THE EARNINGS OF SOVIET WORKERS: EVIDENCE FROM THE SOVIET INTERVIEW PROJECT

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Abstract—Micro data gathered by the Soviet Interview Project provide one of the first opportunities for Western researchers to investigate the determinants of Soviet earnings. The data show that Soviet labor markets operate in many respects like U.S. labor markets, yet institutional differences remain. The most striking institutional impact is that Soviet workers are rewarded and penalized for political behavior external to the firm. As in the United States, education and experience are rewarded; men earn more than women. However, the Soviet pattern of returns to education is different, returns to experience are lower and occupational segregation of women is less important.

I. Introduction

IT is not possible to study Soviet wage differentials using official Soviet data. Soviet statistical authorities do not publish data for correlating earnings with explanatory factors like education, age, and experience. Meaningful Western research on wage differentials has required microdata. Although the Soviets have conducted household surveys, their results are selectively reported in the form of sample averages or simple cross tabulations (Tsypin, 1978). Moreover, Soviet statistical authorities would find it difficult to obtain unbiased responses to questions on politics, underground economic activity, and privileges.

The immigration of large numbers of former Soviet citizens to Israel, West Germany and the United States in the 1970s provides a rare opportunity to study large samples of former Soviet citizens. The first microdata studies of Soviet household economic behavior used a sample of 1,000 immigrants residing in Israel who left the Soviet Union in the early 1970s (Ofer and Vinokur, 1979, 1981, 1983, 1984; Pickersgill, 1976). More recently, the National Opinion Research Center conducted interviews for the Soviet Interview Project (SIP) with 2,793 former Soviet citizens who immigrated to the United States between January 1, 1979 and April 30, 1982.

This paper exploits the unique SIP data to study Soviet wage differentials. An augmented human capital model assumes an active Soviet labor market in which workers can manipulate money rewards by acquiring human capital, selecting job characteristics, and by transmitting loyalty signals. Microdata on privileges and political activities are combined with conventional economic data to estimate a reduced form earnings equation. We confirm that the Soviet labor market works in many respects like the U.S. labor market. Education and experience are rewarded; men earn more than women. Although the effects are directionally the same, they are quantitatively different. The pattern of returns to education is different, returns to experience are lower, occupational segregation of women is less important. The most striking institutional difference is that Soviet workers are rewarded and penalized for political actions external to the enterprise.

II. Modelling the Soviet Labor Market

A. Background

The Soviet labor market bears a stronger resemblance to capitalist markets than do other Soviet factor markets. Despite a number of restrictions, the Soviet adult population largely has freedom of choice of occupation and location. The Soviet wage system, described by Chapman (1979), Bergson (1964), and Kirsch (1972), combines centralized wage setting with enterprise-level flexibility. State committees set industry base pay rates and skill differentials for blue-collar employees and detailed compensation schedules for high-level positions. Adjustment coefficients compensate for undesirable jobs and locations. Bonuses, premiums, piece rates, and reclassification opportunities give the manager some freedom to respond to local labor market conditions.

Received for publication May 28, 1986. Revision accepted for publication May 8, 1987.

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Data for this study were produced by the Soviet Interview Project. This project was supported by Grant No. 701 from the National Council for Soviet and East European Research to the University of Illinois Urbana-Champaign, James R. Millar, Principal Investigator. The analysis and interpretations in this study are those of the authors, not necessarily the sponsors. We would like to express our gratitude to Elizabeth Clayton, Steven Craig, James Griffin, Herbert Levine, Kent Osband, Gertrude Schroeder-Greenslade, and anonymous referees for their helpful comments.

The primary task of the Soviet reward system is to induce people to take jobs among occupations, industries and regions to meet planned staffing requirements. As a first approximation, one can say that the Soviets use market-clearing wages to allocate labor. As such, the Soviet incentive system (like its capitalist counterpart) must offer compensating wage differentials and productivity differentials. The existence of an active market is supported by findings of similar patterns of wage differentials, employment and turnover in Soviet and capitalist labor markets (Bergson, 1964, chap. 6; Pryor, 1985, chap. 8; Gregory, 1973; Ofer and Vinokur, 1981; Granick, 1987). Despite similar patterns, there are important institutional differences between Western and Soviet labor markets (Schroeder, 1979; Feshbach, 1983; and Nash, 1966). The state bears virtually all the explicit (and many implicit) costs of higher education. Graduates of higher education are assigned administratively to first jobs. Administrative positions are filled from a party or state nominations list. Soviet labor unions bear no resemblance to Western-style unions. An internal passport system and the administrative allocation of housing limit the mobility of workers.

If the Soviet labor market behaves generally like its Western counterpart, then standard Western models (modified for institutional differences) of human capital, compensating wage differentials, and incentive-wage contracting (Stiglitz, 1975; Spence, 1973; Becker, 1962; Mincer, 1974) can be applied to Soviet wages. The standard model depicts the equilibrium wage as a function of generalized and firm-specific human capital (including qualitative characteristics such as loyalty to the firm), job characteristics, and demographic attributes. Two additional factors must be added to adapt the model to Soviet circumstances: rewards for political loyalty and the administrative allocation of privileged in-kind benefits.

The effects of the conventional factors on wages are well known. General and firm-specific human capital raise worker productivity and hence wages. Undesirable job characteristics raise compensation. Demographic characteristics affect job preferences. The hypothesis concerning political loyalty is straightforward: the earnings of Soviet workers are positively affected by political loyalty and are negatively affected by political disloyalty. Rational Soviet political authorities desire to maximize regime stability and use the wage system as a control instrument.[1] Soviet workers can be regarded as accumulating a stock of political capital, which can be either positive or negative. Workers can add to their stock by engaging in regime-support activities or make withdrawals through acts of regime disloyalty. Political authorities desire to know the individual's stock of political capital. Insofar as Soviet authorities cannot gather information on actual thought processes, they would have to screen using observable signals and credentials much like Western managers (Spence, 1973). Positive signals consist of organizational memberships, attendance records, and volunteer activities in support of the regime. Anti-government activities (strikes, attending unsanctioned meetings, protests) send out signals of regime disloyalty.

