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Education and Social Policy in Central Asia: The Next Stage of the Transition

Kathryn H. Anderson and Stephen P. Heyneman

Abstract

This paper discusses the challenges facing the education system of Central Asia and evaluates how these have been addressed in the market economy. We first review the evidence on the economic return to education and determine how the rewards to different levels of education changed during the transition. We then examine the trends in school enrolment and evaluate whether changes in supply or demand explain the enrolment trends we observe. Finally, we evaluate the efficiency of the delivery of education and whether market forces have improved the management of schools. We conclude with a summary of the economic and policy lessons derived thus far from the educational transition. The paper uses aggregate administrative data supplemented with survey data, primarily from the Kyrgyz Republic and Kazakhstan, on enrolment, completion, and expenditures.

Keywords

Education; Social policy; Market forces; Central Asia

Introduction

The five Central Asian nations were more isolated and impoverished than many of the other 15 republics in the former Soviet Union, but in 1990 educational opportunity was parallel. There was full attendance in elementary and secondary education. As defined by UNESCO,¹ adult literacy was universal. Post-secondary female enrolment was greater than 50 per cent (Heyneman 1998: 26).

The emergence of the five Central Asia nations as free and independent countries led to challenges of many kinds. Among the most underestimated were the challenges of reforming education. Education had suddenly to meet the new demands of ethnic nationalism, a globally competitive economy, and a labour market freed from administrative control. While education in Central Asia had once been effective and, with respect to science and mathematics, excellent, it had acquired this reputation in a highly constrained

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economic and political Soviet environment. As was true with health, social security, unemployment, agriculture and environmental policy, once that environment shifted, education in Central Asia had to adjust. What have been these adjustments in education policy? Where do the countries of Central Asia lie with respect to reforms in other parts of the former Soviet Union?

From the beginning of the transition, the education adjustments required were fairly clear. Elementary education had to learn to reinforce social stability in an environment where historical origins of ethnic nationalism required legitimacy, yet tolerance. The family's freedom to choose educational philosophy and to invest in the educational process had to be balanced with new pressures on social equality. Curriculum content had to adjust to new subjects and to new teaching and learning emphases driven by pedagogical theories previously considered threatening.² New textbooks and materials needed to be authored. The state had to adjust to modern methods of competitive procurement from private providers. Examinations had to be modernized so that the public could monitor the quality of the system over time, and so that candidates for post-secondary educational institutions could be treated fairly and efficiently. Overly specialized teacher licensing standards which reinforced inefficient pupil/teacher ratios had to be reformed to accommodate newly certified, flexible teachers. Languages of instruction had to be changed, and in certain cases (Uzbekistan and Turkmenistan) both the language and the script had to change, requiring all new materials and a completely retrained professional cadre. Vocational education had to be shifted away from state-owned industries (which could no longer afford them) to Ministry of Education control; the vocational curriculum had to be based on labour market demand and to incorporate evidence of that demand from labour market studies of wages and salaries rather than the techniques of manpower forecasting (Heyneman 1995, 1997a, 1998, 2000).

The challenges in higher education were similarly profound and might be divided into four basic categories (Heyneman 1995). First were the *structural changes*. Under the former Soviet Union higher education was treated as vocational in purpose. Fewer than 10 per cent of the higher education institutions were universities with full curricular offerings. Some 90 per cent of the institutions were situated within the sectoral ministries of agriculture, industry, health and the like. No industrialized democracy with a free labour market organizes higher education within sector ministries. Universities have to be able to shift disciplinary priorities in response to labour market demand, and these include priorities across the sectors. Thus the first challenge has been for countries in Central Asia to shift ministerial ownership of their universities away from sectoral ministries to the Ministry of Education, where they can respond to demand flexibly.

A second challenge was *governance*. Higher education institutions within the Soviet Union were tightly controlled. Budgets were approved by central authorities; resources could not be transferred across budget categories. There were no incentives to be efficient since savings were all returned to the central ministry. Salary scales were uniform across disciplines; there were no incentives to improve performance or to attract faculty from competitive professions. Research was segregated from teaching, and hence teaching was

uninformed by new research experience. There was a prohibition against private education. The mechanisms for promotion were in the hands of full professors and hence were highly personalized and intellectually biased.

The third challenge concerned *the nature of what was taught*. Religion, sociology, economics, political science, journalism and business management were either unknown, tolerated but with suspicion, or treated as political heresy. The last challenge had to do with *finance, property and taxation*. Under the Soviet Union, the sources of higher education finance were solely from the state. However, with the decline in expenditures, universities needed to seek their own sources of finance. They also had to solve two unique post-Soviet problems: the lack of clarity as to the ownership of their property and the ambiguity and inconsistency by which they were treated by tax authorities. All of these challenges were clear in 1990.

In the remaining sections of this paper we evaluate how these changes and challenges to the education system of Central Asia were addressed in the market economy. We first review the evidence on the economic return to education and determine how the rewards to different levels of education changed during the transition. We then examine the trends in school enrolment and evaluate whether changes in supply or demand explain the enrolment trends we observe. Finally, we evaluate the efficiency of the delivery of education and whether market forces have improved the management of schools. We conclude with a summary of the economic and policy lessons derived thus far from the educational transition.

