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A Tajik story: the labour market following war and transition

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Abstract

This paper concerns labour markets in Tajikistan, a country whose economy has experienced turbulence owing to transition and civil war. Human capital models of earnings determination are estimated, separately for public and private sectors, and for men and women. Consideration is given both to sample selection and to endogeneity as possible sources of bias. Estimates are provided of the extent of gender discrimination. Policy conclusions are drawn. © 2002 Elsevier Science B.V. All rights reserved.

1. Introduction

Transition economies have endured great economic turbulence as they have sought new markets for goods and services. Their old markets, which disappeared with the onset of economic transition, derived from an organised system of production in the command economy which was not necessarily responsive to comparative advantage. So the recent exposure to free market forces has forced a major industrial reorganisation in many countries. The products that these countries produced in the past were often technologically advanced. Their development required a high level of human capital in the labour force. Typically the adverse effects of the transition have been cushioned by the fact that the population is highly educated. Yet the economic effects of transition have been as diverse as are the countries which have been in transit. Some of these countries have enjoyed the benefits of a well developed and varied industrial base, a stable government during transition, a

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popular culture which has been willing to embrace change, and comparatively high initial GDP. Others have enjoyed none of these, and have struggled to avoid chronic economic stagnation. Likewise, the labour market effects of transition have been varied.

It is useful therefore to examine the state of the labour market in a country whose transition has been slowed down by a number of adverse factors. Tajikistan gained independence in 1991. It has a low GDP, a narrow industrial base, and suffers the consequences of a protracted civil war which has left many people displaced. It is not a country that is characteristic of transition economies; it is an extreme case. It is particularly instructive therefore to study this economy, since by doing so we can see what a labour market might look like when the odds are stacked against a successful transition.

The paper proceeds as follows. The next section provides some background information about Tajikistan. This is followed by a discussion of our data source, some descriptive statistics, and a full statistical analysis of the data. This allows a number of conclusions to be drawn which have implications for policy. The paper ends with some suggestions for future research.

2. Tajikistan

Tajikistan is the poorest of the countries that once comprised the Soviet Union.[1] Its position in the wake of independence was undermined by a protracted civil war which ended only in 1997. The economy suffered predictably during this time. The war also seriously disrupted the nation's infrastructure and contributed to the displacement of almost 1 million people—a sixth of the total population. After the end of the war, the government took on board an aggressive programme of reforms. By the end of 1999, most small scale enterprises had been privatised, and most larger enterprises had been transformed into joint stock companies ready for privatisation; by the same date, almost half of all arable land was in private hands. There has been some modest improvement in economic conditions over the most recent years, but it remains difficult to assess to what extent this is due to the reforms, and in what measure it is the result of recovery from the wartime disruption.

Per capita GDP in 1999, measured at purchasing power parity, amounted to US$ 1020 (Central Intelligence Agency, 2000). During the war years, GDP fell substantially, bottoming out at around 43% of pre-transition income, but there has since been a modest recovery with growth in each of the last 2 years reaching between 3 and 4% (World Bank, 2000).

A major resource which is available to Tajikistan is its people. Levels of education are generally high, with a literacy rate of some 98%. Nine years of education are compulsory, and this takes students to the end of lower secondary level. Upper secondary and higher education are available only to those who pass entrance qualifications, and is subject also to the anticipated demands of industry.[2] At university level, in particular, entry is highly competitive, and this has become increasingly the case in recent years. A consequence

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[1] This section draws on work by Saavalainen et al. (2000), World Bank (1998), and the Central Intelligence Agency (2000). CIA World Factbook at http://www.cia.gov/cia/publications/factbook/geos/ti.html.

[2] This point is important, since it highlights the role played by manpower planning. It has implications for the human capital analysis of remuneration presented later in the paper.

has been the emergence of commercial universities which explicitly charge tuition fees. [3] The culture of education at post-compulsory level may have been upset by the political and economic turmoil of the 1990s, during which the opportunity cost of education for the young likely rose. At the same time, many educational facilities were destroyed (especially in the south west of the country), and many thousands of teachers—perhaps frustrated with the failure of their pay to keep up with remuneration elsewhere in the economy—decided to quit the profession. The rolls of specialist secondary schools have declined markedly since independence, but it is notable that attendance at higher education institutions has risen, and by 1998, stood at some 77 thousand students.

