MARKETS FOR COMMUNIST HUMAN CAPITAL: RETURNS TO EDUCATION AND EXPERIENCE IN THE CZECH REPUBLIC AND SLOVAKIA

Robert S. Chase

Yale University

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Abstract

This research examines differences in earnings structure between Communist and post-Communist Czech Republic and Slovakia using four sets of similar micro-data. It presents hypotheses about how earnings dispersion returns to education and returns to experience will change across regimes and tests those hypotheses using earnings equations. From approximately 2.5 percent in 1984, the return to education increased to approximately 5 percent by 1993. During that period, returns to experience fell. Though women have higher returns to education, returns for men increased more across regime change. Those with academic secondary education experienced a particularly large earnings increase. Earnings structure changes appear larger in the Czech Republic than in Slovakia.

In former Communist countries, economic, political and social institutions have changed markedly since 1989. Previously, as part of a social policy purported to deliver equity between workers, central planners set wages by industry and occupation, so earnings and income profiles were compressed compared to those of market economies. Now that central planners' influence over the labor allocation system has relaxed, do earnings structures in post-Communist economies approximate those in market economies? While earnings seem to have become more dispersed, questions remain concerning their structure during the Communist era, in post-Communist economies, and differences between the two. How do earnings relate to worker characteristics, particularly worker's education and experience? Comparing the two regimes, are education and experience valued in different ways? How do men's and women's earnings differ across regime change? After correcting for observed human capital differences, is skill

rewarded differently? In this research, I will use micro-data from during and after Communism in the Czech Republic and Slovakia to investigate these questions.

Among transition economies the Czech Republic and Slovakia provide interesting case studies, for one expects stark differences between these countries' Communist and post-Communist outcomes. Arguably, the Czech and Slovak Socialist Republic was most successful in meeting planners' stated social policy goals, achieving greater equality of income than other centrally-planned economies. From that extreme, the Czech Republic is considered to have progressed most rapidly towards a market system compared to its East European neighbors, with the exception of the former East Germany.

The break-up of Czechoslovakia into separate nations offers a second dimension for comparison. Prior to their split on January 1, 1993, the Czech and Slovak Republics operated under similar institutions and policies; as sovereign nations they do not. Compared to the Czech Republic, in Slovakia market institutions and incentives have not been accepted as easily or readily. While one cannot ignore differences in initial conditions between the two regions, comparing relative changes in earnings structure across these countries gives insight into how different human capital characteristics are rewarded under different regimes and circumstances of transition.

LITERATURE REVIEW AND HYPOTHESES

While several authors have discussed the transition's expected impact on labor markets (see for example, Góra (1992), Švejnar (1991), and Švejnar (1992)), empirical approaches using micro-data are less prevalent. Krueger and Pischke (1995) analyze the impact on wages of regime change across East and West Germany. They find that following reunification East

German wage variation increased significantly, wages became more similar to those of West Germany, and education earned under Communism decreased in value. Orazem and Vodopivec (1994) find that returns to education and experience increased in post-Communist Slovenia. Further, the transition to market led men's and women's earning structures to become more similar. Supporting Orazem and Vodopivec (1994), Jones and Ilayperuma (1994) find that returns to education and experience increased between plan and early transition in Bulgaria.

Comparing 1988 with 1991 in the Czech Republic, Flanagan (1994) finds that returns to schooling have increased for university graduates, while there has been little or no change for those with vocational education. Returns to experience were low previously and remained low following the transition. Though Flanagan (1994) addresses questions similar to those of this study, his analysis is not based on micro-data but on wage data grouped by education and potential experience cells. Further, it does not include analysis for Slovakia.

While the comparative systems literature discusses how earnings were established in a centrally-planned economy (see Bergson (1944) for the classic presentation), there is no generally accepted theory of labor allocation and earnings under Communism. The classic labor models applied to market systems provide useful starting points for analysis, though many of the assumptions of those models (*e.g.*, firms maximize profits, firms can alter their wages to reward more productive labor) are unlikely to hold in a centrally planned economy.

However, one can still discuss different perspectives on the determinants of Communist earnings. Two competing approaches, one emphasizing non-market forces, the other focusing on market forces, seek to explain how centrally-planned economies determined earnings. The non-market perspective notes that Communist regimes proclaimed a social policy offering

substantial equality between workers, that central planners established wage levels by industry and occupation, and that the state had significant ability to influence or coerce people's activities. From these facts, a non-market picture of Communist wage determination would include highly compressed earnings profiles, workers forced to take jobs assigned by central planners, limited earnings benefits to being more productive, and low returns to education.

As Bergson (1944) argues, other facts suggest that market forces operated to determine wages in centrally planned economies. Unable to control all agents, planners set firm managers' production targets and total wage bills but allowed them to allocate wage resources. Facing a production target, a fixed wage bill, and a distribution of types of labor, each with different productivity, managers would offer wages proportional to each labor type's productivity. Though planners set wage scales for positions, managers could offer higher productivity workers positions associated with higher earnings. Substantial earnings dispersion and returns to education would result, assuming that higher education led to higher productivity which managers could identify. If increased experience made workers more productive, one would also expect positive returns to experience.

Elements of both non-market and market explanations would likely hold during the Communist period. While managers could offer higher or lower paying positions to reward productivity, they could not offer wages above ceilings or below floors established by planners' wage scales. Assuming restrictive ceilings and supportive floors, low, though positive, returns to education and experience would result. If required for particular jobs that central planners found important, specialized education, such as technical training, would also be rewarded. To ensure adequate labor in favored industries, central planners set higher wage scales for workers

in those industries. Other things being equal, workers in favored industries would receive higher earnings. This study will test for these characteristics in the Communist-era data for the Czech Republic and Slovakia.

Several stylized facts guide hypotheses about transition's effect on earnings structures, returns to education and returns to experience. Market-based models will not be fully appropriate, for micro-economic transitions are unlikely to take place instantaneously (Švejnar (1991)). The legacy of Communist policies and institurions still influences wage structures, and returns to education and experience will not yet be fully comparable to those of market economies.

Although official ceilings and floors no longer bind industry and occupation wages[1], private ownership and management applies to only a limited portion of the economy: even in the Czech Republic, which privatized state-owned industries rapidly in 1993, many still worked in firms the state owned and managed. During the economic downturn normal to early transition, these firms did not restructure their earnings drastically. Among those still working for state-owned firms, earnings dispersion will increase only slightly.

However, during transition private sector firms and opportunities for entrepreneurship appeared. New positions offer earnings substantially higher (or lower) than available under the Communist regime or from state-managed firms. Switching to these private-sector positions, workers face a broader range of possible earnings. Considering all workers, earnings dispersion will be substantially larger during transition.

Within this wider dispersion, it is not obvious which characteristics will be valued. According to Schultz (1975), education allows one to adjust more effectively to disequilibrium.

Considering the transition from Communism to be drastic disequilibrium, more educated people should find positions offering higher earnings. Returns to years of education will increase across regime change. Further, if technical education trains students for a specific job or industry, it will not provide them with as much flexibility as those who have received academic education. Academic education should be relatively better rewarded during transition.

HYPOTHESES CONCERNING CZECH AND SLOVAK TRANSITION

While each formerly centrally-planned economy will handle regime change differently, the Czech and Slovak transition cases are particularly interesting. These two republics existed under a common federal government during Communism, and though their economies were structured differently, they followed similar policies. Up to and through their separation in 1993, however, they responded to the challenges of post-Communist transition in different ways, which will likely have implications for how earnings structures changed.

While the two republics sought to handle transition in similar ways (see Dedek (1996), pp. 46 for a discussion), there are also important differences in their policies and in transition's effects. Although GDP in the two republics fell at roughly the same rate from 1989 to 1992, in 1993 real GDP dropped 0.9 percent in the Czech Republic and 4.1 percent in Slovakia. The Czech Republic compensated for trade lost with Slovakia and former Communist partners, increasing exports to other markets. Slovakia was unable to diversify. Labor demand reflected differences in total demand. Unemployment rates differed greatly between the republics. Although the Slovak unemployment rate in 1992 (10.4 percent) was lower than that of Poland or Hungary, it was significantly higher than in the Czech Republic (2.6 percent).

