RESOURCE ABUNDANCE AND LONG-RUN GROWTH: WHEN IS OIL A CURSE?

The Effects of Oil Discoveries on Kazakhstan's Economy.

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Is natural resource abundance a blessing or a curse? The debate on this old topic was reignited by Sachs and Warner (1995), who found a negative relationship between resource abundance and economic growth in cross-country regressions. Subsequent contributions have refined the debate, establishing that the relationship is conditional (on variables proxying for institutions or on democracy) and that the negative relationship is stronger for oil and minerals than for agriculture.[1] Papyrakis and Gerlagh (2004) obtain a negative coefficient on their natural resource variable (share of minerals in GDP) in a simple conditional convergence growth regression, but the coefficient becomes positive when measures of corruption, openness and schooling are added to the right-hand side. This fits with the observation that successful resource-rich countries like Norway or Australia or Malaysia have open economies and low levels of corruption, but does not address the issue of whether resource-abundance has fuelled corruption in countries like Nigeria or Venezuela.

The debate has an especial familiarity to Canadian economic historians taught the staple theory associated with Innis, Mackintosh, Easterbrook and Aitken and others.[2] This approach to Canadian economic history emphasised the characteristics of successive staple exports, and their implications for economic development *inter alia*. It is not just the magnitude of fish, fur, lumber or wheat exports that matters, but also the transmission mechanisms from the staple exports to the economy and society. In this framework, it is quite plausible that a country might fall into a staple trap if the resource export has effects inimical to future growth and development. As a description, with some resource exporters being cursed and others blessed, the Sachs-Warner results are interesting, but beg the next question: what resources and what transmission mechanisms make a resource boom a curse?

Oilbooms are associated with extreme cases. The 1970s oilboom was a huge windfall for Norway, as well as for Scotland, Alberta, Alaska and elsewhere. For other countries, such as Nigeria and Venezuela, the oilboom appears to have been a curse. Full judgment on the effects of an oilboom requires a fairly long time horizon. Indonesia looked as though it benefited from the oilboom because it invested wisely in human capital formation, but a corruption-fuelled political and economic crisis in the late 1990s put this verdict in doubt. Mexico appeared to be squandering its new wealth when it went bankrupt in 1982, but has been an economic success over the last two decades.

Identification of the transmission mechanisms has focussed on three links: through relative prices (Dutch disease effects), through volatility, and through rent-seeking and distortion of institutions. To a large extent these can be seen as real productive sector links, public finance links, and political economy links. In contrast to much of the staple-theoretic literature of a generation ago (eg. Watkins, 1967), there is little emphasis on backward or forward linkages to other productive sectors,

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[1] See, for example, the literature review and regression analysis in the first two sections of Sala-i-Martin and Subramanian (2003). Isham et al. (2003) distinguish between point-source resources (oil, natural fertilizers and cotton) and coffee/cocoa, which have been associated with poor growth performance, and other natural resources, which have not.
[2] The staple theory was also adopted by Douglass North to explain nineteenth century US history and applied by Robert Baldwin to the twentieth century Third World.

although the modern focus on institutions is reminiscent of the earlier Canadian economic historians' work, not to mention Douglass North.

This paper reviews the resource curse debate through the prism of a case study of Kazakhstan, whose economy has been driven by an oilboom since the discovery of large new oilfields coincided with the 1999-2000 upturn of world oil prices. It discusses the extent to which a sustained oilboom might have deleterious effects on other sectors of the economy by drawing off resources and via Dutch disease mechanisms (ie. an appreciating exchange rate makes production of other traded goods unprofitable) or by discouraging investment in human capital, and an unsustained oil boom would introduce volatility. The main analytical focus, however, is on whether the development of the oil sector, which witnessed the biggest and most corrupt part of the alienation of public resources during the transition from central planning in the 1990s, is related to the quality of institutions and the degree of democracy. The empirical approach is to use household survey data from before and after the start of the oilboom to assess the extent to which the benefits from the oilboom were retained in the oil-producing regions, or spread evenly across the national economy, or were concentrated in the two main metropolitan centres: Almaty, the former capital and financial centre, and Astana, the capital since 1997, which are both geographically far from any oilfields but home to the country's elite.

The next section reviews the three transmission mechanisms. The background, policies and economic performance since Kazakhstan became independent in December 1991 are reviewed in the second section of the paper, which also focuses on the privatization process by which Kazakhstan transformed its ownership structure from that of a Communist economy and on the development of the oil sector.[3] Section 3 introduces a first-cut analysis of the household survey data. Section 4 concludes.

1. Three Transmission Mechanisms

Dutch disease effects have long been in the international trade theory literature (Corden, 1984). An increase in resource-intensive exports will be associated with a decline in output of other traded goods. If the latter have desirable externalities or there are costs to reversing their decline when the resource revenues dry up, then there is a negative effect on long-run growth (Krugman, 1987). Although the Dutch disease literature has a lengthy theoretical pedigree, it appears to be the empirically least important mechanism. Sala-i-Martin and Subramanian (2003), for example, reject Dutch disease explanations of Nigeria's dismal growth record and emphasise the institutions link.

Resource exports typically have more volatile prices in world markets than other goods and services. This can negatively impact on growth if the earnings are invested in domestic projects whose marginal return is low, because the sudden increase in available funds is not matched by a comparable increase in good projects needing finance, or if the earnings are used for consumption which is costly to reverse.[4] If the bust following a boom requires cuts in domestic absorption that fall on those least capable of protecting themselves, then volatility can increase poverty

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[3] This section is based on Pomfret (forthcoming).
[4] The deleterious effects of volatility are emphasised in the case studies in Gelb (1988), and are the focus of the analysis in Devlin and Lewin (2004).

directly as well as indirectly via slower growth.[5] Volatility can be addressed by investing some of the boom-period revenues in diversified assets, as for example Norway's oil fund or Alberta's Heritage Fund, which can be drawn upon as the resource runs out or when boom turns to bust. The effectiveness of such funds is related to the quality of institutions, because with poor institutions the funds are less likely to be well-managed and corrupt rulers are likely to pillage the fund for their own benefit.

The impact of resource abundance on rent seeking and on institutions depends upon the nature of the resource and also on pre-existing institutions. Economic historians have traced the links between the nature of resource endowments and institutional development. Agriculture which was technologically suited to production on the family farm was associated with human capital formation, democracy and other institutional features amenable to economic development with relative economic equality, while resources such as minerals or plantation agriculture were associated with less democratic political systems and less favourable institutional development. The impact of a resource boom on inequality depends upon the nature of the resource. Tornell and Lane (1999) analyse competition for, and dissipation of, rents as the source of the resource curse; "point-based" resources such as oil have rents that may be relatively easily grabbed by a few.[6] In worst-case scenarios competition for resource rents leads to civil conflict as in the 1966-70 Biafra War, or in Angola, Zaire (Congo), Liberia or Sierra Leone. Other authors have suggested other links, eg. resource abundance reduces the incentive to invest in human capital (Gylfason, 2001; Wen and King, 2004), but these have not received much attention in the empirical literature.

