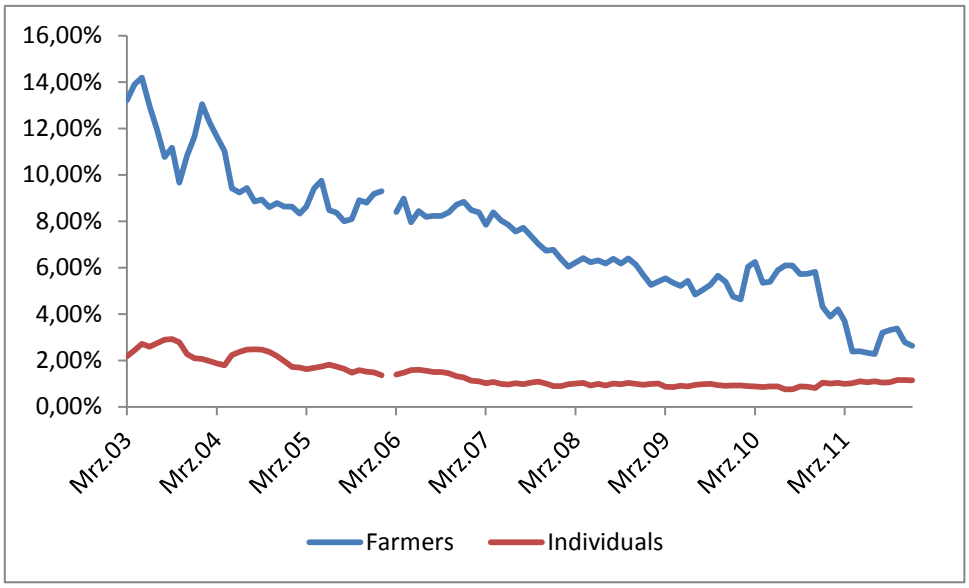


Source: Based on data from the National Bank of the Republic of Kazakhstan (2013)

Since 2009 the state has provided priority loans with low interest payments and enormous subsidies through KazAgro for the production of major agricultural products such as grain, fruits and vegetables, meat, milk, oil crops, poultry, sugar, and wool (Pomfret, 2013). However, the central focus of the support for the agricultural sector was to increase production, while ignoring the efficiency of production as well as socio-economic and environmental issues. KazAgro subsidies and financial support for the agricultural sector (60.5% of total loans were made to

agribusinesses)[61] meant to increase production have inadvertently introduced some inconsistency and inefficiency (OECD, 2013). For instance, some types of subsidies are incompatible with WTO requirements and thus cause obstacles as Kazakhstan seeks membership in the WTO. In addition and in contrast with earlier studies (OECD, 2013) commercial loans provided by the banking system did not decline in absolute terms from 2003 to 2011 even though this share in the total number of loans to the overall economy is relatively insignificant (Figure 4.14). Meyers and Kurbanova (2009) found that decreased demand and the shrinkage of access to financial support had significant impacts on agriculture.

*Figure 4.15: The Shares of Bank Loans for SME in the Agricultural Sector of Kazakhstan Over Time**



Source: NBRK

*The data for February 2006 is missing

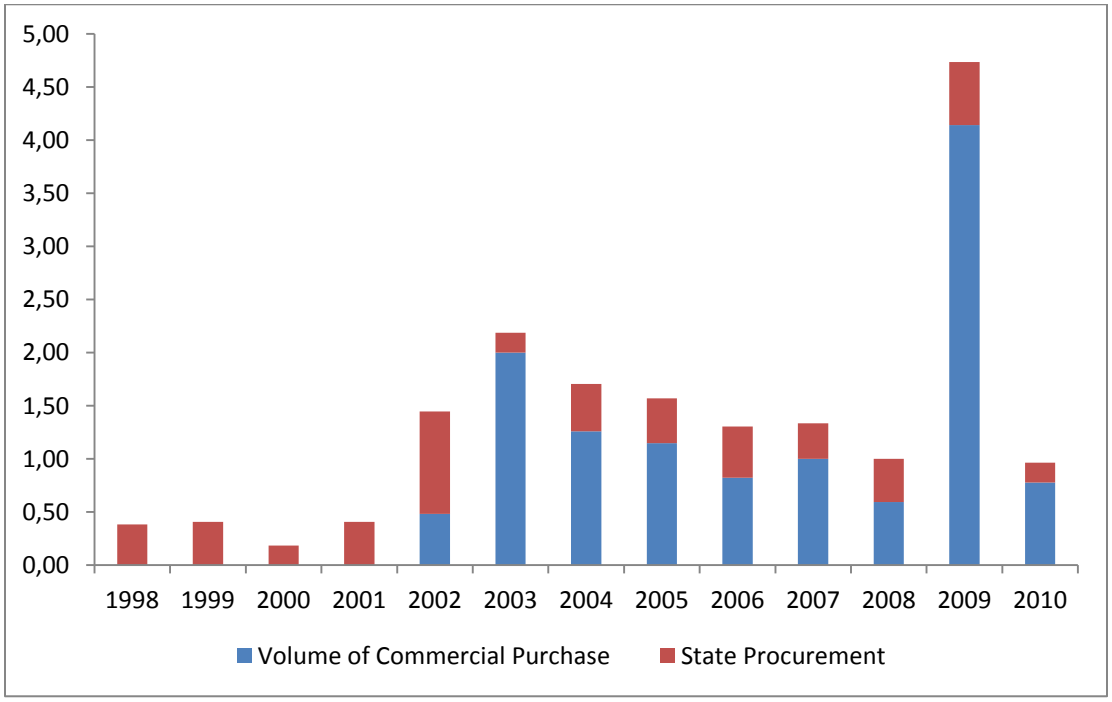
Loans increased more than eight times from 2003 to 2011 (Figure 4.14). Although bank loans to the agricultural sector have also increased, this rise is insignificant relative to the loans provided to the other sectors of economy. The agricultural sector faces high risk due to climate change, prompting the need to develop risk management and insurance policies. The role of KazAgro in

[61] According to the National Bank of the Republic of Kazakhstan database, loans to the agricultural sector accounted for 595 billion KZT of which 360 billion KZT and 235 billion KTZ were provided by KazAgro and second-tier commercial banks respectively in 2012.

financing the agricultural sector has increased during the years in question, which is why the share of loans to the agricultural sector has sharply declined (shown as dashed line in Figure 4.14).

Bank loans for small businesses or small farmers in the agricultural sector have significantly contracted since 2003. The share of loans for small enterprises with respect to loans for all sectors[62] over the period from March 2003 to December 2011 is displayed in Figure 4.15. The share of bank loans for SMEs in the agricultural sector declined from 13.21% in March 2003 to 2.64% in 2011, largely due to the fact that the agricultural sector is high-risk owing to volatile climate and price conditions. According to an OECD investigation (OECD, 2013), price fluctuation and weather conditions hinder financial support of the agricultural sector, particularly with respect to small and medium sized enterprises.

Figure 4.16: State Purchase of Wheat by the Food Contract Corporation in Kazakhstan, 1998–2010 (in millions of metric tons)



Source: Based on data from the SARK database (2013)

[62] Sectors of economy in Kazakhstan are divided as follows: industrial, agricultural, construction, transportation, communication, and trade.

KazAgro also plays a key role in financing the agricultural sector by means of various credit programs and concessional loans. For instance, credit, loans, direct market interventions, and subsidies accounted for 60% of the company's budget in 2008 (World Bank, 2010). The budget is divided between subsidiaries of KazAgro such as the Food Contract Corporation, KazAgroGarant, and KazAgroFinance. Thus, the efficient use of budget resources allocated to the agricultural sector through KazAgro subsidiaries is a crucial issue requiring special focus. Large agricultural producers are less dependent on financial support, given that they can access commercial loans from second-tier banks with less effort than SMEs because they are considered more reliable. Therefore, KazAgro investment and loans to SMEs could boost the efficiency of financial support for agriculture. Moreover, concentration on SME lending in the agricultural sector could enhance competition and the efficient and transparent allocation of financial resources (OECD, 2013).

The state is increasingly becoming a major actor in the wheat market, having made commercial wheat purchases since 2002. The FCC purchased almost 21% of the wheat in the market in 2009,[63] when wheat production reached record high levels since the break-up of the Soviet Union. Of the 21% of wheat purchased by the FCC, more than 18% was purchased for commercial purposes and 3% for state grain stocks. Thus, the colossal FCC purchase of wheat contributed to the relatively high profitability of wheat production in 2009. However, the situation was reversed in 2010 when wheat producers faced severe drought and fire in some regions of Russia and Kazakhstan. According to the new grain law that came into effect in 2010, agricultural producers owning more than 250 ha of arable land are obliged to sell 20% of harvest to FCC. The state purchases wheat at lower than market prices in order to minimize price fluctuations, which in turn reduces the profitability of wheat producers (Figure 4.16).

[63] According to the National Statistical Department of Kazakhstan, 22.7 million MT of wheat were produced in 2009. Out of that 22.7 million MT of wheat 4.7 million MT (approximately 4 million MT for commercial purposes and 600 thousand MT of wheat for stock reserves) of wheat were purchased by the FCC.