Structural differences in the two economies explain some of these differences in total and labor demand: in Slovakia central planners placed heavy industry focused on armaments. These industries suffered disproportionately from the collapse of the Communist trading block. By contrast, industry in the Czech Republic consisted of smaller firms, offering more opportunities for entrepreneurial activities that could draw workers away from larger firms. In addition, the Czech Republic's long border with OECD countries allowed many workers to commute to work outside Czech borders.

The two republics also pursued different policies during transition. The Czech Republic offered the elderly and out-of-work less generous social security benefits. It also privatized industries faster. For example, the Czech Republic successfully completed the first wave of voucher privatization by 1993 and started registration for a second wave in October 1993. By contrast, at the beginning of 1997, Slovakia had not completed the first wave of voucher privatization and was still confronting difficulties with the process.

To consider different effects of transition between the two republics, the framework developed in Katz and Murphy (1992) allows one to consider changes in the supply and demand for well- and less-well-educated workers. As descriptive statistics presented below attest, following Communism, the supply of more educated workers increased in both the Czech Republic and Slovakia: in the youngest cohort entering the work force after 1984, the proportion of people who completed high-school or had some college education is higher.

While people altered their labor supply between the Communist period and post-Communism (see Chase (1996), Chapter 2 for a more complete investigation), labor demand shifts are more likely to affect earnings and differ across republics. Ham, Švejnar, and Terrell

(1996) document the differences between the low unemployment rate in the Czech Republic and the high rates in Slovakia, suggesting that labor demand fell little in the former but a great deal in the latter.

Because of events described above, in Slovakia manufacturing demand fell, decreasing the demand for less-well-educated workers. Assuming this demand shift was of larger magnitude than the drop in relative supply of these workers, less educated workers would suffer a fall in relative earnings. Returns to education will increase in Slovakia. In the Czech Republic, by contrast, there was little fall in the total demand for labor. However, the demand for services increased (descriptive statistics document an increase in the number of workers in this industry category). Demand for better educated workers rose, increasing the relative earnings of this type of labor. Though it likely arose by different means than in Slovakia, in the Czech Republic, the return to education would also increase.

In summary, during the Communist era, one expects relatively compressed earnings, small but positive returns to experience and education, particularly technical education, and premiums for working in industries favored by central planners. In the post-Communist transition, one expects that earnings dispersion will increase, as will returns to education, particularly for academic education. Returns to experience should fall and premiums for favored industries should diminish.

EMPIRICAL STRATEGY

To test changes in earnings determinants for the Czech Republic and Slovakia before and after 1989, I primarily use ordinary least squares (OLS) earnings equations based on Mincer (1974), regressing log earnings on years of schooling, years of post-schooling potential

experience, and experience squared. I expand that list of regressors to include regional and industry dummies and types of education, and correct for selection bias introduced by women's participation decisions. Throughout, I consider changes in the amount of variation which these independent variables explain, attributing changes in residual variance to changes in skill differentials under regime change.

I distinguish between earnings data from the Communist-era, denoted with a superscript "84", and that from the post-Communist era "93". I differentiate Czech Republic "C" data from Slovakia "S" data. Finally, because men and women consistently have different determinants of earnings in the labor economics literature, I separate data for males "M" and females "F". As a result of these divisions, the data is partitioned into eight sub-sets.

The null hypothesis is that, while earnings levels may differ across sub-sets either because of real wage changes or because of difficulties in adjusting for prices, the earnings determinants are identical across them:

$$\ln E_i = a + a^M + a^{93} + a^S + bX_i + e_i \qquad\qquad [1]$$

where E_i is individual i's earnings, α, α^M, α^{93}, and α^S indicate intercepts for general, male, post-Communist, and Slovak dummies, and ß represents a vector of coefficients on the X regressors. Under the null, all sub-sets share the same coefficients ß.

Against this null, I test the hypothesis of different coefficients ß between sub-sets. Interacting the X's dummy variables for male, post-Communist and Slovak respondents in turn, the data reveal different effects of the X's on the earnings of men and women, Communist and Post-Communist, and Czech and Slovak respondents:

$$\ln E_i = a + a^M + a^{93} + a^S + bX_i$$
$$+ b^M X_i^M + b^{93} X_i^{93} + b^{M,93} X_i^{M,93} \qquad [2]$$
$$+ b^S X_i^S + b^{93,S} X_i^{93,S} + e_i$$

where X_i^M, X_i^{93}, X_i^S, $X_i^{M,93}$, $X_i^{93,S}$ are single and two-way interaction terms between the X's and corresponding dummies. F-tests of the joint significance of each set of interaction terms allow one to reject the null hypothesis, finding significant differences in the structure of earnings between these sub-populations. Thus, it is appropriate to separate the data into sub-sets and determine ß coefficients specific to each of the eight sub-populations:

$$\ln E_i^{M,84,C} = a^{M,84,C} + b^{M,84,C} X_i^{M,84,C} + e_i^{M,84,C}$$
$$\ldots \qquad [3]$$
$$\ln E_i^{F,93,S} = a^{F,93,S} + b^{F,93,S} X_i^{F,93,S} + e_i^{F,93,S}$$

Beginning with the simple Mincerian specification of the X vectors, the analysis compares sub-population ß coefficient vectors. For example, differences between $ß^{M,84,C}$ and $ß^{M,93,C}$ show how Czech men's returns to education and experience changed across regime. Following Juhn, Murphy and Pierce (1993), I consider changes in skill differentials across regime by analyzing residual inequality after controlling for education and experience[2].

More extensive sets of regressors are then added to determine the earnings effects of different worker characteristics, including industry, region and type of education. I present changes in industry wage differentials that exist after controlling for other human capital variables. These differentials illustrate how working in particular industries was particularly rewarded during and following Communism. Using an approach developed in Krueger and Summers (1988), I use the standard deviation of industry wage effects as a summary measure of the magnitude of these industry differentials.

As discussed extensively in the labor supply literature (for a survey, see Killingsworth and Heckman (1986)), such estimates will be biased if those people who choose to participate in the labor force, for whom earnings are observed, are not a randomly-selected sub-sample of the population. I use a maximum likelihood, generalized Tobit approach to correct for possible selection bias in the earnings equations for women. Exclusion restrictions identify a joint earnings-participation model, where I include in the participation equation variables excluded from the earnings equation. Appropriate identifying variables will influence the individual's participation decision without influencing market earnings. I follow the labor supply literature and base identification of the participation/earnings model on assets variables as proxies for non-labor income. However, because the study's main objective is to compare similar models for Communist and post-Communist data, it requires identifiers available for all sub-sets of the data. Within this data constraint, I include household/apartment attributes as proxies for wealth.

DATA

The Communist period data results from the 1984 Social Stratification Survey. Reporting information for both republics of the Czecho-Slovak Socialist Republic, the 1984 data has a sample of 18,000 households, though every household was not required to answer information from all survey modules. Each household provided responses regarding their income and benefits. This information was verified through a separate employer questionnaire. The post-Communist data for both the Czech Republic and Slovakia result from a multi-country comparative research project entitled "Social Stratification in Eastern Europe 1993". In May 1993[3] the project collected information from 5600 households in the Czech Republic and 4900 in Slovakia. Based on a sample frame from a recently conducted micro-census, the sample

selection procedure specified that respondents be randomly chosen from within the household (not necessarily the household head) and be between 20 and 69 years of age.[4]

Although the two research projects investigate similar issues, the previous regime designed the 1984 survey and collected the data. Thus, the focus of the questions and probable accuracy of responses differ between periods. One must be careful comparing the two data sets, particularly with regard to earnings. The dependent variable for all 1984 regressions is net earnings from the respondent's only reported job, measured in Crowns per month. It does not reflect total remuneration, for during the Communist era, the firm or state provided non-wage remuneration and benefits including housing, child-care and family allowances. Further, the Communist-era survey included no information on respondents' parallel market or home-production activities. To make the 1984 and 1993 data as comparable as possible, the analysis concerns monthly earnings from the primary job, for that information is available for both time periods.