The link from relatively easily appropriable rents to poor institutions takes various forms. Competition for rents may reduce incentives for productive behaviour, and for formation of institutions to encourage and reward productive activities. Dalmazzo and de Blasio (2003) argue that resource abundance may reduce the incentives to undertake difficult structural reforms, and Auty (2001) makes a similar point in the context of high oil revenues. "Resource curse" outcomes have arisen where resource abundance has led to despotic and corrupt political and institutional set-ups, which inhibit development and impoverish the majority of people.[7] On the other hand, institutions developed before the resource boom may be resilient; resource abundance has been a blessing for democratic oil-rich countries or provinces or states such as Norway, Alberta and Alaska, which have judiciously managed their oil rents.

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[5] When the Indonesian government turned to the IMF for assistance after its 1997 crisis and reduction of the budget deficit was a key condition for such assistance, most of the immediate burden fell on cuts in cooking oil subsidies, which fell disproportionately on the poor. The poverty among plenty aspect of Indonesia's experience is reflected in Transparency International (2004) ranking the leader of Indonesia at the time of the crisis as the most corrupt politician in the world, measured by the amount of public revenue diverted to his family.

[6] Some resource rents are difficult to manage, and Atkinson and Hamilton (2003) find that countries suffer from a resource curse when their true savings, including the running down of natural capital, are negative. In worst case scenarios, competition for resource rents can fuel violent civil conflict, as in the 1966-70 Biafra War or later in Angola, Zaire (Congo), Liberia or Sierra Leone.

[7] A problem with emphasising the third mechanism is that details of the use or dissipation of rents have varied in economically significant ways. The variations may lie in details of national politics, but may also lie in the idiosyncrasies of the political leader, whose personality matters much more in dictatorships than in democracies. Karl (1999) analyses the impact of an oilboom during state formation. Eifert, Gelb and Tallroth (2002) provide a taxonomy of political settings.

2. Policies and Performance in Kazakhstan since 1991

Kazakhstan has huge oil and natural gas reserves, rich unmined veins of copper, chrome and aluminium, and substantial gold deposits, as well as enough developed farm and pastureland to feed itself. Yet, these resources were poorly utilized during the first decade after becoming independent in late 1991. The inheritance of a weak state with a precarious ethnic balance between Kazakhs and Russians created substantial economic uncertainty. Mass migration during the first half of the 1990s contributed to economic decline, and disappointing inflows of foreign capital held up development of the oil and mineral sectors. The situation changed dramatically in 2000 as increased oil production combined with higher world oil prices to fuel export-led growth.

(a) Transition Strategy and Macroeconomic Performance

In the initial years following independence, Kazakhstan's leadership was preoccupied with nation-building in the context of real prospects of secession or internal conflict. Economic policy in 1992-4 was driven in large measure by President Nazarbayev's attempts to maintain economic contacts with Russia. Kazakhstan was the last Soviet republic to formally declare its independence in 1991 and its leader was the most assiduous in trying to construct a viable successor organization to the USSR. Kazakhstan followed Russia's radical reforms, notably the price liberalization of January 1992 and early privatization measures, but macroeconomic stability was not pursued, and even if it had been desired was hamstrung by retention of the ruble until November 1993 (Pomfret, 1995). In 1994 pluralism briefly flourished, before the process of political repression began to take shape and Kazakhstan became noticeably less democratic than Russia. Despite statements to the contrary, economic reform was put largely on hold for the remainder of the decade.

In the mid 1990s Kazakhstan's privatization process took a similar turn to Russia's as a voucher scheme was displaced by asset sales. Between September 1995 and the end of 1996 many of the most valuable state enterprises were sold. In this period the government's attention also began to focus more narrowly on oil sector development, and became associated with wealth accumulation by the elite. Externally, Kazakhstan became seen less as one of the reformist CIS counties and more as an example of a corrupt Soviet successor state. The economy was hit by several negative exogenous shocks in the late 1990s, notably low oil prices and the August 1998 Russian Crisis.

Kazakhstan suffered a severe recession in the first half of the 1990s as GDP fell by over two-fifths between 1991 and 1995. The decline halted in 1996 and 1997, before GDP suffered a further drop in 1998. Anaemic performance in 1999 ended a decade of poor macroeconomic performance (Table 1). This could not be explained by war as in most of the CIS economic disasters. Indeed, with its high initial income and human capital and its abundant natural resources, Kazakhstan might have been expected to do much better.

The most plausible explanation is in terms of disorganization (Blanchard, 1997). The government moved quickly towards price liberalisation in January 1992, but it failed to follow up with the institutions required for a well-functioning market economy. Thus, the functioning, albeit inefficiently, coordinating mechanisms of central planning were followed by a coordinating void. Tardiness in bringing the

hyperinflation of 1992-3 down to moderate inflation levels also contributed to the poor functioning of the market economy, although inflation was more or less under control by 1997 (Table 1).

Physical disintegration was exacerbated because, among the Soviet republics, Kazakhstan was one of the most tightly integrated into the Union economy. In particular, its mineral wealth was associated with single-enterprise towns dependent on production chains involving suppliers, smelters and end-users elsewhere in the Soviet Union (usually in Russia). The fledgling oil industry in western Kazakhstan relied on Russian pipelines, but Kazakhstan's own major refineries in Pavlodar in the northeast and Shymkent in the south were linked by pipeline to Siberian oilfields. The chaotic privatization of large enterprises in 1995-6 added to the confusion, although in the longer run providing clearer ownership rights may have encouraged reduction of the physical problems.[8]

Kazakhstan experienced high emigration during the 1990s, as its population fell from over 17 million at the time of independence to less than 15 million a decade later. According to the final Soviet census in 1989 the population consisted of roughly two-fifths Kazakhs, two-fifths Russian and one–fifth other ethnic groups. The Russians, who had been the largest group in the republic a decade earlier, were concentrated in the capital city, Almaty and in northern and eastern regions bordering the Russian Federation. Among the "other" groups were large contingents of ethnic Germans and Koreans who had been shipped to Kazakhstan by Stalin who feared their potential to be a fifth-column supporting invaders from the west and east. Most of the Germans took advantage of German citizenship laws to emigrate to Germany in the early 1990s. Together with Russian emigration, both of which contained a disproportionate number of the country's well-educated and skilled people, this constituted a substantial brain drain in the early post-independence years.