In the Soviet system, privileges (such as access to closed shops or clinics or use of an official car) are allocated both by managers and by political authorities. Rational managers (like their Western counterparts described by Hashimoto and Raisian, 1985) would preferentially allocate privileges to employees who acquire firm-specific human capital. Soviet managerial allocation of privileges, therefore, should not be expected to depart from Western patterns. Rational Soviet political authorities, however, might allocate privileges independently of the individual's contribution to the firm. Katsenelinboigen (1980) has hypothesized that Soviet officials allocate privileges preferentially to high-level personnel to increase political control of the responsible positions in the economy. The higher the position, the larger the percentage share of privileges in total compensation. Hence, privileges might be allocated among Soviet workers in a manner not explained by worker characteristics and job characteristics. We find empirical support for Katsenelinboigen's propositions.[2]

[1] Political authorities may reward regime loyalists by offering easier access to higher paying occupations and encouraging higher pay within a given occupation. Appointments to responsible positions are controlled by political authorities through the *nomenklatura*. A record of political reliability increases the chances of being admitted to higher education. Personnel committees may select workers with better political records. Politically disloyal workers may be denied overtime work or bonuses or may be placed on higher piece-rate norms.

[2] We ran separate logit regressions on car, clinic, and closed shop privileges and found that the receipt of these privileges

B. Data from the Soviet Interview Project

The interviews were conducted between April and December of 1983, and respondents were asked to speak about their lives in the Soviet Union prior to the break caused by the emigration decision.[3] For most respondents, this was 1978 or 1979—the end of their last "normal" period of life in the Soviet Union. Analysis of associated case interviews (Anderson and Silver, 1987a) shows that despite the retrospective nature of the survey respondents' recall of objective economic data is quite accurate.

Over 90% of the SIP respondents were Jewish, and they came from medium and large cities in the European parts of the Soviet Union. The SIP sample was gathered under favorable conditions for eliciting information on the referent USSR population, the Soviet European urban population residing in medium to large cities. First, the SIP sample was stratified from over 33,000 cases according to geographic, educational, and nationality characteristics of the referent population. Second, there is striking similarity (see table 1) between the SIP sample means and referent population means of standard economic and demographic variables not used in stratifying the sample. Although similar in other respects, the SIP sample is more highly educated and more concentrated in service occupations than the referent population. Third, most respondents were not politically active and expressed both favorable and unfavorable attitudes towards the Soviet system (Millar and Clayton, 1987). A significant number participated regularly in regime-support activities, and some even occupied leadership positions. A very small proportion were leaders of anti-government activities (table 2). Fourth, the proportion of SIP respondents with privileges (5% to 7%) appears to be reasonable given the higher level of education of the SIP sample.

A self-selected sample of immigrants, representing primarily an ethnic minority of the Soviet urban population, is not a representative sample of the referent population. The greatest risk of bias would be a pure Jewish distortion that causes SIP behavioral coefficients to differ from the referent population. The SIP relationship between alcohol consumption and income, for example, could not be generalized. We have no a priori way of identifying such biases that would affect earnings. Soviet Jews find it difficult to enter the highest-level positions, and they may have to work harder for advancement. The potential biases have been addressed in considerable depth by Ofer and Vinokur (1984), Anderson and Silver (1987b), and Swafford (1987). It is our opinion that such biases do not dictate the findings of this study.

C. Specification of the Earnings Model

A reduced form earnings equation relates earnings to conventional human capital factors as well as to measures of job characteristics, privilege and political loyalty. The sample is restricted to respondents who report earnings from 1978 or 1979.

$$\begin{aligned} LOG\ EARNINGS = {} & a_0 + b_1 EXP + b_2 EXP2 \\ & + \Sigma b_{3_i} ED_i + b_4 MOVE + \Sigma c_{1_j} REG_j \\ & + \Sigma c_{2_k} IND_k + \Sigma c_{3_m} OCC_m + d_1 AGE \\ & + d_2 MARRIED + d_3 ADULTS + d_4 KIDS \\ & + d_5 MALE + e_1 CAR + e_2 CLINIC \\ & + e_3 SHOP + e_4 SQMETERS + f_1 GOOD \\ & + f_2 GOOD{:}\,LEADERS + f_3 BAD \\ & + f_4 BAD{:}\,LEADERS \\ & + f_5 GOODL \times BADL + gHOURS + u \end{aligned} \tag{1}$$

A semi-log equation is estimated, the preferred functional form for earnings equations (Rosen, 1977). The dependent variable *LOG EARNINGS* is the natural log of nominal monthly earnings. The explanatory variables are grouped according to generalized human capital measures (the b coefficients), job characteristics (the c coefficients), demographic characteristics (the d coefficients), firm-specific human capital (the e coefficients), and political loyalty (the f coefficients). Since the dependent variable is monthly earnings, a variable for hours worked (*HOURS*) must be included to adjust for part-time work. The u denotes the stochastic error term. Variable definitions and descriptive statistics are given in the appendix.

Generalized human capital is measured by years of work experience (*EXP* and *EXP2*), nine cate-

depends upon earnings and education (the latter in two of the three cases). Privileges tend to be allocated according to the responsibility of the position as proxied by earnings and education.

[3] For an overview of the Soviet Interview Project see Millar (1987). For a discussion of the SIP sampling frame and procedures, see Anderson, Silver and Lewis (1986), Anderson and Silver (1987a, 1987b) and Swafford (1987). The data are available from the Interuniversity Consortium for Political and Social Research, University of Michigan.

