

**Has the Shift Toward Markets Hurt Ethnic Minorities? Changes in Ethnic Earnings  
Differentials in Bulgaria's Early-transition**

**Lisa Giddings<sup>1</sup>**

*University of Wisconsin-La Crosse*

Forthcoming in *The International Journal of Manpower*

---

<sup>1</sup> The author would like to thank Mieke Meurs, Bob Lerman, Steve Pressman, T.J. Brooks, Belton Fleisher and two anonymous reviewers for their excellent comments and suggestions on earlier drafts of this paper.

## **ABSTRACT**

This essay relies on cross-sectional survey data from 1986 and 1993 to explain an increase in the ethnic Turk-ethnic Bulgarian earnings differential in Bulgaria in the country's early transition. Empirical evidence indicates that the ethnic Turks closed both the gap in the number of years of education and experience acquired during this time. Further, the Turks began to enter the growing commerce and transportation industries in the early transition. Shifts in the wage structure, however, favored the ethnic Bulgarians, and these changes outweighed ethnic Turk gains in the measured characteristics. In addition to these shifts, an increase in the overall level of inequality in the labor market punished those at the low-end of the wage distribution, exacerbating the existing ethnic earnings differential. These results imply however, that the ethnic Turks are responding to market signals and if it continues, this trend will diminish the ethnic earnings gap.

## I. INTRODUCTION

Has the transition from plan to market in East and Central Europe imposed greater hardship on ethnic minorities? Labor market studies to date have demonstrated (with some degree of variance among countries) that economies in the transition are experiencing wage decompression, increasing returns to schooling and increased inequality as the countries shift toward markets. Very little research has focused on the effects of the transition on ethnic groups in East and Central Europe. Studies on changes in wage differentials and changes in industry and occupational segregation have mainly covered differences between men and women.<sup>2</sup> Given evidence from other contexts suggesting that ethnic and racial minorities bear the brunt of drastic economic changes, this absence in the literature is curious. Nothing about the transformation from plan to market would imply differently. In 1986 the average ethnic Turkish worker in Bulgaria earned approximately 85 percent as much per month as the average ethnic Bulgarian worker. By 1993, Turks earned about 80 percent as much per month.

The goal of this essay is to account for the increase in the ethnic earnings gap in Bulgaria's early transition within the broader context of the wage structure changes documented in transitioning economies. In particular, the analysis distinguishes between the parts of the increased ethnic earnings gap caused by factors that are "group-specific" from the component caused by changes in the structure of wages. Where "group-specific" factors represent the degree to which differences in skills between ethnic Bulgarians and ethnic Turks or differences in the industry in which one group dominates over the other contribute to the increase in the earnings gap. "Wage-structure" factors consist of the portion of the gap explained by changes in skill prices (such as returns to education or returns to working in a particular industry), and changes in the overall level of inequality in an economy.

---

<sup>2</sup> See Brainerd (1998), Obgloblin (1999), Orazam and Vodopivec (1995, 2000), Newell and Riley (1996), Hunt (1998), Bird, Schwarze and Wagner (1994), Krueger and Pischke (1995), Glinskaya and Mroz (2000), Liu, Meng and Zhang (2000), Giddings (2000).

The empirical research relies on cross-sectional survey data from 1986 and 1993. This allows for a comparison between pre- and early-transition in Bulgaria, as the initial measures of the economic reform were implemented in 1991 when prices and wages were liberalized. The 1986 survey is unique in that it is the only existing pre-transition survey from Bulgaria, thereby enabling an analysis of the heretofore unexplored Bulgarian wage structure prior to 1989. The change in the earnings differentials between 1986 and 1993 is then decomposed using the Juhn, Murphy, and Pierce (1991) technique in order to identify the important factors involved in causing the change.

The earnings decomposition indicates that the returns to schooling increased in Bulgaria's early transition. Despite recent Turkish catch-up in years of schooling, Bulgarians still acquire more education, and the increased returns to schooling favored the Bulgarians over the Turks. With more of an asset that has become more valuable, Bulgarians expanded their earnings gap over the Turks. Furthermore, the decomposition shows increased relative earnings in the commerce and service industries. Similarly, although the Turks began to enter into the service industry, the Bulgarians dominated both of these growing industries and increased their relative earnings as a result. These results imply that the ethnic Turks are responding to market signals by obtaining more education and entering into growing industries. If this trend continues, it is expected that the ethnic earnings gap will diminish as the country continues to move toward a market economy.

This essay is organized as follows. Section 2 provides a brief history of the ethnic Turks in the region, as well as background on the period of the study including an overview of the transition in Bulgaria, economic indicators of the period of the study, and changes in labor market policies. Section 3 presents descriptive statistics. Section 4 provides a description of the methodology employed. Empirical results are presented in Section 5 and concluding remarks in Section 6.

## II. BACKGROUND

Located in the Balkan Peninsula, modern Bulgaria is one of the smaller countries of Europe, with a population of approximately 9 million people and an area of 43,000 square miles. A centrally planned economy coupled with a single-party political system dominated by the Communist Party characterized the Bulgarian post-war socio-economic policy until the ousting of President Todor Zhivkov<sup>3</sup> in November of 1989. The labor market consisted of a well-educated workforce, guaranteed employment, and it prioritized a strategy of rapid industrial growth. An ideology of equality limited wage inequality, and workers enjoyed a strong social safety net that included extensive child-care benefits and paid maternity leave. Cracks emerged in the economy by the mid-1980s and official statistics indicated a marked decline in productivity and national output, together with high rates of inflation. This set the stage for the collapse of central planning and the introduction of market mechanisms.

During the immediate period following the fall of Zhivkov in November 1989, marking the formal end of central planning, Bulgaria's budget deficit grew, the money supply remained unconstrained, and average nominal wages grew by 173 percent until the end of 1990 (Enev and Koford, 1997: 86). In early 1991 a package of fiscal and monetary policies was introduced in the Polish style "big bang shock therapy" to open and stabilize the economy (World Bank, 1996: 23). In February, wages were decentralized and the prices of 90 percent of goods were liberalized.<sup>4</sup> These liberalization and stabilization programs were introduced under extremely unfavorable conditions. The Bulgarian economy had been highly dependent on Council of Mutual Economic Assistance (CMEA) markets and was, consequently, heavily penalized by their collapse.<sup>5</sup> Not only were trade relations with the Commonwealth of Independent States (CIS) halted, the UN

---

<sup>3</sup> President Todor Zhivkov was the longtime communist leader of Bulgaria.

<sup>4</sup> The government continued to monitor prices of 14 essential commodities, four goods were priced by the state, and a special policy was introduced to control energy prices (Pishev, 1992). At this time approximately 1,050 firms were privatized and about 80 percent of citizens turned their coupons into investment funds (Pohl, Anderson, Claessens and Djankov, 1997: 12). The government retained a majority of the shares among larger firms.

<sup>5</sup> GDP declined by 16 percent as a result (Enev, and Koford, 1997).

embargo against the former Yugoslavia limited Bulgaria's access to Western European markets. The Gulf crisis worsened the situation as Iraq's debt was Bulgaria's biggest outstanding foreign loan (Beleva, *et al.*, 1993: 31).

Like other countries in transition, Bulgaria experienced a huge one-time price jump when prices were initially liberalized and real output fell. Table 1 shows annual inflation jumping from

Table 1. GDP, Inflation, Unemployment and Labor Productivity  
(Percentage increases over previous year)

	1989	1990	1991	1992	1993	1994
Nominal GDP <sup>a</sup>	39.58	45.39 (15%)	135.71 (199%)	200.83 (48%)	298.93 (49%)	543.47 (82%)
Real GDP <sup>a</sup>	100.00	90.90 (-9%)	80.30 (-11%)	74.40 (-6%)	72.60 (-2%)	73.60 (1.4%)
Labor Productivity <sup>b</sup>		-3.2	1.5	0.9	-0.8	3.5
Average Annual Inflation Rates <sup>c</sup>	--	22.0	333.5	82.0	72.8	89.0
Wages in state sector <sup>a</sup> (percent change in annual average)	8.7	31.7	165.6	103	59	50.8
Unemployment <sup>d</sup> (% of labor force)	--	1.5	11.5	15.6	16.4	12.8

a. Source: Jones and Miller (1997)

b. Source: The World Bank, 1996: 172.

c. Percentage increases in the CPI. Source: World Bank, 1996.

d. Registered unemployment rate (%). Source: National Employment Service, quoted in Bobeva (1997: 29).