Emigration complicates comparison of Kazakhstan's economic performance because output comparisons across transition countries are usually by total output rather than per capita GDP, so that Kazakhstan's relative performance may look worse than it was. In addition, the biases of all GDP estimates for transition economies probably overstate the extent of the initial recession. Other indicators of well-being reinforce the impression that Kazakhstan did not perform as poorly as the GDP estimates suggest, and that this gap between estimates and reality was bigger for Kazakhstan than for neighbouring CIS countries (Pomfret, 2003b). Nevertheless, whatever its absolute or relative magnitude, Kazakhstan's output performance in the 1990s was well below potential.

The 1998 recession followed the Russian crisis. Although this was an exogenous negative shock, Kazakhstan's susceptibility to contagion reflected to some extent the failure to create a vibrant market economy which could withstand such a shock. The government responded with a large devaluation, which as in Russia helped to kick-start the economy in 1999 and 2000. Since 2000 Kazakhstan has enjoyed rapid economic growth. This coincided with an upturn both in proven oil reserves and in oil prices, and raises the question of whether or not the growth is sustainable in the event of oil price reversals. A major concern is the institutional environment. In the 1990s the situation deteriorated from a promising pluralism in 1994 to crony capitalism in 1995-6. The privatization process, described next, was widely identified with burgeoning corruption and deteriorating standards of governance.

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[8] Table 1, however, illustrates the lack of short-term benefits at the macroeconomic level.

(b) Privatization

The first Privatization and Denationalization Act was passed in June 1991, but Kazakhstan only started to work seriously on privatization in 1992. In the first phase housing was privatized through a coupon-scheme. For most households the number of coupons was sufficient to purchase their apartment or house, so that the outcome was essentially reversion to existing occupiers. In this phase small consumer service businesses such as retail outlets, catering, laundries, saunas, etc. were sold by auction, usually to the existing operators.

The second stage of privatization began in 1993 with the issue of vouchers with which citizens could buy shares in Investment Privatization Funds (IPFs) which would buy shares in medium and large state enterprises. There were conflicts over the fairness of voucher allocation, which was biased in favour of rural residents and hence in favour of Kazakhs, and over the competence of the IPFs to act as governing boards or mutual funds. The vouchers became heavily concentrated in a handful of IPFs (Olcott, 2002, 138), which contributed to some amassment of wealth. The main concern about the voucher privatization process, however, was that the process was slow - by the start of 1995 only a third of vouchers had been used (Kalyuzhnova, 1998, 76) - and to some extent being overtaken by spontaneous alienation of state assets by anybody in a position to steal them.

In November 1993 the government experimented with offering shares in large enterprises to foreign purchasers. Philip Morris purchased a 49% share in the Almaty Tobacco Factory for $313 million. RJR Nabisco purchased 90% of the Shymkent Confectionery Factory for $70 million. Unilever purchased 90% of the Almaty and Karaganda Margarine Plants for $60 million. In 1994 and 1995 the State Property Committee earmarked other large enterprises for sale, but the process of privatization by sale really took hold after September 1995.

In the third stage of privatization, companies were sold in part or whole, or contracted to the management of individual investors for a specified period, under an individually negotiated agreement - "making this the most corrupt stage" (Olcott, 2002, 139). The lack of transparency was exacerbated by the speed with which many of the deals were concluded.[9] Kalyuzhnova (1998, Table 5.1) provides details of twenty-five sales, which raised almost $7 billion between September 1995 and October 1996. At the same time as individual deals were concluded with speed, the overall process moved slowly as many of the enterprises listed for sale failed to attract buyers. In June 1997 the government announced that shares in thirteen of the largest remaining state enterprises would be offered for sale on the stock exchange before the end of 1997, but a year later only three were fully tradable (Olcott, 2002, 141). The government also vacillated on how to deal with natural monopolies, until in December 1998 President Nazarbayev announced that the railways, power transmission lines, and oil and gas pipelines would remain in state hands. Case-by-case privatization has continued, relatively slowly since 2000 because with the oil boom the government is less desperate for revenues, and perhaps more transparently.

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[9] According to Sander Thoenes in an article entitled *Kazakhstan's Sale of the Century*, "Speed differentiates Kazakhstan's privatization more than anything. One company asked a consultancy to submit a proposal for a three-week legal and commercial investigation for a bid. Two days later the consultancy found that the company had already won the bid", *Financial Times* (London), 25th. October 1996 (quoted in Kalyuzhnova, 1998, 78).

The third stage coincided with a period of increased interest in oil exploitation, and sale of rights. Despite the Tengiz agreement with Chevron in the final years of the Soviet era and formation of the Agip-led OKIOC consortium in 1993 to exploit offshore Caspian oil, the involvement of foreign majors in exploration and exploitation was delayed by renegotiation of agreements and by opposition from the "oil barons" of western Kazakhstan. In 1996 Mobil purchased half of the state's original 50% share in Tengiz, to the dismay of Chevron. In August 1996 Hurricane Hydrocarbons of Canada bought into the Kumkol oilfield in central Kazakhstan. In the year starting in spring 1997 a series of oil and gas contracts were signed, as the government came to an accommodation with regional barons. The most important outcome was new injections into the OKIOC consortium to explore the potentially rich offshore fields.

In Kazakhstan the sales of 1995-7 were seen as disposing of state assets at give-away prices to well-connected people or foreigners. The October 1997 replacement of Kazhegeldin as Prime Minister was connected to his failure to realize enough revenue from the sales. However, the policy of case-by-case privatization continued under his successor, Balgymbaev, and Kazhegeldin's dismissal may have reflected intra-elite battles over the spoils. Groups associated with Kazhegeldin, notably Trans-World, fared less well after 1997.[10] Some privatization contracts were reassigned to groups associated with Balgymbaev or President Nazarbayev's family, although the most persistent rumours concerned large direct payments to top leaders during the Balgymbaev era.[11]

Outside the country, initial euphoria at making bargain purchases was quickly tempered by operational difficulties, hidden commitments and concern about the state's ability to recontract. After the Belgian energy group, Tractebel, acquired a 20-year management contract for Almatyenergo in 1996, it experienced difficulty in obtaining fuel and maintaining electricity supplies in the winter of 1996-7 (the nadir of Kazakhstan's transition), and never made a profit (Olcott, 2002, 164-5). After threats and counterthreats Tractebel finally pulled out in early 2000.[12] Hurricane's profits from the Kumkol oilfield were undermined by commitments to supply the Shymkent oil refinery at fixed prices and a number of social obligations whose magnitude the Canadian company failed to appreciate when entering into the deal in 1996 at an apparent bargain price of $120 million (in contrast to the much higher total value of the deal, $930 million, reported in Kalyuzhnova, 1998, Table 5.1). The July 1996 sale of the Shymkent oil refinery was initially to a Dutch company, Vitol, but in early 1997 Vitol backed out and a former subsidiary Kazvit took over the contract.