5 REGIONAL DIMENSIONS OF NATURAL RESOURCE ABUNDANCE AND ECONOMIC GROWTH WITHIN KAZAKHSTAN[64]

5.1 Introduction

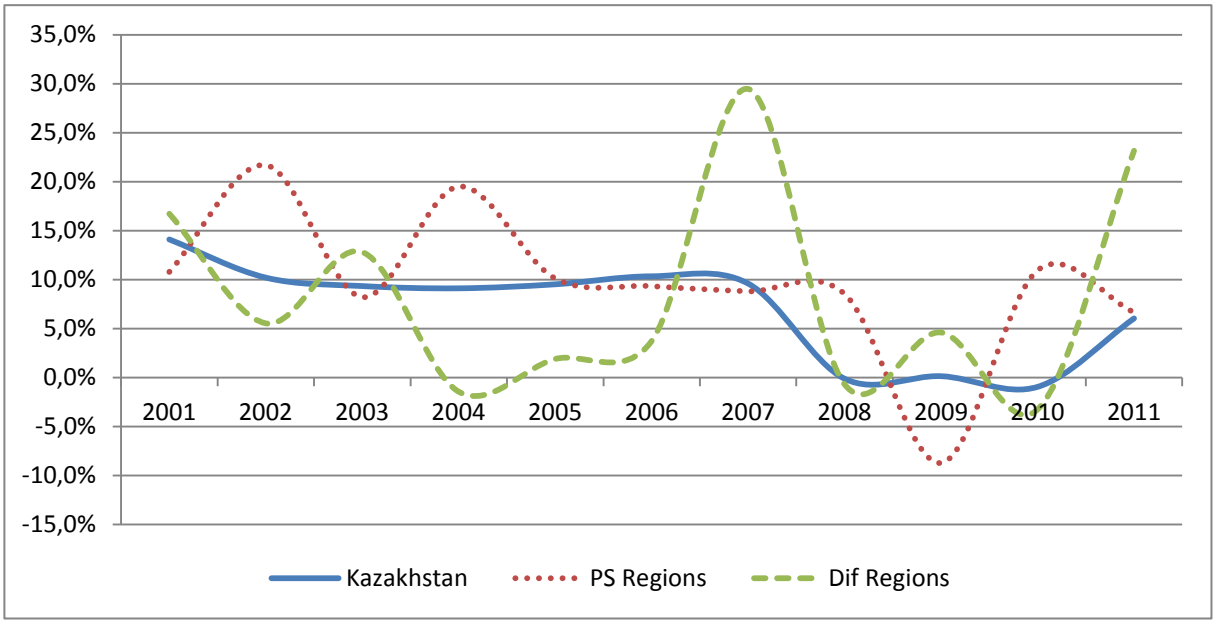
Kazakhstan is one of the most resource-abundant countries in the world. It has concentrated mineral resources, particularly abundant energy resources such as exportable oil, coal, and natural gas. In 1994 its fossil fuel production accounted for 23% of the GDP. Indeed, the energy sector comprises 42% of Kazakhstan's total output. A significant proportion of investment is spent on resource extraction: for instance, in 2009 investments into extractive resource production accounted for 33% of the total annual fixed capital investment, while the manufacturing sector accounted for only 8%. Only 2.3% of the labor force belonged to the extractive resource sector in 2011, whereas the labor force of the agricultural and manufacturing sectors accounted for 28% and 7% of the labor force respectively (SARK, 2013).

The average growth rates of point source resource abundant provinces (Aktobe, Atyrau, Mangystau, Kyzylorda and West Kazakhstan) and diffuse resource abundant provinces (North Kazakhstan, Kostanay and Akmola) versus general economic growth rates are presented in Figure 5.1. Point source resource abundant provinces are largely concentrated on oil exportation, while diffuse resource abundant provinces primarily focus on wheat production and exportation. Surprisingly, the growth of energy producing provinces did not significantly contribute to national economic growth over the 2002–2011 period. The downturn in economic performance is even more surprising considering that the oil resource abundant provinces experienced incredible growth in 2002, 2004 and 2010. In contrast, economic performance coincided more strongly with the average growth rates of diffuse resource abundant provinces. Furthermore, the diffuse resource abundant provinces have performed better than point source resource producing provinces on multiple occasions since 2007. Despite the rapid growth of energy producing provinces, the national economy's vulnerability to shocks can be observed. Kazakhstan's oil and gas industry has recently undergone significant changes through a modification process imposed by politics, however, the seemingly urgent nature of these policies might well lead to failure. For

[64] The chapter was published in Economic Systems Journal in Volume 37 (Issue 2, 2013): 254-270, in cooperation with Mesut Yilmaz and Kanat Abdulla and entitled as "Resource Concentration, Institutional Quality and the Natural Resource Curse."

instance, Ramsay (2011) argued that the recent commodity price booms and tremendous oil revenue increases have caused institutional decay, emphasizing the link between oil rents and political institutions.

Figure 5.1: Real GDP Per Capita Growth Rates in Kazakhstan, 2001–2011

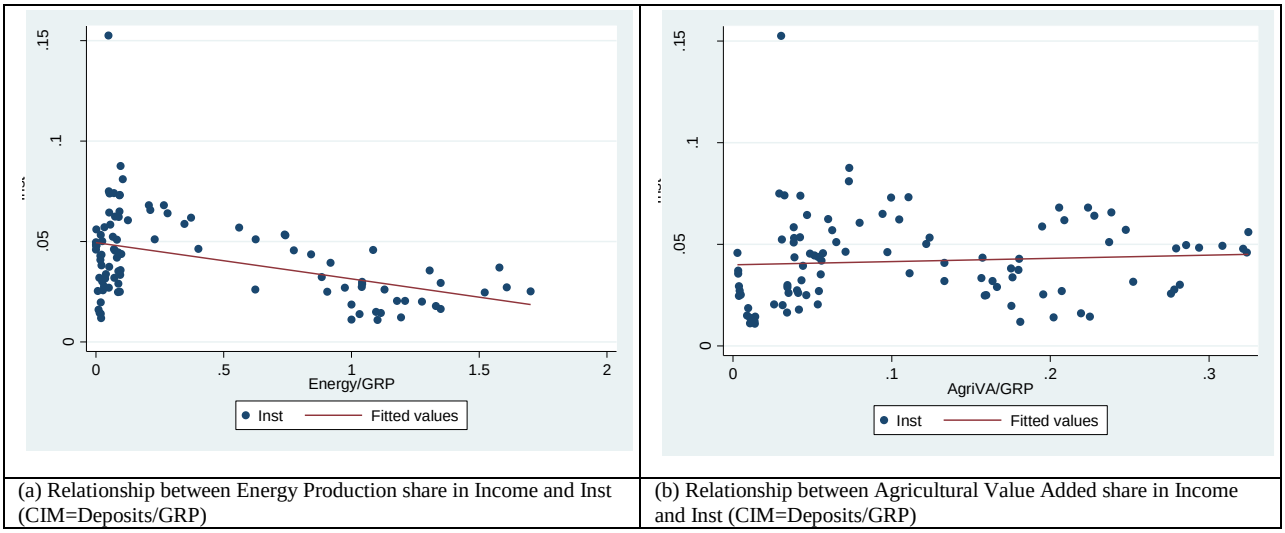


In order to examine the relationships between the divergence in growth with the two categories of resources and institutional quality I created a simple graphical presentation (Figure 5.2).[65] The relationships were examined based on data for 14 Kazakhstan provinces over the period from 2003 to 2009. Contract-Intensive Money (CIM) was used as an institutional quality variable as suggested by Clague et al. (1999). A clear negative relationship between the energy production share of income and institutional quality was observed (Figure 5.2, graph a). In contrast, the agricultural sector value-added share of income, *AgriVA*, had a positive relationship with institutional quality, even though the relationship was weaker than that of the energy sector production share if income presented in graph b of Figure 5.2.

[65] A detailed description and discussion of all data and variables, including the institutional quality variable, are provided in the following sections.

I used a regional database to assess the impacts of point-source resources and diffuse resources on economic growth via institutional quality. The results of the analysis presented in the previous section indicated that diffuse resources can undermine economic performance through institutional arrangements. Energy sector growth and policies to diversify the economy concentrating on other sectors, such as the agricultural sector, led to inefficiency in the wheat sector through institutional arrangements. Thus, the objective of the analysis presented here was to examine the impact of energy (point-source) and wheat production (diffuse) on economic growth via institutional quality.

Figure 5.2: Natural Resource Production and Institutional Quality, 2003–2009 (among Kazakhstan provinces)



(a) Relationship between Energy Production share in Income and Inst (CIM=Deposits/GRP)

(b) Relationship between Agricultural Value Added share in Income and Inst (CIM=Deposits/GRP)

5.2 Literature Review

Despite an abundance of existing research on many aspects of productivity, many researchers fail to recognize corruption and cultural values as key factors of productivity and economic development. First published in 1956, the basic Solow model "A Contribution to the Theory of Economic Growth" made several assumptions that are ambiguous in real life situations (Mankiw et al., 1992). However, other research such as Mankiw et al. (1992) suggests that human capital is a key factor for generating new goods and ideas that stimulate technological progress. Even though these studies recognize the essential influence of human factors on productivity they

disregard corruption and culture, or at least assume that there are many minor factors influencing productivity.

Studies of economic growth can be grouped into three main frameworks: geography, integration, and institutions (Rodrick et al., 2004). The recent works of Diamond (1997) and Sachs (2001) suggest that geography can have direct effects, as can institutions and integration, however, geography is the only exogenous factor among the three. The integration view initially suggested and developed by Frankel and Romer (1999) implies that markets play an important role in economic growth through international trade mechanisms. Finally, the institutional framework dates back to North (1990) and features property rights and the rule of law as crucial development factors for growth.

Diamond (2005) argued that environmental conditions alone would be insufficient to explain why some countries fail. In addition to environmental conditions, there are political economic factors that limit responses to environmental problems. Besley and Persson (2011) argued that the enforcement of contracts, property rights, and the rule of law are effective when economies have developed institutions that encourage common interests by providing for the public good. The lack of cohesive institutions expands various development clusters, which can result in poverty, violence, and weak governance. According to Reinert (2008) the government plays a key role in economic growth by enforcing protectionist measures. Infant industries and domestic business entities must be supported against competition from abroad such as tariff increases to prevent cheaper imports.

Several studies have emphasized the importance of institutional performance and quality as the most important transmission mechanisms of natural resource abundance. By employing instrumental variables for institutional performance, Knack and Keefer (1995), Hall and Jones (1999), and Acemoglu et al. (2002) all found that institutional quality is a crucial determinant of growth. These studies serve as reference point for my research. Hall and Jones (1999) claimed that "capital accumulation, productivity, and therefore output per worker are driven by institutions, government policies, which we call social infrastructure." They also explained that social infrastructure is an endogenous variable that could be specified by historical location and language determinants. Consequently, the authors concluded that the language, location and cultural values of a country are important determinants of its economic development. It is also

worth mentioning the studies conducted by Easterly and Levine (2003) and Rodrick et al. (2004) that found that geographic variables can influence economic growth via institutional quality and performance.

Political science (Isham, 2005) divides the mechanisms that impact institutional quality into three channels: "*rentier effects*," "*delayed modernization*," and "*entrenched quality*," with the first being the most important among this group. Coined by and Robinson (2008), "*rentier effects*" describes how the persistence of elites and thus economic institutions impact economic outcomes. Economic institutions persist, even under *de facto* political power changes, as a result of balancing investment by elites. Therefore, the authors concluded that the balance of power over economic and political institutions between two groups—elites and citizens—determines economic growth, with the balance depending on incentives. Therefore, the quality and performance of institutions are crucial for determining economic outcomes. In addition, Couttenier (2009) found a U-shaped relationship between the quantity of natural resources and institutional performance, suggesting that there is a threshold of natural resource abundance beyond which institutions perform poorly and are consequently detrimental to economic activity. There are plenty of examples of transition economies failing to exploit natural resources for economic growth as a result of the encouragement of rent-seeking activities and corruption, thus failing to establish positive macroeconomic policies (Dolinskaya, 2001).

Finally, resource misallocation could be avoided by extending fiscal tools and instruments (Acemoglu, 2007). The implication of direct fiscal tools and instruments for good governance reduces the need for indirect fiscal tools and inefficient resource allocation (Besley and Persson, 2010). However, Acemoglu (2010) argues that the increase of a government's fiscal capacity should necessarily be followed by improving institutions, otherwise increasing fiscal capacity causes a double-edged sword effect. On the one hand, fiscal strength implies better government control; however, control could also induce political tension and clashes among distinct interests within the country. The latter could outweigh any positive effects, creating a negative overall impact on economic growth. Therefore, the author suggests that dynamic models that simulate the relationships between government strength and political soundness are required in relevant research efforts.