22 percent to over 300 percent in 1991, decreasing to 82 percent in 1992 and further to 73 percent in 1993. Registered unemployment rates in Bulgaria were among the highest of any of the East and Central European countries in transition (Beleva, Jackman, and Nenova-Amar, 1995: 219).

National average of annual unemployment rose from pre-1989 negligible levels to over 11 percent in 1991, over 15 percent in 1992, and peaked at 17 percent in 1993.<sup>6</sup> The foreign trade account reached a low in 1993 at a deficit of \$530 million and then became positive again in 1994 at \$152 million (Bobeva, 1997: 25).

<sup>6</sup> Poland followed in 1993 at about 16.0 percent and Hungary about 14.0 percent (Lenkova, 1997: 301).

## **A Brief History on the Experience of the Ethnic Turks in Bulgaria**

Ethnic Bulgarians and ethnic Turks in Bulgaria have experienced a checkered relationship dating back at least to the Ottoman Empire when the Turks conquered Bulgaria in the end of the 14<sup>th</sup> Century (Crampton, 1997: 31). After Bulgarian independence in 1878, many Turks remained, comprising 9.7 percent of the population.<sup>7</sup> Since that time ethnic relations have undergone waves of intolerance in which the Turks<sup>8</sup> were denied the political, social, and economic rights accorded to them in the provisions of the Treaty of Berlin of 1878 (Karapat, 1990:7).

The communist takeover in 1944 proved to be a mixed blessing for the ethnic Turks in Bulgaria. Their position in society improved considerably; the number of Turkish schools increased, and local Turkish literature emerged along with periodicals and newspapers in every major city (Karapat, 1990: 7). Concurrent with the that the ethnic Turkish cultural rebirth, however, the Communist Party downplayed ethnic differences in an official program of “ethnic unification” in which minorities in Bulgaria were assimilated into mainstream culture (Eminov, 1997: 52, 84). From 1951 to 1952, approximately 155,000 Turks were forced to leave Bulgaria (Karapat, 1990:4). This was the first of at least six forced expulsions of the ethnic Turks from Bulgaria during communism and part of a larger program including a name-changing campaign designed to eradicate cultural differences in Bulgaria. The Communist Party’s Central Committee designed such measures in order to reach *priobshtavne* or homogeneity in the population, and to establish *edinna bulgarska natsiya* or “one Bulgarian nation” (Karapat, 1990: 4). The last occurred in the final months of President Zhivkov’s regime, when the Party began a “regeneration

---

<sup>7</sup> This statistic is based on 1992 Census figures. There are other ethnic minorities living in Bulgaria comprising a smaller portion of the population. The next two largest minority groups include “Pomaks” (Muslim Bulgarians) and Roma. Due to data availability, this analysis cannot explore the effects on minority groups other than the ethnic Turks.

<sup>8</sup> I will use the terms “Turk” and “ethnic Turk”, and “Bulgarian” and “ethnic Bulgarian” interchangeably throughout the paper.

process” in an attempt to finally resolve the “Turkish problem” (Eminov, 1997: 96-97). In 1989 many ethnic Turks were expelled, including intellectuals and leaders.<sup>9</sup>

These actions have periodically put Bulgaria on the United Nation’s Development Programme’s Human Rights Watch List, and the early transition has changed the situation only marginally. A survey conducted by a sociological collective in June of 1992 found that the ethnic Bulgarians sustain a prejudice against the ethnic Turks. The survey showed that over fifty percent of Bulgarians considered the ethnic Turks to be a “real danger to national security,” religious fanatics, and occupying too many important political positions. Over 35 percent supported policies encouraging emigration to Turkey (Kunev, 1992a: 47).

In terms of the labor market, an ideology of equality, coupled with a system of centralized wage-setting limited the level of earnings inequality during communism. In order to limit any negative social consequences of wage and price liberalization, several new institutions developed in the early transition to limit increases in earnings inequality. These included a tax-based incomes policy, a minimum wage, and collective bargaining at the national, regional, and enterprise levels.

A tax-based incomes policy was introduced after price liberalization in 1991 on behalf of a tripartite agreement among government, employers and the largest national trade union federation (Enev and Koford, 1997: 82).<sup>10</sup> Beginning in the second quarter of 1991, direct controls on wages were applied (Tzanov, and Vaughan-Whitehead, 1997:100). Based on actual and expected inflation, the controls imposed a ceiling on the nominal wage bill of individual enterprises in order to limit wage growth (Enev and Koford, 1997). The government planned to

---

<sup>9</sup> Only approximately 100,000 Turks later returned. It is important to note that this exodus may have influenced the relative position of the ethnic Turks in the post-communist Bulgarian economy. If, for example, many Turkish intellectuals, or leaders fled Bulgaria, leaving behind the less-skilled or poorly educated, measured ethnic inequality would increase as a result.

<sup>10</sup> For a detailed description of the wage determination and wage policy in Bulgaria during the period 1990-1993, see ILO-CEET and EC (1994) and Bankov (1993).

enforce the policy by levying a highly progressive tax against excessive wage increases.<sup>11</sup> In reality, enterprises were able to avoid paying the tax (Enev and Koford, 1997).

In addition to the incomes policy, public employee wages were controlled through the maintenance of a universal minimum wage for all full-time workers. Under trade union pressure, the state increased the minimum wage in 1990 from 180 to 191 *Leva* per month. In 1992, the minimum wage increased to 850 *Leva* per month (equivalent to \$30). Although it was adjusted irregularly, the real value of the minimum wage did not keep up with inflation (Tzanov and Vaughan-Whitehead, 1997: 100-101). The real value of the minimum wage based on 1989 *Leva* fell from 180 in 1989 to 71.3 *Leva* per month in 1993.

During the first years of the Communist period (from the 1940s to 1951) collective bargaining over wages was forbidden in Bulgaria while non-wage issues were negotiable. During the early transition (between 1989 and 1993) a pluralist system of industrial relations developed within the context of continuous political upheaval.<sup>12</sup> Trade unions and employers began to distance themselves from the State and the Communist Party (Thirkell and Tseneva, 1992) and union activities were no longer subordinated to the economic goals of the state (Iankova, 2000). By 1993 four levels negotiation were present in Bulgaria (Iankova, 2000). These included national tripartite negotiations between the government, the national trade union organizations and the national organizations of employers, industry and sector level negotiations, regional/local negotiations, and bargaining at the enterprise level including representatives of the state, union and employer organizations. By July of 1991, 37 percent of state enterprises had negotiated collective bargaining agreements, and by November of that year about 74 percent of the wage-earners were covered by collective agreements.

---

<sup>11</sup> The tax on excess wage fund increases between February and June of 1991 was determined by the following scheme: If the increase was < 1% above the fund, a 100% marginal tax rate was placed on the increment; If between 1 and 2% the marginal tax rate was 200%, if between 2 and 3% the tax was 400% and if above 3%, an 800% marginal tax rate.

<sup>12</sup> Between November of 1989 and December of 1991 alone, the country saw four changes in government.

### III. DATA AND DESCRIPTIVE INFORMATION

This analysis is based on two cross-sectional household surveys conducted in Bulgaria, one administered prior to the transition and the other after the initial economic reforms were in place. The 1986 *Town and Village Survey*, conducted by the Institute of Sociology of the Bulgarian Academy of Sciences in Sofia, was carried out in conjunction with the national census delivered in the winter of 1985 and contains heretofore unexplored information on the structure of Bulgarian wages prior to the transition. The sample is random and representative of the population. After eliminating those not in the labor force, and those who reported zero earnings,<sup>13</sup> the sample contains 6,545 useable cases.

The second survey, *Social Stratification in Eastern Europe after 1989: General Population Survey* (SSEE),<sup>14</sup> was conducted in 1993 by a team of investigators from University of California-Los Angeles (UCLA) in conjunction with Bulgarian officials from the Central Statistical office. The SSEE survey was carried out through a two-stage clustered sampling technique with stratification by district, municipality and size of voting section. The field research took place between June and July of 1993 during which 4,921 interviews were completed. The sample contains 2,828 usable cases. The empirical analysis is restricted to employed civilians of working age. In pre-transition Bulgaria, this consisted of those aged 16 to 60, while no upper age restrictions are placed on the 1993 sample. Those working in agriculture and the self-employed individuals are included in this analysis.