Descriptive statistics in Table 1 offer some first information about changes in primary earnings between 1984 and 1993 in the Czech Republic and Slovakia. In the Czech Republic the mean values of nominal earnings are 2493 and 4039 for the years 1984 and 1993, respectively; in Slovakia they were 2421 and 3717. Because of difficulties with Communist-era price indices, wage figures are not corrected for price changes, so it is inappropriate to compare these mean earnings levels across time. One can, however, compare the relative distribution of raw earnings in the four samples. The variance of Czech log earnings is 0.13 and 0.19 in 1984 and 1993, respectively; in Slovakia, corresponding figures are 0.12 and 0.16. Supporting the analysis of Garner, *et al.*(1995), these figures point to growth in earnings dispersion between the two

periods, a phenomenon that will be examined more closely below by an analysis of variance. Further, they provide first evidence that earnings dispersion grew more in the Czech Republic than in Slovakia.

To introduce the discussion of changes in variance, Table 1 also presents the variance of log earnings within education and experience cells. Following Juhn, Murphy and Pierce (1993), this residual earnings variance that exists after correcting for human capital differences can be attributed to skill differentials. Skill differentials increased between 1984 and 1993. In 1984, the human-capital corrected earnings variance was 0.07 in both the Czech Republic and Slovakia. In 1993, in the Czech Republic, the variance associated with skill increased to 0.14 while in Slovakia it increased to 0.11. Again, the amount of change in earnings variance is larger in the Czech Republic than in Slovakia.

Following the Mincerian specification, the primary regressors in this analysis include years of education[5] and potential experience. Potential experience indicates the years elapsed since the respondent completed their education. The study will also explore the possibility that different types of education give higher returns, so that education types are also included.

The percentage of workers in each industry illustrates labor market movements and transformation. In 1984 many respondents (14 percent in the Czech Republic and 18 percent in Slovakia) worked in agriculture; in 1993 these percentages had dropped to 9.5 and 14 percent, respectively. The percentage working in mining fell, from 8.8 to 3.5 percent in the Czech Republic and from 7.1 to 1.9 percent in Slovakia. The percentage of people working in manufacturing also fell, though by a much smaller amount. At the same time, the share who reported they worked for utilities or public services increased. The percent of people who

worked in this industry rose in the Czech Republic, from 16 to 20 percent, and remained

constant at 17 percent in Slovakia. For comparison with European OECD countries, whose

economies were also shifting toward services, according to the ILO *Yearbook of Labour*

Statistics in 1985 24 percent of French workers and 22 percent of German workers were in

service industries. In 1993, 26 percent of French workers and 24 percent of German workers

were. While the service sectors were growing throughout Europe, the Czech Republic's 24

percent increase in workers in the service sector stands out above this European trend. It is

likely due to post-Communist industrial restructuring.

EMPIRICAL ANALYSIS

F-tests suggest that it is appropriate to separate the data into sub-sets for men and

women, 1984 and 1993, and the Czech Republic and Slovakia[6]. As represented in [3], the

empirical analysis proceeds comparing coefficients for each of these eight sub-sets.

Basic Mincerian Specification

Following Mincer(1974), Tables 2a and 2b present OLS regressions of (log) earnings on

years of education, potential experience, and experience squared, without controlling for region

or industry. In the four possible comparisons between 1984 and 1993, that is, within the sub-

populations of Czech men, Czech women, Slovak men and Slovak women, the return to

education increased. Czech men's return to education increased the most, from 2.4 percent to 5.2

percent, and Slovak women's increased the least, from 4.4 percent to 5.4 percent. While relative

increases are large, levels of return to education are still low compared to market economies, the

largest being 5.8 percent for 1993 Czech women. For comparison, Krueger and Pischke

1995:424-425, report the return to education for West Germany to be 7.5 percent for men and

8.2 percent for women and for the United States to be 8.5 percent for men and 10.3 percent for women.

The return to experience decreased and experience-earnings profiles became less concave across regime change in all comparisons but that for Slovak women. For example, considering Czech women, the coefficient on the linear experience term was 0.030 in the 1984 data and 0.009 in the 1993 data.

Tables 2a and 2b also include analysis of variance information which sheds light on the increased earnings dispersion and changes in skill prices suggested in Table 1. Total mean square increased for all groups. In 1984 for men and women in both the Czech Republic and Slovakia, its value was 0.09. For each of those groups it increased substantially in 1993, *e.g*., it rose to 0.17 for Czech men and 0.16 for Czech women. The increase in total wage dispersion was smaller in Slovakia, rising only to 0.14 for men and 0.12 for women. Education and experience explained less of the earnings variance post-Communism, as reflected in the decreasing R-squared values: for Czech women, they fell from 0.21 to 0.15 and for Slovak men from 0.25 to 0.19. For Slovak women, the R-squared rose from 0.18 to 0.23. Further, mean square errors are consistently higher in 1993 than in 1984. Controlling for changes in returns to education and experience, dispersion in skill prices increased following Communism.

Comparing Prague and Other Czech Regions

Prague has been a vital economic center throughout Czech history; it continues to be during post-Communist transition. Table 3 investigates the degree to which earnings structures differ between Prague and the rest of the Czech Republic. F-tests of the hypothesis that coefficients for education, experience and the regression intercept differ between Prague and the

other regions of the Czech Republic are significant for both men and women in 1984 and 1993. Separating Prague from the rest of the Czech Republic, it is apparent that similar changes in the return to education and experience occurred throughout the country, though the degree of change was less in Prague. For example, for men the education coefficient rose from 0.024 to 0.036 in Prague and 0.053 outside the capital. For women, the education coefficient did not increase between 1984 and 1993 in Prague but remained 0.050.

The amount of explanatory information in these human capital variables also varies within the Czech Republic. During Communism in Prague, education and experience explained 24 and 27 percent of earnings variation for men and women, respectively, while in other regions, these variables explained about the same amount of men's variation, 25 percent, but less of women's variation, 19 percent. Following Communism, R-squared values dropped for men and women throughout the Czech Republic, though it fell much more in Prague. Where residual mean square was roughly equivalent for the four groups in 1984, around 0.07, in 1993 it was much higher in Prague, 0.17, than in other regions, 0.14 for men and 0.12 for women. Skill differentials are particularly high in Prague following transition.

Controlling for Industry and Region

Tables 4a and 4b include not only the basic earnings function arguments, but also dummy variables for industry and region. Including industry and region variables may lead to misspecification because these characteristics are not exogenous, but chosen by the worker. Endogeneity may be a particular problem in 1993, for Table 1 showed significant inter-industry movement between 1984 and 1993. However, there was little intra-regional movement, perhaps because continued housing market controls made it difficult for people to move.

With respect to the excluded category "Manufacturing", there is a large premium for men working in mining before and after regime change in both republics, *e.g.*, 17 percent in 1984 and 24 percent in 1993 in the Czech Republic. The premium increased for all groups except Slovak women. Between 1984 and 1993 the relative benefit of working in agriculture fell for all groups, e.g., for Slovak men the coefficient on the "Agriculture" dummy was 0.048 in 1984 and -0.10 in 1993. Though the earnings benefits for services and public services were low in 1984, by 1993 they had increased. For example, Czech women's premium for working in services was -5.3 percent in 1984 and was 8.7 percent in 1993; for Slovak women the coefficient changed from -6.8 percent to 13 percent.

Following Krueger and Summers 1988, Tables 4a and 4b also include the standard deviation of industry effects, which provides a single metric for considering the amount of inter-industry earnings variation existed after controlling for other human capital characteristics. For all groups but women in the Czech Republic, industry wage effects increased during transition, *e.g.*, for Slovak men the standard deviation increased from 0.063 to 0.10.

Compared to the excluded category of Northern Moravia in the Czech Republic and Western Slovakia in Slovakia, the earnings premium for Prague and Bratislava was positive and significant for all groups but Czech men in 1984. After transition, the coefficients for living in these capital cities increased, though that may reflect differential costs of living. In addition, the coefficient on the "North Bohemia" dummy increased to 0.085. For both men and women in Slovakia, the earnings intercept for Central and Eastern Slovakia fell following Communism.