After examining natural resource abundance in Botswana, Acemoglu et al. (2002) concluded that the country has successfully established effective institutions and achieved good governance. They found that Botswana's effective institutions, especially those dealing with private property, evolved from its pre-colonial institutions. Botswana has established solid leadership (restricting British authority) that was able to create incentives for institutional quality (Iimi, 2007). Norway is another example of a point-source resource abundant country that was successful in transforming it natural resource wealth into economic development and growth.

5.3 Estimation Methodology

There is a large body of models that consider government policy and institutional quality as transmission mechanisms through which natural resources impact economic growth (Kormendi and Meguire, 1985; Grier and Tullock, 1989; Barro, 1991). The seminal empirical model that includes the share of primary goods on GDP and recognizes that primary good exports can negatively affect growth was suggested by Sachs and Warner (1995). More recently, Papyrakis and Gerlagh (2004) and Shao and Qi (2009) have improved the model in the following way:

$$(1) \qquad \log(y_{i.t}) = \propto_0 + \propto_1 Inst_{i,t-1} + \propto_2 Z_{i,t-1} + \varepsilon_{i,t},$$

where $\log(y_{i,t-1})$ is the log of per capita income, $Inst_{i.t-1}$ represents institutional quality, and $Z_{i,t-1}$ is the vector of the lagged predictors[66] of economic performance such as the Sachs-Warner estimator of the terms of trade and the share of investments in GRP. The right hand side variables, $Inst_{i.t-1}$ and $Z_{i.t-1}$, represent the two major channels of the natural resource curse: institutional quality and the Dutch Disease impact variables. Several features of this structural model warrant mention. First, I considered the lagged right hand side variables in the equation, assuming that institutional improvement ($Inst_{i.t-1}$) and investment (included in $Z_{i,t-1}$) impacts on economic performance operate over the long term.[67] Evidently the resource abundance variable and institutional quality have possible feedback effect problems; therefore, the endogeneity of the variable should be addressed carefully. Furthermore, resource abundance determinants such as geography and culture variables (see Rodrick et al., 2004) have both direct and indirect impacts on output per worker. The determinants of social infrastructure are valid

[66] All predictors (independent variables) are lagged to control for potential endogeneity.
[67] The same idea applies to the Terms of Trade (*ToT*), as the price is considered to be sticky in the short term.

instruments for the model. Subsequently, the authors (Rodrick et al., 2004) employed a very powerful instrumental variable method in order to escape the endogeneity problem. Therefore, regression of the geographic variables such as precipitation and temperature successfully created the so-called new cleaned up social resource abundance, which does not suffer the causality problem discussed above. Besides, applying instrumental variables to the model provides an opportunity to avoid problems of measurement error. Thus, the authors found a simultaneous solution for two problems and powerfully detected the crucial influence of resource abundance or government policy on output per worker and consequently economic growth.

Alternatively, the specification for the instrumental variables technique suggested by Hall and Jones (1999) can be applied using panel data with the following equation:

$$(2) \qquad \widehat{Inst_{i,t}} = \beta_0 + \beta_1 Z_{i,t} + \beta_2 NR_{i.t} + \beta_3 NR_{i.t-1} + \beta_4 NR_{i,t}^2 + \beta_5 NR_{i,t-1}^2 + \omega_{i,t}$$

where, $Inst_{i,t}$ is expressed as a nonlinear function of natural resource abundance (the shares of energy production and agricultural production in GRP) using$NR_{i,t}$ and $NR_{i,t-1}$. The resource endowments square term, $NR_{i,t}^2$ and its lagged variable $NR_{i,t-1}^2$, are indicators of 'excess production' or overabundance and the novelty of this study. The main hypothesis is that energy production or more specifically excess energy production (squared term) is associated with depressed agricultural resource production through poor institutions. Therefore, a negative sign for $\beta_{4,5}$ representing energy resource abundance was expected, whereby the signs of the coefficients for resource production (β_2) and excess resource production (β_3) would depend on the composition of resources. A negative sign for energy resource production (point source resource) and a positive sign for commodities production (diffuse) were expected. The latter hypothesis has been documented in previous studies,[68] however, I also included squared terms in an attempt to observe the potential impact of excess resource production on economic growth via institutions. Lagged variables were included with the same idea discussed above for the variables in Equation (1), based upon the assumption that the potential impacts of resource endowments on institutional quality occur over the long term.

Although many studies have attempted to investigate the impact of institutional quality on economic development empirically, the majority have conducted cross-country or cross-sectional

[68] See Isham et al. (2005).

research. There are many drawbacks, however, in the empirical models undertaken through such cross-country analyses. Aside from issues stemming from the model specification and econometric procedure, several assumptions cast doubt on the validity of the results. The first assumption is based on the 'implicit homogeneity' of the countries in question. Furthermore, the quality and characteristics (nature) of the data from different countries is treated as the same, producing problematic outcomes.

5.4 Data and Descriptive Statistics

The regional zones (oblasts) of the Kazakh Soviet Republic were initially conceived by the Russian Federation according to their predominant economic activities. The oblasts were subsequently subdivided internally into sub-regions according to their administrative characteristics (Dvoskin, 1986). Kazakhstan can be divided into five regions according to economic and geographic features: central, east, west, north, and south. Economical, transportation, and administrative factors had crucial roles in shaping the boundaries of Kazakhstan's oblasts during the Soviet era. Most oblasts were established based on their participation in energy and agricultural production. In fact, the current administrative centers of all oblasts where the resource producing and refinery industries are located are the cities or centers that were established during the Soviet period. Some oblasts boundaries were determined due to their specific agriculture production or refinery activities. All administrative centers also function as railroad junctions.

The largest region is West Kazakhstan, which includes four oblasts—Aktobe, Atyrau, West Kazakhstan, and Mangistau (Table 5.1). Atyrau has the oldest oil and gas producing industries. Aktobe has 10% of the proven and 30% of the potential hydrocarbon resources in Kazakhstan. The North Kazakhstan region also includes four oblasts, Akmola, Pavlodar, North Kazakhstan and Kostanay, all of which have economies concentrated on the production of grain, agriculture machinery, and related equipment. The most densely populated region is South Kazakhstan, including the oblasts of Almaty, Kyzylorda, Zhambyl, and South Kazakhstan, which produce a wide variety of resources ranging from oil to agriculture products.

The oblasts can be grouped into the following regions based on production structure. The oil extracting oblasts (Aktobe, Atyrau, WestKazakhstan, Kyzylorda and Mangistau) account for

99.97% of the country's total oil production, with their individual oil extraction shares ranging between 12% and 30% of total oil production. The oil producing oblasts are located in the region of West Kazakhstan, while agricultural production oblasts are in the South Kazakhstan and North Kazakhstan regions.

Table 5.1: Internal Gross Regional Product Shares of Total GRP for Kazakhstan (percentages)

	2002	**2009**
Akmola	3.19	3.58
Aktobe	5.52	5.82
Almaty	2.45	2.26
Atyrau	17.79	17.95
WestKazakhstan	6.09	6.20
Zhambyl	1.74	1.80
Karagandy	5.68	5.64
Kostanay	4.10	4.05
Kyzylorda	3.50	4.62
Mangystau	12.31	11.87
SouthKazakhstan	2.41	1.90
Pavlodar	5.89	5.78
NorthKazakhstan	3.33	3.46
EastKazakhstan	4.09	3.34
Astana city	9.53	10.19
Almaty city	12.39	11.55

Source: Based on data from the Statistical Agency of Kazakhstan (2013)

Kazakhstan has achieved high rates of economic growth, largely due to a boom in its oil industry. Therefore it is unsurprising that the related oblasts, especially Atyrau and Mangystau, have increased their shares of gross regional product per capita in the country's overall GRP per capita (Table 5.2). Almaty and Astana administrative districts have also achieved high shares of GRP per capita as a result of the strong performance of the construction sector and administrative works.

Variability in GRP per capita among the different oblasts has risen due to the disparity of economic growth between oil production and the agricultural sector. Non-oil producing oblasts have also benefited from high oil revenues due to spillover effects occurring through different channels such as increased overall demand and government distribution and redistribution

activities. The latter might be achieved though investment, transfers, and provisions to economically lagging oblasts. Another potential channel is the movement of the labor force, primarily from poorer to richer regions (USAID, 2006).

Table 5.2: Internal GRP Per Capita Growth Rate of Kazakhstan, (percentages)

	2004	2005	2006	2007	2008	2009	S.d. across years
Akmola	6.54%	7.41%	10.93%	19.91%	4.82%	6.75%	0.06
Aktobe	8.83%	14.05%	9.31%	10.58%	8.34%	–1.01%	0.05
Almaty	5.40%	8.10%	9.48%	11.78%	5.54%	6.99%	0.02
Atyrau	10.52%	9.45%	11.24%	4.73%	12.98%	0.60%	0.05
WestKazakhstan	24.69%	4.50%	9.69%	7.67%	9.64%	–1.53%	0.09
Zhambyl	6.68%	8.09%	5.46%	12.45%	5.42%	7.84%	0.03
Karaganda	4.90%	12.43%	13.22%	8.79%	8.88%	2.66%	0.04
Kostanai	5.85%	7.42%	7.49%	15.86%	7.61%	3.09%	0.04
Kyzylorda	12.27%	12.18%	16.98%	12.57%	10.92%	–4.67%	0.07
Mangistau	11.78%	15.23%	11.53%	7.96%	11.20%	–1.53%	0.06
SouthKazakhstan	–0.12%	4.85%	5.61%	13.43%	4.29%	11.79%	0.05
Pavlodar	9.38%	5.56%	8.01%	9.69%	13.48%	2.51%	0.04
NorthKazakhstan	3.68%	8.72%	10.49%	12.95%	7.70%	7.11%	0.03
EastKazakhstan	6.66%	7.57%	12.59%	10.46%	2.56%	4.62%	0.04
Kazakhstan (entire country)	**11.22%**	**10.74%**	**11.58%**	**7.86%**	**7.84%**	**1.93%**	0.07
S.D. across regions	0.06	0.04	0.03	0.04	0.04	0.04	

Source: Based on data from the Statistical Agency of Kazakhstan (2013)

Considering the average GRP per capita growth rates during the 2001–2009 period, the Kyzylorda and Mangistau oblasts (the main oil-producing oblasts) lead with respective average annual growth of 10.04% and 9.36%. Conversely, oblasts in East Kazakhstan that are largely concentrated on wheat production recorded the lowest average growth rates of real GRP per capita at 7.41%. The standard deviations of the real GRP values are presented for all regions in the final row of Table 5.2. Growth disparities among regions demonstrated a downward sloping pattern during the 2004–2006 period as standard deviation in the growth rates per capita declined from 0.06 to 0.03, although there was a slight increase during the crisis of 2007–2009. There was a remarkably high standard deviation of growth rates per capita for all regions in 2004 due to the difference between the West Kazakhstan region (oil-extracting region) which achieved a real GRP growth rate of 24.69% and the slowest developing regions (South Kazakhstan and North Kazakhstan) that are heavily involved in the agricultural sector. Institutions have not been able to

mitigate these regional disparities in economic performance (USAID, 2006). Thus, the oil boom has exacerbated the regional disparities in growth rates per capita.