Returns to Education

As discussed by Falkingham (this volume), independence in the Central Asian economies brought a 5–10 year period of economic instability. Recently, growth has been positive in all five countries, but relative real GDP has only reached the 1989 level in Uzbekistan. From the most recent data, performance in Kyrgyzstan and Tajikistan significantly lags behind economic performance in Kazakhstan and Uzbekistan. The picture of regional development suggests widening cross-country inequality in economic development. The fall in output has also been accompanied by widening inequality within countries (see Falkingham, this volume), suggesting that an increasing number of households in the country are relatively poor and not benefiting from economic recovery. These economic changes along with changes in education policy over the 1990s and into the twenty-first century affected public and private investment decisions and the payoff to education investment. In this section, we examine how the return to education changed over the transition decade.³

Anderson and Pomfret (2002, 2003) estimated the private rate of return to education in four of the five countries of Central Asia using survey data on household expenditures to approximate household income and on the wages of adult workers in the formal sector of the labour market.⁴ For Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan, they calculated the returns from models of per capita household expenditures; for the Kyrgyz Republic, they also estimated returns for men and women from models of market

Table 1
Returns to education, 1993–1999

Country, year	Completed secondary	Vocational/technical	Tecnikum	College graduate
<i>Expenditures</i>				
Kazakhstan, 1999	0.006	0.122*	0.165*	0.268*
Kyrgyz Republic, 1997	-0.063	-0.060	0.074	0.215*
Tajikistan, 1999	0.026	0.097*	0.263*	0.329*
Uzbekistan, 1999	0.115	-0.050	0.351*	0.430*
<i>Wages</i>				
Men: Kyrgyz Republic, 1993	0.065	0.072	---	0.187*
Women: Kyrgyz Republic, 1993	-0.029	0.161	---	0.208*
Men: Kyrgyz Republic, 1997	0.017	-0.019	---	0.201*
Women: Kyrgyz Republic, 1997	0.095	0.030	---	0.174*

Source: Anderson and Pomfret (2002, 2003).

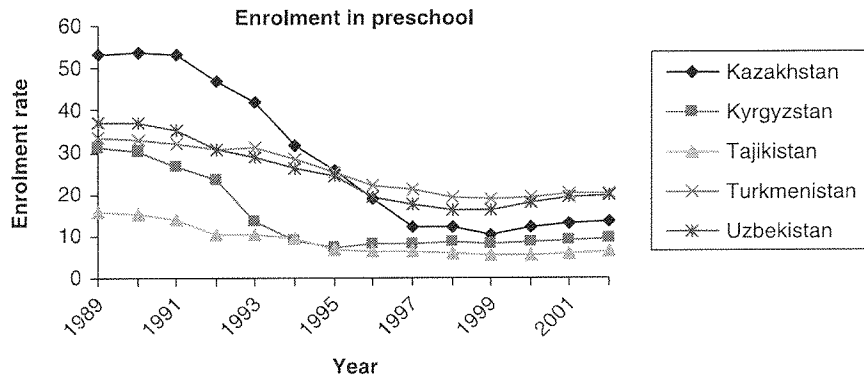
monthly wages.⁵ The returns estimated from earnings functions assume that the opportunity cost of education is the only cost of schooling. This assumption is credible when there are no tuition charges, fees, or costs of textbooks and supplies, as in the pre-independence period. However, over time, the direct costs of education have become increasingly important. The return estimates for the post-independence period are upward biased because these costs are not taken into account. Given this caveat, the estimates in table 1 give some information on which types of schooling were most valued in the labour market of the 1990s. These returns are all relative to the earnings of persons with only incomplete secondary or primary education.

In all countries and years, completing secondary education did not produce higher expenditures or monthly earnings over incomplete secondary or primary education. Vocational/technical education increased expenditures in Kazakhstan (1996) and Tajikistan (1999) but had no impact on expenditures or wages in the Kyrgyz Republic or Uzbekistan. Skilled, general education did yield significant expenditure and wage returns in each country. Per capita expenditures were 17–35 per cent higher when the household head had completed Tecnikum (specialized technical post-secondary school) education and 22–43 per cent higher when the head was a university graduate, both in comparison to incomplete secondary education. The annual return to college education was 4–8 per cent. In the Kyrgyz Republic, only higher education paid off in higher wages, and the returns were similar for men and women in 1993 and 1997. In comparison to incomplete secondary or primary schooling, wages were 17–21 per cent higher if the worker had a college degree. This represented a return to each year of higher education of 3–4 per cent.

The pattern of returns over time is explained by the changes in the labour market after independence. Many state enterprises could not operate at the same production level when they had to compete in the open market.

Figure 1

Trends in preschool enrolment, 1989–2002



Source: UNICEF-IRC, TransMonec, 2004.

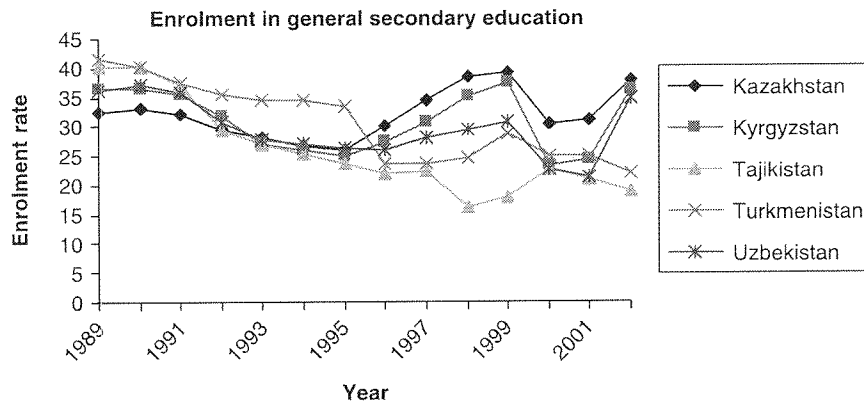
Vocational training was in less demand in these firms, and the return to vocational training collapsed. However, as state firms were replaced with private firms, market competition rewarded those workers who had general entrepreneurial and analytical skills. In addition, because knowledge of how to operate in a competitive economy was low in general, workers who acquired this knowledge were in demand. Persons with higher education were rewarded with higher wages, and returns to these education investments were positive. The pattern of returns to different levels of education in the region is also consistent with changes in school enrolment rates. The enrolment trends are summarized in the next section.