Different Types of Education

The basic earnings function specification gives information on the return to a year of generic education. However, it may not adequately reflect earnings benefits to different types of human capital. In the Czech Republic and Slovakia people followed one of several distinct educational paths. (See the Appendix for a description of the Czech and Slovak education system.) Tables 5a and 5b distinguish earnings returns associated with different types of education. Figures in brackets show the per-year return to a particular type of education (represented by a dummy variable), compared to having only primary education.

As expected, during the Communist period the earnings associated with having secondary technical education are higher than having secondary academic education, *e.g.*, for Czech men the return is 3.8 percent per year for the former and 3.2 percent for the latter, for Slovak men the returns are 2.3 percent and zero. In 1993, returns to academic education increased relative to other types: for Slovak men, the return to technical secondary is 4.9 percent and academic secondary 5.8 percent. While technical education continues to be valuable in 1993, it no longer provides markedly higher returns than academic education. Presumably, this is the result of those with academic education being more flexible in the way they can adjust to transition.

Participation Selection Correction

As discussed above, OLS estimates may be biased if the sample of people for whom we observe earnings is not randomly selected. The labor supply literature concentrates on how the decision whether or not to participate in the labor market depends on earnings. In the 1984 and 1993 data for both the Czech Republic and Slovakia, nearly all men work, so there is unlikely to be a selection bias in the estimates for men. However, women have lower participation rates, so

their earnings coefficients could be based on non-randomly selected data. Figures 1a and 1b present a simple descriptive picture of women's participation as a function of age during and after Communism.

Though Communist regimes boasted of high rates of women's labor force participation, and young women did work at rates almost equaling that of men, women left the labor force earlier. Post-Communism, women's profile of participation continues to drop off approximately 8 to 10 years earlier than that for men. More dramatically, though, young women in both the Czech Republic and Slovakia are much less likely to work in 1993 than they were in 1984. Just as in analysis of market economies, if participation selection in fact biases OLS estimates, it is most likely to affect women's estimates, particularly women post-Communism.

Tables 6a and 6b present for women the results of maximum likelihood estimates of a joint earnings-participation model. As noted above, this analysis uses exclusion restrictions to identify this model. The number of persons per room and the household attributes proxy wealth and are assumed to affect women's participation decisions without also affecting their labor earnings. For comparison, the first column, labeled "Uncorrected", repeats the results of the OLS specification presented in Tables 5a and 5b. The second column, labeled "Corrected", reports the maximum likelihood estimates of earnings and participation, where crowdedness and the set of household attributes are included in the participation equation.

In each of the time periods for each of the regions, the maximum-likelihood selection-corrected estimates differ from the uncorrected estimates. One indicator of the effect of the correction is the joint significance of the identifying assets variables. In each of the four sets of

data, chi-squared tests of these variables' joint effects are significant at the 0.05 level: *e.g.*, for the Czech Republic in 1984 the test statistic is 19.45, and in 1993 it is 29.44.

In the 1984 estimates for both republics, the returns to experience are largely unchanged after correcting for participation selection. By contrast, in each of the 1993 estimates, the experience coefficients varied markedly: *e.g.*, in Slovakia, the linear experience term fell from 0.023 to 0.009. Following Communism, the drop in participation among young women (and increase in participation among older women in Slovakia) biased upwards the uncorrected experience-earnings profiles. In Slovakia prior to correction, estimates suggested that returns to experience had not changed for women, while in fact those returns had fallen. Further, in the Czech Republic, selection bias had underestimated the fall in returns to experience.

The selection correction also illuminated biases in the returns to different types of education, both during and after Communism. In the 1984 data, selection bias led to higher estimates of the effects of women's education, for in both the Czech Republic and Slovakia the corrected estimates are lower than the uncorrected estimates for every type of education. The participation bias has more complicated effects in the 1993 data. In general, in Slovakia, selection effects increased the education estimates, so that the uncorrected estimates are higher than the corrected ones. However, with the exception of the "Vocational" and "Secondary Incomplete" categories, in the Czech Republic, participation bias had little effect on education coefficients following Communism.

CONCLUSION

This paper examines several hypotheses concerning changes in earnings structure between Communist and post-Communist Czech Republic and Slovakia. Earnings dispersion

was expected to increase across regime change. While returns to education would be positive but small during the Communist regime, they should increase when wage constraints imposed by that regime were relaxed. Returns to experience would be high under Communism and would drop as private sector opportunities for younger, less experienced workers became available. Further, one would expect workers to shift industries and for the premiums associated with industries to be reordered. If these effects are associated with micro-economic transition from Communism toward a more market-based system, then they should be more pronounced in economies that have more fully made that transition.

The analysis supports these hypotheses. Descriptive statistics show increased earnings dispersion between 1984 and 1993. Correcting for human capital characteristics, skill differentials increased during transition. The return to education was quite low during the Communist era, in the range of 2.5 percent, and increased markedly by 1993, to approximately 5 percent. In general, women have higher returns to education than men, though men have larger increases in returns across regime change. While workers with academic secondary education had low returns to their human capital investment, they experienced a particularly large increase in returns across regime change, perhaps because that type of education allows workers to respond more effectively to emerging opportunities.

Earnings structures changed more in the Czech Republic than in Slovakia. In the Czech Republic earnings became more dispersed, returns to education increased more and returns to experience fell more. If these earnings structure transformations indicate micro-economic transition to a market system, that transition has been more extensive in the Czech Republic.

Selection correction made significant differences in coefficient estimates for women, showing that OLS estimates were biased up in the Communist education coefficients and transition experience estimates.

As an analysis of changing labor markets in the Czech Republic and Slovakia based on micro-economic data, this research shows differences in the earnings structure between men and women and between a Communist economy and a post-Communist one. It supports many of the hypotheses about likely changes to that structure as a Communist economy begins to operate more openly according to market principles.

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1. Wages were not completely freed from administrative control. During the early part of the transition in Czechoslovakia, the Government implemented a wage policy imposing tax penalties on firms that drastically increased earnings. This wage policy was designed to forestall a potential wage-price spiral that had led to serious inflation in other post-Communist economies.

2. Juhn, Murphy and Pierce (1993) compare skill prices at for workers at different points on the residual distribution. Unfortunately, this analysis is unable to make comparisons in real wage between the 1984 and 1993 because, by the nature of the previous regime, market-clearing prices for 1984 are unavailable.

3. The questionnaire asked respondents to report income from the past year. Thus, much of the income denoted "1993" would have been earned in 1992.

4. The data used in the 1993 Czech regressions are based on a data-set that over-sampled residents of Prague, though it does not include sample weights to correct for this oversampling. Rather, it indicates the 500 observations which resulted. Although these oversampled observations are included in the regressions, they are omitted in the calculation of descriptive statistics for the 1993 Czech Republic.

5. Because the 1993 data consists of respondents aged 20 to 69, most of whom would have completed their education prior to regime change, we would not expect the collapse of Communism to have affected people's choices about educational investment as reflected in years of education. We would expect similar educational outcomes for both the 1984 and 1993 samples, though the means are not particularly similar. In the Czech Republic, the mean years of education increased from 10.76 years in 1984 to 11.25 years in 1993, and in Slovakia, it increased from 10.75 years to 11.30. Cohort effects explain much of these differences. The oldest cohort from the 1984 sample, with the lowest mean years of education, left the sample by 1993. Because the youngest cohort in the 1993 sample has a higher mean level of education than the cohort of average age, the inclusion of this young, well-educated cohort would also lead to higher mean levels of education in 1993.