TABLE 1.—COMPARISONS OF THE USSR POPULATION AND SOVIET INTERVIEW PROJECT SAMPLE: EMPLOYMENT, HOUSING AND FAMILY SIZE

Variable	USSR Urban Population 1978	Moscow 1978	SIP 1978–79
1. EMPLOYMENT			
a. Employment Status[a] (in percent)			
Employed	71.0		69.5
Going to school	3.0		2.5
Retired, disabled, maternity leave	16.0		16.5
Keeping house	10.0		9.1
Other	—		2.4
	100.00		100.00
b. Branch of Employment (in percent)			
Industry	38.3	27.0	30.5
Agriculture, forestry	0.1	0.0	0.2
Transportation, communication	12.3	9.6	6.3
Construction	11.8	7.1	8.9
Trade, catering supplies	10.5	9.2	14.1
Communal housing and services	4.6	4.7	5.5
Health	5.6	5.2	7.0
Education	8.0	5.4	10.3
Arts and culture	1.7	1.5	3.8
Science	3.8	19.2	9.9
Credit and Government apparatus	3.3	5.3	3.5
	100.00	100.00	100.00
c. Average Monthly Earnings (in rubles)			
All workers (excluding agriculture)	160	166	159
Industry	177	174	167
Transportation	190	188	187
Communication	139	158	129
Construction	191	183	191
Trade and catering	124	126	135
Communal housing & services	123	121	140
Health	116	129	132
Education	132	149	141
Arts and culture	108	144	162
Science	170	170	185
Credit and government apparatus	147	172	165
d. Hours worked per week, industry	40.6		40.0
e. Time spent shopping per workday (in minutes)	41.0		60.0
2. HOUSING			
a. Space per capita (square meters)	12.9		13.5
b. Private ownership (percent)	24.0		37.0
3. AVERAGE FAMILY SIZE (persons)	3.2		3.2

[a] USSR Employment status is for 1979.

Sources: Items 1a, 1d, 1e, 2a, 2b, 3 from *Narodnoe Khoziaistvo SSR 1979*, p. 375, p. 397; *Vestnik Statistiki*, No. 6, 1981, p. 79.

Item 1b: There is no urban population breakdown after the 1970 census. Therefore, we adjust the 1978 branch employment distribution (*Narodnoe Khoziaistvo SSR 1978*, p. 366) by the urban to total USSR employment ratios in the 1970 census (*Itoqi vsesoiuznoi perepis' naseleniia 1970 goda*, Vol. V, pp. 192–197). The Moscow distribution is from *Moskva v tsifrakh* 1979, p. 87.

Item 1c: *Narodnoe Khoziaistvo SSR 1978*, p. 373. *Moskva v tsifrakh* 1979, p. 93.

gories of completed education (*ED*), and by job moves (*MOVE*). Job characteristics are measured by 16 regions (*REG*), 20 industries (*IND*), and 44 occupational categories (*OCC*).[4] Demographic characteristics are given by (*AGE*), marital status (*MARRIED*), presence of other adult family members (*ADULTS*) or children (*KIDS*) in the family and gender (*MALE*).

Political loyalty is measured by the memberships and activities reported by SIP respondents (such as memberships in trade unions, workers committees, komsomol), how frequently they attended, and whether they played leadership roles.

[4] It is important to note that the occupational breakdown is quite detailed (34 groups for high-level workers and 10 for blue-collar workers). For brevity, the 44 occupation groups are not reported here but are described in a working paper (Gregory and Kohlhase, 1986).

TABLE 2.—POLITICAL ACTIVITY OF THE SIP SAMPLE

	Variable Name	High-Level (percent)	Blue-Collar (percent)
Support Activities			
Participated regularly in at least one regime-support activity such as party committees, trade union, workers committee or was a komsomol (communist youth league) activist; excluding leaders	*GOOD*	29.7	25.4
Was a leader in above activities	*GOOD: LEADER*	29.7	17.9
Disloyalty Activities			
Participated in at least one antigovernment activity such as unofficial art shows, study groups, protests, strikes, distribution of illegal publications; excluding leaders	*BAD*	29.0	15.9
Was a leader in above activities	*BAD: LEADER*	2.7	1.7

Soviet citizens routinely belong to certain organizations (like the trade union); therefore, only those who reported regular attendance or leadership roles were placed in the four political groups described below (table 2). Respondents who self-identified as being leaders, organizers, or officers were classified as *GOOD: LEADERS*. Regular participants (but non-leaders) were classified as *GOOD*. Respondents who engaged in acts of political disloyalty were differentiated in the same way as *BAD: LEADERS* or *BAD*. An interaction term (*GOODL* × *BADL*) was included to test for tradeoffs between political loyalty and disloyalty at the leadership level.

We do not have direct data on firm-specific human capital, but SIP did gather information on privileges—access to a closed shop (*SHOP*), closed health clinic (*CLINIC*), use of an official car (*CAR*) and housing space (*SQMETERS*). Such privileges are included because they may proxy (as argued above) for firm-specific human capital and for the perceived political importance of the respondent.

Positive coefficients are expected on the political loyalty variables with greater rewards for political activism (*GOOD: LEADER*) than for regular participation (*GOOD*). We expect negative coefficients for political disloyalty, with stronger penalties for leaders (*BAD: LEADER*) than participators (*BAD*). The sign on the interaction term (*GOODL* × *BADL*) is an empirical issue. A negative sign shows that individuals can compensate for being disloyal by engaging in regime support activities. The coefficients on the education dummies are expected to be larger (positive) for higher levels of education. The rewards to experience (*EXP* and *EXP*2) should increase at a decreasing rate so that a positive sign is expected on *EXP* and a negative sign on *EXP*2. The male gender (*MALE*) coefficient is likely to be positive based upon previous studies of sex differentials.

The signs on the four privilege variables (*CAR*, *CLINIC*, *SHOP*, *SQMETERS*) are indeterminate. While privileges serve as a proxy for desirable employee characteristics, they are also a fringe benefit that could be traded off for lower money wages (Dye and Antle, 1984; Leibowitz, 1983; Ehrenberg, 1980). In the Soviet case where privileges typically cannot be purchased legally, the marginal value of privilege may be higher than in the West. The net effect depends upon whether the positive effect of desirable worker characteristics dominates the negative effect of the privilege–wage tradeoff.