Earnings were not adjusted for hours spent in the labor market in either the 1986 or the 1993 analysis. The number of hours worked was only available in the 1993 survey; however, it is a reasonable assumption that all employed individuals during Communism worked full-time. Normal working hours per week were generally longer in Central and Eastern than in Western European countries; in particular, the average workweek in Bulgaria during Communism was

---

<sup>13</sup> There were 22 cases that reported zero earnings in the sample of the employed.

approximately 40.5 for both men and women (Kroupova, 1990: 10, quoted in Hubner, Maier, and Rudolph, 1991: 34). Adjusting for hours in the 1993 analysis made no significant difference in the results.<sup>15</sup>

Respondents in the SSEE survey were permitted to record incomes either as annual or as monthly. The variable used in this analysis includes monthly incomes with imputed missing and implausible values (implausible because they are values that could not realistically occur in Bulgaria given the other characteristics of the respondent, and hence almost certainly constitute errors in reporting or recording). The imputation was made by assigning expected values from a regression of each income variable being imputed on a set of characteristics known to determine incomes.<sup>16</sup>

Table 2. Changes in Log Ethnic Earnings Differentials, Bulgaria 1986 & 1993<sup>a</sup>

	Log of Bulgarian Earnings	Log of Turk Earnings	Ethnic Gap
1986	5.3101 (0.347)	5.1483 (0.371)	0.1618
1993	7.6395 (0.457)	7.4544 (0.417)	0.1850
<b>Gap<sub>93</sub> – Gap<sub>86</sub></b>			<b>0.0232</b>

<sup>a</sup> Data is from a sample of the employed. Log wages are reported in nominal terms and reflect the massive realignment of prices in the transition. Standard deviations are in parentheses.  
Source: author's calculations.

Changes in the ethnic earnings differentials during Bulgaria's transformation from a planned economy to a mixed-market economy are reported in Table 2, which provides information on log earnings for ethnic Bulgarians and ethnic Turks. According to the table, the ethnic earnings gap increased over that time period from 0.1618 to 0.1850, or an increase of

<sup>14</sup> The Bulgarian survey is part of a larger multi-country comparative research project including five other Central and East-European countries.

<sup>15</sup> The results of the 1993 analysis after adjusting for hours as well as a description of how the data was adjusted to account for hours, are available from the author upon request.

<sup>16</sup> Despite the fact that using expected values rather than values that reflect the variance around the regression surface overstates the relation between income and its determinants, because so few cases were imputed, little distortion was introduced. Cases that could not be imputed because data were missing for the independent variables in the regression equations were assigned a value of 0 and dropped from the analysis. Results from the analysis using non-imputed values show a slightly larger increase in the ethnic earnings gap and are available from the author upon request.

0.0232 log points. This evidence indicates that the log ethnic earnings differential increased by over 14 percent over the period.

The effects of the transition on ethnic minorities in the labor market are not consistent across transitioning countries. In Estonia, for example, ethnic Russians are performing relatively better in the early years of the transition. The mean log wage differential between male ethnic Estonians and male ethnic Russians fell from 0.0186 in 1989 to 0.0028 in 1994 (Kroncke and Smith, 1999: 189). The Non Slovenian males in Slovenia experienced a slight decline in their earnings premium from 2.3 percent in 1987 to 2 percent 1992 whereas Non Estonian males in Estonia earned less than their Estonian counterparts in both 1989 (2.9 percent less) and 1994 (7.9 percent less) (Orazem and Vodopivec, 2000: 291). Data from urban China indicates that earnings premia for a male national minority fell from 1.8 percent in 1988 to -3.9 percent in 1995 (Gustafsson and Li, 2000: 320-322). Such inconsistent results across the transition may reflect differences in skills and access to education between the majority and minority groups in a country.

### **Explaining the Increase in the Ethnic Earnings Gap**

***“Group-specific” factors*** Economists traditionally approach the question of wage differentials between men, women, and among racial/ethnic groups by focusing on the role of differences in qualifications between gender and ethnic groups, and on differences in the treatment of similarly qualified individuals (discrimination). Segregation by occupation, industry, or sector in which members of different gender, racial, or ethnic groups are disproportionately employed in particular occupations (industries or sectors) can also lead to differences in wages. Such differences between groups in human capital or occupational characteristics, can be referred to as *group-specific* factors—where groups are based on gender, race, or ethnicity—that influence

wage differentials (Blau and Kahn, 1996).<sup>17</sup> The following tables explore changes in such group-specific factors over time in an attempt to explain some of the increase in the ethnic earnings gap.

Table 3 presents changes in human capital characteristics among ethnic Turks and ethnic Bulgarians between 1986 and 1993. The information in this table indicates that the ethnic Bulgarians acquired more schooling than the Turks in both 1986 and 1993 (10.72 years versus 7.51 years and 11.49 years versus 8.59 years respectively). However, the Turks began to close the education gap by 1993. The Turks also closed the gap in labor market experience. This evidence indicates a probable decline in the ethnic earnings gap and therefore, does not explain the observed increase in earnings differentials.

Table 3. Pre and early-transition education and experience distribution of ethnic Bulgarians and Ethnic Turks in the labor market, Bulgaria 1986 and 1993

	All Change	Ethnic Bulgarians		Change	Ethnic Turks		Change
		1986	1993		1986	1993	
Years of Schooling	0.939	10.716	11.485	0.769	7.510	8.591	1.081
Experience	4.653	16.792	21.192	4.4	14.557	21.939	7.382
N		5,464	2,392		645	259	

Columns may not sum to 1.0 due to rounding. Data is from a sample of the employed.  
Source: author's calculations.

In addition to education and experience, systematic differences between the Bulgarians and the Turks in the industry in which they are predominately employed may explain some of the increase in the ethnic earnings gap. Table 4 presents the distribution of ethnic Bulgarians and ethnic Turks in the labor market as well as the change in employment in each industry. This information indicates that commerce, services and transportation experienced the most growth in employment in the early transition. In contrast, manufacturing, construction, agriculture, public administration, and communications saw a decline in overall employment over this time. Employment among the ethnic Bulgarians grew in commerce, services and transportation in the early transition whereas employment among the ethnic Turks grew in construction, services,

<sup>17</sup> Francine Blau and Lawrence Kahn refer to these factors as “gender-specific.” Because this essay focuses on ethnic differences, the term “group-specific” will be used here instead.

transportation and communications. This indicates that with the exception of the commerce industry, the ethnic Turks, like the ethnic Bulgarians, are moving into the growing industries in the transition. Therefore, even though the Turks do not dominate these industries in an absolute sense, they are adopting to changes in industrial demand and benefiting from growth in services and transportation. As was the case with education and experience, this evidence does not explain the increase in the ethnic earnings gap.

Table 4. Pre and early-transition industry distribution of male ethnic Bulgarians and Ethnic Turks in the labor market, Bulgaria 1986 and 1993<sup>a,b</sup>

	All		Ethnic Bulgarians		Ethnic Turks		% Change
	%	1986	1993	%	1986	1993	
	Change			Change			
Manufacturing	-0.1578	0.3561	0.2972	-0.1654	0.2775	0.2625	-0.0540
Construction	-0.1398	0.0769	0.0598	-0.2223	0.0682	0.1042	0.5282
Agriculture	-0.0684	0.1332	0.1313	-0.0148	0.4186	0.3822	-0.0869
Commerce	0.8289	0.0758	0.1421	0.8760	0.0481	0.0425	-0.1163
Services	0.4074	0.0937	0.1313	0.4009	0.0605	0.0811	0.3410
Public Administration	-0.4082	0.0686	0.0393	-0.4274	0.0233	0.0154	-0.3359
Transportation	0.2919	0.0641	0.0861	0.3445	0.0496	0.0541	0.0895
Communications	-0.0609	0.1277	0.1129	-0.1164	0.0512	0.0579	0.1320
N		5,464	2,392		645	259	

a. Columns may not sum to 1.0 due to rounding.

b. Note that the industry groups refer to 1-digit industry codes. Data is from a sample of the employed.

Source: authors' calculations.