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[10] After Kazhegeldin's fall from power, one of the original Trans-World partners Aleksandr Mashkevich attempted to grab company assets, reportedly with President Nazarbayev as a silent partner (Olcott, 2002, 139-40)

[11] A suit filed in London in fall 1997 by international businessman Farhat Tabbah accused Balgymbaev, three US businessmen, and a subsidiary of Mobil of cheating him out of millions of dollars. Although the suit failed, it stimulated US investigations which led to a high-profile trial of one of the US businessmen (James Giffen, a former Adviser to President Nazarbayev) under the Foreign Corrupt Practices Act and to the conviction of a second of the US businessmen (Bryan Williams, a former Mobil executive) to 47 months in jail for failure to declare in his tax return monies received from Giffen. For lurid details see Seymour M. Hersh "The Price of Oil; What was Mobil up to in Kazakhstan and Russia?" *New Yorker*, 9th. July 2001, p. 48-65. The two high Kazakhstan officials implicated in the US cases are referred to only as KO1 and KO2, but it soon became widely known that they were Nazarbayev and Balgymbaev.

[12] In May 2000 a buyout was agreed which turned over Almatyenergo to Access Industries, a group headed by Len Blavatnik, a businessman with close ties to Nazarbayev.

Other high profile deals with reputable foreign companies fell through in opaque circumstances, such as a 1995 contract with Placer Dome of Canada to exploit the Vasilkovskoe gold mine or the Deutsche Telekom offer for 49% of Kaztelekom which fell through in January 1997.

A number of the deals involved corrupt practices. Cases before the US courts concern a series of payments by US oil companies during the period 1995-2000, which allegedly led to millions of dollars being paid through a US intermediary into offshore accounts of senior Kazakh officials. In 2003, a former Mobil executive was imprisoned for tax evasion related to monies he received in connection with the 1996 sale of a 25% share in the Tengiz oilfield to Mobil. ChevronTexaco officials are being questioned by the US Justice Department about Texaco's 1997 agreement to develop the Karachaganak field, and contracts involving Amoco and Phillips have also been cited in US judicial proceedings. In connection with its management contract for Almatyenergo, Tractebel reportedly paid $55 million through the Eurasian Bank, whose chairman Aleksandr Mashkevich was subsequently charged with money laundering and investigated for bribery by a Belgian judge. When the government finally sold its share of Vasilkovskoe, the country's most attractive goldmine, fees and signing bonuses were reported to be worth $35 million (Olcott, 2002, 167).

Despite the problems, Kazakhstan has been relatively successful among CIS countries in attracting foreign direct investment (FDI). Chevron began negotiating for the Tengiz oilfield in 1990, in what was the biggest FDI deal of the USSR's history, but otherwise FDI was sluggish in the first half of the 1990s. The sales of 1995-6, creation of a "one-stop" State Investment Committee in November 1996, and generally more inviting environment encouraged greater FDI, although it remained overwhelmingly in the energy and metals sectors. From 1996 to 2000 FDI exceeded one billion dollars a year and since 2001 it has exceeded two billion dollars (Table 1c), with over 85 percent going to natural resource activities.[13] In manufacturing some of the earliest investors have made further investments, eg. Philip Morris built a $340 million tobacco factory in 2000 and now controls eighty percent of Kazakhstan's tobacco market (Olcott, 2002, 145), but the amount of FDI in manufacturing is small.

The method of large-scale privatization and of allocation of oil and mineral rights undermined the institutional quality of the economy. More positively, the cumulative impact has been to diminish the state's hold on economic activity as the private sector's share of GDP rose from a mere 25% in 1995 to 40% in 1996, 55% in 1997, 60% in 1999 and 65% in 2002 (EBRD, 2003, 158), although whether the privatized enterprises are more efficient than state-owned enterprises remains an open question.[14] For the purposes of this paper, the question is whether the undermining of institutional quality and associated delay of political and economic reform will determine the consequences of the oilboom. First, let us examine the structure of the oil and minerals sectors in Kazakhstan and the inception of the energy boom.

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[13] Data from European Bank for Reconstruction and Development, *Transition Report 2003*; cumulative FDI 1989-2002 of $13,568 million or $938 per capita is the highest in the CIS, although less than FDI in Poland, Hungary and the Czech Republic.
[14] Kalyuzhnova et al. (2003), using industrial survey data from 1996-8, found no difference in efficiency, apart from within the subgroup of export-oriented firms where there was some evidence of privatized firms' superior efficiency.

(c) The Oil and Minerals Sectors

The oil sector in Kazakhstan suffered from several handicaps during the 1990s. The pre-existing pipelines were controlled by a Russian monopoly which discriminated against Kazakh oil. The ownership status of the principal oilfield, Tengiz was disputed and only resolved, together with some easing of the pipeline problems, when Russian shareholder participation was agreed. Prospecting for new reserves under the potentially oil-rich North Caspian was delayed by disagreements over delimitation of national territories and by domestic wrangles over selling exploration rights to foreign firms possessing the technology to explore the offshore fields. The turnaround in 2000 was highlighted by rising oil prices and discovery of the huge Kashagan offshore field. Although Kazakhstan only reached agreement with Russia in 2002 over delimitation of the Caspian Sea bed, oilfields explored in the late 1990s will come online in the first decade of the twenty-first century with huge potential production levels. The pipeline issue is also taking time to resolve, but since 2001 the situation is becoming more favourable to Kazakhstan.

The Tengiz field with recoverable reserves of 6-9 billion barrels is the largest active field in Kazakhstan. After the dissolution of the USSR, the government of Kazakhstan took over the state's share in the TengizChevron joint venture, but Russia claimed rights to part of the oil and also controlled the only existing pipeline about whose access no commitment had been made in the original agreement. The Russian state-owned pipeline company, Transneft, engaged in monopsonistic practices such as artificially high assessments of technical losses, arbitrary long route allocations, and other discriminatory pricing including absence of a quality bank which would recognize the higher quality of Tengiz oil; the net effect was that transit tariffs for Kazakhstan's crude were typically double those for Russian crude.[15] Operations at Tengiz were also dogged for most of the 1990s by disputes over ownership shares, as Mobil and LUKoil were brought into the joint venture.[16]

The Kumkol fields in central Kazakhstan suffered even more from high transport costs. Developed by Hurricane Hydrocarbons of Canada, which was renamed PetroKazakhstan in 2003, the Kumkol field produces over 7mmt per year, but its expansion has been constrained by transport costs of around $12/bbl.[17] The firm has been exporting oil by railcar to China and to the Trasneft Russian pipeline system, and in 2003 signed an agreement to sell 1mmt per year to Tehran in exchange for Iranian crude on the Gulf.