Three further points must be made concerning the model. First, we include regional dummy variables (*REG*) to control for differences in local amenities, climate, and living costs.[5] Second, an

[5] We experimented with direct measures of amenities for the 18 cities from which a majority of the respondents came. Measures such as per capita medical facilities, libraries, and theaters were entered as explanatory factors but failed to yield significant coefficients. We also experimented with measures of city size but failed to find significant size coefficients.

instrumental variables procedure is used to estimate hours of work (*HOURS*) as hours depends upon earnings per unit of time.[6] Third, the privilege coefficients are subject to a simultaneous equation bias which the compensation literature recognizes but does not solve (Ehrenberg, 1980, pp. 480–483; Brown, 1980). As a component of the full wage, fringes belong on the left-hand side; as proxies for worker characteristics, they belong on the right-hand side. The data do not allow us to solve this potential bias, but the other coefficients are unaffected by whether the privilege variables are included.

III. Regression Results

Regression results for 1,349 high-level (white-collar, technical, scientific, and managerial) employees and for 591 blue-collar workers are given in table 3. Separate models are estimated for blue-collar and high-level manpower because of the institutional differences in Soviet compensation practices for each group (described in Chapman, 1979). Significance tests for coefficient heterogeneity show that the coefficient sets are indeed statistically different.

Analysis of coefficients from regressions with and without occupation provides information about the channels through which earnings are affected. Accordingly, table 3 reports two columns of coefficients for each sample: the first column includes detailed occupational (*OCC*) dummies to hold the respondent's occupation constant and the second column omits the *OCC* dummies. Coefficients on the dummy variables are interpreted relative to the omitted control categories identified in the table notes.[7]

A. Loyalty and Disloyalty

The five political behavior coefficients test the proposition that Soviet authorities reward loyalty and penalize disloyalty. The regressions support this proposition, but not without surprises. Activist regime loyalty (being in the *GOOD*: *LEADER* category) is rewarded by higher earnings. With occupation held constant, a high-level employee in the *GOOD*: *LEADER* category earns 6.1% more than an employee with no regular political involvement. The return rises to 8.8% when occupation is not held constant. Thus, 2.7 percentage points of the 8.8% monetary reward for activist loyalty comes in the form of placement in a higher-paying occupation, while the remaining 6.1 percentage points represent higher pay within a given occupation. The monetary reward for regime loyalty appears to come primarily in the form of higher pay *within* a given occupation rather than as an admission ticket to higher-paying occupations. Blue-collar workers earn a similar reward for activist loyalty (about 9%), but the loyalty reward is exclusively in the form of a higher pay within a given occupation. Less-active regime loyalty (being simply in the *GOOD* category) does not yield higher earnings. To earn a reward for political loyalty, one must be an activist.

Regime disloyalty appears to be severely punished in the case of blue-collar workers. A blue-collar *BAD*: *LEADER* may earn from 34% to 36% less than a fellow worker with otherwise identical characteristics.[8] If blue-collar workers suffer an earnings loss of this magnitude, activist disloyalty is the most important determinant of blue-collar earnings. The activist disloyalty of high-level employees is not punished by lower earnings (the *BAD*: *LEADER* coefficient is negative but not significant). The SIP sample does provide ample evidence that activist anti-government actions by high-level employees are punished (Bahry and Silver, 1987). Our result suggests only that Soviet authorities use punishment other than monetary sanctions. As in the case of nonactivist loyalty, nonactivist disloyalty does not appear to carry any monetary sanctions. The *BAD* coefficients are uniformly insignificant. The insignificant $GOODL \times BADL$ interaction coefficients suggest that Soviet workers cannot compensate for disloyalty by acts of regime support.

A possible explanation for the difference between the disloyalty coefficients is that blue-collar "bad" activities tend to be more factory-protest

[6] The instruments are the exogenous variables in the wage equation plus dummies for second and private jobs, spouse's earnings and spouse's earnings squared, number of children and the interaction of children and spouse's earnings.

[7] The coefficient on continuous variables shows the percentage change in earnings brought about by a one unit change in the explanatory variable. For dummy variables, the coefficient shows the approximate percentage difference in earnings between the dummy group and the omitted control group (Halvorsen and Palmquist, 1980).

[8] Note that the negative coefficients on activist regime disloyalty are significant at the 10% level.

TABLE 3.—DETERMINANTS OF SOVIET EARNINGS, INSTRUMENTAL VARIABLES ESTIMATES[a]