Panel data for the 14 oblasts of Kazakhstan covering the period between 2003 and 2009[69] were obtained from the statistical database of the Statistical Agency of Republic of Kazakhstan or 'SARK' (2013). The descriptive statistics of all variables are presented in Table 5.3.A in the Appendix. The mean and maximum log values of GRP per capita, *Log(y)*, were 4.80 and 8.20 respectively, representing balanced growth rates across regions. The highest log values of GRP per capita, *Log(y)*, were for the oil- producing oblasts of Atyrau and Mangystau in 2008, one year after the crisis of 2007. In contrast to the agricultural sector production share of income, *AgriVA*, there was a high standard deviation for the energy production share of income, *EnergyProd*, indicating volatility in the energy sector. The standard deviation of *EnergyProd* was close to that of the log of GRP per capita, *Log(y)*, yet it was more severe in case of *EnergyProd*, with the highest value of 1.70 in Mangystau in 2005 and the lowest value of 0 in the oblast of North Kazakhstan in 2003. The highest agricultural sector production share of income, *AgriVA*, was 0.56 in the oblast of North Kazakhstan in 2004, while the lowest value of 0.004 was for Mangistau in 2009, reflecting the exact opposite trend of the energy production shares of income.

Although growth was observed for all regions it was uneven across the regions mentioned. The *EnergyProd* variable had values higher than one in most of the oblasts of the West Kazakhstan region and the Kyzylorda oblast (situated in the southwest of Kazakhstan), all of which are oil producing oblasts. The institutional quality variable, *Inst*, was more balanced than the resource abundance variable, with a highest value of 1.10 (Kyzylorda in 2003) and lowest value of 0.21 (Almaty in 2008).

Several criticisms can be made of the natural resource measures used in academic research:

1. There is no differentiation among the types of natural resources used (Sachs and Warner, 1995; Isham et al., 2005);
2. There may be selection bias problems regarding the data (Fearon, 2005);
3. Important natural resources may be excluded (Fearon, 2005); and

[69] Two administrative center cities, Astana and Almaty (formerly the capital city of Kazakhstan), were not included in the dataset.

4. There are endogeneity problems (Rodrick et al., 2004; Brunnschweiler, 2008).

Nicolas Sarkozy suggested a new way of estimating national wealth, at the same time heavily criticizing "GDP fetishism," referring to a welfare measure that has served well since World War II (Schwartz, 2010). This suggestion was initially proposed by Nobel Prize Winners Joseph Stieglitz and Amartya Sen, as well as by Fitoussi (2009). Their argument is that GDP ignores key economic indicators such as unemployment rates and food demand, which are also important indicators of well-being. Furthermore, an appropriate index of a country's well-being should reflect education, health, material living standard, personal and social activity, environmental, and security considerations. As an alternative to estimating national wealth, there is a consensus among economists that a genuine savings indicator might be more appropriate than GDP (van den Bergh, 2009). The 'genuine savings' are defined as the savings rate within the national accounting framework, including resource depletion and degradation. Indeed, this indicator better reflects national wealth (especially for resource-rich countries), given that it takes into account capital investment, resource depletion, and pollution, thus representing an improved wealth estimation option (Fereira and Vincent, 2005). This has been highlighted by Dosmagambet (2010), who found evidence of negative genuine savings despite growth in gross and net savings over the 1993–2006 period, which can be explained by energy and mineral resource depletion.

The key estimator of national wealth used in this research is Gross Regional Product (GRP), which is similar to GDP. The estimator used for regional national accounts, however, does not include some items included in the GDP estimator, such as value added by the defense sector. Therefore, GRP usually differs from GDP, including in its figures produced (USAID, 2006).

There are many studies that suggest that corruption has a negative impact on FDI inflow and thus economic growth (Mauro, 1995). The implied effect stems from the fact that institutional quality could establish a favorable climate for FDI inflow such as government efficiency, the security of property rights, rule of law, and the efficiency of judicial law (Globerman and Shapiro, 2002; Benassy-Quere, 2007). Recent empirical studies (i.e., Aidt, 2009) also suggest that the negative impacts of corruption on sustainable development depend on institutional environments.

Given that the objective of this investigation was to evaluate the impact of natural resource abundance through institutional quality, the ratio of registered economic crimes to population (per thousand people) was used as a proxy for institutional performance. A number of studies have investigated the causes and solutions to the natural resource curse in Kazakhstan. Initial studies (Weinthal and Luong, 2001) associated the resource curse with tax volatility, claiming that it was the result of the dominance of foreign over domestic investment, spurring higher taxes. Tsalik and Ebel (2003) later emphasized the importance of good governance in determining the quality of institutions. Furthermore, Kaiser and Pulsipher (2007) concluded that the main obstacles to good governance in Kazakhstan are bureaucracy, unstable legislation on energy resources, and corruption; reflecting business uncertainty and high levels of risk.

Clague et al. (1999) suggested the use of contract-intensive money as a proxy measure for institutional quality.[70] Following their approach, I estimated the approximate variable for institutional quality as follows: *Inst*=(M2-M0)/GRP.[71] The numerator is simply the difference between M2 money supply and M0 currency in circulation outside of the banking system, or the quantity of deposits in second-tier financial institutions. Proxies that are widely used in economic literature as indices of institutional quality include; the Worldwide Governance Index (Kaufmann et al., 2010), ICRG, BERI, and BI, however, they are not available for Kazakhstan at the regional level. Moreover, there are other disadvantages of using these indices, such as the risk of obtaining an incorrect measure of institutional quality based on incorrect information provided by reporters who are misled by other characteristics of the economic situation.[72] Indeed, one of the criteria for choosing the measure is that it should also represent the quality of governance of both local and higher-level institutions.

The index suggested in this study was examined carefully in terms of its reliability as a proxy indicator for institutions and governance. To this end, the correlations between this indicator of institutional quality and WGI were tested. Table 5.4 presents the correlation values of the

[70] Although the results are not shown here, I also used the number of registered economic crimes as a proxy for institutional quality (see Oskenbayev et al., 2013). Initially, the idea was to employ crime rates, which have identical results as a CIM indicator of institutional quality and reassures us of the validity of instruments used as a proxy for institutional quality.

[71] Clague et al. (1999) defined CIM in their original work as follows: CIM = (M2-M0)/M2, where M2 is the money supply, including deposits and currency in circulation, while M0 is currency in circulation. The data for deposits in second-tier banks was available while the data for currency in circulation was missing for the different provinces of Kazakhstan. Thus, GRP was used as a denominator of the estimate.

[72] See Clague et al. (1999) for a detailed discussion.

average[73] institutional quality estimate, *Inst*, across regions of Kazakhstan and the Worldwide Governance Indicators suggested by Kaufmann et al. (2010) from 2003 to 2009. The data was obtained from the World Bank database, Worldwide Governance Index (WGI), which is an aggregate index compiled by many individuals. This measure of institutional quality was highly correlated with two World Governance Indicators (Government Effectiveness [GE] and Political Stability and the Absence of Violence [PA]). The higher the World Governance Indicators value, the better the institutional quality. The same is also true for the measure used to represent institutional quality, *Inst*, indicating that it represents an adequate measure of institutional quality.

Table 5.3: Correlation Matrix for the Institutional Quality Variable 'Inst' (median value of 14 provinces) and the Worldwide Governance Indicators (Kaufmann et al., 2010), 2003–2009

	Inst	VA	PS	GE	RQ	RL	CC
Inst	1.00						
VA	0.23	1.00					
PA	0.77**	–0.12	1.00				
GE	0.74*	–0.46	0.73*	1.00			
RQ	0.33	–0.54	0.58	0.73*	1.00		
RL	0.57	–0.46	0.76**	0.86**	0.85**	1.00	
CC	0.58	–0.18	0.70*	0.67*	0.71*	0.51	1.00

Note: 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; *** denotes significance at the 1% level; ** at the 5% level; * at the 10% level
Source: Worldwide Governance Indicators (WGI) data available at www.govindicators.org

Another proxy variable used in this investigation was the terms of trade, *ToT*, estimated as the ratio of the unit labor costs of the non-traded goods sector to that of the traded goods sector following Oomes and Kalcheva (2007). In turn, the unit labor cost (in both the non-traded and traded goods sector) was determined as the correspondence of wages in different sectors to their respective productivity of labor, W/(Y/L), where W represents wages, and Y/L is the ratio of output to labor (Hasanov, 2011a). High inflation and thus exchange rate overvaluation was particularly high during the 2003–2006 period due to rapid inflows of foreign investment,

[73] Median estimates for the 14 provinces of Kazakhstan.

particularly because of the construction industry boom. Conversely, real exchange rate overvaluation in 2007–2009 was due to high oil prices (Bilyasheva and Bineau, 2011).

Regarding the measurement of resource abundance, which has been a keenly debated issue in the literature of economic development and growth, the natural resource curse phenomenon is sensitive to resource abundance measurements. The share of primary goods exports, either in income or as a portion of total exports, is commonly employed in literature (Bond and Malik, 2009). Evidently, primary goods export is a proxy variable used for resource abundance measurement, although it does not directly represent the resource richness of a country. A more accurate measurement has recently been suggested by the World Bank (2005) based on the net present value of wealth divided into three components: produced assets, human resources and natural capital. However, this method heightens the identification problem in empirical studies (e.g., Brunnschweiler, 2008). Another method used in the literature that has received broad attention suggests two ways of estimating resource abundance based on the income share of the particular resource (Bond and Malik, 2009). Given that investigation of resource abundance measurement based on the latter method relies on the majority of natural resources being consumed domestically, export shares might not offer an accurate estimate. I used resource production data of energy and agriculture sector shares in GRP for this research. Economists are concerned with two major problems in employing this type of estimate, the data quality and the possibility of an endogeneity issue (Brunnschweiler, 2008). The endogeneity problem was addressed using a two-stage least squares panel data model that is discussed in further detail in the following section.