Education Enrolment, 1990–2001

Enrolment in school was affected by economic change and education policy. In figure 1 we present data on enrolment in preschool. For all countries, preschool enrolment dropped significantly from 1992 to 1997 and stabilized at this low rate. The largest change was in Kazakhstan where the rate dropped from 53 per cent in 1991 to 12 per cent in 1997, and there has been no increase in preschool enrolment in recent years. The same enrolment pattern is found in the other four countries. Official statistics indicate that girls were disproportionately withdrawn from preschool relative to boys, especially in Tajikistan (Silova and Magno 2004). Preschool education was provided primarily by industry under the Soviet Union. After independence, many state-owned enterprises were privatized, and most of them closed their preschool facilities. Preschool became more expensive and less convenient to parents; enrolment declined because of the decline in supply and the increase in cost.

Figure 2

Trends in general secondary enrolment, 1989–2002



Source: UNICEF-IRC, TransMonce, 2004.

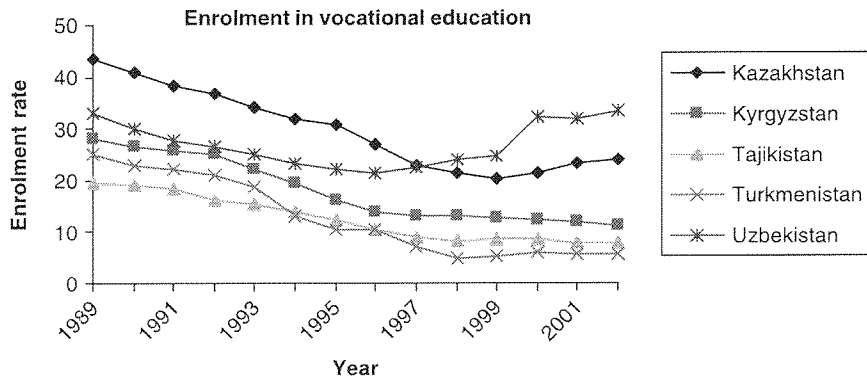
Education is mandatory through grade 8 or 9, and enrolment in basic education is high in each country. Official statistics indicate a decline in basic enrolment in Tajikistan and Turkmenistan but an increase in enrolment in the other countries. Changes in basic enrolment occurred equally for boys and girls (Silova and Magno 2004). At the upper secondary level, however, a significant drop in enrolment is indicated in official statistics. Girls disproportionately withdrew from secondary school relative to boys in Tajikistan and Uzbekistan. In the other countries, the enrolment of girls was equal to or greater than that of boys (Silova and Magno 2004).

Upper secondary education is in the form of general secondary or vocational/technical training. Overall enrolment in post-compulsory education fell from 63–74 per cent in 1990 to 30–55 per cent in 2001 and there were declines in both general secondary and vocational education. Figure 2 presents data on enrolment in general secondary education. In 1990, before independence, enrolment at the general secondary level ranged from a low of 33 per cent in Kazakhstan to a high of 40 per cent in Tajikistan and Turkmenistan. Enrolment declined sharply in all countries following independence, bottomed out by 1996 in all countries except Tajikistan, and peaked in 1999. After 1999 there was another sharp decline in general secondary enrolment, with Kazakhstan reporting 31 per cent and the other countries reporting 21–24 per cent. Only in Kazakhstan was the general secondary enrolment rate in 2001 comparable to the pre-independence rate; in all other countries it was significantly lower.

Figure 3 presents the enrolment pattern for vocational education. Enrolment dropped dramatically in all countries after independence. The decline continued through 1997. Enrolment increased slightly in 2001 in Kazakhstan,

Figure 3

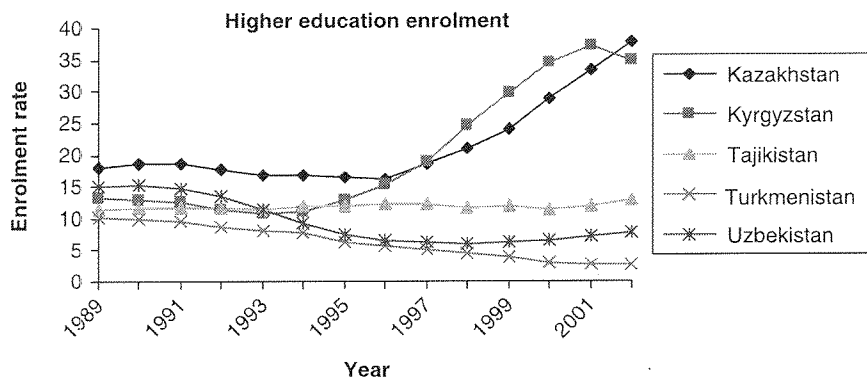
Trends in enrolment in vocational education, 1989–2002



Source: UNICEF-IRC, TransMonce, 2004.

Figure 4

Trends in enrolment in higher education, 1989–2002



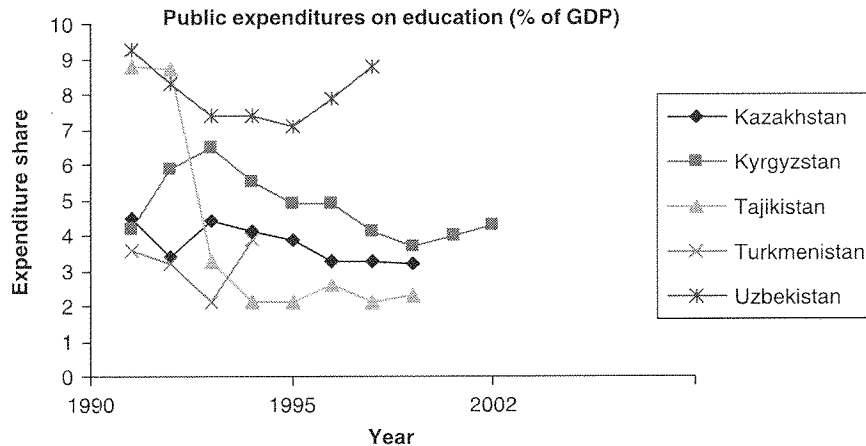
Source: UNICEF-IRC, TransMonce, 2004.

but the rate remained significantly below the 1991 level. No other country has recorded a recent increase in vocational enrolment.