As a consequence of the disruption of transition and of war, the proportion of the work-force employed in industry declined through the 1990s. Meanwhile the proportion employed in agriculture increased. By the middle of the decade, these proportions stood at 17 and 45%, respectively, having been 22 and 43%, respectively in 1990 (United Nations, 1996). There has, since independence, been a gradual increase in the proportion of workers employed with the state sector. But reform has been slow, and it remains the case that most workers are public employees.

As has been the case in many transition economies, the decline in output during the early years of the 1990s was not accompanied by a particularly dramatic rise in official unemployment figures. At the end of 1998, the official unemployment rate stood at 5.8%, but this disguised a considerable degree of underemployment and of unregistered unemployment. Indeed, Saavalainen et al. (2000) suggest that an unemployment rate of 25% would be close to the mark for 1998. This is indicative of a labour market that was still suffering from the aftershocks of transition. We shall see further evidence of this in the analysis which follows.

3. Data

The data set which we shall use in the present study is the Tajik Living Standards Survey (TLSS). This was conducted by the Tajik State Statistical Agency and the Centre for Strategic Studies in the spring of 1999. It represents part of a broader programme of surveys in a wide range of countries—the Living Standards Measurement Study—sponsored by the World Bank and the United Nations Development Programme. The data, and more information about this programme, are freely available at http://www.worldbank.org/lsms/.

Some 2000 households, which together comprise 14,142 individuals, form the base of the Tajik study. The households were randomly selected and constitute a sample which is nationally representative. In the wake of the civil war, some parts of the country—notably the Karategin Valley, east of the capital city Dushanbe—are still controlled by the United Tajik Opposition; the survey team was successful in negotiating permissions to conduct the survey in these areas.

Data collected in the survey relate to household characteristics, housing, health, employment, education, migration history, incomes and expenditures. The data on incomes and

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[3] Examples include the Technological University of Tajikistan, the University of Municipal Services, and the Commercial University—all established shortly before or after independence from the Soviet Union in 1991. In addition to tuition fees, these institutions receive income from contracts with the employers of their graduates.

expenditures are particularly detailed. In addition, further information concerning the characteristics of the locale in which respondents reside was collected; so we have information about the social infrastructure and economy of the area of residence. Furthermore, detailed information about prices was collected as part of the survey.

4. Preliminary analysis

Some descriptive statistics appear in Table 1. These are based on people in the sample between the ages of 21 and 65 years inclusive. Several features stand out from this table. First, it is clear from the data in Table 1 that a higher proportion of people in work reside in urban areas than is the case for the general population; in other words, non-employment is associated with rural residence. There is a particularly strong effect associated with residence in the capital, Dushanbe.

Secondly, we may observe some strong effects of household composition on individuals' propensities to work. While some 81% of men in the relevant age range are married, the same is true of 88% of working men. The effect of marriage for women is different: while 76% of women are married, only 71% of working women are married. For both sexes, work is associated with a slightly lower household size. In general, though, it should be noted that the number of people in a typical household in Tajikistan is quite large, at about eight.

Thirdly, men are paid (much) more than women. This observation is worth extensive study in its own right and will be a focus of the work which follows later in the present paper. It should be noted that a large proportion of workers did not receive remuneration in the month prior to the survey. As in some other transition economies, there is in Tajikistan a severe problem of delay in wage payments. This appears to be particularly acute amongst relatively low paid workers outside the main urban areas. The results reported in the sequel use as dependent variable the log of the wage that workers should receive per hour. [4]

For reasons of space, detailed information about occupation and industry structure is not reported in Table 1. In the next section, we explore the determinants of individuals' labour market performance in some more detail, using a multiple regression approach.