Changes in industrial demand as the economy shifts towards markets may favor certain industries. Such changes could benefit one group over another due to industrial segregation in an economy. Table 5 presents changes in earnings by industry between 1986 and 1993. Earnings grew fastest in the commerce, services, and communications industries. The disproportionate employment of ethnic Bulgarians in these sectors has contributed to their relative earnings gains in the early transition. However, with the exception of commerce, the Turks are entering into these favored industries. Thus, if this trend continues, the earnings disadvantage of ethnic Turks will wither and perhaps disappear.

Table 5. Relative earnings growth by industry of employment (percentage change in nominal log earnings in Bulgaria 1986-1993)

	All	Bulgarians	Turks
--	-----	------------	-------

Manufacturing	0.4302	0.4283	0.4495
Construction	0.4220	0.4233	0.4181
Agriculture	0.4363	0.4218	0.4543
Commerce	0.5039	0.5053	0.4924
Services	0.4730	0.4753	0.4142
Public Administration	0.3988	0.4018	0.3631
Transportation	0.4303	0.4310	0.4252
Communications	0.4494	0.4483	0.4662

<sup>a</sup> Data is from a sample of the employed. Log wages are reported in nominal terms and reflect the massive realignment of prices in the transition.

Source: author's calculations.

**“Wage-structure” factors** In addition to group-specific factors, labor market institutions associated with the overall wage structure in an economy can affect wage differentials play an important role in generating wage differentials (Blau and Kahn, 1992, 1995, 1996, 1997, 1999). What they call “wage-structure” factors refer to how different characteristics (such as schooling, experience, or industry) are *rewarded* in an economy as well as changes in the overall level of inequality in an economy.

Table 6 reports results from ordinary least squares human capital earnings functions (Mincer, 1974) in order to examine changes in the returns to human capital variables and differences in returns between ethnic Bulgarians and ethnic Turks in the early transition in Bulgaria. The natural log of earnings is the dependent variable and the two regressions include independent variables associated with a traditional human model. The “basic” regression includes continuous variables for years of schooling and years of work experience (and its square). The “extended” regression includes variables for education, work, and dummy variables for region and industry.

Table 6. Baseline log earnings functions and changes in returns to skill in the early transition, Bulgaria 1986 and 1993

	Bulgarian				Turk			
	1986		1993		1986		1993	
	Basic	Extended	Basic	Extended	Basic	Extended	Basic	Extended
intercept	4.7245	4.5750	7.0939	6.8505	4.6152	4.6283	7.3530	7.3036
years of schooling	0.0325 (21.98)	0.0326 (22.72)	0.0421 (14.96)	0.0417 (14.53)	0.0392 (8.13)	0.0291 (5.97)	0.0096 (0.78)	0.0099 (0.86)
experience	0.0201 (12.48)	0.0259 (17.22)	0.0071 (2.88)	0.0096 (3.91)	0.0258 (5.01)	0.0237 (4.70)	0.0046 (0.67)	0.0051 (0.69)
experience2	-0.0003 (-6.26)	-0.0005 (-11.61)	-0.0002 (-3.07)	-0.0002 (-3.48)	-0.0005 (-3.15)	-0.0005 (-3.60)	-0.0001 (-1.00)	-0.0001 (-0.71)

sex	0.2662			0.2100		0.2424		0.1122
	(33.38)			(12.23)		(8.37)		(1.86)
married	0.0037			0.0062		0.0958		0.0339
	(0.35)			(0.29)		(2.22)		(0.40)
sofia	0.0403			0.1477		-0.2045		-0.0003
	(3.48)			(6.64)		(-1.42)		(-0.01)
state	0.0481			0.0836		-0.0270		0.0015
	(2.99)			(2.45)		(-0.75)		(0.02)
private	-0.0165			0.2762		-0.2691		0.1794
	(-0.09)			(6.34)		(-1.96)		(1.69)
const	-0.0121			-0.0259		0.0079		-0.0293
	(-0.85)			(-0.62)		(0.16)		(-0.31)
ag	-0.0620			-0.0420		-0.1508		-0.1471
	(-3.78)			(-1.33)		(-3.97)		(-2.01)
comrce	-0.1882			-0.0347		-0.1755		0.0479
	(-12.91)			(-1.11)		(-3.41)		(0.23)
svcs	-0.1606			-0.0535		-0.0733		-0.2980
	(-12.64)			(-1.90)		(-1.53)		(-2.75)
pubadmin	0.0275			-0.0445		-0.0434		-0.3511
	(1.70)			(-1.04)		(-0.56)		(-1.53)
trans	-0.0568			0.0010		-0.0345		-0.0233
	(-3.40)			(0.03)		(-0.60)		(-0.21)
communi	-0.1402			-0.1151		-0.1809		-0.1267
	(-11.54)			(-4.14)		(-3.62)		(-1.07)
R2	0.1327	0.3503	0.0958	0.2096	0.1301	0.2905	0.0126	0.1094
F-test	273.61	197.94	94.19	37.40	27.93	16.47	1.41	3.02
N	5,464	5,464	2,392	2,392	645	645	259	259

<sup>a</sup> Data is from a sample of the employed. Log wages are reported in nominal terms and reflect the massive realignment of prices in the transition. T-statistics are in parentheses, Log of monthly earnings is dependent variable.  
Source: author's calculations

The regression results indicate that as Bulgaria moved toward a market economy, the returns to a year of schooling among ethnic Bulgarians increased from approximately 3 percent in 1986 to over 4 percent by 1993. In contrast, the returns to a year of schooling fell for ethnic Turks from 3.9 percent to less than one percent. Changes in returns to schooling are likely to have a significant impact on the ethnic earnings gap. The magnitude of the effects depend both on differences in educational attainment and quality of education between the ethnic Turks and the ethnic Bulgarians.<sup>18</sup> Not unlike other transitioning economies, the returns to experience in the labor market fell in the early transition for both Bulgarians and Turks. Changes in the returns to human capital favored the ethnic Bulgarians over the ethnic Turks.

The extended log earnings function presented in Table 6 controls for demographic factors such as marital status and living in the capital city, Sofia, as well as sector of employment

<sup>18</sup> Note that while the regression can account for differences in the number of years of schooling, it cannot account for differences in the quality of schooling obtained by ethnic Turks and ethnic Bulgarians which may significantly

(private, state or cooperative) and one-digit industry codes of employment.<sup>19</sup> There is a debate regarding the appropriateness of including industry or occupational dummies in earnings regressions. One side argues that earnings differentials may be the result of job discrimination against women/racial minorities/ethnic minorities who want to enter into high-paying industries or occupations.<sup>20</sup> With ethnic Turks' being concentrated in low-wage industries or occupations, the inclusion of industry or occupational dummies could lead to an under-estimation of actual wage discrimination against ethnic Turks who have the same schooling and experience as Bulgarians. The possibility of occupational and/or industry segregation should be considered when interpreting the extended earnings regression estimates reported in Table 6.

The results presented in Table 6 indicate that changes in the pay to workers in particular industries differed by ethnicity. As compared to the benchmark industry, manufacturing, the pay in agriculture, commerce, services, transportation and communications grew for both the ethnic Bulgarians and the ethnic Turks. The greatest gain among the ethnic Bulgarians was made in transportation. Among the ethnic Turks, the greatest growth occurred in the communications industry where pay grew from 17 percent less than in the benchmark industry to 4.8 percent more. These results indicate that the Turks are benefiting from the changes in industrial demand that favored the commerce industry.

---

contribute to differences in earnings between the two groups. Differences in quality of schooling fall into the unmeasured category of the regressions and later in the earnings decompositions.

<sup>19</sup> Charles Kroncke and Kenneth Smith (1999) included the ability to speak English in a similar regression examining the wage effects of ethnicity in Estonia. They hypothesized that English language ability would command a higher wage premium in the transition due to changes in industrial demand and in new trading partners. While this is an entirely plausible hypothesis for the Bulgarian case, the 1993 Bulgarian SSEE sample would not allow for inclusion of English language ability as an independent variable as none of the ethnic Turks in the sample spoke English.