The opening in autumn 2001 of the first privately owned and commercially operated pipeline, the Caspian Pipeline Consortium (CPC), provided an alternative

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[15] IMF estimates from International Monetary Fund, "Cross-Border Issues in Energy Trade in the CIS Countries", *IMF Policy Discussion Paper PDP/02/13*, December 2002. See also International Monetary Fund (2003b).

[16] Chevron was reportedly unhappy at Mobil's buying into Tengiz, but in 1997 Chevron itself sold a 5% stake in the joint venture to LUKoil. Delays in the late 1990s and early 2000s in agreeing upon new investment were related to the increased number of principals and Chevron's wariness of its partners.

[17] The $12 calculation is reported in International Monetary Fund (2003b, 9), and also by Gaël Raballand (a World Bank economist) and Ferhad Esen (a petroleum economist in the research department of a French bank). Raballand and Esen estimate that the costs would have been reduced to $8 if PetroKazakhstan could have joined the CPC, but it was induced by the Kazakhstan government to sign on to construction of a 700 km link to the existing pipeline network which will reduce its transport costs to $9.5 per barrel.

route through Russia, which cut transport costs from Tengiz in half.[18] Other producers in Kazakhstan have also benefited from the CPC. In early 2003 a 450km pipeline was completed to link the Uzen (Aktobe) oilfield, operated by the Chinese National Petroleum Company, to the CPC. Aktobe's production was expected to rise to 6mmt by 2005, from around 2.5mmt in the late 1990s. The CPC's existence also led to reductions in the costs of using the Transneft pipeline, but doubts remain over whether the CPC pipeline will provide true competition in the long term or whether Russia will enforce monopsonistic practices.

With oil prices reaching $50 per barrel in 2004-5, alternative pipelines are becoming profitable and the Russian monopoly will end. The 1760km long Baku-Ceyhan pipeline is due to become operational in 2005 with an eventual capacity of one million barrels of oil per day. Initially it will mainly serve Azerbaijan, but as Kazakhstan's Caspian oil output increases it is expected that substantial amounts will be exported via the Turkish port of Ceyhan, especially if Azeri production begins to decline at the same time. Construction of a pipeline link to western China was begun in 2004. A pipeline to South Asia is under discussion, but clearly hostage to the security situation in Afghanistan and India-Pakistan relations. Even without the last route or the geographically obvious route through Iran, having pipeline options via Turkey and China as well as Russia will be enough to reduce Kazakhstan's oil export costs.

The largest gas and gas condensate field is Karachaganak in the northwest. Exports in the early 2000s went to Gazprom in Orenberg at well below Russian and even further below European market prices. As with the oil pipelines, however, the Russian company took a less aggressively monopsonistic position after 2001, and a 2002 agreement to create a joint venture with Gazprom led to more attractive prices for Kazakhstan's gas exports and access to western European markets.

Oil output and exports began to grow rapidly after 1999 (Table 2), and are set to expand substantially in the coming years.[19] A three-year $3 billion investment program in Tengiz was launched in 2003. Meanwhile, the even bigger offshore Caspian field of Kashagan, discovered in 2000 and estimated to contain 45 billion barrels of which 8-13 billion are recoverable with existing technologies should begin production in 2006. Other oil and gas fields are being actively explored and exploited by foreign companies. Unexplored areas of the north Caspian are expected to also contain large fields. The IMF is forecasting annual oil exports of 84 mmt earning $10 billion, and natural gas production of around 40 bcm by 2010 and, although government revenue from product sharing is always back-loaded, it could amount to around $165 billion over the next 45 years (IMF, 2003b, 15-16). Unless these

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[18] The CPC is half-owned by Russia (24%), Kazakhstan (19%) and Oman (7%), and the other half is divided among ChevronTexaco (15%), LUKoil (12.5%), ExxonMobil (7.5%), Rosneft/Shell (7.5%), Agip (2%), British Gas (2%), Kazakhstan Pipeline Ventures (1.75%) and Oryx Caspian Pipeline (1.75%). After the dissolution of the USSR, the CPC (then consisting of Transneft, Kazakhstan and Oman) was awarded the rights to transport oil from Tengiz to the Black Sea, but negotiations dragged on how much Chevron should pay towards construction. After Mobil bought 25% of Tengiz and LUKoil/Arco purchased 5%, the Tengiz partners together with other investors took a half-share in the CPC.

[19] To understand the heightened expectations since the late 1990s, see the survey by Ruseckas (1998), who in 1997 placed Kazakhstan's total proven oil reserves at 10 billion barrels and considered $18 per barrel as a reasonable, but perhaps optimistic, world price over the life of the reserves. Oil revenues to the state do not follow the time-path of export earnings, because state revenues include commercial delivery bonuses, which were very large in 2003 due to Kashagan (IMF, 2003a, 13)

forecasts turn out to be far above the mark, the coming decades will see a huge stimulus to the economy and potential for economic development..

(d) Agriculture and Economic Diversification

Although the energy sector has come to dominate Kazakhstan's economy in the early twenty-first century, this is a recent phenomenon. In the Soviet era the economy was initially pastoral and then diversified by mineral and industrial developments, and it also became a major grain producer after the Virgin Lands campaign to develop northern Kazakhstan's agriculture was initiated in the late 1950s. The agricultural sector is still a major part of the economy, employing over a third of the labour force, even though it accounts for less than ten percent of GDP. During the transitional recession of the 1990s, agriculture (and other non-oil sectors) suffered from poor policies, lack of a clear transition strategy and under-investment.

The farm sector was in deep crisis throughout the 1990s (Gray, 2000). Between 1992 and 1995 input prices were liberalized while important output prices remained controlled, leading to farm losses. Direction by local authorities led to farms concentrating on activities which they knew to be loss-making, while the continued extension of loans to loss-making farmers sunk them ever deeper into debt. Imposition of heavy penalties for tax arrears also distorted farmers' incentives to repay their creditors. Most farms became indebted and the problem was exacerbated by drought conditions in much of the country during the 1996-8 seasons. Reversal of the price squeeze began in 1999, when the government introduced a price support system for wheat and then extended it to other goods, and this led to a dramatic increase in the numbers employed in agriculture, from 1.3 million in 1999 to 2.4 million in 2001 (IMF, 2003b, 76). Price support is, however, an inefficient response, leading to accumulated grain stocks. Relative prices have been brought onto a more rational basis in the twenty-first century, but the legacy of the price policy errors of the early transition years remains in the debt overhang.