5. Regression analysis

Our main emphasis here will be on an examination of the determinants of earnings for workers aged 21–65 years in the Tajik economy. The human capital earnings function pioneered by Mincer (1974) is standard in the literature, and is used here too. This approach has been extensively used in transition economies (see, for recent examples, Newell and Reilly, 1999, and Munich et al., 2000). Whether remuneration is determined by market forces or by bureaucratic means—whether education boosts productivity or merely acts as

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[4] Repeating the exercise using data on the hourly wage that they actually received in the last month yields results which are qualitatively similar, but which are based on fewer observations. A check for this is reported in Table 2, where the second column is based on the wage that should be received and the third is based on the wage that is actually received.

Table 1
Descriptive statistics

Variable	All men	All women	Working men	Working women	All working in public sector	All working outside public sector
Hourly wage (Tajik roubles)			92.77 (433.89)	41.98 (63.11)	91.62 (475.26)	56.53 (112.32)
Age	36.5 (12.09)	36.3 (11.74)	37.6 (10.94)	36.0 (9.45)	38.5 (10.52)	35.6 (10.18)
Higher education	0.143 (0.35)	0.055 (0.23)	0.196 (0.40)	0.105 (0.31)	0.292 (0.44)	0.085 (0.24)
Resident in urban area	0.228 (0.42)	0.248 (0.43)	0.256 (0.44)	0.307 (0.46)	0.349 (0.48)	0.194 (0.40)
Married	0.806 (0.40)	0.763 (0.43)	0.880 (0.32)	0.707 (0.46)	0.816 (0.39)	0.822 (0.38)
Household size	8.54 (3.67)	8.32 (3.68)	8.09 (3.64)	7.68 (3.56)	7.80 (3.30)	8.09 (3.91)
Excellent or good health	0.738 (0.44)	0.698 (0.46)	0.728 (0.45)	0.664 (0.47)	0.727 (0.45)	0.681 (0.47)
Tajik	0.715 (0.45)	0.720 (0.45)	0.698 (0.46)	0.657 (0.47)	0.720 (0.45)	0.645 (0.48)
Dushanbe	0.068 (0.25)	0.071 (0.26)	0.082 (0.27)	0.099 (0.30)	0.108 (0.31)	0.067 (0.25)
Gorno–Badakhshan	0.044 (0.21)	0.044 (0.21)	0.045 (0.21)	0.044 (0.20)	0.073 (0.26)	0.014 (0.12)
Regions of Republican Subordination—excluding Dushanbe	0.246 (0.43)	0.246 (0.43)	0.172 (0.38)	0.152 (0.36)	0.187 (0.39)	0.141 (0.35)
Leninabad	0.284 (0.45)	0.286 (0.45)	0.309 (0.46)	0.290 (0.45)	0.255 (0.44)	0.354 (0.48)
Public sector			0.540 (0.50)	0.485 (0.50)		
Male					0.668 (0.47)	0.619 (0.49)

Note: the table reports means, with standard deviations in parentheses. At the time of the survey, the nominal exchange rate was 1200 Tajik roubles = US$ 1. The omitted region is Khatlon.