Table 7. Changes in the Wage Structure: Ratios of Top Decile Earnings to Bottom Decile Earnings by Ethnicity, Education, and Industry<sup>a</sup>

	Ratio of Top Decile to Bottom Decile		
	1986	1993	change
All	3.2962	5.3405	2.0443
Manufacturing	3.2464	4.9553	1.7089
Construction	3.1843	5.5345	2.3502
Agriculture	3.4455	6.0528	2.6073
Commerce	2.8711	6.0281	3.1570
Services	3.2869	5.0059	1.7190
Public Administration	3.2738	5.1988	1.9250
Transportation	3.0778	4.8135	1.7357
Communication	3.1576	5.2140	2.0564

<sup>a</sup> Data is from a sample of the employed.

Source: author's calculations.

A change in the overall level of inequality in an economy affects ethnic earnings differentials. An absolute increase in inequality can penalize workers at the low-end of the distribution even if relative inequality is unchanged. Table 7 presents evidence of a widening relative distribution of wages in Bulgaria in the early transition. The ratio of average top-decile to bottom-decile earnings for both 1986 and 1993 are presented as are percentage changes in the ratio by industry. Earnings differences between the very rich and the very poor in Bulgaria grew between 1986 and 1993. The increased inequality grew most among those working in construction, agriculture and commerce. The widening of the wage distribution indicates that the position of those at the low-end of the earnings distribution in 1986 worsened by 1993.

In summary, group-specific factors and wage-structure factors both indicate that the ethnic Turks are adopting to the signals of the market economy by obtaining more years of education and labor market experience, and they are entering into the growing industries in the transition. Further, despite evidence that the Turks continue to have fewer years of education and are disproportionately under-represented in the growing industries of commerce, services, and transportation, trends indicate their movement toward these areas. Changes in the returns to education that benefited the Bulgarians to a greater extent, and the increase in overall inequality

---

<sup>20</sup> Andrew Gill (1994) showed that racial differences in access to high-paying occupations played

in the economy that hurt those at the low-end of the wage distribution could explain the small increase in the ethnic earnings gap in Bulgaria's early transition.

#### IV. DESCRIPTION OF THE WAGE DECOMPOSITION METHODOLOGY

The Juhn *et al.* methodology begins by estimating an ethnic Bulgarian wage equation for ethnic Bulgarian worker  $i$  in time  $t$ <sup>21</sup>

$$Y_{it} = X_{it}\beta_t + \sigma_t\theta_{it} + u_{it} \quad (1)$$

where  $X_{it}$  is a vector containing the observable characteristics of an individual ethnic Bulgarian worker and  $\beta_t$  gives the coefficients on these characteristics in year  $t$ ; it is assumed that  $E(u_{it}|x_{it}) = 0$ , so that this equation gives mean wages for ethnic Bulgarians with given characteristics.  $\sigma_t$  is the standard deviation of the residual of the ethnic Bulgarian wage function in year  $t$ , and  $\theta_{it} = u_{it}/\sigma_{bt}$  is a "standardized" residual of the ethnic Bulgarian regression (with mean zero and variance one). Changes in  $\sigma_t$  through time reflect changes in within-group inequality.

The actual wage differential between ethnic Bulgarians and ethnic Turks is:

$$\Delta Y_t = Y_{bt} - Y_{kt} = (X_{bt}\beta_{bt} + \sigma_{bt}\theta_{bt}) - (X_{kt}\beta_{kt} + \sigma_{kt}\theta_{kt})$$

If we assume that ethnic Turks have the same returns to schooling and experience and the same standard deviation of residuals in the wage equation as Bulgarians, but differ in the amount of schooling, experience, and standardized earnings residuals, the earnings differential can then be written as:

$$\begin{aligned} \Delta Y_t &= Y_{bt} - Y_{kt} = (X_{bt} - X_{kt})\beta_{bt} + \sigma_{bt}(\theta_{bt} - \theta_{kt}) \\ &= \Delta X_t\beta_{bt} + \sigma_{bt}\Delta\theta_t \end{aligned} \quad (2)$$

where  $\Delta X_t = (X_{bt} - X_{kt})$  is the difference between ethnic Bulgarians and ethnic Turks in the average of the individual observable characteristics, the term  $\Delta X_t\beta_t$  is the predicted gap between ethnic Turks and ethnic Bulgarians in time  $t$ .  $\Delta\theta_t = (\theta_{bt} - \theta_{kt})$ , is the difference in the average

---

a significant role in racial wage differentials in the U.S.

standardized residual for ethnic Bulgarians and ethnic Turks in time  $t$ .  $\theta_{kt} = (Y_{kt} - X_{kt}\beta_{bt}) / \sigma_{bt}$

where  $(Y_{kt} - X_{kt}\beta_{bt})$  is the difference between an ethnic Turk's actual wages and the wages that he would have received had s/he been rewarded for his/her characteristics at the same rate as ethnic Bulgarians.

Using this formulation, wage divergence between ethnic Bulgarians and ethnic Turks between one year, such as year  $t$ , and another year, such as year  $s$ , can be written as:

$$\Delta Y_s - \Delta Y_t = (\Delta X_s - \Delta X_t) \beta_{bt} + \Delta X_s (\beta_{bs} - \beta_{bt}) + (\Delta \theta_s - \Delta \theta_t) \sigma_{bt} + \Delta \theta_s (\sigma_{bs} - \sigma_{bt}) \quad (3)$$

This decomposes the wage convergence into four components of observable and unobservable characteristics. The first term in equation 3 is the portion of the change in the wage gap due to differences in measured characteristics such as years of schooling and experience, or industry, evaluated at fixed ethnic Bulgarian prices,  $(\Delta X_s - \Delta X_t) \beta_{bt}$ . The second term measures the amount of the change in the wage differential over time that is attributable to changes in the prices paid to ethnic Bulgarians for those measured characteristics,  $\Delta X_s (\beta_{bs} - \beta_{bt})$ . The third term denotes changes in ethnic Turk's relative position in the ethnic Bulgarian residual wage distribution  $(\Delta \theta_s - \Delta \theta_t) \sigma_{bt}$ . The last term reflects differences in residual inequality over time, or the difference in the "penalty" placed on being at a lower position in the wage distribution,  $\Delta \theta_s (\sigma_{bs} - \sigma_{bt})$ .<sup>22</sup>

According to Blau and Kahn (1996), the sum of the first and third terms is a reflection of the group-specific factors that contribute to the difference in wages. Group differences in qualifications and group differences in wage rankings at a given level of measured characteristics. The sum of the second and fourth terms is a reflection of the labor market structure. The wage-structure effect measures the impact of cross-time differences in returns to measured and

---

<sup>21</sup> Note that this discussion will reference the ethnic wage gap in Bulgaria, but could be easily applied to any gender or racial/ethnic wage differential. Subscripts 'b' and 'k' refer to the ethnic Bulgarians and the ethnic Turks respectively.

<sup>22</sup> It is important to note that although this decomposition breaks down the residual factors into two components, as opposed to the Blinder (1973) or Oaxaca (1973) techniques, the residual components still represent that portion of the difference in wages that cannot be explained by the explanatory variables in the wage equation. In other words, regardless of the fact that the residual is decomposed, it is still a residual, and it is still a measure of our ignorance and dependent on the structure of the regression equation.

measured characteristics. The sum of the third and fourth terms represents the impact of cross time differences in the “unexplained” differential in traditional decompositions.<sup>23</sup>

## V. RESULTS

The decomposition of the increase in the ethnic wage differentials between 1986 and 1993 is presented in Table 8. In order to explain these changes, the differentials are broken down into four separate effects: the observed characteristics effect, the observed price effect, the gap effect, and the unmeasured prices effect. Group-specific factors consist of the “observed characteristics effect plus” the “gap” effect. Wage-structure factors consist of the “observed price effect” plus the “unmeasured prices effect”.

*Group-specific and Wage-structure factors* Based on the decomposition of the basic model presented in Table 8, three of the four components of the Juhn *et al.* decomposition are positive, contributing to an increase in the ethnic wage gap.<sup>24</sup> Only the “observed characteristics effect” served to diminish wage differences between ethnic Bulgarians and ethnic Turks. A negative “observed characteristics effect” indicates that changes in the differences between the ethnic Turks and the ethnic Bulgarians in observable characteristics such as the number of years of schooling or the industry in which one group tends to participate diminished earnings differences. In other words, obtaining additional years of schooling, for example, benefited the Turks and improved their relative earnings position. This is not surprising given that the Turks began to close the gap in number of years of schooling between 1986 and 1993 and entirely closed the experience gap.