[6]To test the hypothesis that the structure of earnings differed between men and women, 1984 and 1993, and the Czech Republic and Slovakia, I aggregated all eight sub-populations to produce 19,389

observations on log earnings lnE_i and the regressors X_i: years of education, (potential) experience, and experience squared. Joint F-tests demonstrate that adding interaction terms for women's, 1993 and Slovak data lead to statistically significant improvements (at the 5% level) in the models' ability to explain log earnings variation. When I relaxed the constraint that men and women have same determinants of earnings, a test on the joint significance of produces a significant F statistic of 40.70. Allowing different 1984 and 1993 coefficients yields a significant F statistic of 61.11. Finally, relaxing the constraint of similar earnings structure between the Czech Republic and Slovakia yields a significant F statistic of 3.93.

APPENDIX: CZECH AND SLOVAK EDUCATION SYSTEM

Nearly all of respondents surveyed for this study completed their education during the Communist period. In the years following 1989, there were no major changes in the education system, so the following would apply to those completing their education during transition.

The first segment of the Czech and Slovak education system is basic school (základní škola), which children generally enter at age 6. Basic school lasts for 8 years and offers a primary education curriculum to all students.

When children complete basic school, they face four secondary education options: a vocational education program that does not lead to a certificate (ucení bez maturity), a vocational education program that does lead to a degree (ucení s maturitou), a technical education program (strední škola), and a general academic program (gymnázium). The first option is effectively an apprenticeship, when a person spends two or three years learning a vocational trade. The second option is also directed toward learning a vocational trade, though it generally takes four years and leads to a formal diploma, certifying the person's vocational preparedness. The technical education program lasts four years and offers a diploma. There are several different types of strední škola, depending on the type of technical training desired, *e.g*., nursing or engineering. Academic high-school also lasts four years and leads to a diploma, though it offers a less applied, more academic curriculum.

Gymnázium is the primary path to tertiary education (univerzita), though some graduates of technical secondary school also go on to university. University lasts four to six years, depending on the program. As in the United States, following university, some students opt for post-graduate study.

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Table 1. Descriptive Statistics for the Czech Republic and
Slovakia from 1984 and 1993.
(Standard Deviations in Parentheses)

	Czech Republic		Slovakia	
	1984	1993	1984	1993
EARNINGS VARIABLES				
Primary Earnings	2492.81	4038.53	2421.28	3716.73
	(907.94)	(2,013.72)	(851.44)	(1,601.45)
Log of Primary Earnings	7.76	8.20	7.73	8.14
[Log Variance]	[0.13]	[0.19]	[0.12]	[0.16]
Variance of Education-				
Experience Cells	0.07	0.14	0.07	0.11
HUMAN CAPITAL VARIABLES				
Years of Education	10.76	11.25	10.75	11.30
	(2.39)	(2.61)	(2.65)	(2.83)
Primary	0.21	0.13	0.28	0.16
Vocational	0.38	0.43	0.29	0.37
Secondary Incomplete	0.090	0.044	0.074	0.042
Secondary Technical	0.19	0.22	0.20	0.21
Secondary Academic	0.036	0.034	0.044	0.041
Incomplete Tertiary	0.012	0.035	0.011	0.043
Tertiary	0.075	0.090	0.089	0.092
Post-Graduate	0.005	0.015	0.008	0.023
Experience	21.89	22.90	20.11	21.49
	(12.35)	(11.22)	(12.53)	(11.24)
Experience Squared	631.52	650.18	561.43	588.14
	(616.42)	(558.24)	(590.01)	(535.84)
Male	0.51	0.52	0.52	0.54
INDUSTRY SHARES				
Agriculture	0.14	0.095	0.18	0.14
Mining	0.088	0.035	0.071	0.019
Manufacturing	0.29	0.28	0.25	0.24
Construction	0.080	0.080	0.10	0.077
Utilities	0.071	0.10	0.062	0.12
Services	0.16	0.20	0.17	0.17
Public Services	0.16	0.20	0.18	0.24
REGIONAL DUMMIES				
Prague	0.11	0.12	-.-	-.-
Central Bohemia	0.11	0.11	-.-	-.-
South Bohemia	0.066	0.067	-.-	-.-
Western Bohemia	0.084	0.088	-.-	-.-
North Bohemia	0.12	0.13	-.-	-.-
Eastern Bohemia	0.12	0.11	-.-	-.-
Northern Moravia	0.19	0.19	-.-	-.-
Southern Moravia	0.20	0.18	-.-	-.-
Bratislava	-.-	-.-	0.11	0.08
West Slovakia	-.-	-.-	0.31	0.35
Central Slovakia	-.-	-.-	0.30	0.32
East Slovakia	-.-	-.-	0.28	0.25
Number of Respondents	8422	3059	4124	3268

Source: See "Data" section.

Table 2a. Determinants of Earnings
Based on Years of Education and Experience: Czech Republic.
(Absolute Values of T-Statistics in Parentheses)

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Intercept	**7.35	**7.68	**6.79	**7.28
	(319.43)	(145.94)	(270.44)	(140.47)
Years of Education	**0.024	**0.052	**0.042	**0.058
	(14.40)	(16.26)	(22.60)	(17.34)
Experience	**0.037	**0.014	**0.030	**0.009
	(31.92)	(4.77)	(25.66)	(3.40)
Experience Squared (a)	**-0.076	**-0.032	**-0.054	*-0.012
	(33.53)	(5.42)	(22.00)	(2.19)
Number of Respondents	4278	1862	4144	1753
R-squared	0.24	0.14	0.21	0.15
Model Mean Square	32.65	14.96	25.94	13.87
Residual Mean Square	0.07	0.15	0.07	0.14
Total Mean Square	0.09	0.17	0.09	0.16

Table 2b. Determinants of Earnings
Based on Years of Education and Experience: Slovakia.
(Absolute Values of T-Statistics in Parentheses)

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Intercept	**7.28	**7.52	**6.84	**7.12
	(248.34)	(173.56)	(194.71)	(155.93)
Years of Education	**0.028	**0.049	**0.044	**0.054
	(13.21)	(17.10)	(17.56)	(18.20)
Experience	**0.036	**0.025	**0.023	**0.025
	(22.69)	(9.51)	(13.21)	(9.27)
Experience Squared (a)	**-0.071	**-0.054	**-0.040	**-0.050
	(22.12)	(9.96)	(10.12)	(9.27)
Number of Respondents	2131	1776	1992	1492
R-squared	0.25	0.19	0.18	0.23
Model Mean Square	14.91	15.31	10.29	14.88
Residual Mean Square	0.06	0.11	0.07	0.10
Total Mean Square	0.09	0.14	0.09	0.13

(a) Coefficient multiplied by 100.
* Statistically significant at the .10 level; ** at the .05 level.

Source: See "Data" section.

Table 3. Differences in Earnings Determinants
between Prague and Other Regions of the Czech Republic
(Absolute Values of T-Statistics in Parentheses)

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Joint F-Test of the hypothesis that independent variables have different effects in Prague {Distribution}	**4.49 F{4,4270}	**12.40 F{4,1854}	**5.63 F{4,4136}	**17.65 F{4,1745}

Prague

	1984	1993	1984	1993
Intercept	**7.27 (102.39)	**7.98 (75.96)	**6.69 (93.34)	**7.46 (71.50)
Years of Education	**0.024 (5.77)	**0.036 (6.15)	**0.050 (10.77)	**0.050 (7.72)
Experience	**0.043 (10.55)	**0.013 (2.27)	**0.031 (9.18)	**0.012 (2.31)
Experience Squared (a)	**-0.080 (10.30)	**-0.029 (2.45)	**-0.051 (7.66)	*-0.019 (1.88)
Number of Respondents	460	458	505	475
R-squared	0.24	0.09	0.27	0.12
Model Mean Square	3.97	2.55	4.59	3.60
Residual Mean Square	0.08	0.17	0.07	0.17
Total Mean Square	0.11	0.19	0.10	0.19

Other Regions in the Czech Republic

	1984	1993	1984	1993
Intercept	**7.37 (291.26)	**7.62 (124.53)	**6.83 (250.40)	**7.30 (123.88)
Years of Education	**0.024 (12.36)	**0.053 (13.35)	**0.039 (18.68)	**0.052 (13.31)
Experience	**0.037 (30.26)	**0.016 (4.80)	**0.030 (24.13)	**0.010 (3.39)
Experience Squared (a)	**-0.076 (32.13)	**-0.038 (5.52)	**-0.055 (20.92)	**-0.015 (2.47)
Number of Respondents	3818	1404	3639	1278
R-squared	0.25	0.14	0.19	0.13
Model Mean Square	28.56	10.06	20.58	7.03
Residual Mean Square	0.07	0.14	0.07	0.12
Total Mean Square	0.09	0.16	0.09	0.13

 (a) Coefficient multiplied by 100.
* Statistically significant at the .10 level; ** at the .05 level.