The 1995 Farm Reform established the principle of state ownership of land, with private use-rights under long-term (99-year) leases. The government adopted a fresh approach to restructuring in 1998, based on acceptance of the need for bankruptcies that would lead to changes in ownership and management. In 2003 the government announced several new agriculture initiatives, most of which reflected statist attempts to modernize infrastructure, relocate farmers and publicize output targets. The overall impression is that the government has still not resolved the issue of how the farm sector should be organized in the market-based economy.

The proximate problem facing the farm sector today is lack of investment to improve the infrastructure and permit quality upgrading. The capital-output ratio, labour productivity and total factor productivity all continued to decline in the second half of the 1990s and early 2000s, when productivity growth had become positive in other sectors.[20] Much of the farm produce is spoilt or has become overpriced before reaching its primary market. The fruit and vegetables and processed food products are often uncompetitive with imported goods because of poor storage, processing or packaging. The government earmarked one billion dollars for a three-year program

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[20] According to IMF (2003b, 23) estimates, TFP in agriculture declined by an annual average of 1.8% during the period 1996-2001, when TFP growth averaged 5.8% in industry, 9.5% in construction and 4.0% in services, and labour productivity fell by 8.2% per year in agriculture while it was increasing by more than TFP in the other sectors.

(2003-5) for restoration and development of the agriculture sector, which may help, but is unlikely to be sufficient even if it is well-used. In microcosm and with its own specific problems, the agricultural sector typifies the failure of the non-oil economy to adapt to and flourish in a market-based environment. The travails of the farm sector are not yet over, because Russia's imminent accession to the WTO will likely work against Kazakhstan's farmers who will face increased competition from non-CIS suppliers to the Russian market.

The industry policy being formulated in 2002-3 includes sector- and even firm-specific assistance to promote diversification and non-oil development (IMF, 2003a, 14; IMF, 2003b, 37-55). In May 2003 the government announced as priority areas sectors with linkages to the oil extraction sector, high value-added sectors (such as space, nuclear and information technology), and agriculture (EBRD, 2003). Three institutions will provide financial support to private sector development: the Development Bank, the Investment Fund and the Fund for Innovation. However, all are small. The efforts of the government to support non-oil sectors suggests a commitment to the idea, underlying Dutch disease arguments, that these activities have positive externalities lacking the in oil sector.

To date, however, there is little evidence of a resource curse working through a negative impact on non-resource sectors. Government intervention in agriculture during the oil boom years has had greater positive impact than any negative relative price effect from high oil prices or via the exchange rate. Indeed, the Kazakh tenge depreciated in real terms from 1999 to 2002 (IMF, 2003a, 11), ie. long after the crisis-induced recession of 1998-9. A stronger real-economy argument may be that relative-factor-price effects led to a lower return to investment in human capital, but this is difficult to observe; the transition from Communism had a much stronger negative effect on the value of human capital than any observed in the twenty-first century. Transmission of an oil curse through price volatility is also difficult to assess because so far Kazakhstan has only experienced the boom part of the cycle; in principle, the government is taking appropriate income-smoothing steps through the establishment of an oil fund, but the key question concerns the independence of the oil fund and its management during the bust phase of the cycle. There have been positive linkages to the construction sector and some tradables (IMF, 2003b, 19-36), but these are small.

3. Living Standards in Kazakhstan, 1996 and 2002: Before and during the Oil Boom

This section compares the determination of per capita household expenditure in Kazakhstan during the 1990s transition era with a year from the sustained growth period since 2000. Data availability in the 1990s was hampered by the poor quality of the inherited household budget surveys, and external researchers relied almost exclusively on the one-off 1996 LSMS survey.[21] In 2001 the National Statistical Agency revised the household budget survey using sampling techniques and questionnaires comparable to those of the LSMS, although the data are now collected continuously and reported quarterly and annually rather than for the two-week period of the 1996 survey. I use 2002 data to examine whether the principal determinants of household expenditures changed in importance between 1996 and 2002.

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[21] The 1996 survey was conducted under the aegis of the World Bank's Living Standards Measurement Study. Examples of use of the dataset are Anderson and Pomfret (2002; 2003), Rama and Scott (1999), and Verme (2001).

In all of the formerly centrally planned economies the transition to more market-based systems was accompanied by changes in the labour markets and in the determinants of household expenditure levels. The role of human capital variables, which are consistently significant determinants of earnings in established market economies, became more important. In Central Asia this pattern was accompanied during the 1990s by a large increase in the cost (in terms of lower per capita household expenditure) of large family size, especially the presence of children. Large regional differences in household expenditure, *ceteris paribus*, also indicated that national labour markets were not yet established in Central Asia. In Anderson and Pomfret (2002; 2003) these three sets of variables were consistently significant in various specifications, while other demographic characteristics such as the ethnicity, age, health or marital status of the head of the household were seldom statistically significant and had little explanatory power.

In the estimating equation the per capita expenditure of households is determined by the level of human capital, the number of household members, and the location of the household. The dependent variable is household expenditures per capita, based on a headcount of household members[22] and the reported expenditures on goods (excluding vehicles), food, health, education and other services, housing, utilities, communication, and transportation.[23] Because the log of expenditure more closely follows a normal distribution, we estimate semi-logarithmic regressions of the log of per capita expenditure on household characteristics.

To capture human capital, measures of the education level attained by the highest-educated household member are assumed to be indicative of the household's human capital.[24] Education is characterized by five levels: higher education (university and postgraduate), Tecnikum education, vocational or other technical training, completed secondary education, and incomplete secondary schooling.[25] In analysing the 1996 data Anderson and Pomfret used the last as the omitted education category, but with the 2002 data this led to generally insignificant coefficients. The reason for this anomaly appears to be the presence of a few households reporting no education but having high expenditure levels; 28 of the households reporting nobody

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[22] Anderson and Pomfret (2002) test the sensitivity of the results to this assumption (ie. assigning equal expenditure weight to all children and adults in the household) by estimating the model with an alternative dependent variable in which children, women and the elderly are assigned lower expenditure weights than prime working age adult men. The results do not change in any significant way. The numerical results might also be sensitive to the implicit assumption of no scale economies in the provision of household services; adjusting for economies of size with a scaling such as $E^* = E/n^{\theta}$, where E is household expenditure and n is family size, would soften the main conclusion about household size. Given that small households typically consist of adults, the equivalence scale implicitly makes some allowance for scale economies, but beyond that it is uncertain which equivalence scale would be appropriate. Some studies of transition economies find that the qualitative results are not sensitive to assumptions about size economies, eg. Jovanovic (2001) reports that varying θ within a plausible range did not alter his results for Russia in any significant way.

[23] Expenditure is preferred to income because the arrears problem in former Soviet republics during the 1990s meant that income often came in lumps so that many households reported zero income during the two-week survey period. We also expect under-reporting to avoid tax or other impositions to be less prevalent for expenditure. Non-purchased items, such as food grown on household plots, are valued and included in expenditure.