---

<sup>23</sup> This method of decomposing wage differentials is subject to the familiar index problem. The year that one chooses as a base may alter the specific values obtained for each of the four components of the decomposition. Regardless of what base year is used, the overall results are robust.<sup>23</sup> Similarly, whether or not one chooses to base the decomposition on an ethnic Turk wage equation versus an ethnic Bulgarian wage equation will also affect the specific results. Following other studies, this formulation bases the decomposition on the ethnic Bulgarian regression because it is expected that differences over time in discrimination against ethnic minorities will affect the ethnic Bulgarian regression coefficients to a lesser extent.

<sup>24</sup> Note that a negative number indicates that the factor serves to decrease the ethnic earnings gap, or a relative improvement of the standing of the ethnic Turks. A positive number indicates that the factor serves to increase the ethnic earnings gap, contributing to a relative decline in standing for the ethnic Turks.

The other three components, the “observed prices effect,” the “gap effect” and the “unobserved prices effect” are positive, serving to increase the ethnic earnings gap. These three components indicate that changing returns to education, experience, and industry benefited the ethnic Bulgarians. Further, changes in overall inequality in the economy penalized the ethnic Turks to a greater extent than the ethnic Bulgarians.

In all, changes in “group-specific factors” helped the ethnic Turks whereas changes in “wage-structure factors” hurt the Turks. However the wage-structure effect was larger than the group-specific effect such that the gains made by the ethnic Turks in measured characteristics were more than lost by the changes in wage structure and inequality that benefited the Bulgarians. Importantly, little of the differential is explained by what is sometimes referred to as “discrimination” (the gap effect plus the unobserved prices effect). Particularly in the “extended” model which includes industry dummies and other demographic characteristics.

Table 8. Analysis of Log Wages: Human Capital Regression Models

	Basic	Full
<b>Observed Characteristics Effect (Xs)</b>	<b>-0.0393</b>	<b>-0.0697</b>
years of schooling	-0.0101	-0.0102
experience	-0.0600	-0.0773
experience squared	0.0309	0.0530
sex		-0.0172
married		-0.0001
sofia		0.0029
state		-0.0038
private		-0.0007
const		0.0006
ag		-0.0021
comrce		-0.0135
svcs		-0.0027
pubadmin		-0.0006
trans		-0.0010
communi		0.0030
<b>Observed Prices Effect</b>	<b>0.0328</b>	<b>0.0909</b>
years of schooling	0.0278	0.0264
experience	0.0097	0.0122
experience squared	-0.0048	-0.0117
sex		0.0054
married		-0.0002
sofia		0.0223
state		0.0065
private		0.0121
const		0.0006
ag		-0.0050
comrce		0.0153
svcs		0.0053
pubadmin		-0.0017

trans		0.0019
communi		0.0014
<b>Gap Effect</b>	<b>0.0137</b>	<b>-0.0073</b>
<b>Unobserved Price Effect</b>	<b>0.0160</b>	<b>0.0092</b>
		0.0232
Total Change in Gap (1993-1986)		
	0.0232	
Sum of Group-Specific Effects	-0.0256	-0.0769
Sum of Wage Structure Effects	0.0488	0.1000
Sum of Unobserved Effects	0.0297	0.0020

Note: The components of the decomposition are defined as follows: Observed Characteristics Effect =  $(\Delta X_{93} - \Delta X_{86})\beta_{b86}$ , Observed Price Effect =  $\Delta X_{93}(\beta_{b93} - \beta_{b86})$ , Gap Effect =  $(\Delta\theta_{93} - \Delta\theta_{86})\sigma_{b86}$ , Unobserved Price Effect =  $\Delta\theta_{93}(\sigma_{b93} - \sigma_{b86})$ . Where X is a vector of explanatory variables,  $\beta$  is a vector of estimated coefficients from an ethnic Bulgarian earnings equation,  $\theta$  is a standardized residual,  $\sigma$  is the residual standard deviation of ethnic Bulgarian earnings, and  $\Delta$  denotes the average of the ethnic Bulgarian/ethnic Turk difference in the variable that follows. The regression includes controls for education, experience and its square, living in the capital city, marital status, sector of the economy, and industry. T-statistics are in parentheses. <sup>a</sup> Data is from a sample of the employed. Log wages are reported in nominal terms and reflect the massive realignment of prices in the transition.

Source: Author's calculations.

**Observed Characteristics** Looking first at the “observed characteristics” category, Table 8 shows that the impact of measured characteristics is negative for both models, indicating that the ethnic Turks in 1993 have relatively favorable levels of schooling, experience, and industry of employment as compared to 1986. Members of the ethnic Turkish minority experienced a relative gain in observable characteristics contributing to a decline in the ethnic wage differentials over the period by 0.0393, and 0.0697 log points in each model respectively.

Disaggregating the “observed characteristics” effect into its component parts in the extended model shows that, as expected both years of education and experience contributed to a decline in the ethnic earnings differential. Similarly, participation in agriculture, commerce, services, public administration and transportation also diminished the gap. In particular, participation in the growing commerce industry caused the gap to decline by 0.0135 log points (the largest effect among the industries).

**Observed prices** In contrast to the “observed characteristics effect”, the “observed prices effect” increased the ethnic wage differential in each model by 0.0328, and 0.0909 log points respectively. This effect is the largest of the four components of the decomposition in the “extended model”. This indicates that rising returns to schooling, sector of the economy, and industry, for example, favored the ethnic Bulgarians over the ethnic Turks in the transition.

Focusing on the extended model and breaking down the “observed prices effect,” changing returns to schooling exacerbated the ethnic earnings differential in the transition. Changes in the returns to schooling favored the Bulgarians and increased the gap by 29 percent (0.0264/0.0909).

Changes in returns to the previously identified “growth” industries (commerce, services and transportation) also contributed to an increase in the ethnic earnings differential in Bulgaria’s early transition. These three industries alone comprise of 0.0225 log points, translating into over 24 percent of the observed prices effect (0.0225/0.0909). This indicates that rising returns to commerce, services, and transportation favored the ethnic Bulgarians over the ethnic Turks in the transition.

One interpretation of the large observed price effect (particularly in the “extended model”) on the change in the ethnic wage differential is that this is due to the persistent high level of industry segregation by ethnicity. Blau and Kahn (1997) point out that the observed price effect may reflect discrimination if segregation by industry ‘crowds’ women or members of a particular racial/ethnic group into certain industries in the economy, thereby decreasing wages (see also Bergmann, 1974). As of 1993, the ethnic Turks continued to be disproportionately represented in agriculture (see Meurs 1998 and Meurs and Giddings 1999). Thus, although, the ethnic Turks are entering the growth industries, they remain disproportionately underrepresented and the gains benefited the Bulgarians to a greater extent.

***The Gap effect*** The “gap” effect measures the contributions of each year’s ethnic Turkish placement in the ethnic Bulgarian residual wage distribution to the change in the ethnic wage differential between 1986 and 1993. This effect increased the ethnic pay gap by 0.0137 log points in the “basic model”, and decreased it by 0.0073 in the full model. That is, the ethnic Turks moved up relative to the Bulgarian residual wage distribution.

***Unmeasured prices*** The “unmeasured prices” effect served to increase the ethnic wage gap over time in both models by 0.0160, and 0.0092 log points respectively. On net, however, controlling for education, experience, demographic characteristics, sector, and industry, in the full

model the “gap” effect and the “unmeasured prices” effect increased the ethnic gap by only 0.0297 log points in the basic model and 0.0020 log points in the extended model. This evidence indicates that what is sometimes considered to be a measure of discrimination can explain little of the increase in the ethnic earnings gap.

Group-specific components in the extended model reduced the ethnic earnings gap by 0.0769 log points, while wage-structure factors increased the gap by 0.1000 log points. Assuming that price changes affected the ethnic Bulgarians and the ethnic Turks similarly, rising inequality in the transition reclaimed more than the gains that the ethnic Turks would have made had the price changes not occurred. In other words, although the Turks were attempting to “swim upstream” by closing the education and experience gap and improving their situation in terms of observed characteristics, they were “swept downstream” by the tide of increasing inequality in the economy. Changes in returns to the observed characteristics that favored the Bulgarians more than counteracted the gains the Turks made over the period. In summary, changing returns to schooling, experience, sector and industry in the transition favored the ethnic Bulgarians over the ethnic Turks, causing the ethnic wage differential to increase.