Finally, figure 4 presents data on higher education enrolment. Enrolment initially declined in all countries except Tajikistan. In Kazakhstan and the Kyrgyz Republic, this trend was reversed, and since 1995 both countries have reported dramatic increases in higher education enrolment. There has been no change in enrolment in Tajikistan over time, and enrolment in Uzbekistan

Figure 5

Public expenditure on education (percentage of GDP)



Source: International Monetary Fund, Recent Economic Developments, various years.

increased slightly in 2000. In Kyrgyzstan and Kazakhstan, girls enrol in higher education at a significantly higher rate than boys; in Tajikistan the enrolment of boys exceeds the enrolment of girls. There are no data on enrolment by gender for Uzbekistan and Turkmenistan (Silova and Magno 2004).

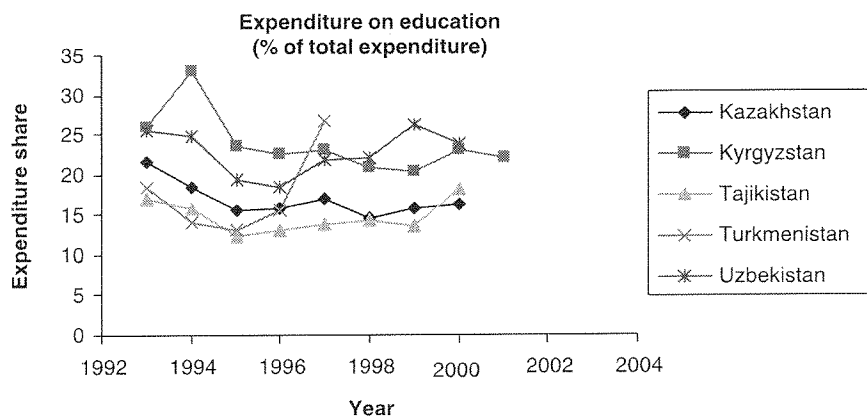
Supply of Schools

The changes in enrolment described above are associated with both demand and supply factors. On the supply side, enrolment is correlated with the change in public expenditure on education, availability of institutions at the preschool level, for Kazakhstan availability at the secondary school level, and availability at the higher education level. Figure 5 presents data on public expenditures on education as a percentage of GDP and illustrates the recent decline in public commitment to education. In the Kyrgyz Republic, expenditure dropped from 6 to 4 per cent of GDP between 1995 and 2002. In Kazakhstan, expenditure dropped slightly after 1997. Turkmenistan and Uzbekistan show a U-shaped expenditure profile over time: falling expenditure until 1996–7 and rising thereafter. Tajikistan recorded little change over the period after 1994 but had the lowest public commitment to education at about 2 per cent of GDP. In contrast, expenditures on defence rose over the period in most countries (see the Appendix). A similar picture is seen from data on expenditures on education relative to total government expenditures in figure 6.

The decline in public expenditure on education led to a reallocation of resources within the education budget of local and republican governments.

Figure 6

Public expenditure on education (percentage of total expenditure)



Source: International Monetary Fund, Recent Economic Developments, various issues.

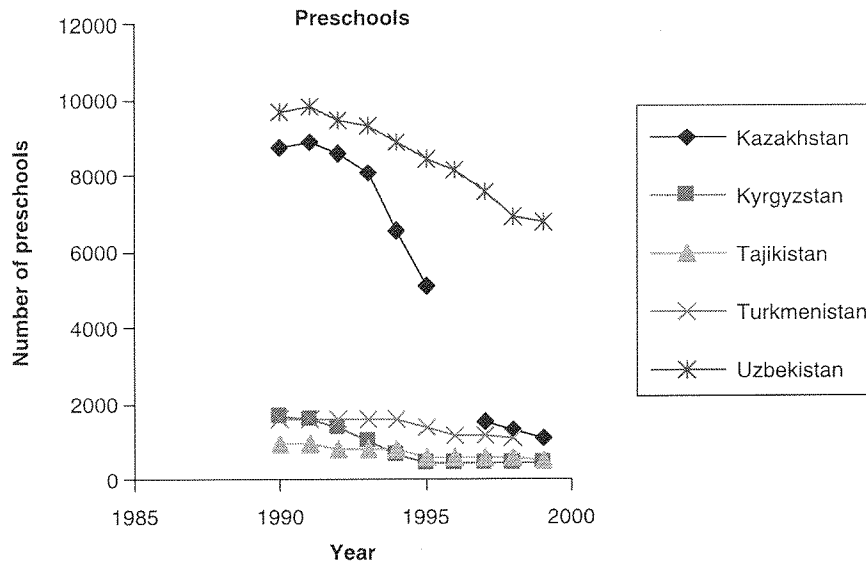
In Kazakhstan, over 60 per cent of the budget was allocated to teacher salaries and utilities in 2000. Only 1 per cent was allocated to equipment and furnishings and 1 per cent to repairs and rehabilitation. School construction stopped, and space availability became a problem, particularly in urban centres. One-third of schools dealt with overcrowding by offering two or three shifts per day (World Bank 2000). In the Kyrgyz Republic, only 10 per cent of primary schools had a single shift; 19 per cent of urban schools operated triple shifts (World Bank 2004).

Education resources were also reallocated among different types of education. In Kazakhstan, the share of public expenditure on primary and secondary education increased from 44.7 per cent in 1994 to 62.3 per cent in 1998. The share spent on higher education also increased, but the change was more modest—from 11.2 per cent in 1994 to 14.4 per cent in 1998. These increases were at the expense of other levels of education. Preschool funding declined from 11.7 to 5.7 per cent; vocational school funding decreased from 16.6 to 9.3 per cent; funding for education at other institutions declined from 11.6 to 4.1 per cent. These changes were consistent with rate of return estimates suggesting higher payoff to general training and no return to vocational or technical training (World Bank 2000).