	High Level Earnings				Blue Collar Earnings			
	Occupation Included		Occupation Omitted		Occupation Included		Occupation Omitted	
Variable	coefficient	(*t*-statistic)	coefficient	(*t*-statistic)	coefficient	(*t*-statistic)	coefficient	(*t*-statistic)
Human Capital								
*ED*0	—	—	—	—	−0.0401	(−0.15)	0.0377	(0.14)
*ED*1	0.0084	(0.04)	−0.0956	(−0.51)	−0.2251[a]	(−2.29)	−0.1959[b]	(−1.96)
*ED*2	−0.0297	(−0.37)	−0.0985	(−1.19)	−0.0937	(−1.60)	−0.0905	(−1.54)
*ED*3	−0.0190	(−0.15)	−0.1116	(−0.92)	−0.0705	(−0.75)	−0.0548	(−0.59)
*ED*4	−0.1750	(−0.91)	−0.2524	(−1.24)	−0.1194	(−0.83)	−0.0867	(−0.60)
*ED*6	0.0064	(0.17)	0.0113	(0.28)	0.0564	(1.10)	0.0415	(0.82)
*ED*7	0.0809	(1.12)	0.0884	(1.27)	−0.0094	(−0.09)	−0.0210	(−0.21)
*ED*8	0.1279[b]	(3.17)	0.2238[b]	(5.58)	0.0637	(0.84)	0.0646	(0.83)
EXP	0.0258[b]	(5.39)	0.0312[b]	(6.61)	0.0169[a]	(1.74)	0.0218[b]	(2.25)
*EXP*2	−0.0004[b]	(−3.14)	−0.0005[b]	(−4.47)	−0.0002	(−1.21)	−0.0003[a]	(−1.90)
MOVE	0.0056	(0.16)	0.0145	(0.40)	−0.0457	(−0.58)	−0.0650	(−0.85)
Political Loyalty								
GOOD	0.0035	(0.16)	0.0073	(0.31)	−0.0404	(−0.88)	−0.0468	(−0.99)
GOOD: *LEADER*	0.0607[b]	(2.21)	0.0878[b]	(3.07)	0.0885[a]	(1.73)	0.0845[c]	(1.63)
BAD	0.0087	(0.39)	0.0137	(0.60)	0.0143	(0.22)	−0.0037	(−0.06)
BAD: *LEADER*	−0.0547	(−0.73)	−0.0781	(−0.98)	−0.3394[c]	(−1.63)	−0.3587[a]	(−1.73)
GOODL × *BADL*	0.0617	(0.56)	0.0527	(0.45)	0.1312	(0.40)	0.1707	(0.53)
Privilege								
CAR	0.0788[b]	(2.31)	0.0796[b]	(2.04)	−0.0997	(−0.92)	−0.1256	(−1.13)
CLIN	0.0445	(0.84)	0.0320	(0.68)	0.0087	(0.05)	0.0385	(0.22)
SHOP	−0.009	(−0.02)	0.0443	(0.89)	0.0910	(0.78)	0.1597	(1.40)
SQMETERS	0.0002	(0.68)	0.0002	(0.98)	−0.0002	(−0.57)	−0.0002	(−0.60)
Demographic								
AGE	−0.0005	(−0.18)	0.0009	(0.29)	−0.0016	(−0.29)	0.0001	(0.02)
MARRIED	0.0126	(0.48)	0.0172	(0.61)	0.0582	(1.10)	0.0618	(1.16)
ADULTS	0.0022	(0.21)	0.0013	(0.12)	−0.0015	(−0.09)	0.0050	(0.30)
KIDS	−0.0268[b]	(−1.96)	−0.0195	(−1.36)	0.0057	(0.22)	0.0166	(0.62)
MALE	0.1809[b]	(4.49)	0.2236[b]	(5.95)	0.1867[b]	(3.51)	0.2870[b]	(6.10)
Job Characteristics								
HOURS	−0.0025	(−0.17)	0.0019	(0.18)	−0.0030	(−0.21)	−0.0009	(−0.06)
*IND*1	−0.0415	(−0.45)	−0.0854	(−0.86)	−0.3993	(−1.29)	−0.3526	(−1.18)
*IND*2	−0.1147	(−1.13)	−0.0535	(−0.51)	0.1053	(0.46)	0.1458	(0.64)
*IND*4	−0.0126	(−0.17)	−0.0122	(−0.16)	0.1387	(0.91)	0.0732	(0.48)
*IND*5	−0.0717	(−1.37)	−0.0500	(−0.93)	−0.1244[a]	(−1.65)	−0.1167	(−1.54)
*IND*6	0.1810	(1.50)	0.2034	(1.62)	−0.1729	(−1.12)	−0.2352	(−1.53)
*IND*7	0.0889	(1.32)	0.1666[b]	(2.29)	−0.1010	(−0.86)	−0.1018	(−0.84)
*IND*8	0.0502	(0.29)	0.1830	(1.02)	0.2417	(0.97)	0.1805	(0.70)
*IND*9	−0.0149	(−0.23)	0.0035	(0.05)	−0.0458	(−0.46)	0.0095	(0.11)
*IND*10	−0.0939	(−0.76)	−0.0298	(−0.22)	−0.2244	(−1.18)	−0.2484	(−1.51)
*IND*11	−0.0271	(−0.66)	0.0103	(0.24)	0.1257	(1.50)	0.1036	(1.22)
*IND*12	−0.1079[b]	(−1.96)	−0.1413[b]	(−2.80)	−0.2586[b]	(−3.26)	−0.3577[b]	(−5.32)
*IND*13	−0.1414	(−1.32)	−0.1209	(−1.06)	−0.2229	(−0.67)	−0.2500	(−0.79)
*IND*14	−0.1066	(−1.45)	−0.1294[a]	(−1.76)	−0.5312[b]	(−2.37)	−0.5082[b]	(−2.45)
*IND*15	−0.0698	(−1.04)	−0.0786	(−1.14)	−0.0847	(−1.04)	−0.1821[b]	(−2.60)
*IND*16	−0.1496[b]	(−2.15)	−0.1888[b]	(−4.05)	−0.3851[b]	(−2.62)	−0.4471[b]	(−3.32)
*IND*17	−0.2005[b]	(−3.44)	−0.1951[b]	(−2.04)	−0.3466[b]	(−1.72)	−0.3939[b]	(−2.03)
*IND*18	−0.2089[b]	(−2.65)	−0.0696	(−0.69)	−0.1732	(−0.90)	−0.2047	(−1.19)
*IND*19	−0.0836[b]	(−2.05)	−0.0004	(−0.01)	−0.2000	(−1.30)	−0.2230	(−1.43)
*IND*20	−0.0304	(−0.57)	−0.0284	(−0.52)	−0.1660	(−1.16)	−0.2353[a]	(−1.86)

TABLE 3.—(CONTINUED)