## **VI. CONCLUSIONS**

The ethnic wage gap between the Turks and their Bulgarian counterparts increased as the country began its transition from plan to market. Economists find that differences in personal characteristics such as the amount of education, labor market experience, and participation in certain industries (group-specific factors) are usual suspects in causing wage differentials. Additionally, differences in the returns to such characteristics and changes in the overall structure of wages (wage-structure factors) can contribute to earnings differentials. This analysis explored the degree to which group-specific and wage-structure factors contributed to the increase in the ethnic earnings differential.

Descriptive analyses showed the ethnic Turks closed both the gap in the number of years of education obtained as well as the number of years of labor market experience between 1986

and 1993. Furthermore, the ethnic Turks began to enter the growing commerce and transportation industries in the early transition. This evidence indicates that the ethnic Turks, like the ethnic Bulgarians began responding to market signals, obtaining more education and reallocating resources in response to changes in industry demand. These changes do not explain the increase in the ethnic earnings gap, but point instead to an improvement in the Turk's relative position in the labor market.

In addition to these personal characteristics, this analysis explored the effect of changes in the wage structure as related to level of education and industry. In other words, how changes in the remuneration to different levels of education and industry affected the ethnic wage gap. The results indicated that shifts in the wage structure favored the ethnic Bulgarians, and the wage structure changes explain the increase in the earnings gap. The returns to schooling favored the ethnic Bulgarians, increasing during the early transition to a greater degree than for the ethnic Turks. Similarly, the returns to the growing commerce, services and transportation industries contributed to the increase in the earnings gap, favoring the Bulgarians. In addition to these shifts, an increase in the overall level of inequality in the labor market punished those at the low-end of the wage distribution, the ethnic Turks, exacerbating the existing earnings differential.

These results imply that both the Bulgarians and the Turks are responding to market signals in the early transition. Although the gains made by the ethnic Turks in schooling, labor market experience, and shifts toward growing industries were outweighed by changes in the wage structure that favored the Bulgarians, these trends point toward an eventual improvement in the Turk's relative position in the labor market.

## APPENDIX

Table A. Variable Definitions

Variable	Definition
lny	The natural log of monthly labor earnings in respondent's primary occupation.
y	Average monthly earnings from employment.
s	The average number of years of schooling obtained.
priminc	Incomplete primary education.
primcomp	Complete primary degree, possibly some secondary, but incomplete.
techcomp	Completed technical secondary degree.
vocomp	Completed vocational secondary degree.
gencomp	Completed general secondary degree.
unicomp	Completed university degree.
ex	Number of years of total labor market experience.
exsq	Years of labor market experience squared.
married	Dummy variable for marital status. Married = 1, not married = 0.
sofia	Dummy variable for living in the capital city, Sofia, 1= yes, 0 = no.
state	Dummy variable for employment in the state sector.
private	Dummy variable for employment in the private sector.
const	Dummy variable for employment in the construction industry.
ag	Dummy variable for employment in the agriculture industry.
comrce	Dummy variable for employment in the commerce industry.
svcs	Dummy variable for employment in the services industry.
pubadmin	Dummy variable for employment in the public administration industry.
trans	Dummy variable for employment in the transportation industry.
communi	Dummy variable for employment in the communications industry.

## REFERENCES

- Bankov, G. 1993. "The Cabinet New Views on the Policy Concerning the Incomes of the Population." Paper presented at the ILO Conference on 'Restructuring Labor Practices in Bulgarian Industry'. May 18-20, Sofia.
- Bankov, G. 1994. "The Incomes Policy for 1994 and the Mechanisms of its Implementation." *Economic Thought*, No. 3: 3-25 (in Bulgarian).
- Beleva, Iskra, Daniela Bobeva, Silvia Dilova, and Asen Mitchkovski. 1993. "Bulgaria: Labour market trends and policies." In *Structural Change in Central and Eastern Europe: Labour Market and Social Policy Implications*. Georg Fischer and Guy Standing (Eds.), Center for Co-Operation with the Economies in Transition: Organisation for Economic Co-operation and Development.
- Beleva, Iskra, Richard Jackman, and Mariela Nenova-Amar. 1995. "Bulgaria." In *Unemployment, Restructuring, and the Labor Market in Eastern Europe and Russia*. Simon Commander and Fabrizio Coricelli (Eds.), Economic Development Institute of the World Bank: Washington, DC.
- Bergmann, Barbara R. 1974. "Occupational segregation, wages and profits when employers discriminate by race or sex." *Eastern Economic Journal*. Vol. 1: 103-110.
- Blau, Francine D. and Lawrence M. Kahn. 1992. "The Gender Earnings Gap: Learning from International Comparisons." *American Economic Review*. Vol. 82 No. 2.
- Blau, Francine D. and Lawrence M. Kahn. 1995. "The Gender Earnings Gap: Some International Evidence." In Richard Freeman and Lawrence Katz (Eds.), *Differences and Changes in Wage Structures*. Chicago: University of Chicago Press.
- Blau, Francine D. and Lawrence M. Kahn. 1996. "Wage Structure and Gender Earnings Differentials: an International Comparison." *Economica*. Vol. 63: S29-S62.
- Blau, Francine D. and Lawrence M. Kahn. 1997. "Swimming Upstream: Trends in the Gender Wage Differential in the 1980s." *Journal of Labor Economics*. Vol. 15 No. 1: 1-42.
- Blau, Francine D. and Lawrence M. Kahn. 1999. Understanding International Differences in the Gender Pay Gap. Paper presented at the annual meetings of the American Economic Association, New York.
- Blinder, Alan. 1973. "Wage Discrimination: Reduced Form and Structural Estimates." *Journal of Human Resources*. Vol. 8 No. 4: 436-455.
- Bird, E.J., J. Schwarze and G. Wagner. 1994. "Wage effects of the move towards free markets in Germany." *Industrial and Labour Relations Review*. Vol. 47: 390-400.
- Bobeva, Daniela. 1997. "Employment Policies and Programmes in Bulgaria." In Martin Godfrey and Peter Richards (Eds.), *Employment policies and programmes in Central and Eastern Europe*. Geneva: International Labour Office.
- Brainerd, Elizabeth. 1998. "Winners and Losers in Russia's Economic Transition." *American Economic Review*. Vol. 88 No. 5: 1094-1115.

- Crampton, Richard J. 1997. *A Concise History of Bulgaria*. London: Cambridge University Press.
- Creed, Gerald W. 1998. *Domesticating Revolution: From Socialist Reform to Ambivalent Transition in a Bulgarian Village*. University Park, Pennsylvania: The Pennsylvania State University Press.
- Eminov, Ali. 1997. *Turkish and other Muslim Minorities in Bulgaria*. New York: Routledge.
- Enev, Tihomier and Kenneth Koford. 1997. "Incomes policies in Bulgaria." In Derek C. Jones and Jeffrey Miller (Eds.), *The Bulgarian Economy: Lessons from Reform During Early Transition*. Aldershot, Brookfield, Singapore, Sydney: Ashgate: 81-98.
- Giddings, L. A. 2000. Does the Shift to Markets Impose Greater Hardship on Women and Minorities? Three Essays on Gender and Ethnicity in Bulgarian Labor Markets. Ph.D. Dissertation, American University.
- Gill, Andrew M. 1994. "Incorporating the Causes of Occupational Differences in Studies of Racial Wage Differentials." *The Journal of Human Resources*. Vol. 29 No. 1: 20-41.
- Glinskaya, Elena and Thomas A. Mroz. 2000. "The gender gap in wages in Russia from 1992 to 1995." *Journal of Population Economics*, Vol. 13: 353-386.
- Gustafsson, Bjorn and Shi Li. 2000. "Economic transformation and the gender earnings gap in urban China." *Journal of Population Economics* Vol. 13: 305-329.
- Hubner, Sabine, Friederike Maier, and Hedwig Rudolph (Eds), 1991. *Women's Employment in Central and Eastern Europe: Status and Prospects*. Manuscript from ILO/OECD Technical Workshop: Evolving Labour Markets, Social Policy and Industrial Relations in Eastern Europe.
- Hunt, Jennifer. 1998. "The Transition in East Germany: When is a Ten Point Fall in the Gender Wage Gap Bad News?" National Bureau of Economic Research, Inc. Working Paper Number 6167.
- Iankova, Elena A. 2000. "Multi-Level Bargaining During Bulgaria's Return to Capitalism." *Industrial and Labor Relations Review*. Vol. 54 No. 1: 115-137.
- ILO-CEET and European Commission. 1994. *The Bulgarian Challenge: Reforming Labor Market and Social Policy*, Country Objective Review, Budapest.
- Institute of Sociology. 1986. *Town and Village Study Survey Data*. Sofia: Bulgarian Academy of Sciences.
- Jackman, Richard and C. Pages. 1993. "Wage Policy and Inflation in Eastern Europe." Paper prepared for a World Bank Conference, 7-8 October.
- Jones, Derek C. and Takao Kato. 1997. "The nature and the determinants of labor market transitions in former communist economies: Evidence from Bulgaria." *Industrial Relations*, Vol.36 No. 2: 229-254.
- Jones, Derek C. and Mieke Meurs. 1991a. "Worker participation and workers' self-management in Bulgaria." *Comparative Economic Studies*, Vol. 33 No. 4: 48-71.