5.5 Empirical Investigation Results of Resource Abundance Impacts on Economic Performance in Kazakhstan

Following the discussion above concerning the institutional quality endogeneity problem, an IV/GMM fixed effects dynamic panel data model was used to combine fixed effect panel estimates with instrumental variables. Natural resource endowments were used as instrumental variables for the regression analysis, while institutional quality (Contract-Intensive Money), *Inst*, was instrumented. The results of the instrument validity and exogeneity tests are presented in Table 5.5 and Table 5.6. The fact that the geopolitical boundaries of the different provinces of

Kazakhstan were established according to economic factors implies that economic performance could affect resource abundance among the regions. Consequently a feedback effect problem arose, which usually can be dealt using an FE 2SLS model. Although the FE 2SLS method addresses unobserved individual heterogeneity, it relies on the assumptions that there is no autocorrelation and an absence of heteroscedasticity in the equation. However, when such problems occurs the efficiency of the estimates is called into question. Therefore the dynamic panel data IV/GMM method was applied to generate robust standard errors to address the arbitrary heteroscedasticity and autocorrelation problems. In the case of a short time span, fixed effects estimates are often inconsistent (Nickell, 1981) and IV and GMM (Arellano and Bond, 1991) methods are both regularly employed. A IV plus 2-way FE procedure was applied (based on Driscoll and Kraay, 1998) and the results are presented in Table 5.5 and Table 5.6.[74] This method makes corrections to standard errors to address heteroscedasticity, serial correlation, and cross-sectional dependence problems. I used a two-step GMM model instead of the System-GMM, which is asymptotically efficient. The results of the tests of the validity of the instruments utilized for institutional quality are presented in Table 5.5. As indicated by the results of the Hansen J-statistic overidentification tests, orthogonality cannot be rejected in almost all of the cases.[75] Thus, orthogonality test results imply that the instruments are valid, with exogeneity being confidently rejected. The Kleibergen-Paap Wald F, K-P LM statistics indicate that the null hypothesis should be rejected for all cases. Therefore, the IV/GMM panel data dynamic method was specified as being reliable in the specifications (2)–(4).

The relationships between public investment, private investment, and economic performance have been an important issue in study of economic growth (Evans, 1985; Aschauer, 1989). Thus, there is a general belief that these two types of investment can have divergent effects on economic performance. For instance, public investment in human capital formation and infrastructure can boost private investment. On the other hand, if public investments are raised by means of borrowing and subsequently increasing interest rates they 'crowds out' private investment (Khan and Kumar, 1997; Ghali, 1998; Ramirez, 2002). Thus, it is important for policymakers in developing countries to define the difference between public and private

[74] I used the *xtivreg2* command in Stata, which yields robust standard errors (Schaffer, 2007).
[75] It was only rejected when resource abundance variables were included in the model with one lag (Column 1, Tables 5.5 and 5.6), verifying that the specification with two lags are crucial, as expected.

investments. I found that the investment share of income was not a significant determinant of economic growth. Indeed, this has also been observed in earlier studies with model specifications that include regional variables (e.g., Gylfason, 2001). However, in this study I used a relatively small sample and a short time span. In this respect, the question remains open for further investigation.

Table 5.4: Dynamic Panel Data IV/GMM Regression

	Dependent Variable: $Log(y)_t$			
Variables	(1)	(2)	(3)	(4)
$Inst_{t-1}$	63.48***	84.80***	57.27***	18.11***
	(21.64)	(18.78)	(10.35)	(6.37)
$Investment_{t-1}$	–0.205	–0.064	–0.507	0.211
	(0.746)	(1.106)	(0.607)	(0.288)
ToT_{t-1}	0.027	–0.007	–0.026**	–0.029***
	(0.025)	(0.014)	(0.010)	(0.01)
$Log(y)_{t-1}$				4.34***
				(0.447)
Observations	84	70	70	70
F-stat. (p)	2.80 (0.04)	19.73 (0.00)	19.73 (0.00)	45.74 (0.00)
Number of id	14	14	14	14
Underid. Tests: H_0 =Eq. is underidentified				
K-P LM statistic[a]	13.37 (0.00)	14.798 (0.01)	16.02 (0.04)	14.82 (0.06)
K-P Wald F statistic[a]	12.35 (0.002)	17.37 (0.002)	49.57 (0.00)	27.72 (0.00)
Overid. Tests: H_0 =Overid. Restrictions are valid				
Hansen J statistic[a]	16.51 (0.00)	5.01 (0.17)	11.70 (0.11)	9.02 (0.25)

Note: Robust standard errors in parentheses; (a)Chi-sq. and F-stat. p-values in parentheses were obtained using the *xtivreg2* command in Stata; *** p<0.01, ** p<0.05, * p<0.1

The estimation results for Equation (1) demonstrate the effect of the natural resource curse on economic growth through two channels: the Dutch Disease and institutions (Table 5.5). The different variables and lags used as instruments specified in Table 5.6 distinguished between the different specifications shown in columns (1)–(4) in Table 5.5. For instance, only the first and second lags of natural resources were employed in first two specifications as shown in (1) and (2) of Table 5.6, while squared terms were included in specifications (3) and (4). The final specification differed in that it included the lagged variable of economic growth. The results are described in Table 5.5. First, the results provide evidence of a fact that many scientists have established either theoretically or empirically; that institutional quality is an important determinant of growth. Second, the results refute the hypothesis that economic growth is

determined solely by institutional quality and performance. Evidence of the Dutch Disease impact is revealed by the results presented in columns (3) and (4), accompanying institutional quality as another major channel of the natural resource curse effect. Thus, institutional quality alone is not a strong predictor of growth.

The Dutch Disease effect variable reflecting the lagged variable of the relative per unit labor costs of non-tradable goods sectors to that of tradable goods sectors, ToT_{t-1}, indicates a significant negative impact on economic growth.[76] Primary resource concentration and increased returns trigger a spending effect. An increase in the relative price of non-tradable goods to tradable goods occurs as a result of a spending boom, because the prices of non-tradable goods are influenced by increased spending, unlike the prices of tradable goods. Subsequently real wages soar, followed by relative price increases, raising overall domestic prices and thus deteriorating competitiveness, particularly of the manufacturing sector.

An oil price increase and oil sector boom in oil resource-rich countries is likely to be accompanied by a decrease in the risk premium of foreign funds to the country. This is followed by an improvement in the terms of trade, causing the Dutch Disease problem (Kuralbayeva and Vines, 2008). Indeed, in relying on their share of current and future oil revenues, the private sector bases its consumption decisions accordingly. Thus, domestic spending increases significantly as a result of private sector consumption behavior (Ploeg and Venables, 2011). Indeed, this is evident in the case of Kazakhstan, with the recent oil price increase having fuelled the spending behavior of the private sector, jeopardizing sustained economic growth and institutional prudence.[77] This relationship could be explained according to the Balassa-Samuelson effect, implying that a productivity increase in the energy sector (especially oil production) leads to relative price increases in non-tradable goods sectors. Thus, the real exchange rate increase following relative price increases reduces the competitiveness of non-tradable goods sectors.[78]

[76] The significance is evident when the abundant resources production share of income (i.e., squared terms of resources production), variables were included in the model.

[77] See Esanov and Kuralbayeva (2010), a case study of the Natural Resource Curse and its potential channels in Kazakhstan. The negative impact of *ToT* on institutional quality was documented in the first stage regression results (see below).

[78] See Kuralbayeva et al. (2001) and Algozhina (2006) on the Dutch Disease impact in Kazakhstan.

The results of the first stage regression disclosed in Table 5.6 are similar to the findings of previous studies.[79] Indeed, this confirms the suggestion made by other scientists that not all natural resources deteriorate institutional quality, but rather specific ones, particularly point-source natural resources.[80] For instance, one standard deviation in the energy production value-added share of income would lead to a 0.078 (7.8%) decrease in institutional quality.[81] However, the lagged variable of the energy production share of income and its squared term *EnergyProd_SQ*, are weakly significant predictors of growth through institutional quality (Table 5.6). The energy production share of income negatively influences economic performance through propagating 'bad' or inefficient institutions. Mehlum et al. (2006) argued that resource concentration only undermines growth through its impacts on institutional quality. Heavy concentration in energy production favors 'grabber friendly' institutions and worsens economic performance, while resource reliance associated with 'producer friendly' institutions favors economic growth. Thus, primary commodity production concentration also influences economic growth through institutions.

In contrast with the findings of other studies, the agricultural value-added share of income did not have a positive impact. The marginal effect of the agricultural value-added share of income on institutional quality was estimated using specification (4) in Table 5.6, indicating that a negative impact overwhelms the positive impact of overabundant resource production.[82] For instance, a one standard deviation (0.15) increase in agricultural value added leads to a 0.0227 (2.27%) decrease in institutional quality. Initially it seems that this negative impact contradicts the findings observed in previous studies, because diffuse resources are supposed to have positive impacts on institutional quality. However, taking into account that the agricultural sectors in CIS countries, including Kazakhstan, are mainly controlled by state or large-scale agricultural producers it can be considered as a point-source resource sector. Accordingly, this is

[79] The Angrist-Pischke tests such as first-stage Chi^2 and F-test for underidentification and weak identification test results show that the endogenous variable is identified.

[80] See Auty (1997), Woolcock et al. (2001), and Isham et al. (2005).

[81] Only the squared term was considered because the energy production value-added term is insignificant. Therefore, the marginal effect was estimated as follows: $\hat{\beta}_8 * (stdev(EnergyProd\_SQ)/stdev(Inst))$= -0.0245*(0.7/0.22) = –0.078.

[82] The marginal effect was estimated as follows: $\Delta Inst = \left(\widehat{\beta_6} + 2 * \widehat{\beta_{10}} * \overline{AgriVA}\right) * st.dev.AgriVA$, where $Inst$ is the level of institutions, $AgriVA$ is the agricultural value-added share of income, and $st.dev.AgriVA$ is the standard deviation of agricultural value added share in income. Thus the marginal effect estimation gives the following result:$\Delta Inst =$ (–0.264+2*0.313*0.18)*0.15=–0.0227, where the mean of agricultural value added is 0.18, its standard deviation is 0.15.

why it has a negative impact rather than positive one, as has been found in earlier empirical investigations.[83]