	High Level Earnings				Blue Collar Earnings			
	Occupation Included		Occupation Omitted		Occupation Included		Occupation Omitted	
Variable	coefficient	(*t*-statistic)	coefficient	(*t*-statistic)	coefficient	(*t*-statistic)	coefficient	(*t*-statistic)
Region								
*REG*2	−0.0862[b]	(−3.33)	−0.1176[b]	(−4.29)	0.0109	(0.14)	0.0248	(0.32)
*REG*3	0.0438	(0.65)	0.0185	(0.30)	−0.0406	(−0.36)	−0.0561	(−0.48)
*REG*4	0.0775	(0.65)	−0.0160	(−0.13)	0.3513	(1.37)	0.3134	(1.21)
*REG*5	−0.0943[b]	(−2.63)	−0.1085[b]	(−3.03)	0.0444	(0.62)	0.0773	(1.07)
*REG*6	−0.2052[b]	(−3.83)	−0.2475[b]	(−4.37)	0.0358	(0.33)	0.0777	(0.73)
*REG*7	−0.1340[b]	(−2.78)	−0.1581[b]	(−3.09)	−0.0846	(−0.88)	−0.0700	(−0.72)
*REG*8	−0.2014[b]	(−4.15)	−0.2381[b]	(−4.67)	0.0684	(0.73)	0.0566	(0.60)
*REG*9	−0.0580	(−1.20)	−0.0671	(−1.38)	0.0205	(0.20)	0.0469	(0.45)
*REG*10	0.3063[a]	(1.86)	0.2639	(1.52)	−0.2724	(−1.07)	−0.3220	(−1.26)
*REG*11	−0.1112[b]	(−2.28)	−0.1264[b]	(−2.45)	−0.0015	(−0.02)	0.0365	(0.40)
*REG*12	−0.0105	(−0.21)	0.0067	(0.13)	0.0335	(0.40)	0.0368	(0.44)
*REG*13	−0.1532[b]	(−2.70)	−0.1487[b]	(−2.51)	0.1166	(0.98)	0.1238	(1.03)
*REG*14	0.1434	(0.60)	0.1439	(0.67)	0.3380	(1.02)	0.1785	(0.53)
*REG*15	0.0008	(0.02)	−0.0246	(−0.53)	0.0465	(0.54)	0.0412	(0.46)
*REG*16	−0.1544	(−0.80)	−0.2525	(−1.26)	−0.1133	(−0.65)	−0.1247	(−0.70)
Constant	4.76737[b]	(8.87)	4.3928[b]	(11.46)	4.7314[b]	(8.34)	4.5914[b]	(8.03)
R^2	0.51		0.41		0.36		0.33	
$\bar{R}^2$	0.47		0.39		0.27		0.25	
Mean Square Error	0.0983		0.1143		0.1710		0.1760	
Sample Size	1349		1349		591		591	

Note: A two-stage estimation procedure is used where an instrument for hours worked is constructed in the first stage. The dependent variable in the second stage is the natural log of monthly earnings; omitted categories are *REG*1, *IND*3, *ED*5, no privilege, no political behavior, service workers (blue collar) or entry level engineers (high level). For brevity coefficients on occupation are not reported; complete tables are available upon request from the authors.

[a] Significant at 10% level, 2-tailed test.

[b] Significant at 5% level, 2-tailed test.

[c] Significant at 10% level, 1-tailed test.

oriented than while-collar "bad" activities, which tend to be more intellectual in nature (Bahry, 1987; Bahry and Silver, 1987). If the regime regards factory protests as more serious threats to regime stability, it would impose heavier sanctions.

B. Returns to Education

Because of extensive vocational education and correspondence schooling in the Soviet Union, it makes little sense to measure educational attainment as a continuous variable (such as years of schooling). Rather, education attainment is better broken down into different categories of schooling. High school graduates are used as the control group and alternate regressions show that the choice of control group does not affect the outcome.

Table 3 reveals that having either very low or very high educational attainment affects Soviet earnings, while successive increments of education in the intermediate ranges do not affect earnings relative to high school graduates. For high-level manpower only completed higher education raises earnings. In the blue-collar sample, having 4–6 years of schooling or less lowers earnings by a substantial 20% to 22%, while having only 7–8 years lowers earnings by 9%. Beyond this point, additional general education, vocational training, or even secondary specialized education does not significantly impact earnings.

Higher education has two effects on the earnings of high-level Soviet workers. First, higher education enables persons to enter higher paying occupations. Second, once in a given occupation, persons with higher education earn more than others in the same occupation with less education. The 22.4% total education effect on high-level earnings is composed of 9.6% (22.4–12.8) due to education's impact on occupational choice and 12.8% due to the effect of education within a given occupation.

The 22.4% return to completed higher education (relative to high-school graduation) for high-level workers is close to that found by Ofer and Vinokur (1984, pp. 142–143) for the early 1970s. These results also confirm, at least partially, their

finding that returns to education increase with higher levels of schooling. However, we find no statistically significant earnings differences between eight years and completed university education, while Ofer and Vinokur find a monotonic progression. The Soviet pattern of rising returns is contrary to the Western pattern of falling rates of return for successively higher levels of schooling (Mincer, 1974, p. 48; Becker, 1975, p. 206).

The Soviet pattern of high incremental returns to the most-highly educated members of society is not entirely expected. Because the state bears most of the costs of higher education, the demand-side effect should drive down returns to the university educated. However, there are a limited number of entry positions in sought-after universities and institutes and preferential university admissions is one way the elite passes on its status to the next generation (Mathews, 1978; Voslesensky, 1984). While speculative, our results suggest that the supply effect dominates the demand effect.

C. *Experience*

Table 3 reveals that both high-level and blue-collar earnings are significantly and nonlinearly related to years of experience in the workforce. The initial year of work experience raises earnings by 2% to 3%, a figure slightly below that found by Ofer and Vinokur (1981). For high-level employees, earnings peak at 33 years of experience. Blue-collar earnings peak somewhat later, somewhere between 33 and 40 years, depending upon whether occupation is held constant. Thus white-collar and blue-collar earnings peak at the same age because of the later start in the labor force of high-level workers.

The Soviet return to experience (2% to 3% in the initial year) appears to be lower than in the United States, where estimates are typically in the 5% to 8% range (Mincer, 1974; Duncan and Hoffman, 1979; Lang and Ruud, 1986). Although by no means conclusive, our results suggest that earnings are less sensitive to experience than in the American labor market. One possible explanation is that American firms, in their implicit contracting, must reward experience more to retain firm-specific human capital. Soviet managers may be aided in retaining experienced workers by the lesser geographic mobility of workers and by housing constraints.