Table 2
Regression results: human capital model

Variable	All	All	All	All	Men	Women
Constant	2.2094 (6.87)	0.5459 (0.88)	2.8310 (9.35)	3.2138 (10.64)	2.9477 (7.85)	3.0447 (5.74)
Male	0.5609 (10.58)	0.3326 (3.25)	0.3234 (7.26)			
Age	0.0382 (2.26)	0.0501 (1.53)	0.0093 (0.67)	−0.0054 (0.39)	0.0240 (1.34)	−0.0164 (0.67)
Age squared	−0.0004 (1.92)	−0.0005 (1.19)	−0.0001 (0.59)	0.0001 (0.48)	−0.0003 (1.21)	0.0002 (0.62)
Higher education	0.9033 (13.26)	1.0556 (8.02)	0.4737 (7.78)	0.5292 (8.65)	0.4929 (6.77)	0.4309 (3.66)
Urban			0.0211 (0.38)	−0.0124 (0.22)	0.0237 (0.33)	0.0471 (0.54)
Married			0.0310 (0.55)	0.1208 (2.16)	0.0470 (0.54)	−0.0130 (0.18)
Household size			−0.0143 (2.27)	−0.0142 (2.21)	−0.0159 (1.98)	−0.0121 (1.17)
Excellent health			0.1461 (1.51)	0.1761 (1.80)	0.1670 (1.43)	0.0772 (0.43)
Good health			0.1310 (2.97)	0.1450 (3.24)	0.1283 (2.22)	0.1308 (1.92)
Tajik ethnicity			−0.0454 (1.05)	−0.0354 (0.81)	−0.0463 (0.82)	−0.0518 (0.77)
Private sector			0.8244 (9.33)	0.8639 (9.67)	0.8120 (7.47)	0.9184 (5.85)
Public sector			0.2508 (3.77)	0.2751 (4.08)	0.2598 (3.06)	0.2131 (1.95)
Dushanbe			0.4473 (5.25)	0.4431 (5.13)	0.2919 (3.06)	0.6763 (5.05)
Gorno–Badakhshan			−0.1910 (1.94)	−0.1987 (1.99)	−0.2332 (1.87)	−0.1067 (0.65)
RRS			0.1808 (3.01)	0.1994 (3.28)	0.2106 (2.79)	0.0606 (0.60)
Leninabad			−0.1754 (3.46)	−0.1612 (3.14)	−0.2445 (3.76)	−0.0587 (0.72)
Industries	–	–	12	12	12	12
Occupations	–	–	9	9	9	9
r^2	0.148	0.046	0.520	0.507	0.480	0.538
Number of observations	1976	1976	1944	1944	1267	677

Note: t statistics are in parentheses. The dependent variable in column 3 is the log of the hourly wage received by the respondent. In all other columns it is the log of the hourly wage that the respondent *should* receive. The two differ because of arrears; see text. The private and public sectors are not collectively exhaustive because of the presence also of co-operatives, joint ventures and multinationals.

a signalling or screening device—we would expect the individual's stock of human capital to influence earnings.

Some results are reported in Table 2.[5] For ease of comparison with other studies, the second and third columns report simple Mincerian earnings functions. The second column uses as the dependent variable the log of the hourly wage that should be received by the worker; the third column uses the log of the hourly wage that is actually received. These two may differ because of wage arrears. The constant term is much lower in the third column than in the second, this being consistent with the deferred payment of wages. That aside, the results reported in the two columns are fairly similar. So in the sequel we shall confine the analysis to the study of the log hourly wage that should be received as the dependent variable.

Several features stand out from the remainder of the table. First, the only measure of schooling which we have employed in the regression is a binary variable denoting experience of higher education. Attached to this is a coefficient which implies that higher education augments earnings by between 43 and 53%. These figures are somewhat greater than corresponding statistics for other countries; in the UK, for example, Blundell et al. (2000) recently estimated that the wage premium attached to higher education is about 15% for men.

While the results reported thus far imply that human capital is a major driver of earnings in Tajikistan, the coefficients estimated on the linear and quadratic terms in age do not support such a sanguine view. Age here is used as a proxy for experience (which is not observable in our data). The coefficients attached to the terms in age are insignificant, and apart from the males equation are signed contrary to prior expectation. It is noteworthy that the majority of workers in Tajikistan are still employed in the public sector. To the extent that remuneration in that sector is determined by rules rather than by the equation of wages with the marginal revenue product, the insignificance of the age terms might indicate the dominance of public employment. We shall investigate this further at a later stage, by examining public and private sectors separately. Meanwhile, we would note that earnings are highest in the private sector, other things being equal.[6]

Regional effects on wages are quite strong, with the highest wages being observed in Dushanbe, the capital, and in its environs—the Regions of Republican Subordination (RRS).[7] The relatively high earnings in Dushanbe echo the agglommeration effects cited by Ciccone and Hall (1996), though it should be noted that there we find no evidence of an urban effect on wages over and above the regional effects described here. It is also worth emphasising the fact that the regional disparities in earnings vary considerably across genders. The premium attached to residence in Dushanbe is particularly high for women, and the penalty associated with residence in Leninabad is especially pronounced (and indeed, is significant only) in the case of men.

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[5] These are ordinary least squares results, and do not correct for any sample selection bias that might arise from the endogeneity of labour market participation. Such corrections are frequently made, especially in the case of women. In the present data, however, no such bias appears to be present—in preliminary work, a Heckman (1979) model was estimated in which participation is modelled as a function of household composition variables; the inverse Mills ratio thus obtained was insignificant in the earnings equation.