Source: See "Data" section.

Table 4a. Determinants of Earnings Including Dummy Variables for Industry and Region: Czech Republic
(Absolute Values of T-Statistics in Parentheses)

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Intercept	**7.32	**7.61	**6.74	**7.23
	(291.22)	(131.96)	(248.51)	(130.91)
Years of Education	**0.030	**0.049	**0.048	**0.052
	(16.70)	(14.37)	(23.73)	(14.68)
Experience	**0.36	**0.016	**0.030	**0.011
	(32.78)	(5.54)	(26.10)	(4.20)
Experience Squared (a)	**-0.074	**-0.036	**-0.054	**-0.017
	(34.00)	(6.07)	(22.68)	(3.15)
INDUSTRY DUMMIES ("Manufacturing" excluded)				
Agriculture	**0.029	**-0.090	**0.14	0.012
	(2.42)	(2.69)	(9.99)	(0.31)
Mining	**0.17	**0.24	**0.054	**0.17
	(12.89)	(5.43)	(2.80)	(2.05)
Construction	-0.009	**0.14	-0.027	**0.15
	(0.68)	(4.64)	(1.16)	(2.48)
Utilities	0.014	*0.052	0.029	0.034
	(0.94)	(1.78)	(1.54)	(0.94)
Services	**-0.11	0.013	**-0.053	**0.087
	(8.08)	(0.49)	(4.63)	(3.68)
Public Services	**-0.11	0.009	**-0.071	0.021
	(6.73)	(0.30)	(5.87)	(0.89)
Standard Deviation of				
Industry Effects (b)	0.095	0.11	0.072	0.069
REGIONAL DUMMIES ("Northern Moravia" excluded)				
Prague	0.018	**0.15	**0.064	**0.18
	(1.14)	(5.12)	(4.20)	(6.50)
Central Bohemia	**-0.031	0.031	-0.012	0.05
	(2.14)	(0.89)	(0.73)	(1.41)
South Bohemia	**-0.050	-0.015	-0.024	0.029
	(2.85)	(0.36)	(1.28)	(0.69)
Western Bohemia	**-0.033	0.031	-0.01	**0.079
	(2.02)	(0.83)	(0.59)	(1.98)
North Bohemia	-0.021	**0.085	0.014	**0.072
	(1.45)	(2.47)	(0.90)	(2.12)
Eastern Bohemia	**-0.057	0.0017	-0.002	-0.054
	(3.90)	(0.05)	(0.15)	(1.52)
Southern Moravia	**-0.053	0.00	0.00	0.008
	(4.23)	(0.01)	(0.01)	(0.26)
Number of Respondents	4278	1862	4144	1753
R-squared	0.32	0.20	0.25	0.20

(a) Coefficient multiplied by 100.
(b) Following Krueger and Summers (1988), average industry effect weighted by employment share.
* Statistically significant at the .10 level; ** at the .05 level.
Source: See "Data" section.

Table 4b. Determinants of Earnings Including Dummy Variables
for Industry and Region: Slovakia
(Absolute Values of T-Statistics in Parentheses)

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Intercept	**7.25	**7.52	**6.81	**7.17
	(222.26)	(165.77)	(179.04)	(152.89)
Years of Education	**0.031	**0.048	**0.048	**0.050
	(13.09)	(16.13)	(17.34)	(15.96)
Experience	**0.036	**0.025	**0.023	**0.022
	(23.16)	(9.88)	(13.35)	(8.87)
Experience Squared (a)	**-0.071	**-0.054	**-0.041	**-0.044
	(22.44)	(10.13)	(10.41)	(8.31)
INDUSTRY DUMMIES ("Manufacturing" excluded)				
Agriculture	**0.048	**-0.10	**0.057	0.018
	(2.99)	(4.11)	(2.90)	(0.62)
Mining	**0.093	**0.20	0.002	-0.041
	(4.55)	(3.91)	(0.06)	(0.32)
Construction	-0.016	**-0.10	-0.036	**0.15
	(0.91)	(3.58)	(1.22)	(2.74)
Utilities	0.017	0.035	0.008	**0.098
	(0.76)	(1.40)	(0.28)	(2.76)
Services	**-0.089	0.012	**-0.068	**0.13
	(4.76)	(0.45)	(3.86)	(5.33)
Public Services	**-0.065	-0.008	**-0.074	**0.080
	(2.92)	(0.31)	(4.20)	(3.73)
Standard Deviation of				
Industry Effects (b)	0.063	0.10	0.046	0.071
REGIONAL DUMMIES ("Western Slovakia" excluded)				
Bratislava	**0.044	**0.14	**0.057	**0.13
	(2.12)	(4.40)	(2.74)	(4.29)
Central Slovakia	-0.005	*-0.032	0.022	**-0.075
	(0.35)	(1.67)	(1.46)	(3.85)
East Slovakia	-0.021	**-0.049	0.009	**-0.080
	(1.49)	(2.41)	(0.57)	(3.78)
Number of Respondents	2131	1759	1992	1492
R-squared	0.28	0.23	0.20	0.28

 (a) Coefficient multiplied by 100.
 (b) Following Krueger and Summers (1988), average industry effect weighted by employment share.
 * Statistically significant at the .10 level; ** at the .05 level.
 Source: See "Data" section.

Table 5a. Determinants of Earnings Replacing "Years of Education" with Dummy Variables for Education Type: Czech Republic (b)
(Absolute Values of T-Statistics in Parentheses)
["Per Year" Returns to Education in Brackets]

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Intercept	**7.54	**7.99	**7.14	**7.66
	(393.72)	(155.81)	(396.07)	(177.13)

EDUCATION DUMMIES ("Primary Education" excluded)

	Male 1984	Male 1993	Female 1984	Female 1993
Vocational	**0.084	**0.10	**0.057	**0.056
	(6.81)	(2.86)	(4.98)	(2.16)
	[0.042]	[0.049]	[0.029]	[0.028]
Secondary Incomplete	**0.10	0.051	**0.11	**0.096
	(5.74)	(0.92)	(7.24)	(2.24)
	[0.034]	[0.017]	[0.035]	[0.032]
Secondary Technical	**0.15	**0.23	**0.21	**0.27
	(10.37)	(5.99)	(16.29)	(9.87)
	[0.038]	[0.057]	[0.052]	[0.067]
Secondary Academic	**0.12	**0.20	**0.16	**0.28
	(4.45)	(2.95)	(7.75)	(6.33)
	[0.030]	[0.050]	[0.040]	[0.069]
Incomplete Tertiary	**0.23	**0.29	**0.36	**0.32
	(6.68)	(5.26)	(8.49)	(6.65)
	[0.033]	[0.042]	[0.051]	[0.046]
Tertiary	**0.26	**0.48	**0.42	**0.46
	(14.55)	(11.26)	(20.85)	(12.19)
	[0.029]	[0.053]	[0.047]	[0.051]
Post-Graduate	**0.48	**0.48	**0.56	**0.50
	(9.39)	(7.19)	(7.00)	(7.17)
	[0.040]	[0.040]	[0.046]	[0.042]
Experience	**0.036	**0.016	**0.030	**0.011
	(32.49)	(5.53)	(26.05)	(4.07)
Experience Squared (a)	**-0.073	**-0.035	**-0.054	**-0.016
	(33.59)	(5.99)	(22.64)	(2.99)
Number of Respondents	4278	1862	4144	1753
R-squared	0.32	0.20	0.26	0.22

(a) Coefficient multiplied by 100.
(b) Industry and regional dummy variables included, though not reported.
* Statistically significant at the .10 level; ** at the .05 level.