D. *Female Earnings*

Holding occupation constant, women working in high-level and blue-collar jobs earned between 18% and 19% less than men working in the same industry and having equivalent education, training, and personal characteristics. For blue-collar workers, the female earnings gap rises to 29% when occupation is not held constant. This means that occupational segregation explains about 10 percentage points of the blue-collar female earnings gap. For high-level workers, the female earnings gap rises from 18% to 22% when occupation is not held constant. Only 4 percentage points of the female earnings gap is accounted for by occupational segregation in the case of high-level workers.

Our figure for the unexplained differential (about one-fifth) is close to Ofer and Vinokur (1981, p. 144), who find an unexplained differential of 21% to 25%. For high-level Soviet workers, occupational segregation plays only a minor role in accounting for lower female earnings. For blue-collar Soviet workers, the effects of lower earnings within a given occupation is twice that of occupational segregation. Although there is controversy about the relative importance of occupational segregation in explaining American earning differentials by sex (summarized in the accompanying note),[9] we conclude that occupational segregation plays a less important role in the Soviet labor market.

E. *Privilege*

There is no significant relationship between earnings and privilege for blue-collar workers. Privileges do not have a significant effect on high-level earnings (although most of the coefficients are positive) except for the use of an official car (*CAR*), which carries 8% higher earnings. Positive fringe benefit coefficients have also been found for

[9] Oaxaca (1973) finds that equalizing occupational distributions would reduce the female earnings gap by about 9%, about one-half of the unexplained gap. Malkiel and Malkiel (1973) find that occupational segregation explains most of the earnings differential in the large corporation studied. Although there are ongoing controversies about the relative effects of occupational segregation and lower pay within the same job, we interpret the literature as arguing that occupational segregation is more important in explaining the American female earnings gap. For a survey of this literature, see Ehrenberg and Smith (1982), pp. 396–400.

the United States (Leibowitz, 1983) so this is not an unusual result. The privilege results support the interpretation that privileges are used to reward desired worker characteristics (including the level of the position) because a positive coefficient means that such rewards dominate the substitution of privilege for lower wages. This conclusion must remain speculative because of the potential simultaneous equation biases discussed above.

F. Regional and Industry Effects

Space limitations prevent a full discussion of regional and branch effects. Table 3 reveals that the branches in which earnings are low are those (trade, health and physical culture, and education) that are typically identified as low priority branches. This finding suggests that Soviet authorities are indeed successful in enforcing their branch priorities on the wage system.

For the regional coefficients, Moscow, which is assumed to be the most desired location in the Soviet Union, is used as the control region. Non-Moscow regions are expected to have positive compensating real wage differentials relative to Moscow. The results do not support the expectation. For blue-collar workers, the regional coefficients are uniformly insignificant. For high-level workers, there are a number of negative coefficients for non-Moscow regions. Because *REG* proxies for several effects in addition to amenities, the coefficients represent the combined impact of many factors. There are four possible explanations for finding relatively higher wages in Moscow for high-level workers. Higher wages may be explained by cost-of-living differences because we are using nominal earnings.[10] Entry permits may create artificial labor shortages in Moscow. Moscow residents may be better "connected" than residents of other regions. Marginal social productivity may be higher at the center in a centrally-planned economy.

IV. Conclusions

We use micro data gathered from the Soviet Interview Project to investigate the determinants of Soviet earnings. The unique SIP data set, unlike official Soviet statistics, allows an in-depth study of the Soviet incentive structure. Our analysis confirms that Soviet labor markets operate in many respects like U.S. labor markets. Yet immense institutional differences between the two nations cause differential returns to certain worker characteristics. The most striking institutional impact is the Soviet practice of rewarding and penalizing political behavior that is external to the firm.

The Soviet wage system rewards activist regime support. Workers who are leaders of regime-support activities earn from 7% to 9% more, ceteris paribus. High-level employees are rewarded for activist regime loyalty principally by higher pay within a given occupation, but they are also rewarded by admission to higher-paying occupations. Blue-collar workers are rewarded entirely in the form of higher pay within a given occupation. Activist regime disloyalty of high-level manpower is surprisingly not punished by lower money wages. For blue-collar workers, however, activist disloyalty appears to result in significant losses of earnings. Only political activism matters. Non-leadership records of loyalty or disloyalty do not affect earnings.

As in the United States, Soviet labor markets reward education and experience. Yet the different institutional setting for attaining higher education in the Soviet Union translates into a differential pattern of rewards. The return to education is low for Soviet workers except at the upper and lower bounds, contrary to the U.S. pattern of declining rates of return to higher levels of education. For high-level manpower, only completed higher education yields a positive rate of return. For blue-collar workers, only those with limited general education earn less. Returns to experience appear lower than in the United States.

Even the Soviet system encounters a substantial gap between the earnings of otherwise identical male and female workers. However, the Soviet gap

[10] Soviet pricing authorities set zonal retail prices for food products; nonfood products are not officially differentiated by geographic zones. Food prices in state stores should be higher by 8% in Moscow, Leningrad and the Baltics than in the Ukraine according to official regulations (Kokorev, 1978, pp. 184–190). It is also likely that collective farm food prices are higher in Moscow than elsewhere, although there is no firm data to support this point. We are grateful to Gertrude Schroeder-Greenslade for bringing information on regional price variations to our attention.

We conclude that the cost-of-living differential for Moscow, if it exists, is likely to be small. We estimate a 10% upper bound on the higher cost of living in Moscow relative to other Western USSR regions. Furthermore, information provided by SIP respondents on cost of living (perceived poverty standard and five-year inflation rate in the immediate community) did not indicate that Moscow had a significantly higher cost-of-living.

is associated with different forces than the gap in the United States. The Soviet female earnings gap is about 20%, holding other factors including occupation constant. Without occupation held constant, Soviet women earn from 22% to 29% less. Lower pay within a given occupation accounts for a much higher proportion (two-thirds to four-fifths) of the female earnings differential than in the United States.