Table 5.5: First Stage Estimates of the IV/GMM Regression

First Stage equation for IV estimation of IV/GMM regression (Coefficients and robust standard errors in parenthesis)				
Dependent Variable: $Inst_{t-1}$				
Variables	(1)	(2)	(3)	(4)
$Investment_{t-1}$	0.004	–0.006	–0.011	–0.0073
	(0.012)	(0.018)	(0.021)	(0.015)
ToT_{t-1}	–0.0005**	–0.0001	–0.00003	–0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0005)
$EnergyProd_{t-1}$	–0.0235***	–0.017**	–0.064	–0.0596
	(0.007)	(0.008)	(0.0502)	(0.054)
$EnergyProd_{t-2}$		–0.0002	0.032	0.031
		(0.005)	(0.027)	(0.0304)
$AgriProd_{t-1}$	–0.0344**	–0.006	0.020	0.0294
	(0.013)	(0.022)	(0.095)	(0.102)
$AgriProd_{t-2}$		–0.065**	–0.292**	–0.264**
		(0.031)	(0.140)	(0.115)
$EnergyProd\_SQ_{t-1}$			0.0226	0.0235
			(0.021)	(0.0232)
$EnergyProd\_SQ_{t-2}$			–0.0231*	–0.0245*
			(0.012)	(0.012)
$AgriProd\_SQ_{t-1}$			–0.037	–0.044
			(0.110)	(0.115)
$AgriProd\_SQ_{t-2}$			0.331**	0.313**
			(0.163)	(0.1426)
Log of GRP $_{t-1}$				0.0201
				(0.0512)
Angrist-Pischke test (H_0=unidentified)				
UnderidentificationTest[a]	Chi-sq (*p*-val.)	Chi-sq (*p*-val.)	Chi-sq (*p*-val.)	Chi-sq (*p*-val.)
	12.35(0.002)	17.37(0.002)	49.57(0.000)	27.72(0.000)
Weak Identification Test[a]	F-test (*p*-val.)	F-test (*p*-val.)	F-test (*p*-val.)	F-test (*p*-val.)
	5.82 (0.005)	3.88 (0.01)	5.09 (0.000)	2.78 (0.014)

Notes: Robust standard errors in parentheses; (a)Chi^2 and F-stat. p-values in parentheses obtained using the *xtivreg2* command in Stata; *** p<0.01** p<0.05, * p<0.1

More specifically, the abundance of point-source resources and their appropriateness (easiness) to extract, particularly energy resources and wheat production in Kazakhstan, attract different groups that manipulate these resources to control the gains from extracting them, which in turn leads to inefficient resource management. It is important to clarify that resource overabundance

[83] In addition, Oskenbayev and Karimov (2013) suggest that agricultural resource price volatility associated with poor institutional quality negatively influences economic growth.

does not have a direct negative effect on economic growth; rather the effect is dependent on institutional quality. Therefore, in cases where 'producer friendly' institutions are prevalent in resource overabundant countries, point-source resources can contribute to economic growth. This probably explains why some point-source resource rich countries (e.g., Norway, Botswana, Chile and Mauritius) succeed more than others. The fact that overabundant resource production and concentration is often accompanied by poor quality institutions, given that it can lead to inefficient institutional activities when resource production is excessive and not in every case, suggests that better (e.g., more transparent) management of point-source resources could derive economic growth rather that have a detrimental effect on growth.

The 'excess' or overabundant resource production itself, *EnergyProd_SQ* and *AgriVA_SQ* (with lags), suggests that institutional quality, *Inst*, is endogenously determined by natural resource endowments and concentration, and that it is a significant estimator of growth (see columns 3 and 4 in Table 5.6). However, it rather shows that either the energy resource (*EnergyProd*) production or its 'excess' production (*EnergyProd_SQ*) undermines the quality and performance of institutions.[84] Indeed, this is the major finding of this investigation. The interaction of a squared term of the share of energy production of income ($EnergyProd\_SQ_{t-2}$) has a weakly significant negative impact on $Inst_{t-1}$, thus downgrading the institutional quality. The variable is significant in terms of magnitude, as well as in comparison to other variables in the model. In other words, *ceteris paribus*, energy production (of point-source resources) or its overabundant level of production often favors poor or inefficient institutions.

5.6 Concluding Remarks

The results of this study are relatively interesting given that it is a case study. The most important econometric finding of this study is that institutional quality is a function of point source and diffuse natural resource endowments considered as a nonlinear function (squared terms), which is an indicator of 'overabundance' or excess production. I found that the squared term of the energy production share of income had a negative effect on institutional quality, implying that excess production is detrimental to institutional quality. The overabundance or excess production of point-source resources and their appropriateness (easiness) to extract, particularly in terms of energy resources, attracts groups that seek to control these resources for their own benefit. In

[84] See columns 1–4 in Table 5.6.

turn, this stimulates inefficient institutional activities. Resource overabundance does not have direct negative effects on economic growth, rather it reduces institutional quality and causes poor economic performance. Either energy or agricultural resource production can have negative impacts on economic growth via adverse effects on institutional quality. Although overabundant agricultural resource production has a positive influence on institutions and economic growth, a negative overall effect of agricultural resources on economic growth was detected. One potential explanation for this result is that agricultural resource production is manipulated and regulated by large-scale agricultural enterprises in Kazakhstan. From this perspective agricultural resource production is more similar to point-source than diffuse resources.

Therefore, the energy production share of GRP exhibits a negative impact on economic growth via institutions. Excess or overabundant energy resource production share of income negatively effects economic performance by favoring weak institutions. Either energy resource production or the 'excessive' production share of income as well as the agricultural value-added share of income have detrimental effects on institutional quality. Thus, it is the excess nature of energy resource production associated with low levels of commodity production that is detrimental to institutional quality, demonstrating the indirect effect of energy resource production. Indeed, this was also observed with the inclusion of the energy production share of income.

Heavy concentration on energy production generates 'grabber friendly' institutions that are detrimental to economic growth. Thus, primary commodity production can also positively influence economic growth through institutions, as is documented with the inclusion of excess agricultural resource production (squared term). In this respect greater transparency and political accountability in the management of specific point-source resources (e.g., oil production) is the most significant policy recommendation resulting from this investigation, given that a lack of transparency makes point-source resource production appropriable by rent-seeking entities and prone to inefficient utilization. In addition, overly complicated rules and regulations enhance opportunities to extract bribes. Therefore, a lack of transparency as well as burdensome regulations and rules reflect key issues to be addressed in managing point-source resource industries. Excessive regulations and burdensome rules force small businesses to engage in inefficient institutional practices. By contrast, under a transparent business regulation regime small businesses are motivated to conduct business efficiently. A greater number of small- and

medium-sized enterprises would boost competition, especially in the agricultural sector, consequently eliminating the domination of large-scale agricultural enterprises. In turn, this would create an environment that is more amenable to reforms such as ensuring land property rights, which would help undermine the position of elites and their resistance to democratic reforms. Therefore, inclusion of more small and medium businesses would favor institutional quality and improve the contribution of the agricultural sector to economic development.

6 CONCLUSIONS AND RECOMMENDATIONS

The first objective of the study was to assess the potential channels of the resource curse based on data from developing countries. The study results indicate that resource abundance has adverse and persistent effects on income per capita via institutional quality and governance. I also examined the weak hypothesis that institutions and governance is the only channel of the resource curse. In particular, the Dutch disease effect (the real exchange rate) was not observed using terms of trade data. However, this may stem from the fact that the functional relationship might differ between countries. Moreover, another drawback of the investigation is that the available real exchange data is for a relatively short time span, from 2000 to 2010. An important finding of this research study is that excess energy resource production or 'overabundance' is associated with a decline in agricultural resource production based on research in CIS countries (see the detailed discussion in Chapter 3). Furthermore, it was also observed that the total effect of agricultural value added had a negative impact on institutional quality and economic growth, despite the squared term of agricultural value added exhibiting a positive impact on institutional quality and economic growth. Indeed, this has also been documented in analyses from Kazakhstan and other CIS countries. This is an implication that the agricultural sectors are dominated by state or large agricultural enterprises in these countries, and in this sense the sector can be regarded as a point-source resource sector. The dominance of large agricultural enterprises or state companies has negatively influenced the progress of reforms; for instance, land property rights are not enacted or established in almost all of the CIS countries.

Another key finding of this study is that the wheat sector of Kazakhstan, often considered as a diffuse resource sector in the literature, can be perverted by point source resource industries (e.g., energy production) owing to institutional arrangements. In contrast to other studies, I found that diffuse resources such as wheat can be detrimental to governance. In 2007 Kazakhstan designated 30 corporate leaders that would be the drivers of the economy in the international arena. The Samruk-Kazyna state holding company is major actor that serves as the engine of these corporate leaders. KazAgro, a subsidiary company of the national holding company, announced the choice of clusters and large-scale agricultural producers. This reveals that the government intentionally fostered and lobbied for large-scale agriculture enterprises. For instance, agricultural land and transportation reforms reveal that large-scale farms are promoted

by the relevant institutions, especially with respect to financing activities and land distribution. In particular, this explains the divergent paths of growth between the CIS and Central and Eastern European (CEE) economies in their agricultural sectors. Although, energy resources are more exposed to rent capture, it is possible to extract rents from agricultural resources through transportation bottlenecks, export bans, and opaque licensing practices, as discussed in Chapter 4. Furthermore, the price volatility of agricultural resources can deteriorate institutional quality by increasing rent-seeking activities. Thus, the combination of price volatility and weak institutions can also undermine economic performance in the case of the agricultural sector. The dramatic increase in wheat production in 2009 and the fires that affected Russia and some parts of Kazakhstan in 2010 prompted the government of Kazakhstan to undertake several policy actions, with financial assistance allocated to supporting grain transportation costs. In addition, a law was introduced that requires producers to sell part of their wheat harvest to KazAgro in the event that their harvests exceed the government-defined level. While these policies were ostensibly intended to boost the competitiveness of the agriculture sector and support small producers, they could also lead to rent-seeking behavior. Institutional reforms that discourage rent-seeking behavior should be applied in this case, given that the government will have increasing responsibility for the wheat market in future years.

The agricultural sector was ignored by the state during the early years of independence when it confronted a substantial decline in food production. However, the state has reversed its policies towards the development of the agricultural sector since 2000 as part of its economic diversification strategy with the support of increased oil revenues. Indeed, statistics show that the government has significantly increased subsidies and other types of financial support, predominantly to large-scale producers. Isham et al. (2005) classified wheat as a diffuse resource that is grown on relatively small family farms in North America, implying that cultivable land was not occupied by elites. The fact that arable land was originally distributed among small farmers in North America ensured innovative property rights earlier on than in many countries, which in turn enabled sound institutions to develop. By contrast, institutional arrangements and government policies such as state budget support, financial resources to cover transportation and exporting costs, and land property rights have significantly contributed to the formation and expansion of large-scale agricultural producers and state companies in Kazakhstan. As a result, the process of enacting land and property rights reforms has been rather slow. On the other hand,

this in turn has induced a case of the Dutch Disease problem, deteriorating the agricultural sector's competitiveness. The food price decline in the first decade of independence has been reversed, considerably reversing in favor of agricultural producers due to substantial state budget support.

Kazakhstan's economy has undergone substantial institutional arrangements in order to diversify its economy. Most importantly, the state holding company Samruk-Kazyna was created in 2008, with subsidiary companies in the major sectors of the Kazakhstan economy, including the agricultural sector. The policy intended to use oil funds to benefit neglected sectors of the economy, particularly to avoid the potential for a Dutch Disease problem. Consequently, the state holding company KazAgro was established under the auspices of the Ministry of Agriculture along with other subsidiary state companies of Samruk-Kazyna.