Education expenditures were reallocated from the republican budget to the local budget.⁶ By 1999, in Kazakhstan, all expenditure on preschool and vocational education was determined at the local level, and over 90 per cent of expenditure on primary and secondary education was managed locally. The share of local government expenditures in total public expenditures on education increased from 66 per cent in 1990 to 89 per cent in 1999 (World Bank 2000). In the Kyrgyz Republic, education accounted for almost half of

Figure 7

Supply of preschools



Source: Statistical Yearbook of the Commonwealth of Independent States.

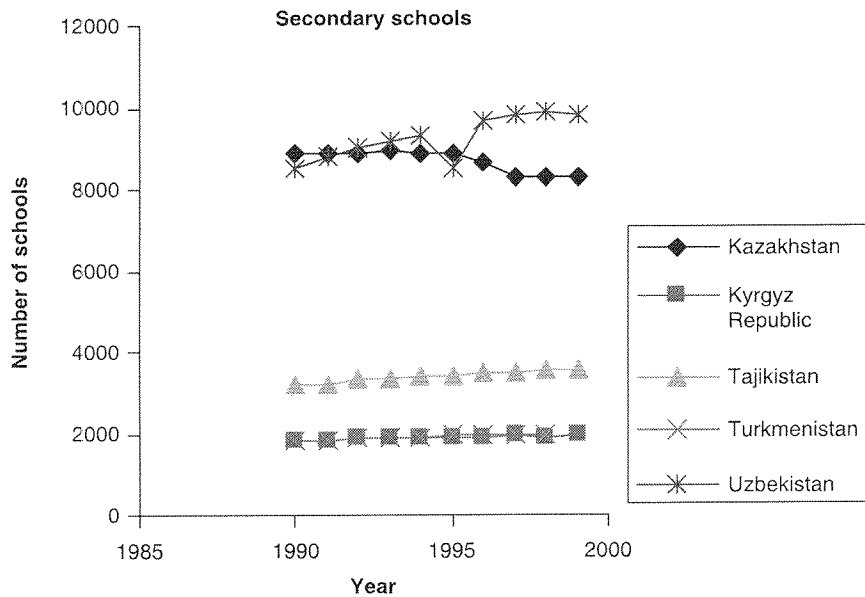
the local budget in 1999 and 2000 (World Bank 2004). In comparison, the percentage of education policy decisions made at the local level is 4 in the UK, 17 in Germany, and 29 in Hungary (OECD 2004).

The change in administration of education from the central government to the local government was the result of a change in policy towards decentralization of education financing. However, local expenditures depend on revenues transferred from the central government. Local government revenue is primarily distributed from republican government tax revenue; a small share of local revenue is generated from local sources such as fees and fines. Conditional grants for education, based on population size, are provided by the republican government to the local governments. This lack of “financial autonomy” at the local level impedes the successful administration of local services, including education. Since 1992 the share of government revenue going to the central government relative to local governments increased, while the management of local services such as education was transferred from the central government to the local areas (Meurs 2004).

Figures 7, 8, and 9 present data on the number of institutions at the preschool, comprehensive secondary, and higher education levels. The decline in preschools is the most dramatic. In Kazakhstan, the number of preschools fell by 88 per cent from 8,881 in 1991 to 1,102 in 1999; this was the largest

Figure 8

Supply of secondary schools



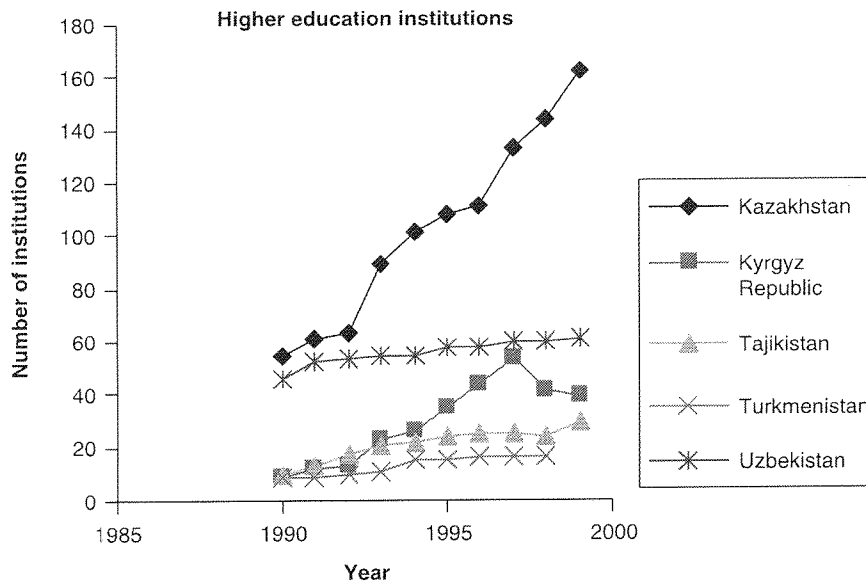
Source: Statistical Yearbook of the Commonwealth of Independent States.

change reported in the region. The decline in preschool availability was 75 per cent in the Kyrgyz Republic, 44 per cent in Tajikistan, 37 per cent in Turkmenistan, and 33 per cent in Uzbekistan. Preschools in state-owned enterprises were closed when these industries were privatized, and the state did not compensate communities for the loss of preschools. In all countries, poor communities experienced the largest decline in preschool availability (Vandyke 2001).