[6] The excluded groups are family businesses, co-operatives and multinationals.

[7] Residence in Leninabad, the other major industrial region, does not appear to carry a wage premium.

A legacy of substantial migrations of population during the Soviet era is the fact that Tajiks, while being in a majority, are not the only ethnic group with a substantial presence in Tajikistan. They form some 72% of the observations in the relevant age range. The evidence provided by our earnings equations suggests that they are nonetheless rewarded less generously than other ethnic groups in the labour market—to the tune of around 5%—though the ethnicity variable is significant only at generous levels. [8] The largest minority ethnic group is the Uzbeks, who comprise some 25% of our sample.

Apart from the second and third columns, the wage regressions reported in Table 2 also include 12 industry dummies and 9 occupation dummies. [9] The coefficients on these are not reported in the table for reasons of space. Other things being equal, manufacturing wages are the highest, followed by construction and mining. Workers in the health sector receive particularly low wages. The coefficients on the occupation dummies indicate that professional workers are the highest paid, other things being equal, followed by other non-manual workers. Somewhat surprisingly, those who report themselves to be managers do not report especially high earnings; this may be due to semantics and sample size—many Tajiks who have managerial responsibilities may not think of themselves as managers, and indeed only 1.5% of respondents state that they fall into this occupational group. The reasons for this may be numerous, but we can only speculate upon them at this juncture. They might include, however, the effects of displacement due to war, the underdeveloped industrial structure, and the delays that have occurred in privatisation.

Much of the recent literature on earnings equations has focused extensively on the correction of endogeneity bias. In particular, there is some concern that schooling might be endogenous. [10] Endogeneity bias could arise from a number of sources. One is the omission (owing to data limitations) of ability as a regressor; since ability is likely positively to affect schooling, we might expect the coefficient on schooling to be biased upward. A second source of bias might be the potential mis-reporting of education by respondents; if respondents claim to have completed education at a level which they did not in fact attain, then OLS estimates of the return to education will be downwardly biased. Thirdly, a similar downward bias might result if there is unobserved heterogeneity in time preference across individuals; people with high discount rates may be less likely than others to enter post-compulsory education, and this leads to a sample selection bias. It is not clear from the literature what the net effect of these biases might be; some studies report a net positive bias, while others report a net negative bias (see Rosenzweig and Wolpin, 2000). To correct for the possible existence of these biases, we instrument schooling using the educational attainment of the most highly educated member of the household (other than the respondent himself or herself), logged monthly household expenditure on smoking, and logged annual

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[8] The results reported in Table 4 suggest, however, that ethnicity is a significant determinant of earnings within the public sector, and that the extent of the ethnic pay gap in that sector is somewhat larger than indicated here.

[9] The occupations are: (i) legislators, senior officials, managers; (ii) professionals; (iii) technicians and associate professionals; (iv) clerks; (v) service workers and market sales workers; (vi) skilled agricultural workers; (vii) craft and related trade workers; (viii) plant and machine operatives; (ix) armed forces and labourers. The industries are: (i) agriculture; (ii) mining; (iii) manufacturing; (iv) electricity, gas and water; (v) construction; (vi) retail, restaurants and hotels; (vii) transport; (viii) finance, real estate and insurance; (ix) public administration; (x) education; (xi) health and social work; (xii) other services.

[10] See, for example, Ashenfelter et al. (2000), Harmon and Walker (1995) and Ashenfelter and Krueger (1994).