- Jones, Derek C. and Mieke Meurs. 1991b. "On entry in socialist economies: Evidence from Bulgaria." *Soviet Studies*, Vol. 43 No. 2: 311-328.
- Jones, Derek C. 1991. "The Bulgarian Labour Market in Transition." *International Labour Review*, Vol. 130 No. 2: 231-248.
- Jones, Derek C. 1992. "The Transformation of Labor Unions in Eastern Europe: The Case of Bulgaria." *Industrial and Labor Relations Review*. Vol. 45 No. 3: 452-470.
- Juhn, Chinhui, Kevin M. Murphy, and Brooks Pierce. 1991. "Accounting for the Slowdown in Black-White Wage Convergence." in Marvin H. Kosters, (Ed.), *Workers and Their Wages*. Washington DC: American Enterprise Institute Press.
- Karapat, Kemal H. 1990. "Introduction: Bulgarian Way of Nation Building and the Turkish Minority." In Kemal H. Karapat (Ed.), *The Turks of Bulgaria: The History, Culture and Political Fate of a Minority*. Istanbul: The Isis Press.
- Kroncke, Charles and Kenneth Smith. 1999. "The wage effects of ethnicity in Estonia." *Economics of Transition* Vol. 7 No.1: 179-1999.
- Kroupova, Alena. 1990. Women, Employment and Earnings in Central and East European Countries. Tripartite Symposium on Equality of Opportunity and Treatment for Men and Women in Employment in Industrialized Countries. Unpublished manuscript, Prague.
- Krueger, Alan B. and Jorn-Steffen Pischke. 1995. "A Comparative Analysis of East and West German Labor Markets: Before and After Unification." In Richard B. Freeman, and Lawrence F. Katz. (Eds.), *Differences and Changes in Wage Structures*. Chicago and London: University of Chicago Press.
- Kunev, Krasimir. 1992. "Etniceskite predrasudci i etnokulturnata situacija" in Krasimir Kunev, (Ed.), *Etnokulturnata Situacija v Bulgarija*. Sofia.
- Lenkova, Christina. 1997. "Bulgarian Labor Market During Early Period of Transition." In Derek C. Jones and Jeffrey Miller (Eds.), *The Bulgarian Economy: Lessons from Reform During Early Transition*. Aldershot, Brookfield, Singapore, Sydney: Ashgate: 301-327.
- Liu, Pak-Wai, Xin Meng and Junsen Zhang. 2000. "Sectoral gender wage differentials and discrimination in the transitional Chinese economy." *Journal of Population Economics*. Vol. 13: 331-352.
- Mason, Bob. 1995. "Industrial Relations in an Unstable Environment: The Case of Central and Eastern Europe." *European Journal of Industrial Relations*. Vol. 1 No. 3: 341-367.
- Meurs, Mieke. 1998. "Imagined and Imagining Equality in East Central Europe: Gender and ethnic differences in the economic transformation of Bulgaria." In John Pickles and Adrian Smith (Eds.), *Theorizing Transition: The Political Economy of Post-Communist Transformations*. London and New York: Routledge: 330-372.
- Meurs, Mieke and Lisa Giddings. 1999. When the Margin Becomes the Core: Occupational Stratification and the Impact of the Economic Transition in Bulgaria on Women and Ethnic

Minorities. Paper presented at the annual meetings of the International Association for Feminist Economics, Ottawa, Canada.

Mincer, Jacob. 1974. *Schooling, Experience and Earnings*. Boston: National Bureau for Economic Research.

Newell, Andrew and Barry Reilly. 1996. "The Gender Wage Gap in Russia: Some Empirical Evidence." *Labor Economics*. Vol. 3: 37-356.

Oaxaca, Ronald. 1973. "Male-Female Wage Differences in Urban Labor Markets." *International Economic Review*. Vol. 14 No. 3: 693-709.

Ogloblin, Constantin G. 1999. "The Gender Earnings Differential in the Russian Transition Economy." *Industrial and Labor Relations Review*. Vol. 52 No.4: 602-627.

Orazem, Peter F. and Milan Vodopivec. 2000. "Male-female differences in labor market outcomes during the early transition to market: The cases of Estonia and Slovenia." *Journal of Population Economics* Vol. 13: 283-303.

Orazem, P. F. and Vodopivec, M. 1995. "Winners and Losers in Transition: Returns to Education, Experience and Gender in Slovenia." *World Bank Economic Review*. Vol. 9: 201-230.

Petkov, Krastyo and John Thirkell. 1991. *Labor Relations in Eastern Europe: Organizational Design and Dynamics*. London and New York: Routledge.

Pishev, Ognyan. 1992. "Bulgaria: Political Economy." Paper for the Hoover Institution Conference on Economy, Society, and Democracy, 7-9 May, Washington, DC.

Pohl, Gerhard, Robert E. Anderson, Stijn Claessens and Simeon Djankov. 1997. "Privatization and Restructuring in Central and Eastern Europe: Evidence and Policy Options." World Bank Technical Paper No. 368. Washington, DC: The World Bank.

Poulton, Hugh. 1989. "Minorities in the Balkans." Minority Rights Group. Report No. 82.

Rutkowski, Jan J. 1996. "Labor Markets and Poverty in Bulgaria: A background paper prepared for the Bulgaria Poverty Assessment Study of the World Bank." Unpublished manuscript, Washington, DC: The World Bank.

Schienstock, Gerd, and Franz Traxler. 1994. "Economic Transformation and Institutional Change: A Cross-National Study in the Conversion of Union Structures and Politics in Eastern Europe." *International Journal of Comparative Labour Law and Industrial Relations*, (Winter): 313-338.

Slomp, Hans, Jacques van Hoof, and Hans Moerel. 1996. "The Transformation of Industrial Relations in Some Central and Eastern European Countries." In Joris Van Ruysseveldt and Jelle Visser, eds. *Industrial Relations in Europe: Traditions and Transitions*. London: Sage: 337-357.

Szelenyi, Ivan, and Donald J. Treiman. 1994. "Social Stratification and Mobility in Eastern Europe After 1989: General Population Survey" (computer file). Los Angeles, CA.: University of California, Los Angeles, Department of Sociology, Eastern European Group (producer); Los

Angeles, CA.: University of California, Los Angeles, Institute for Social Science Research, Social Science Data Archive (distributor).

Thirkell, John and Elena Atanassova Tseneva. 1992. "Bulgarian labour relations in transition: Tripartism and collective bargaining." *International Labour Review*. Vol. 131 No. 3: 355-366.

Thirkell, John, Richard Scase, and Sarah Vickerstaff. Eds. 1995. *Labour Relations and Political Change in Eastern Europe*. London: UCL Press.

Tzanov, Vassil and Daniel Vaughan-Whitehead. 1997. "Macroeconomic effects of restrictive wage policy in Bulgaria: empirical evidence for 1991-95." In Derek C. Jones and Jeffrey Miller (Eds.). *The Bulgarian Economy: Lessons from Reform during Early Transition*. Ashgate: Aldershot, Brookfield, Singapore and Sydney: 99-125.

United Nations Development Program (UNDP). 1998. *National Human Development Report: Bulgaria 1998: The State of Transition and Transition of the State*. Sofia.

World Bank. 1996. *From Plan To Market: World Development Report 1996*. Washington, DC: World Bank.