At the comprehensive secondary level, only Kazakhstan reported a drop in the number of schools between 1991 and 1999—from 8,843 to 8,321, a decline of about 6 per cent (figure 8). In each of the other countries, the number of secondary schools increased and was higher in 1999 than in 1991. The decline in secondary enrolment is not explained by decline in the supply of schools. At the higher education level, all countries reported large increases in educational institutions as private education expanded (figure 9). Kazakhstan increased its supply of higher education institutions from 61 in 1991 to 163 in 1999, a 160 per cent increase. The slowest growth in supply was in Uzbekistan and Turkmenistan. These changes in supply are consistent with the increase in higher education enrolment in Kazakhstan and the Kyrgyz Republic and the small change in enrolment in Uzbekistan.

Figure 9

Supply of higher education institutions



Source: Statistical Yearbook of the Commonwealth of Independent States.

We get a similar picture of access to education from survey data from the Kyrgyz Republic, 1993–1998. The data are from three household surveys: the autumn 1993 Kyrgyzstan Poverty Monitoring Survey and the 1997 and 1998 Kyrgyzstan Living Standards Measurement Surveys. The surveys contain modules of questions at the community, household and individual levels.⁷ We examine the change in education access in the communities represented in the surveys. Results for 1993 and 1997 are obtained from Anderson *et al.* (2004). In 1993, 81 per cent of communities reported a kindergarten or preschool. Access dropped to 66 per cent in 1997 and 46 per cent in 1998. The largest decline occurred in poor, rural communities.

At the secondary level, we find no evidence of a decline in access to schools between 1993 and 1997; 93 per cent of communities in 1993 and 96 per cent in 1997 reported a secondary school near their community. We do find a significant drop in secondary schools in communities in 1998, however, with only 72 per cent reporting access to secondary schools. In both 1997 and 1998, we find a large decline in availability of gymnasiums. In 1993, some 59 per cent of communities reported a gymnasium in the community; this fell to 13 per cent in 1997 and 7 per cent in 1998.

Community representatives were asked whether the schools had improved; only 26–28 per cent thought that they had. While about 80 per cent thought

that there were enough teachers in the local schools, there was a large decline in the percentage who thought that the quality of teaching was good; 27 per cent were satisfied with teaching quality in 1997, but only 14 per cent in 1998.

Community respondents were generally satisfied with school facilities: buildings, blackboards and furniture. About 56 per cent in each year were satisfied with the heating systems in their schools. However, there were significant declines in satisfaction with books and other school supplies. Only 33 per cent thought that the schools had adequate supplies of books in 1997, and this fell to 28 per cent in 1998. Some 53 per cent were satisfied with other supplies in 1997 and 46 per cent in 1998. The results on books, supplies and teaching quality suggest that the quality of education in local communities experienced significant decline over the decade of the 1990s.

Demand for Schools

On the demand side, education decisions of households responded to price changes and income shocks. At all levels of education, fees increased, and costs of supplies were passed on to students. We do not have data for each country on education expenditures. We do have survey information from the Kyrgyz Republic and can measure the expenditure change at three points in time—1993, 1997 and 1998.

Preschool

At the preschool level, expenditures by households on education among children aged 3–5 increased dramatically over the period from 3 soms per child in 1993 to 17 soms in 1997 and 21 soms in 1998 for children enrolled in preschool (table 2). Expenditures rose sixfold over the five-year period. Associated with this increase in private expenditures was the decline in preschool attendance. In 1993, 48 per cent of children aged 3–5 attended preschool; this dropped to 7 per cent in 1997 and 1998. The preschool provider also changed over the period. In 1993, 73 per cent of children attended preschool provided by a parent's employer and 24 per cent attended public preschool. By 1998, only 22 per cent of children in preschool attended at a parent's employer while 74 per cent attended public preschools. Over time, preschool facilities became less available through the private sector and were less convenient and more expensive.

General secondary school

At the general secondary school level, there was a large increase in attendance after 1993. In 1993, 18.4 per cent of children aged 15–17 reported attending secondary school (table 2). By 1997, 59 per cent attended, and by 1998, 62 per cent attended. A similar picture is found for secondary school completion among children aged 16 and 17. There was an increase in the percentage completing secondary school by the age of 17, but the change was

Table 2

Aspects of household demand for education, Kyrgyz Republic, 1993–8

	1993	1997	1998
Household expenditures on preschool for children aged 3–5 (soms)	3.1	17.4	21.6
Percentage of children aged 6–11 reporting expenditure on			
(a) books	14.6	83.4	77.8
(b) tuition	1.0	5.9	3.4
Percentage of children aged 12–17 reporting expenditure on			
(a) books	11.7	80.7	74.9
(b) tuition	0.8	6.6	4.2
Percentage of children aged 3–5 reported as attending preschool	48.0	7.4	7.0
Percentage of children aged 15–17 reported as attending secondary school	18.4	59.0	62.0
Percentage of children aged 16–17 reported as having completed secondary school	62.0	63.0	67.0

Source: Kyrgyzstan Poverty Monitoring Survey, 1993; Living Standard Measurement Surveys for the Kyrgyz Republic, 1997 and 1998.

not as dramatic as for secondary school attendance. In 1993, 62 per cent of children in this age group completed secondary school; by 1998 the figure was 67 per cent.

Expenditures on secondary education increased over the 1993–1998 period. Table 2 shows the percentage of children who had tuition and book expenses during each year. Among children aged 6–11 and 12–17, expenses on tuition and books increased dramatically. For children 6–11, the percentage reporting tuition expenses increased from 1 per cent in 1993 to 3.4 per cent in 1998, and the percentage reporting expenses on books increased from 15 in 1993 to 78 in 1998. For children aged 12–17, the same pattern emerges. The percentage reporting tuition expenses increased from 1 in 1993 to 4 in 1998, and the percentage reporting book expenses increased from 12 in 1993 to 75 in 1998. In urban areas of the country, parental contributions to education are often more than \$100 a year; contributions from parents in rural areas are smaller because of the lower income and higher incidence of poverty. This increasing reliance on parental contributions exacerbates already existing regional disparities in the quality of education (World Bank 2004).