Table 3
Regression results: human capital model with schooling instrumented

Variable	All	Men	Women
Constant	2.8045 (9.03)	2.9887 (7.63)	3.1061 (5.54)
Male	0.3679 (8.20)		
Age	0.0108 (0.76)	0.0222 (1.18)	−0.0188 (0.73)
Age squared	−0.0001 (0.71)	−0.0002 (1.10)	0.0002 (0.69)
Higher education	0.6029 (1.41)	0.6137 (1.27)	0.6854 (0.93)
Urban	0.0204 (0.34)	0.0168 (0.21)	0.0322 (0.33)
Married	0.0114 (0.18)	0.0456 (0.51)	−0.0144 (0.19)
Household size	−0.0146 (2.24)	−0.0162 (1.92)	−0.0123 (1.17)
Excellent health	0.1399 (1.43)	0.1686 (1.42)	0.0738 (0.40)
Good health	0.1246 (2.68)	0.1244 (2.07)	0.1288 (1.87)
Tajik ethnicity	−0.0525 (1.16)	−0.0500 (0.87)	−0.0617 (0.87)
Private sector	0.8093 (8.94)	0.7995 (7.14)	0.9235 (5.79)
Public sector	0.2462 (3.61)	0.2546 (2.95)	0.2228 (1.95)
Dushanbe	0.4303 (4.40)	0.2767 (2.18)	0.6445 (4.21)
Gorno–Badakhshan	−0.2047 (1.85)	−0.2405 (1.82)	−0.1552 (0.71)
RRS	0.1778 (2.92)	0.2114 (2.76)	0.0610 (0.60)
Leninabad	−0.1778 (3.46)	−0.2419 (3.65)	−0.0705 (0.82)
Industries	12	12	12
Occupations	9	9	9
r^2	0.505	0.462	0.529
Number of observations	1944	1267	677

household income as instruments. [11] The results are shown in Table 3. As is easily observed, the coefficients on schooling are a little higher, but somewhat less precisely estimated, than the corresponding coefficients in the ordinary least squares regressions of Table 2. [12] These results need to be treated with caution, however; the instruments that are available in the current data set are somewhat unrefined. [13]

The rationale for estimating separate equations for women and men is straightforward: the mechanisms underpinning earnings determination are likely to vary across gender. Hence, for instance, we observe that women enjoy an especially large premium for being residents of the RRS, or for being employed in the manufacturing sector. A natural extension of the estimation of gender-specific equations is to conduct an analysis of the gender wage gap. We proceed, using the decomposition approach pioneered by Oaxaca and Ransom (1994). [14] Here, the difference in the log wage is decomposed into three components, evaluated at mean values of the independent variables:

$$\ln w_m - \ln w_f = Z_m(\beta_m - \beta^*) - Z_f(\beta_f - \beta^*) + (Z_m - Z_f)\beta^* \tag{1}$$

[11] The motivation for including smoking as an instrument is provided by Evans and Montgomery (1994).

[12] The bias is small for men and for the pooled sample, and so we shall work with OLS results in the sequel. The somewhat larger bias in the equation for women suggests that the third source of bias is particularly strong amongst this group.

[13] This observation might also explain the failure of the Heckman procedure to pick up any effects of sample selection bias—see footnote 6.

[14] Earlier analyses of gender wage differentials in transition economies include Newell and Reilly (1996, 2001) and Ogloblin (1999).

Table 4
Gender wage effects

Variable	Male advantage	Female disadvantage	Difference due to difference in characteristics
Constant	−0.266	0.169	–
Age	0.568	0.235	0.003
Higher education	−0.007	0.011	0.047
Urban	0.009	−0.019	0.001
Married	−0.065	0.095	0.021
Household size	−0.014	−0.015	−0.006
Health	−0.012	0.013	0.009
Tajik	−0.008	0.011	−0.002
Private sector	−0.008	−0.007	0.028
Public sector	−0.008	0.031	0.012
Region	−0.027	−0.039	−0.004
Industry	−0.029	−0.273	0.218
Occupation	−0.031	−0.041	0.062

Note: the data for age in this table include the effects of both age and age squared; likewise the data for health include the impact of both the excellent health and good health variables. Figures do not add to the totals given in the text because of rounding.

where Z_m and Z_f denote the vectors of characteristics for men and women, respectively, and β_m, β_f and β^*, respectively the coefficients estimated in the male equation, the female equation, and the pooled equation. The first term on the right-hand side of this equation represents the 'male advantage' due to discrimination; the second term is a measure of the 'female disadvantage'. Both of these terms are due to gender differences in the 'prices' of human capital and other personal characteristics. They both therefore represent 'unjustified' discrimination. The remaining term in the equation refers to that part of the wage gap that is due to gender differences in characteristics.