State intervention has had a substantial impact in the domestic wheat market. As shown in Figure 4.6, the state is becoming a key player in the wheat market of Kazakhstan. It is the de-facto trader in the market, given that an enormous volume of wheat is purchased for commercial purposes. On one hand, the state purchases helped farmers to avoid low profitability in 2009 due to the record harvest levels and low wheat prices in the market. On the other hand, agricultural producers and farmers often have to wait until the state announces the government-set wheat prices, which creates some uncertainty for other traders within the market. For instance, if the state sets the wheat price higher than the market price, other traders are unable to participate in the wheat market and remain excluded until the state completes it purchases.

Due to the evolving nature of its institutional structure, Kazakhstan has been incapable of developing comprehensive energy industry policies during the initial stage of attracting foreign investments into the oil and gas industries. Despite recent positive signs the insignificant share of Kazakhstan content, uncompetitive refinery production, and additional processing industries might not be conducive to the expected sector improvements.

High resource concentration represents a typical problem of capital intensive sectors, which leads to conflict among unbalanced interests. In countries with good governance over natural resources industries governments pursue stakeholder interests by introducing step-by-step development strategies. However, the recent price increase for oil products and the vast amount

of revenues were followed by an increase in state capacity. As the power of government institutions became dominant the tax regime system became volatile. Rushed decision making and crisis response policies since 2009 have harmed, or at least worsened, the investment climate; moreover, indirect fiscal tools have led to the inefficient use of natural resources.

Further Research

While there is a broad range of literature concerning the natural resource curse, consideration of natural capital depreciation using real GDP per capita growth rather than genuine income as the main indicator of economic development is rare. Some research has taken into account genuine income, strongly or weakly suggesting a natural resource curse in terms of genuine income (Mikeseel, 1997; Neumayer, 2004), albeit without unanimous agreement on the existence of a resource curse in terms of genuine savings and income. Genuine income is obtained by deducing depreciation from GDP. Such research has found evidence of the natural resource curse when correcting GDP per capita growth with genuine savings and income. The majority of supporters of the use of genuine income advocate on the basis of the natural resource curse explanation, particularly emphasizing unsustainable overconsumption, namely falsely indicating high income levels and leading to unsustainable consumption. Thus, the erroneous perception of income levels by policy-makers fuels overconsumption beyond sustainable levels. The revelation of the existence of a natural resource curse by taking into account genuine income indicates that overconsumption is crucial in explaining the resource curse. Therefore, it remains important to conduct further investigation of the natural resource curse and its causes by employing a genuine income estimate. From my perspective, future investigation focusing on the resource curse should be carried out using panel data analyses to control for unobserved effects and avoid the problem of estimate inconsistency. Moreover, future studies should take into account natural capital stock and resource depletion rather than other traditional measures of economic development such as GDP, which has been used in many empirical studies of the resource curse.

I did not find evidence that fixed capital formation has an impact on economic growth. Economic theory suggests that the effects of the public and private investment nexus depend on several factors. Public investment might boost economic growth if it enhances human capital formation and infrastructure, while on the other hand it can crowd out private investment. Many studies are limited due to the fact that they analyze small samples and data over short time spans. This study

shares these limitations. In addition, other determinants of growth such as human capital and macroeconomic instability should be taken into consideration when evaluating the issue. The volatility of energy resources reflects a central issue in economic development. External shocks and energy price volatility associated with weak institutions in natural resource rich economies can cause welfare losses (Loyaza et al., 2007). Therefore, how to overcome volatility and manage risks associated with the volatility of energy and commodities prices deserve additional investigation. Furthermore, emphasis should be placed on determining how to reduce the negative effects of volatility on economic growth and poverty.

Some resource-rich countries (e.g., Norway, Chile) have exhibited relatively rapid growth, while others (e.g., Venezuela, Papua New Guinea) have suffered from stagnation. By the same token, some resource poor countries have experienced slow growth, while others such as some Southeast Asian countries have experienced significant economic growth. The variability in the expression of the natural resource effect is likely due to the fact that it can manifest through different channels. Consequently, further investigations should focus on determining the impacts of natural resource concentration or abundance on specific economies. A case study approach, rather than cross-country investigation, can potentially provide specific explanations as to why resource-rich countries experience divergent outcomes with respect to economic development.

One of the key channels of the negative impact of natural resources on economic growth is rent-seeking activities, which deteriorate institutional quality. However, natural resources can contribute to economic development under the tutelage of ‘producer friendly’ institutions. Thus, further research should concentrate on the motives or channels through which natural resource concentration fuels rent-seeking activities that ultimately undermine long-term economic growth.

Policies

The major policy strategy in the agricultural sector of Kazakhstan during the 1990s was privatization. However, the manner of execution of this process led to the takeover of control over production by the existing farm managers. Large-scale agricultural producers have become increasingly dominant in crop production, whereas livestock production has been more conducive to individual producers. Consequently, the disparity between large and small enterprises has substantially increased. Large-scale enterprises prevail in North Kazakhstan

where wheat production dominates the sector. Policies have reversed since 1999 when the government decided to support the agriculture sector and improve public finance availability. Nevertheless, the key actors in the wheat sector remain influential and central government policies are not implemented if they run counter to the interests of large agro-holding companies. There are several factors contributing to the inefficient allocation of financial support to the agricultural sector, including high transaction costs, the dominance of the state holding company in the credit market, low returns on investment, and the risk involved in the agricultural sector due to volatile weather conditions, especially in the wheat producing regions of Kazakhstan. Evidently, the national holding company's (KazAgro) presence in the market has compensated for the lack of financial resources. However, the efficient allocation of public finances requires careful assessment. Corporate governance and the transparent allocation of financial support by KazAgro must be addressed for the sake of the efficient use of public financial resources. This would enhance public financial support for agricultural producers, especially small and medium enterprises. Moreover, it would also stimulate lending by second-tier banks, creating a more competitive environment. Thus, transparency would mitigate the limited availability of commercial bank loans to small and medium agricultural producers.

The policies and institutional arrangements to diversify the economy pursued in 2006–2007 have revealed several weaknesses. These subsidy and financial assistance programs intended to facilitate grain production were often accompanied by the inefficient use of public financial resources. Thus, subsidy policies have fuelled corruption to some extent.

7 APPENDICES

Appendix Table 2.1.A: Detailed Export Classification for Developing and Emerging Countries, 2009–2010

	Economy	SITC Export Code for First and Second Export	First and Second Most Important Exports	Share of Total Exports (%) First	Share of Total Exports (%) Second	Share of Category Exports (%) First**	Share of Category Exports (%) Second**
			Manufacturing				
1	Bangladesh*	845; 841	Articles of apparel; Male clothing, woven	32.3	22.5	7.12	10.4
2	Botswana*	667; 284	Pearls; Nickel ores, concentrates etc.	55.1	17.5	4.08	16.47
3	Central African Republic*	667; 247	Pearls; Woods	24.5	21.4	0.06	0.69
4	China*	752; 764	Computer equipment; Telecommunications equipment	9.4	8.7	64.17	44.64
5	Costa Rica	776; 759	Valves tubes, diodes transistors; Office equipment part & accessories	27.5	18.4	0.77	1.45
6	Dominican Republic*	872; 122	Medical instruments appliances; Manufactured tobacco	11.4	5.5	4.54	4.99
7	El Salvador*	845; 71	Articles of apparel; Coffee and coffee substitutes	22.2	5.7	1.12	1.36
8	Haiti*	845; 844	Articles of apparel; Female clothing, knitted crocheted	45.4	7	0.32	0.13
9	Honduras*	845; 71	Articles of apparel; Coffee and coffee substitutes	19.4	12.4	1.24	3.8
10	Hong Kong, China*	776; 764	Valves tubes, diodes transistors; Telecommunications equipment	15.9	14	18.11	18.89
11	Jordan*	562; 542	Manufactured fertilizer; Medicines including veterinary	14.5	8.9	5.66	2.97
12	Korea, Republic of*	764; 793	Telecommunications equipment; Ships	9.8	9.6	15.02	44.32
13	Lesotho*	667; 841	Pearls; Male clothing, woven	30.3	24.3	0.42	0.47
14	Liberia*	793; 231	Ships; Natural rubber, latex, gum, etc.	35.3	29.1	0.07	0.3
15	Madagascar*	845; 75	Articles of apparel; Spices	16.5	8.7	0.22	2.15
16	Malaysia*	776; 422	Valves tubes, diodes transistors; Fixed veg. fat and oil	16	6.5	8.88	39.58
17	Mauritius*	845; 61	Articles of apparel; Sugar, molasses and honey	16.8	12.2	0.41	1.08
18	Morocco*	842; 773	Female clothing, woven; Electric distribute equipment	8.9	8	3.05	3.34

	Economy	SITC Export Code for First and Second Export	First and Second Most Important Exports	Share of Total Exports (%) First	Share of Total Exports (%) Second	Share of Category Exports (%) First**	Share of Category Exports (%) Second**
19	Nicaragua*	845; 71	Articles of apparel; Coffee and coffee substitutes	14.1	13.3	0.28	1.25
20	Pakistan*	658; 42	Made-up textile article; Rice	15.8	10.4	9.96	12.46
21	Panama	793; 541	Ships; Pharmaceuticals excluding medicines	13.2	9	0.13	0.54
22	Philippines*	776; 752	Valve tubes, diode transistors; Computer equipment	30.7	15.5	4.31	3.44
23	Singapore*	776; 334	Valve tubes, diode transistors; Heavy petroleum & bituminous oil	23.8	15.3	23.13	18.46
24	Thailand*	752; 776	Computer equipment; Valve tubes, diode transistors	7	4.8	5.98	2.62
25	Turkey*	781; 676	Passenger cars and race cars; Iron steel bar rod section piling	5.7	4.9	7.35	26.87
26	Sierra Leone*	667; 285	Pearls; Aluminum ore concentrate alumina	24.2	12.2	0.12	0.76
			Diffuse				
27	Argentina*	81; 421	Animal feed excluding unmilled cereal; Fixed veg. fat and oil	14.1	7.3	35.33	49.6
28	Benin*	263; 334	Cotton; Heavy petroleum & bituminous oil	34.7	15.6	6.77	0.08
29	Burkina Faso*	263; 971	Cotton; Gold non-monetary excluding ores	40.9	32.5	6.67	0.47
30	Fiji*	61; 34	Sugar, molasses and honey; Fish	14.5	10.7	0.4	0.32
31	Gambia*	57; 421	Fruit nut; Fixed veg. fat and oil	34.9	9.8	0.02	0.02
32	Guatemala	61; 57	Sugar, molasses and honey; Fruit nut	9.3	9.1	3.2	2.2
33	Guinea-Bissau*	057	Fruit	89.5		0.33	
34	Kenya*	74; 292	Tea and mate; Crude vegetable materials	17.8	12.9	16.57	6.66
35	Malawi*	121; 74	Tobacco and refuse; Tea and mate	58.3	7.1	8.67	1.56
36	Mali*	971; 263	Gold non-monetary excluding ores; Cotton	58.6	20.7	1.43	5.72
37	Mozambique*	684; 351	Aluminum; Electric current	38.9	10	2.94	5.58