Higher education

Because higher education was artificially constrained under state socialism,⁸ the demand for university training increased dramatically. In the Kyrgyz Republic, 12–14 per cent of those aged 18–22 were enrolled in higher

Table 3

Teachers' salaries as percentage of average wage

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
1993	61.9	65.4	74.7	88.6	79.2
1994	52.1	102.1	81.2	56.1	64.7
1995	61.6	84.0	61.3	73.2	64.1
1996	73.7	71.9	49.1	64.5	73.9
1997	75.1	61.0	-----	-----	-----

Source: CIS Statistical Committee (1998) as reported in Berryman (2000).

education in 1997 and 1998. The decline in public resources for education led to an increase in the share of higher education costs financed by students. In Kazakhstan, the share of students paying fees increased from 10 per cent in 1991 to 35 per cent in 1998. The average fee in 1997 was \$1,200 at universities (World Bank 2000). In the Kyrgyz Republic, few students paid college tuition in the early 1990s; by 1997–8, 52–54 per cent paid tuition, and the average yearly tuition payment rose from 1,523 soms in 1997 to 2,370 soms in 1998.

Moreover, the demand for certain fields of study came to be based on an individual's expected rates of return instead of the occupational quotas and state planning documents. Demand for outdated fields of engineering declined; demand to study sociology, business administration, English language, and journalism increased. Despite this active market, however, central ministries continued to attempt to control syllabi, accreditation, prices, faculty remuneration, the allocation of student places, and other important functions (Vandyke 2001; McLendon 2004).

Efficiency

The largest component of the education budget is spent on teacher salaries. However, these are low in comparison to the national average (see table 3). In 1993, teacher salary as a percentage of the average salary ranged from a low of 62 per cent in Kazakhstan to a high of 89 per cent in Turkmenistan. This ratio declined throughout the 1990s in all countries except Kazakhstan. By 1997, the salary ranged from 75 per cent of the national average in Kazakhstan to 49 per cent in Tajikistan. Low teacher salaries create morale problems in schools, encourage corruption, and force many teachers to take second jobs in order to support themselves, and so the quality of education is compromised (World Bank 2004).

Teachers are underpaid, but also underutilized. On two dimensions—student–teacher ratio and teacher hours per day—teachers are used less intensively than in OECD countries. Table 4 presents data on student–teacher ratios in Central Asia from 1992 to 1999 at three levels of education.

Table 4
Student-teacher ratio

	Preschool		Secondary		Higher Education	
	1993	1999	1993	1999	1993	1999
Kazakhstan	8.6	4.7	11.6	12.0	11.3	13.5
Kyrgyzstan	9.4	12.4	12.3	15.4	11.1	19.0
Tajikistan	12.2	10.4	12.5	15.3	13.0	16.2
Turkmenistan	14.3	—	13.5	13.5*	12.1	9.7*
Uzbekistan	11.6	9.6	12.1	12.9	11.3	11.5
OECD average	—	15.4	—	14.6	—	15.3

*1997 data on secondary education, 1995 data on higher education.
Source: *Statistical Yearbook of the Commonwealth of Independent States*; OECD (2001).

At each level the ratio is lower than the ratio in OECD countries. In 1999, the average preschool class in OECD countries had 15.4 children per teacher. The ratio declined over time in most countries in Central Asia and ranged from a low of 4.7 in 1999 in Kazakhstan to a high of 12.4 in the Kyrgyz Republic.

At the secondary level, the disparity in the student-teacher ratio between OECD and Central Asian countries was smaller; in two countries—the Kyrgyz Republic and Tajikistan—the ratio is higher than in OECD countries. The OECD average in 1999 was 14.6 students per teacher. By 1999 the ratios in Kazakhstan (12.0), Turkmenistan (13.5) and Uzbekistan (12.9) were lower than that in the OECD.

At the higher education level, the same pattern is found. The OECD average was 15.3 students per teacher in 1999. By 1999, Kazakhstan, Uzbekistan and Turkmenistan were significantly below the OECD level while the Kyrgyz Republic (19.0) and Tajikistan (16.2) reported a higher ratio.

Data on teaching hours per week indicate underutilization of teacher time in school. In OECD countries in 2002, teachers were assigned from 20 periods per week in Turkey to 33 periods per week in the United States. In the Kyrgyz Republic in 2002, teachers taught only 18 periods per week.

Overall salaries paid to teachers are too low to encourage high-quality teaching. In addition, there are too many teachers relative to the number of students in preschool education in all countries and in secondary and higher education in Kazakhstan, Turkmenistan and Uzbekistan, and teachers are assigned too few hours of instruction. Expenditures on teachers comprise the largest share of public expenditures on education. These expenditures could be allocated more efficiently by raising salaries, reducing the number of teachers at all levels of education, and increasing the hours of work per teacher.

Conclusions

The adjustment of the education sector in Central Asia was close to the predictions of ten years ago (Heyneman 1995, 1997a, 1998, 2000). The collapse in public expenditures in the early 1990s placed fiscal pressures on the education system similar to those in sub-Saharan Africa and other parts of the developing world in the 1980s. Construction stopped, new capital investment could not be considered, non-salary recurrent expenditures were reduced to a minimum, maintenance and repairs to buildings and equipment were postponed. The value of teacher salaries slipped precipitously by comparison to professionals with equivalent qualifications, and the delivery of teacher salaries was frequently delayed. Teachers of English and other specializations in high demand abandoned the system for employment where they could maintain their families. The recovery of expenditures in the late 1990s, however, did not lessen the educational challenges.

The most serious educational challenges in Central Asia are only loosely related to expenditures. They are those of adjustment in policy in response to changes in the wider economy and polity. Education systems under state socialism were effective but inefficient. Under an open democracy the old structures and standards became largely ineffective (Heyneman 1997b). Under state socialism vocational training was largely provided through state-owned industries, and wage levels were artificially administered. As the state-owned industries became private, and wages became increasingly based on marginal productivity, the demand for vocational training declined in four out of five countries. By contrast, the demand for general training was associated with significant increases in household expenditures and wages in every country. One can find rapid increases in higher education enrolments across most of Central Asia in spite of the dramatic increase in private costs associated with higher education. Although tuition and other higher education fees increase annually, the private demand for higher education, and the ability to privately pay for it, is increasing just as rapidly.