Source: See "Data" section.

Table 5b. Determinants of Earnings Replacing "Years of Education" with Dummy Variables for Education Type: Slovakia (b)
(Absolute Values of T-Statistics in Parentheses)
["Per Year" Returns to Education in Brackets]

	Male Respondents		Female Respondents	
	1984	1993	1984	1993
Intercept	**7.53	**7.93	**7.18	**7.54
	(320.15)	(208.82)	(294.64)	(206.36)

EDUCATION DUMMIES ("Primary Education" excluded)

	Male 1984	Male 1993	Female 1984	Female 1993
Vocational	*0.027	**0.058	**0.13	**0.098
	(1.83)	(2.25)	(7.15)	(4.03)
	[0.014]	[0.029]	[0.067]	[0.049]
Secondary Incomplete	**0.074	**0.11	**0.10	**0.19
	(3.25)	(2.49)	(4.08)	(4.22)
	[0.025]	[0.036]	[0.035]	[0.062]
Secondary Technical	**0.091	**0.19	**0.22	**0.24
	(4.90)	(6.56)	(12.40)	(9.57)
	[0.023]	[0.049]	[0.056]	[0.059]
Secondary Academic	0.01	**0.26	**0.17	**0.25
	(0.42)	(4.49)	(6.38)	(6.70)
	[0.004]	[0.058]	[0.043]	[0.063]
Incomplete Tertiary	**0.17	**0.27	**0.43	**0.35
	(3.61)	(6.21)	(5.93)	(7.96)
	[0.025]	[0.038]	[0.061]	[0.051]
Tertiary	**0.25	**0.42	**0.44	**0.50
	(10.72)	(12.32)	(16.37)	(14.09)
	[0.028]	[0.047]	[0.049]	[0.056]
Post-Graduate	**0.56	**0.53	**0.50	**0.45
	(10.72)	(8.92)	(4.94)	(8.40)
	[0.047]	[0.044]	[0.041]	[0.038]
Experience	**0.036	**0.025	**0.023	**0.023
	(23.09)	(9.90)	(13.42)	(8.99)
Experience Squared (a)	**-0.071	**-0.055	**-0.040	**-0.044
	(22.55)	(10.15)	(10.30)	(8.24)
Number of Respondents	2131	1776	1992	1492
R-squared	0.29	0.23	0.21	0.29

(a) Coefficient multiplied by 100.
(b) Industry and regional dummy variables included, though not reported.
* Statistically significant at the .10 level; ** at the .05 level.

Source: See "Data" section.

Figure 1a. Comparing Age Profiles of Women's Labor Force
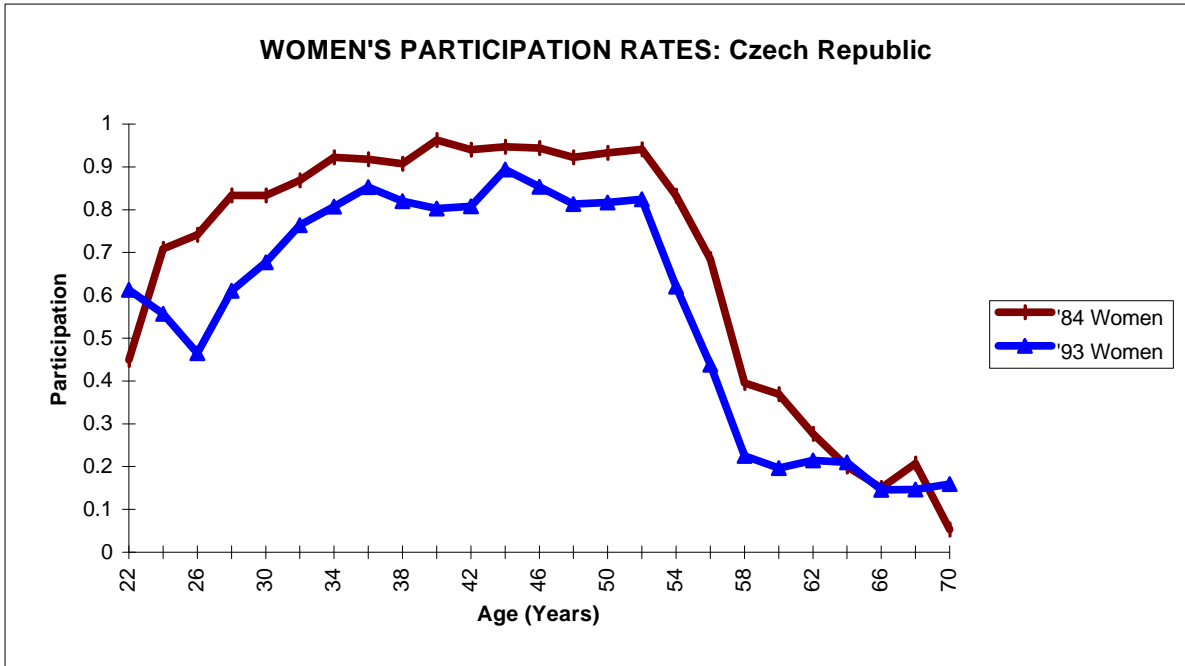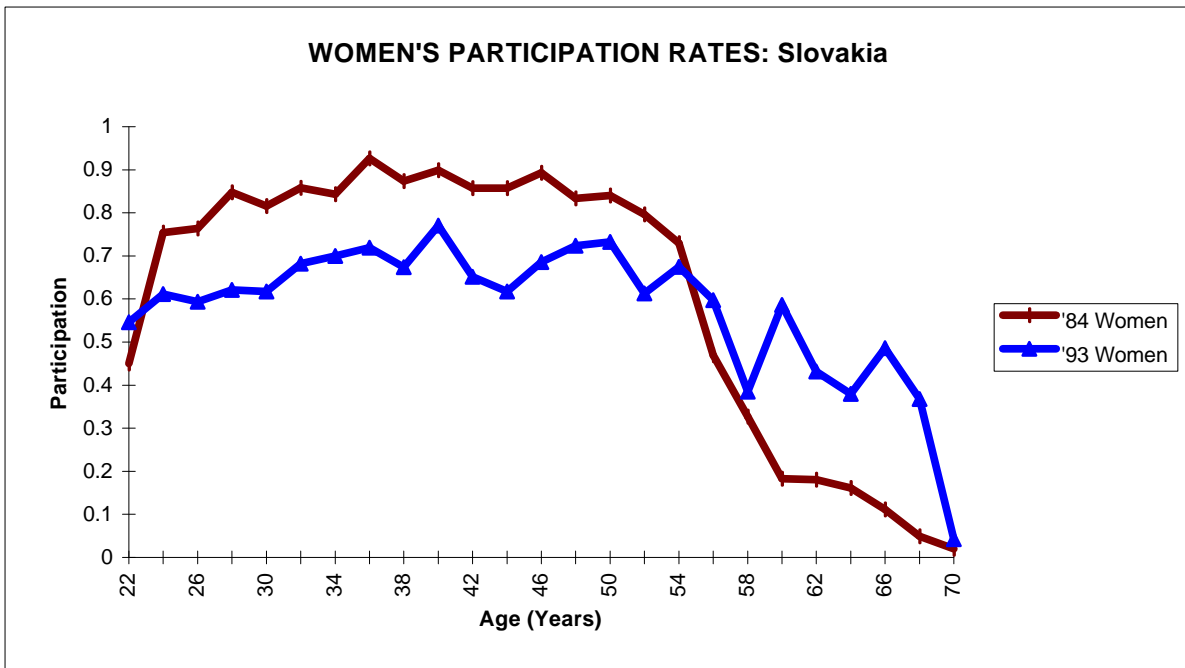Participation in 1984 and 1993: Czech Republic (a)

Figure 1b. Comparing Age Profiles of Women's Labor Force
Participation in 1984 and 1993: Slovakia (a)

(a) Y-axis represents the percentage of respondents in each age group participating in the
labor force.
Source: See "Data" Section

Table 6a. Comparison of Women's Earnings Determinants When Correcting for Participation Sample Selection: Czech Republic (b)
(Absolute Values of T-Statistics in Parentheses)