A remaining mystery concerns the Soviet practice of setting regional wage adjustment coefficients. While we find support that central industry priorities are capitalized into earnings, we find no conclusive evidence of regional priorities being capitalized. This will be the topic of future research.

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APPENDIX

TABLE A1.—CHARACTERISTICS OF HIGH LEVEL AND BLUE COLLAR SAMPLES

Variable	Description	High Level Mean	High Level Standard Deviation	Blue Collar Mean	Blue Collar Standard Deviation
Human Capital					
ED0	Less than 4 years general school	0.000	0.000	0.005	0.071
ED1	4–6 years general school	0.003	0.054	0.047	0.213
ED2	7–8 years general school; 1–2 years trade school	0.018	0.132	0.154	0.361
ED3	More than 8 years general school; some secondary specialty school	0.009	0.094	0.051	0.220
ED4	3 or more years trade school; 2 year degree program	0.002	0.047	0.017	0.129
ED5	Attestat (high school)	0.071	0.257	0.367	0.482
ED6	Complete secondary specialty school	0.266	0.442	0.223	0.417
ED7	Some higher education	0.048	0.214	0.044	0.205
ED8	Completed higher or more	0.583	0.493	0.091	0.288
EXP	Public sector experience defined as age − number of years not working at a public sector job	19.275	9.634	22.184	10.695
EXP2	Experience squared	464.276	412.661	606.34	514.391
MOVE	Moved in last 5 years (= 1)	0.085	0.278	0.091	0.288
Political Loyalty					
GOOD	Participates in good activities (= 1)	0.297	0.457	0.254	0.436
GOOD: LEADER	Leader in good activities or Komactiv (= 1)	0.297	0.457	0.179	0.384
BAD	Participates in bad activities (= 1)	0.290	0.454	0.159	0.366
BAD: LEADER	Leader in bad activities (= 1)	0.027	0.163	0.017	0.129
GOODL × *BADL*	Good leaders times bad leaders	0.013	0.112	0.008	0.092
Privilege					
CAR	Use of official car (= 1)	0.094	0.292	0.039	0.194
CLIN	Legal access to closed clinic (= 1)	0.054	0.226	0.014	0.116
SHOP	Legal access to closed shop (= 1)	0.059	0.236	0.034	0.181
SQMETERS	Square meters of living space	39.683	37.417	45.614	63.291
Demographic					
AGE	Age at end of last normal period	37.675	9.239	39.479	10.638
MARRIED	Married (= 1)	0.844	0.363	0.838	0.369
ADULTS	Household size minus *KIDS*	2.540	0.938	2.663	1.138
KIDS	Children under 18 years	0.887	0.737	0.980	0.922
MALE	Male (= 1)	0.431	0.495	0.613	0.488

TABLE A1.—CONTINUED

Variable	Description	High Level		Blue Collar	
		Mean	Standard Deviation	Mean	Standard Deviation
Job Characteristics					
EARNINGS	Nominal gross monthly earnings (in rubles)	165.779	90.996	162.037	88.451
LOG EARNINGS	Natural log of gross monthly earnings	5.012	0.432	4.967	0.484
HOURS	Predicted hours worked	38.918	4.949	42.137	3.811
HRSWKLNP	Hours worked per week	38.918	8.973	42.137	8.199
*IND*1	Manufacturing: chemical	0.010	0.098	0.005	0.071
*IND*2	Man: energy, metallurgy	0.009	0.094	0.007	0.082
*IND*3	Man: machine building	0.096	0.294	0.169	0.375
*IND*4	Man: wood, building material	0.018	0.132	0.017	0.129
*IND*5	Man: light-no food	0.047	0.213	0.142	0.349
*IND*6	Man: light-food	0.007	0.081	0.015	0.123
*IND*7	Man: other	0.022	0.148	0.036	0.185
*IND*8	Agriculture, forestry	0.003	0.054	0.007	0.082
*IND*9	Transportation	0.027	0.163	0.080	0.271
*IND*10	Communications	0.005	0.072	0.014	0.116
*IND*11	Construction	0.095	0.293	0.076	0.265
*IND*12	Trade, social catering	0.057	0.232	0.151	0.358
*IND*13	Material, technical supply	0.007	0.086	0.003	0.058
*IND*14	Other productive services	0.021	0.145	0.008	0.092
*IND*15	Municipal economy, housing	0.024	0.155	0.174	0.380
*IND*16	Health-physical culture	0.114	0.318	0.022	0.147
*IND*17	Education	0.160	0.367	0.017	0.129
*IND*18	Culture & arts	0.052	0.222	0.017	0.129
*IND*19	Science	0.179	0.383	0.015	0.123
*IND*20	Credit, state, party	0.044	0.205	0.025	0.157
Regions					
*REG*1	Moscow	0.262	0.440	0.108	0.311
*REG*2	Leningrad	0.235	0.424	0.127	0.333
*REG*3	European RSFSR, Excluding Moscow-Leningrad	0.033	0.180	0.039	0.194
*REG*4	Non-European RSFSR	0.006	0.077	0.008	0.092
*REG*5	Kiev	0.107	0.310	0.161	0.368
*REG*6	Odessa	0.035	0.183	0.041	0.198
*REG*7	West Ukraine	0.041	0.198	0.058	0.233
*REG*8	East Ukraine, excluding Kiev-Odessa	0.041	0.198	0.066	0.248
*REG*9	Baltic capitals	0.048	0.214	0.044	0.205
*REG*10	Baltic, excluding capitals	0.003	0.054	0.005	0.071
*REG*11	Kishinev & Minsk	0.043	0.203	0.069	0.254
*REG*12	Byelorussia & Moldavia, excluding capitals	0.039	0.194	0.102	0.304
*REG*13	Transcaucasian capitals	0.043	0.203	0.030	0.172
*REG*14	Transcaucasian, excluding capitals	0.003	0.054	0.003	0.058
*REG*15	Central Asian capitals	0.059	0.235	0.112	0.315
*REG*16	Central Asia, excluding capitals	0.002	0.047	0.025	0.157
Sample size		1349		591	