Although predicted, changes in the education sectors in the Central Asian republics have been profound. New curricula, textbooks and pedagogies have appeared. New languages of instruction, sometimes accompanied by a change in script, have been implemented.⁹ Sources of finance have been diversified; providers have included both private and public authorities. However profound, these changes constitute only the first stage of the educational transition.

The next stage will be a transition of professional management. Nowhere in the former Soviet Union was the education sector managed by professionals. Today, the demands for skills and managerial training and background are unprecedented. The shift which one can expect over the next ten years will include an increased emphasis on the empirical comparisons of educational efficiency in Central Asia with that of other parts of the world; an increasing emphasis on curricular standards based on an understanding of the standards elsewhere; and a professional approach to establishment of credibility based on the evidence of a corruption-free system of degrees and credentials, subject to external verification.

Appendix

Expenditure on defence and education (% of GDP)

	Kazakhstan		Kyrgyzstan*		Tajikistan		Turkmenistan**		Uzbekistan***	
	Def.	Ed.	Def.	Ed.	Def.	Ed.	Def.	Ed.	Def.	Ed.
1994	---	---	0.9	5.9	2.0	8.7	1.8	3.6	9.4	8.3
1995	1.1	4.5	1.5	6.5	1.1	3.3	2.3	3.2	10.6	7.4
1996	1.1	3.4	1.2	5.2	1.3	2.1	2.0	2.1	7.0	7.4
1997	1.1	4.4	1.5	4.8	1.7	2.1	4.0	3.9	5.6	7.1
1998	1.3	4.1	1.4	4.8	1.6	2.6	3.3	6.9	6.6	7.9
1999	0.9	3.9	1.7	3.9	1.5	2.1	3.0	5.4	5.5	8.2
2000	0.8	3.3	1.9	3.7	2.5	2.3	---	---	---	---
2001	0.9	3.3	1.3	3.9	---	---	---	---	---	---
2002	0.8	3.2	---	---	---	---	---	---	---	---

*Administration, defence, and internal security.

**Defence and security; 1999 data are from the approved budget.

***Other expenditures, including defence.

Source: International Monetary Fund, Recent Economic Developments, various issues; Statistical Appendix, various issues; Selected Issues and Statistical Appendix, various issues.

Notes

1. There are two definitions of adult literacy in use. In the UNESCO definition literacy consists of the answer in the census to the questions "have you finished the fourth grade?" or "can you read?" The OECD definition of adult literacy is performance-based, with data gathered from sample surveys of the adult population. The difference between the two definitions is profound. In essence, we have no knowledge of adult literacy in Central Asia based on OECD standards (Heyneman 1999).
2. Choice of emphases by families or local communities was subject to central approval; "child-centered" orientations such as those based on Steiner, Montessori, Dewey, Schiller or Bloom were suspect because it was assumed that the Party guide to childrearing was all that was necessary (Kerr 1990; Kaufman 1994; Kitaev 1993; Tomiak 1992a, 1992b).
3. The economic return is a measure of the net benefits of education investment over one's expected lifetime. Benefits in each period t (B_t) include higher earnings and productivity; costs in each period (C_t) include direct costs such as tuition and fees, transportation expenditures, and opportunity costs or the earnings that one could have without additional education. If the expected lifetime is T years and the market rate of interest is r , then the total net benefits from additional education

over the lifetime are equal to: $\sum_{t=1}^T \frac{B_t - C_t}{(1+r)^t}$. If this sum is equal to zero, then the

lifetime benefits equal the lifetime costs and the investor breaks even. The internal rate of return to an individual or to society is equal to the interest rate that leads to this break-even point. If this return is greater than the market interest rate, the benefits exceed the costs, and education is a good investment.

4. The data from Kazakhstan were obtained from the 1996 Living Standards Measurement Survey. The data from the Kyrgyz Republic were from the 1993 Kyrgyzstan Poverty Monitoring Survey and the 1997 Living Standards Measurement Survey. The data from Tajikistan were from the 1999 Living Standards Measurement Survey. The data from Uzbekistan were from a 1999 pilot study in the Fergana *oblast* for the redesigned Household Budget Survey.
5. To estimate the return to education from an earnings function, the log of earnings or income (expenditures) is regressed on education, experience and other variables that may affect the productivity of labor. The regression coefficient on education is the return to education. If education is measured with a series of categorical variables, the coefficient on education measures the proportionate increase in earnings or income associated with that level of education relative to the omitted education category—incomplete secondary or primary education in our case.
6. This shift was typical across the 12 new republics of the Newly Independent States (NIS). The shift in responsibility was in part tactical. Under extraordinary pressure because of the collapse of public revenues, the republican Ministry of Finance was either not able or did not want to balance demands from different sectors. Downloading the responsibility for social expenditures to the regions was a way to avoid direct confrontations. Although local authorities had acquired the responsibility for managing these expenditures, they did not acquire the authority to initiate new taxation. They were expected to finance social expenditures solely from the resources allocated to them from central authorities. Nor did the responsibility for local finance necessarily imply that regional authorities were to acquire authority in other administrative arenas. Curriculum standards, teacher salaries, pedagogical rules and regulations continue to originate from central authorities.
7. The community is a census enumeration unit. A separate random sample of communities was selected in each year.
8. In the 1980s, higher education enrolment rates under state socialism were about half of those in Western Europe and a third of those in North America, and because wages were determined artificially, the private economic rates of return to higher education were actually negative (Heyneman 1995).
9. Decisions over language of instruction and choice of (Arabic, Cyrillic or Roman) script are made on the basis of political priorities rather than on considerations of cost or pedagogical efficiency.

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