[24] In analysing the 1996 situation Anderson and Pomfret found no significant difference between using education variables based on the head of household's education and using the highest-educated person. For 2002 I prefer to use highest-educated because, rather than following a consistent definition, the surveyors appear to have treated the person who answered the questionnaire as the head of household.

[25] The distinction between Tecnikum and other vocational training relates to the skill level.

with completed secondary education had income levels around 600,000 tenge, ie. over six standard deviations above the sample mean. For this reason we report regression results using completed secondary education as the control and omitting the 9.4 percent of households in the lowest education group; the results for the other variables are almost identical to the results when the entire sample is used.

Location of the household is measured by five region-specific dummy variables. The Central region contains Akmola and Karaganda oblasts and Astana City. The South is Jambyl, Kyzylorda and South Kazakhstan oblasts. The West consists of Aktobe, Atyrau, West Kazakhstan and Mangystau oblasts, where most of the country's oil-production is located. The North is Kostenay, Pavlodar and North Kazakhstan oblasts. The East is East Kazakhstan and Almaty oblasts, but not Almaty city. The omitted category for regional location is the largest city, Almaty.

Household composition is measured by three variables describing the number of children under the age of 18, the number of elderly, and the number of non-elderly adults in the household.[26]

Summary statistics for the two years are reported in Table 3. The aggregate level of household expenditures is not of interest in the present context because we are trying to understand the determinants of relative living standards. In the education categories the major change has been the fall in the portion reporting vocational-technical education. This is consistent with other evidence from Central Asia and elsewhere that during the 1990s much of the specialized lower-level technical training from the Soviet era had no market value in the transition economy. People ceased taking such courses, and in some cases may no longer have claimed this type of training as an education. The drop in the vocational-technical category is largely matched by an increase in the number reporting completed secretary as their highest level of education. The proportion of households without anybody who completed secondary education is higher in 2002 than in 1996, although as explained above there appear to be some anomalous entries in this category.[27]

The main change in location is an increase in the proportion of households from the oil-producing western region and a decline in the proportion in the Centre and North. The Centre and the North are the main wheat-producing areas of the country and also specialize in metallurgy and heavy industry such as steel and coalmines, all sectors which have declined in relative importance. These regions were also the home for many of the Slav and German residents of Kazakhstan who emigrated after the dissolution of the USSR. The South is the poorest part of Kazakhstan, growing cotton and producing intermediate manufactured goods, and has the highest birthrate.

The number of people per household increased slightly from 3.59 to 3.69. The change was due to an increase in working age adults per household and a smaller increase in the elderly, partially offset by a smaller number of children. This reflects the demographic patterns of the 1990s when the birthrate fell and the death-rate rose.[28]

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[26] For 2002 "elderly" is defined as aged 60 or over. For 1996 Anderson and Pomfret (2002) defined a person as elderly if he or she was eligible for a state pension, ie. at age 60 for a man and age 55 for a woman.

[27] The average per capita expenditure level for households in the lowest education category is over 114,000 tenge, which is above the sample average and higher than for any other education category apart from those with university degrees.

[28] It also might be influenced by emigration patterns, as a disproportionate number of elderly were among the Germans and Slavs who left Kazakhstan during the 1990s.

The regression results are reported in table 4. The three groups of variables which dominated in 1996 remain statistically significant but the magnitude of the coefficients changes considerably in 2002. Family size continues to be negatively related to household living standards, but the magnitudes are much smaller in 2002 and there is little distinction between the age groups. Whereas in 1996 having an extra child was the largest cost in terms of lower per capita household expenditure and an elderly person brought the next highest cost, the impact of these two age groups in 2002 differs little from that of an additional working-age adult.

Education remains important. In 2002 having a university or Tecnikum educated person in the household is associated with 6-7% higher per capita household expenditures, *ceteris paribus*, than having nobody educated beyond completed secondary education. The changes in the magnitudes of the effect of different levels of human capital between 1996 and 2002 are difficult to assess because there is a difference in definition (household head in 1996 versus highest-educated person in 2002) and in control group between the first and last columns of Table 4.[29] Nevertheless, it does appear that the returns to greater skill and education levels were lower in 2002, which is surprising.

The location variable shows the most striking differences between 1996 and 2002. In 1996 a household located in the North had on average a 30% higher living standard than a similar household in Almaty and a household located in the South had a 45% lower living standard than one in Almaty *ceteris paribus*, while the other regions were not significantly different from Almaty. In 2002 households in all locations outside Almaty had significantly lower living standards than otherwise similar households in Almaty. The difference is still most pronounced, negatively, in the South, but the situation of households in the North and East is significantly worse than Almaty in 2002 whereas they were better off than Almaty households in 1996. The improved position of the Central region (relative to all other regions except Almaty) may have been due to moving the capital to Astana, located in the Centre, and the substantial public construction associated with that decision. The most surprising aspect of the location results is that in 2002, in the midst of an oil boom, location in the oil-producing western region is not associated with higher living standards.

Table 5 reports similar regression results for 2002 run by region. The explanatory power is surprisingly low, and there is little to be gleaned from these results. One striking difference across regions, however, is the significance of the higher education variables in the oil-producing west. The share in national population of this region increased between 1996 and 2002, and Table 5 suggests that this may have been in response to higher rewards for skilled labour. In contrast, the regional regression for Almaty city reveals no statistically significant relationships between human capital variables and household living standards.

In ongoing research (with Boris Najman), we are using the 2002 household survey data to distinguish between channels for distribution of the oilboom benefits. Initial results suggest that little happens through higher wages in oil-producing districts or through social transfers, but that "informal" earnings (captured by households having much higher expenditures than incomes) are significantly more important in the oil districts than in the country as a whole. Informal earnings are,

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[29] In regressions using the entire sample and having incomplete secondary education as the control, the coefficients on all education levels apart from university did not differ from zero at the five percent significance level.

however, even more prevalent for households in Astana, the new national capital, and to a lesser extent in Almaty, the financial capital.

4. Conclusions

Whether resource abundance is a curse or a blessing depends upon the nature of the resource and on variables reflecting institutions and governance. Of all resources, oil appears to produce the most extreme outcomes, from Nigeria to Norway. Kazakhstan is interesting because the scale of the future oil boom was scarcely anticipated during the 1990s and because key institutions remain in embryonic and malleable form.