Using the regression coefficients reported in the final three columns of Table 2, the male advantage amounts to 0.091, the female disadvantage is 0.170, and the impact of characteristics is 0.389. These figures are expressed in terms of the difference in logged wages. Hence, the total wage gap between males and females amounts to about 65%. Most of the gender wage differential is due to differences across the sexes in characteristics, but a large proportion of the gap—some 40%—appears to be the result of pure discrimination, most of which may be labelled as female disadvantage. The precise breakdown of the gender wage gap is shown in Table 4. It is clear from this that differences in the gender-specific returns to age account for more than the whole of the gender wage gap. The other important factor, which partially mitigates the age effect, is the gender difference in the returns to industry choice. [15]

It is instructive to observe that the gender wage gap in Tajikistan is quite large in comparison with many western economies. In one respect this is surprising. Many observers have commented upon the relatively small gender wage gap in Australia, and have attributed this to the low wage premium that is attached to labour market experience in that country.

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[15] Most of this industry effect (0.16 of the 0.27 female advantage) comes from the agriculture industry.

Table 5
Regression results: public sector only

Variable	All	Men	Women
Constant	3.8132 (8.67)	3.4908 (6.36)	3.8155 (4.91)
Age	−0.0313 (1.64)	−0.0083 (0.34)	−0.0411 (1.23)
Age squared	0.0004 (1.57)	0.0001 (0.29)	0.0005 (1.05)
Higher education	0.5809 (8.30)	0.5487 (6.45)	0.5008 (3.98)
Urban	0.0311 (0.46)	0.1192 (1.36)	0.0447 (0.43)
Married	0.1755 (2.34)	0.1157 (0.91)	−0.0368 (0.38)
Household size	−0.0118 (1.32)	−0.0185 (1.68)	0.0046 (0.31)
Excellent health	0.1013 (0.79)	0.1539 (0.99)	−0.1350 (0.60)
Good health	0.1655 (2.60)	0.2072 (2.56)	0.0529 (0.53)
Tajik ethnicity	−0.1286 (2.10)	−0.1006 (1.29)	−0.2216 (2.28)
Dushanbe	0.2676 (2.52)	0.0869 (0.64)	0.5186 (3.15)
Gorno–Badakhshan	−0.2021 (1.81)	−0.2807 (2.05)	−0.0013 (0.01)
RRS	0.3011 (3.79)	0.3346 (3.47)	0.0980 (0.71)
Leninabad	−0.2042 (2.83)	−0.3166 (3.53)	0.0205 (0.17)
Industries	12	12	12
Occupations	9	9	9
r^2	0.417	0.346	0.522
Number of observations	1036	695	341

However, in Tajikistan too there appears to be a low premium on experience, but this has not led to a narrow gender wage differential. Perhaps a note of caution should be inserted here: if labour market institutions in Tajikistan were to be reformed in a manner that encourages a widening of the income distribution, this could lead to a still more acute wage differential between the sexes. Indeed Brainerd (1998, 2000) has shown that the widening of the income distribution in neighbouring Russia has already had a detrimental effect on the labour market position of women relative to that of men.

Thus far, the wage equations which have been reported use data which are pooled across all sectors of the economy. It is plausible, however, to suppose that wages are determined by different mechanisms in different sectors. For example, the private sector might be characterised by wages that reflect productivity at the level of the individual worker, while the public sector might operate as a collection of internal labour markets in which rules determine remuneration. To check this, we estimate separate earnings equations for broad sectors of the Tajik economy. [16] The results for the public sector are reported in Table 5, while those for the private sector appear in Table 6. [17]

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[16] Once again, the issue of sample selection bias might arise. But once again, early experimentation revealed that any non-randomness in the allocation of workers into economic sectors does not bias the coefficient estimates.

[17] For the purposes of this part of the analysis, the public sector is defined to include government offices and state enterprises. Meanwhile, and in contrast to the definition of 'private' used in Tables 2 and 3, the private sector includes joint ventures, multinationals and co-operatives as well as other private sector firms. This ensures that we have a reasonably large number of observations, though of course it introduces some heterogeneity into the sample. In the case of the private sector, there are no observations in the mining, finance, education or public administration sectors, and owing to a paucity of observations, manufacturing, construction and the utilities have been merged to form one industry group. Industry mix could therefore be a factor in explaining the differences between Tables 5 and 6.