	Economy	SITC Export Code for First and Second Export	First and Second Most Important Exports	Share of Total Exports (%) First	Share of Total Exports (%) Second	Share of Category Exports (%) First**	Share of Category Exports (%) Second**
38	Namibia*	34, 667	Fish, fresh live chilled frozen; Pearls	14.8	14	2.55	0.92
39	Niger*	1; 525	Live animals; Radioactivity& associated materials	25.5	25.2	7.24	19.24
40	Paraguay*	222; 11	Oil seed, etc., for soft oil; Beef	33.2	18.6	6.47	7.77
41	Rwanda*	74; 287	Tea and mate; Base metal ores & concentrates	33.8	23.3	1.6	0.37
42	Somalia	1; 971	Live animals; Gold non-monetary excluding ores	31.5	28.9	3.83	0.17
43	Sri Lanka*	74; 845	Tea and mate; Articles of apparel	16.6	12.8	24.77	1.2
44	Uruguay*	11; 42	Beef, fresh chilled frozen; Rice	18.3	7.4	11.99	2.75
45	Zimbabwe*	121; 325	Unmanufactured tobacco and refuse; Coke, semi coke retort carbon	13.9	9.1	4.37	12.19
			Point Source				
46	Algeria*	333; 343	Crude petroleum & bituminous oil; Natural gas	45.1	31.2	3.02	18.24
47	Angola*	333; 667	Crude petroleum & bituminous oil; Pearls	96.8	1.2	5.66	0.97
48	Bolivia*	343; 287	Natural gas; Base metal ores & concentrates	41.7	12.7	2.74	4.71
49	Brazil*	281; 333	Iron ore and concentrates; Crude petroleum & bituminous oil	12	7.3	55.53	1.68
50	Cameroon*	333; 72	Crude petroleum & bituminous oil; Cocoa	33.6	16.8	0.16	4.98
51	Chad*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	84.5	7.5	0.33	0.09
52	Chile*	682; 283	Copper; Copper ores and concentrates	36.7	18.5	40.22	37.4
53	Colombia*	333; 321	Crude petroleum & bituminous oil; Coal excluding non-agglomerated	29.5	14.8	1.4	16.41
54	Congo*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	77.4	4.5	0.72	0.13
55	Ecuador*	333; 57	Crude petroleum & bituminous oil; Fruit nut	48.8	13.4	1	6.44
56	Egypt*	334; 343	Heavy petroleum & bituminous oil; Natural gas	9.9	8.2	0.98	2.37

	Economy	SITC Export Code for First and Second Export	First and Second Most Important Exports	Share of Total Exports (%) First	Share of Total Exports (%) Second	Share of Category Exports (%) First**	Share of Category Exports (%) Second**
57	Gabon*	333; 247	Crude petroleum & bituminous oil; Wood	73.8	9.2	0.66	15.67
58	Guinea*	285; 333	Aluminum ore concentrate alumina; Crude petroleum & bituminous oil	48.1	14	14.61	0.02
59	Guyana*	971; 42	Gold non-monetary excluding ores; Rice	35.6	13.9	0.4	0.74
60	India*	334; 667	Heavy petroleum & bituminous oil; Pearls	14.2	9.5	11.43	35.72
61	Indonesia*	321; 422	Coal excluding non-agglomerated; Fixed veg. fat and oil	11.6	10.1	48.66	47
62	Iran*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	77	2.5	9.06	0.88
63	Iraq	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	97.2	0.8	5.81	0.14
64	Jamaica*	285; 334	Aluminum ore concentrate alumina; Heavy petroleum & bituminous oil	37.1	18.8	11.1	0.1
65	Mauritania*	281; 34	Iron ore and concentrates; Fish, fresh live chilled frozen	45.5	13.1	2.04	1.06
66	Mexico*	333; 764	Crude petroleum & bituminous oil; Telecommunications equipment parts	11.7	7.4	4.03	7.09
67	Myanmar	343; 247	Natural gas; Wood	31.3	13.1	2.99	27
68	Nepal	674; 659	Steel; Floor Cover	9.0	7.7	0.46	1.14
69	Nigeria*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	80.2	5.2	6.32	1.22
70	Oman*	333; 343	Crude petroleum & bituminous oil; Natural gas	50.6	7.7	2.13	2.85
71	Papua New Guinea*	971; 283	Gold non-monetary excluding ores; Copper ores and concentrates	28.3	21.9	2.01	3.82
72	Peru*	971; 283	Gold non-monetary excluding ores; Copper ores and concentrates	23.4	16.3	9.53	16.27
73	Saudi Arabia*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	74.1	6.6	20.74	5.5
74	Senegal*	334; 522	Heavy petroleum & bituminous oil; Inorganic chemical elem oxide salt	24.7	8.9	0.2	1.07
75	South Africa*	681; 321	Silver, platinum, platinum metals; Coal excluding non-agglomerated	11.8	7.8	42.49	18.09

	Economy	SITC Export Code for First and Second Export	First and Second Most Important Exports	Share of Total Exports (%) First	Share of Total Exports (%) Second	Share of Category Exports (%) First**	Share of Category Exports (%) Second**
76	Sudan*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	79.5	8	0.95	0.29
77	Syria*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	26.7	8	0.4	0.36
78	Tanzania*	971; 289	Gold non-monetary excluding ores; Precious metal ore concentrate excl. gold	17.5	11.5	0.81	10.11
79	Togo*	661; 72	Lime cement construction material; Cocoa	13.1	11.4	0.81	0.82
80	Trinidad & Tobago*	343; 334	Natural gas; Heavy petroleum & bituminous oil	32.7	19.5	3.61	0.73
81	Tunisia*	333; 845	Crude petroleum & bituminous oil; Articles of apparel	12	10.6	0.24	1.99
82	Venezuela*	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	65.3	19.5	5.18	4.57
83	Zaire	333; 334	Crude petroleum & bituminous oil; Heavy petroleum & bituminous oil	77.4	4.5	0.72	0.13
84	Zambia*	682; 283	Copper; Copper ores and concentrates	68.1	4	6.87	0.75
			Coffee and Cocoa				
85	Burundi*	71; 74	Coffee and coffee substitutes; Tea and mate	56.6	11.2	0.27	0.18
86	Cote D'lvoire*	72; 334	Cocoa; Heavy petroleum & bituminous oil	33.4	15.1	26.53	0.59
87	Ethiopia*	71; 54	Coffee and coffee substitutes; Vegetable	27.3	17.5	3.31	1.81
88	Ghana*	72; 287	Cocoa; Base metal ores & concentrates	48	7.5	26.4	3.32
89	Uganda	71; 34	Coffee and coffee substitutes; Fish	19.8	7.6	2.57	0.81

* Countries included in the regression model.

** Indicates the grouping to which the country belongs, and the percentage share shown is applied. The percentage is the share of exports of each commodity shown by the country in the relevant grouping of total exports for that commodity (i.e., "developing," which refers to developing economies; "transition," which refers to transition economies and "developed," which refers to developed economies).

Source: Author's estimation using the UNCTAD database (2010).

Appendix Table 2.7.A: The relationship between resource abundance and manufacturing sector growth (Robust std. err.)

VARIABLES	Manufacturing value added per capita growth rate			
	1991–2000	1991–2000	2001–2010	2001–2010
	(1)	(2)	(3)	(4)
RR	0.0164	–1.10e–05	0.109**	0.141**
	(0.0445)	(0.0464)	(0.0510)	(0.0662)
FDI	0.538**	0.564**	0.287**	0.550*
	(0.211)	(0.232)	(0.122)	(0.305)
*FDI*RR*	–0.0203***	–0.0206***	–0.00148	–0.00572
	(0.00710)	(0.00763)	(0.00517)	(0.00595)
mva90		–0.0485		0.125
		(0.0670)		(0.127)
Constant	0.756	1.768	–0.283	–3.259
	(0.618)	(1.209)	(0.828)	(3.166)
Observations	57	54	59	55
R-squared	0.189	0.224	0.196	0.209
Joint Significance test of *RR* and *FDI*RR* (p_value)	6.21*** (0.00)	5.63*** (0.00)	2.96* (0.06)	2.54* (0.09)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3.1.A: Data and Descriptive Statistics

Variable	Abbrev.	Definition	Mean	Std. Dev.
GDP per capita growth (annual %)	*G*	Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. *Indicator Code: NY.GDP.PCAP.KD.ZG*	3.48	9.48
Total Natural Resource Rents (% GDP)	*RR*	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. *Indicator Code: NY.GDP.TOTL.RT.ZS*	13.10	17.20
Agriculture, Value Added (% GDP)	*AgriVA*	Agriculture corresponds to ISIC divisions 1–5 and includes forestry, hunting and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator. *Indicator Code: NV.AGR.TOTL.ZS*	16.89	11.23
Terms of trade, Net barter terms of trade index (2000 = 100)	*Tot*	The terms of trade index is calculated as the percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000. *Indicator Code: TT.PRI.MRCH.XD.WD*	120.19	39.87
Institutional Quality, CIM	*Inst*	Contract-Intensive Money suggested by Clague et al. (1999)	0.39	0.14
First component of institutional quality, CIM	M_2	Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. *Indicator Code: FM.LBL.MQMY.CN*		
Second component of institutional quality, CIM	*C*	Money is the sum of currency outside banks and demand deposits other than those of central government. This series, frequently referred to as M1, is a narrower definition of money than M2. Data are in current local currency. *Indicator Code: FM.LBL.MONY.CN*		

Table 5.3.A: Model Variables and Descriptive Statistics

Variable	Abbreviation	Definition	Mean	Std. Dev.	Min.	Max.
Log of Real Gross regional product (GRP) per capita	*Log(y)*	Log difference of current and previous years' Real (deflated by CPI) GRP per capita	6.25	0.78	4.80	8.20
Energy Production	*EnergyProd*	Energy sector production (including oil, gas and coal production) share in GRP	0.43	0.51	0	1.70
Agriculture sector value added share in income	*AgriVA*	Agriculture sector value added (including livestock and food agriculture products) share in GRP	0.18	0.15	0.004	0.56
Investments share in income	*Inv*	Share of regional fixed capital investment in GRP	0.265	0.155	0.088	0.883
Institutional Quality or Performance	*Inst*	The share of deposits in second-tier banks in GRP	0.042	0.022	0.011	0.153
Proxy for real exchange rates (Balassa-Samuelson effect variable)	*ToT*	Unit labor costs ratio of non-traded goods sector to that of traded goods sector	1.26	0.49	0.51	4.24

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I hereby declare, that I have produced this Dissertation just by myself, and all means for help and all sources, as well as academic inputs are referenced in the manuscript.

29.08.2014

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