	1984 Respondents		1993 Respondents	
	Uncorrected(c)	Corrected(d)	Uncorrected(c)	Corrected(d)
WAGE VARIABLES				
Intercept	**7.14	**7.19	**7.66	**7.89
	(396.07)	(235.21)	(177.13)	(115.05)
Experience	**0.030	**0.030	**0.011	*0.009
	(26.05)	(15.28)	(4.07)	(1.76)
Experience Squared (a)	**-0.054	**-0.055	**-0.016	-0.01
	(22.64)	(12.07)	(2.99)	(1.00)
Vocational	**0.057	**0.028	**0.056	**0.074
	(4.98)	(2.36)	(2.16)	(2.87)
Secondary Incomplete	**0.11	**0.080	**0.096	**0.099
	(7.24)	(5.17)	(2.24)	(2.33)
Secondary Technical	**0.21	**0.16	**0.27	**0.27
	(16.29)	(12.24)	(9.87)	(9.90)
Secondary Academic	**0.16	**0.13	**0.28	**0.28
	(7.75)	(6.06)	(6.33)	(6.46)
Incomplete Tertiary	**0.36	**0.28	**0.32	**0.32
	(8.49)	(6.68)	(6.65)	(6.75)
Tertiary	**0.42	**0.36	**0.46	**0.45
	(20.85)	(17.39)	(12.19)	(11.84)
Post-Graduate	**0.56	**0.49	**0.50	**0.48
	(7.00)	(6.02)	(7.17)	(6.90)
PARTICIPATION VARIABLES				
Intercept	-.-	**-0.54	-.-	**1.50
		(5.02)		(7.53)
Experience	-.-	**0.14	-.-	**0.20
		(31.33)		(21.85)
Experience Squared (a)	-.-	**-0.33	-.-	**-0.47
		(35.86)		(25.59)
Vocational	-.-	**0.45	-.-	**0.20
		(8.56)		(2.42)
Secondary Incomplete	-.-	**0.52	-.-	0.16
		(7.31)		(1.26)
Secondary Technical	-.-	**0.68	-.-	**0.36
		(10.38)		(4.00)
Secondary Academic	-.-	**0.21	-.-	0.21
		(2.25)		(1.50)
Incomplete Tertiary	-.-	0.34	-.-	0.25
		(1.58)		(1.58)
Tertiary	-.-	**0.92	-.-	**0.46
		(7.75)		(3.42)
Post-Graduate	-.-	*1.40	-.-	**0.55
		(1.76)		(2.00)

Table 6a. (continued)

	1984 Respondents		1993 Respondents	
	Uncorrected(c)	Corrected(d)	Uncorrected(c)	Corrected(d)
PARTICIPATION VARIABLES (Continued)				
People per Room	-.-	-0.03	-.-	**0.10
		(0.89)		(3.62)
WC	-.-	-0.05	-.-	**0.42
		(0.80)		(2.75)
Phone	-.-	0.02	-.-	0.03
		(0.44)		(0.38)
Color TV	-.-	-0.07	-.-	**0.18
		(1.23)		(2.13)
Freezer	-.-	**-0.14	-.-	-0.01
		(2.49)		(0.15)
Washer	-.-	*-0.080	-.-	-0.11
		(1.79)		(1.56)
Car	-.-	**0.12	-.-	*-0.11
		(2.88)		(1.68)
Sigma(1)	-.-	0.27	-.-	0.36
Rho (1,2)	-.-	0.021	-.-	-0.15
Log-Likelihood	-.-	-2983.0	-.-	-1898.1
Number of Respondents	4144	6686	1753	3040
Chi-Squared (7)	-.-	**19.45	-.-	**29.44

(a) Coefficient multiplied by 100.
(b) Regional dummy variables included, though not reported.
(c) OLS estimates from Tables 5a and 5b.
(d) Maximum likelihood estimates of participation selection corrected coefficients
* Statistically significant at the .10 level; ** at the .05 level.

Source: See "Data" section.

Table 6b. Comparison of Women's Earnings Determinants When Correcting for Participation Sample Selection: Slovakia (b)
(Absolute Values of T-Statistics in Parentheses)

	1984 Respondents		1993 Respondents	
	Uncorrected(c)	Corrected(d)	Uncorrected(c)	Corrected(d)
WAGE VARIABLES				
Intercept	**7.18	**7.23	**7.54	**7.97
	(294.64)	(171.97)	(206.36)	(141.54)
Experience	**0.023	**0.023	**0.023	**0.009
	(13.42)	(8.45)	(8.99)	(2.77)
Experience Squared (a)	**-0.040	**-0.039	**-0.044	(0.01)
	(10.30)	(6.04)	(8.24)	(1.57)
Vocational	**0.13	**0.11	**0.098	**0.089
	(7.15)	(5.37)	(4.03)	(3.38)
Secondary Incomplete	**0.10	**0.080	**0.19	**0.22
	(4.08)	(2.96)	(4.22)	(4.65)
Secondary Technical	**0.22	**0.19	**0.24	**0.21
	(12.40)	(9.20)	(9.57)	(7.91)
Secondary Academic	**0.17	**0.15	**0.25	**0.27
	(6.38)	(5.56)	(6.70)	(6.71)
Incomplete Tertiary	**0.43	**0.37	**0.35	**0.35
	(5.93)	(5.15)	(7.96)	(7.48)
Tertiary	**0.44	**0.39	**0.50	**0.46
	(16.37)	(13.36)	(14.09)	(11.84)
Post-Graduate	**0.50	**0.47	**0.45	**0.42
	(4.94)	(4.55)	(8.40)	(7.22)
PARTICIPATION VARIABLES				
Intercept	-.-	**-0.69	-.-	**-0.45
		(5.00)		(2.57)
Experience	-.-	**0.14	-.-	**0.094
		(21.41)		(11.36)
Experience Squared (a)	-.-	**-0.32	-.-	**-0.23
		(23.90)		(14.49)
Vocational	-.-	**0.59	-.-	0.13
		(7.15)		(1.59)
Secondary Incomplete	-.-	**0.68	-.-	(0.15)
		(5.46)		(1.10)
Secondary Technical	-.-	**0.94	-.-	**0.23
		(10.77)		(2.65)
Secondary Academic	-.-	*0.21	-.-	0.00
		(1.81)		(0.00)
Incomplete Tertiary	-.-	0.19	-.-	0.05
		(0.60)		(0.32)
Tertiary	-.-	**1.36	-.-	**0.38
		(8.00)		(2.68)
Post-Graduate	-.-	0.61	-.-	0.31
		(1.26)		(1.41)

TABLE 6b (continued)

	1984 Respondents		1993 Respondents	
	Uncorrected(c)	Corrected(d)	Uncorrected(c)	Corrected(d)
PARTICIPATION VARIABLES (continued)				
People per Room	-.-	0.00	-.-	0.04
		(0.10)		(1.13)
WC	-.-	0.10	-.-	-0.04
		(1.52)		(0.46)
Phone	-.-	0.04	-.-	0.05
		(0.54)		(0.92)
Color TV	-.-	-0.05	-.-	*0.14
		(0.62)		(1.94)
Freezer	-.-	0.07	-.-	0.06
		(0.85)		(1.08)
Washer	-.-	-0.07	-.-	**0.14
		(0.98)		(2.38)
Car	-.-	0.03	-.-	-0.02
		(0.61)		(0.36)
Sigma(1)	-.-	0.27	-.-	0.35
Rho (1,2)	-.-	-0.009	-.-	-0.68
Log-Likelihood	-.-	-1616.9	-.-	-1707.7
Number of Respondents	1992	3436	1492	2470
Chi-Squared (7)	-.-	**5.16	-.-	**19.75

(a) Coefficient multiplied by 100.
(b) Regional dummy variables included, though not reported.
(c) OLS estimates from Tables 5a and 5b.
(d) Maximum likelihood estimates of participation selection corrected coefficients
* Statistically significant at the .10 level; ** at the .05 level.

Source: See "Data" section.