The evidence marshalled in this case study is preliminary, as the story is still unfolding. There is little evidence of Dutch disease or volatility transmission mechanism producing a "curse" outcome, but political and institutional developments during the decade after independence created a situation where political economy mechanisms could turn oil wealth into a curse. The abundance of oil contributed to the culture of rent-seeking and to distortion of governance during the transition from central planning to a market-based economy in the 1990s. When the oilboom began at the turn of the century, the benefits went to well-placed people in the political and financial centres rather than being distributed evenly across the country or accruing to people working in the oil-producing regions. The household survey evidence reported in this paper provides some support for this interpretation insofar as the benefits from the post-2000 oilboom have not resulted in higher living standards in the oil-producing regions, but have been associated with higher living standards in the capital city and in the metropolitan centre where the country's elite lives.

This is, of course, a short-term view of an evolving process. Despite the concentration of political power in the presidency, there is an active opposition and Kazakhstan's political future is far from clear. The March 2005 revolution in neighbouring Kyrgyzstan indicated the potential in Central Asia for popular discontent with a corrupt system to gather force with unforeseen speed.[30] Where oil wealth has produced corrupt dictatorships, the outcome has often been political unpredictability. In Kazakhstan the early stage of the oilboom means that the jury still has a long wait before determining whether oil will be a blessing or a curse.

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[30] The Kyrgyz President, who is related to President Nazarbayev by marriage, was like his Kazakh counterpart appointed by Mikhail Gorbachev as First Secretary of the Soviet republic and then transformed to president of the successor state. Both created super-presidential systems, winning elections which were generally viewed as unfair, while downgrading the authority of parliament. Both were seen as presiding over corrupt regimes, in which their children were especially seen to benefit. The transition from Soviet-style leadership in Georgia in 2003 and in Ukraine in 2003 provided.a more attractive model for the opposition than the hand-picked succession in Russia or the hereditary succession in Azerbaijan.

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Table 1: Macroeconomic Data

(a) Output Growth and Inflation (per cent)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2002; 1989=100
Growth in Real GDP	-11	-5	-9	-13	-8	1	2	-2	3	10	14	10	9	86
Inflation	79	1,381	1,662	1,892	176	39	17	7	8	13	8	6	6	

Source: EBRD (2003, 56 and 58).
Notes: 2002 = preliminary actual figures from official government sources. 2003 = EBRD estimates.

(b) Exports and Imports (million US dollars)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Exports	1,107	3,227	5,256	5,926	6,497	5,511	5,598	9,876	9,085	9,670	14,875
Imports	1,704	3,285	3,807	4,247	4,302	4,373	3,686	5,048	6,478	6,584	9,377

Source: International Monetary Fund *Direction of Trade Statistics*.

(c) Foreign Direct Investment (million US dollars)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
FDI	100	473	635	964	1,137	1,320	1,143	1,584	1,278	2,796	2,138	2,500

Source: EBRD (2003, 65).

Table 2: Oil and Gas Output and Exports, 1998-2002

	1998	1999	2000	2001	2002
Oil production (mmt)	25.6	29.4	35.4	39.3	47.3
Oil exports (mmt)	20.4	23.7	29.4	31.7	39.5
Oil exports ($m.)	1,650	2,164	4,429	4,463	5,157
World oil price ($/bbl)	13.1	18.0	28.2	24.3	24.9
Natural gas production (bcm)	7.9	9.9	11.5	11.6	13.1

Source: International Monetary Fund (2003b, p.8 (oil) and p.72 (gas)).
Note: the source projects oil production in 2010 of 96.7 mmt and natural gas production of 39.3 bcm.

Table 3: Household Surveys: Summary Statistics

Variables	Kazakhstan (1996)	Kazakhstan (2002)
Per capita expenditure:	4963.76	112,524.3
	(3515.27)	(75,999.73)
Education of Most Highly Educated:		
University (%)	26.8	24.9
Tecnikum (%)	33.1	32.9
Vocational-technical (%)	26.6	12.9
Completed secondary (%)	7.8	19.9
Incomplete secondary (%)	5.7	9.4
Location of household:		
Central (%)	20.7	19.5
South (%)	18.1	18.8
West (%)	8.5	12.5
North (%)	22.3	19.5
East (%)	21.0	21.0
Almaty city (%)	9.4	8.8
Household composition:		
Number of children	1.263	1.167
	(1.228)	(1.244)
Number of elderly	0.414	0.460
	(0.676)	(0.685)
Number of non-elderly adults	1.914	2.060
	(1.119)	(1.386)
Sample size (households)	1,890	12,000

Notes: Standard deviations of continuous variables are in parentheses. Expenditures are in national currency units (tenge); note that the two surveys' observation periods differ so that the nominal tenge values are not comparable even apart from problems of measuring inflation.

Table 4. Household Expenditure Model: Kazakhstan, 1996 and 2002**.**

Variables	1996		2002	
	Coefficient	t-statistic	Coefficient	t-statistic
Intercept	8.542*	89.60	12.19*	488.62
Education:				
University	0.272*	5.62	0.069*	4.53
Tecnikum	0.167*	3.63	0.057*	3.97
Vocational-technical training	0.114*	2.56	0.020*	1.13
Completed secondary	-.001	-0.02	--	--
Location of household:				
Central	-0.036	-0.70	-0.527*	-23.43
South	-0.447*	-8.38	-0.971*	-42.16
West	0.089	1.43	-0.626*	-25.92
North	0.295*	5.67	-0.720*	-31.72
East (not Almaty city)	0.038	0.74	-0.742*	-33.02
Household composition:				
Number of children	-0.174*	-14.04	-0.023*	-5.02
Number of elderly	-0.116*	-3.82	-0.017*	-1.97
Number of non-elderly adults	-0.058*	-4.18	-0.012*	-2.87
R-square	0.30		0.17	
F-statistic	47.14*		223.44	
Sample size	1,890		10,716	

An asterisk indicates significant at the 5% level.

Table 5. Household Expenditure Model by Region: Kazakhstan, 2002**.**

	Central	North	South	East	Wesr	Almaty City
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Intercept	11.55*	11.40*	11.12*	11.43*	11.59*	12.09*
Education:						
University	0.211*	0.083*	0.009	-0.051	0. 134*	0.086
Tecnikum	0.121*	0.095*	-0.001	-0.009	0.141*	0.031
Vocational-technical training	0.051	0.047	-0.017	0.019	0.025	0.099
Household composition:						
Number of children	-0.040*	-0.027*	0.002	-0.031*	-0.043*	0.024
Number of elderly	-0.036	-0.037	0.000	0.024	-0.042	-0.030
Number of non-elderly adults	-0.018	-0.010	-0.001	-0.013	-0.054*	-0.004
R-square	0.03	0.00	0.00	0.01	0.05	0.01
F-statistic	10.17	2.90	0.09	3.64	12.22	1.40
Sample size	2,111	2,009	2,143	2,224	1,407	822

An asterisk indicates significant at the 5% level.