Table 6
Regression results: private sector only

Variable	All	Men	Women
Constant	3.7256 (8.54)	3.2557 (6.03)	3.9329 (5.19)
Age	0.0104 (0.48)	0.0541 (1.93)	−0.0234 (0.63)
Age squared	−0.0001 (0.24)	−0.0006 (1.68)	0.0004 (0.71)
Higher education	0.3054 (2.33)	0.2392 (1.65)	−0.0922 (0.26)
Urban	−0.0543 (0.51)	−0.1068 (0.79)	0.1243 (0.73)
Married	0.0691 (0.79)	−0.0329 (0.26)	0.0356 (0.31)
Household size	−0.0158 (1.65)	−0.0096 (0.79)	−0.0386 (2.59)
Excellent health	0.2752 (1.72)	0.1390 (0.75)	0.2746 (0.89)
Good health	0.1167 (1.78)	0.00542 (0.64)	0.1786 (1.84)
Tajik ethnicity	0.0789 (1.21)	0.0187 (0.22)	0.1709 (1.75)
Dushanbe	0.6934 (4.49)	0.5741 (2.94)	1.1353 (4.55)
Gorno–Badakhshan	0.4007 (1.57)	0.6376 (1.88)	0.1918 (0.51)
RRS	0.0899 (0.92)	0.0387 (0.31)	0.1045 (0.70)
Leninabad	−0.1450 (1.91)	−0.1881 (1.91)	−0.1736 (1.51)
Industries	6	6	6
Occupations	6	6	6
r^2	0.514	0.528	0.548
Number of observations	908	572	336

It is readily observed that the linear and quadratic terms in age have coefficients of the expected sign only in the private sector—and even here, only for men. This finding of a stronger concavity of the wage–age relationship in the private sector mirrors that of Munich et al. (2000). Higher education is particularly well rewarded in the public sector. This suggests that signalling or screening effects might be present. Regional effects are apparent in both sectors, and the capital city effect is particularly pronounced in the private sector. It should be noted that few of the coefficients are estimated with any great precision in the case of the sector-specific equations for females.

6. Conclusions

In many respects, the Tajik labour market resembles labour markets elsewhere. Highly educated workers receive earnings premia, as do those who live in metropolitan areas and those who are in good health. As in other countries, there is some evidence of earnings declining with household size—at least for some groups of workers. There are earnings differentials associated with ethnic origin, and there is a severe pay gap between men and women which cannot be explained by appeal to differences in human capital characteristics. The inverse-U relationship between age (or experience) and wage that is typical of free labour markets is observed in the private sector in Tajikistan.

But, at the end of the 1990s, the private sector still accounted for a minority of workers. In the public sector and in regressions estimated for the labour market as a whole, the conventional relationship between age and earnings is not observed. This is consistent with experience in other transition economies—Newell and Reilly (1999), for example, find

that 'in Kazakhstan, Azerbaijan, Russia and Yugoslavia in 1995, the age effects become poorly determined'. We have also seen that the unexplained gender pay differential is high in Tajikistan. Policy makers in Tajikistan will need to address the question of how best to protect the interests of groups which might be subject to discrimination as reforms are introduced.

A number of areas suggest themselves as being suitable for further research. As the transition progresses in the economy as a whole, it would be interesting to gain an understanding of the effects of privatisation and liberalisation on the labour market practices of individual enterprises. Do some types of enterprise effect a transition to profit maximising behaviour in the labour market more quickly than others? And, if so, how does this compare with the same enterprises' behaviour in the product market?

Secondly, the nature of transition from manpower planning (where the education sector and the labour market are bound together by government control) to a free labour market is worthy of further study. The appropriate timing and sequencing of reforms is a complex issue—how much of the labour market needs to be free before market forces could be relied upon to drive the education sector? Further research into this area, both within Tajikistan and in the transition economies more generally, would appear to be warranted.

Acknowledgements

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