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EFFECTS OF TRANSITIONAL POLICIES ON LABOR MARKET OUTCOMES FIFTEEN YEARS AFTER TRANSITION: THE CASE OF UKRAINE AND LITHUANIA

BY

OLGA PAVLOVA

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree
of
Doctor of Philosophy
in the
Andrew Young School of Policy Studies
of
Georgia State University

GEORGIA STATE UNIVERSITY
2006

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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics in the Andrew Young School of Policy Studies of Georgia State University.

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ABSTRACT

EFFECTS OF TRANSITIONAL POLICIES ON LABOR MARKET OUTCOMES FIFTEEN YEARS AFTER TRANSITION: THE CASE OF UKRAINE AND LITHUANIA

By

OLGA PAVLOVA

December 2006

Committee Chair: Dr. Julie L. Hotchkiss

Major Department: Economics

This dissertation explores how different labor market policies implemented following the transition to market system in Eastern Europe affected labor market outcomes. As the result of different policies implemented countries of Eastern Europe that were very similar at the beginning of the transition achieved different economic outcomes. We focus on Lithuania and Ukraine that represent two groups of countries with respect to the broad approach to economic transition. Our analysis explores change in gender wage gap in the two countries as well as evolution in returns to human capital.

We compare labor market institutions and composition of the labor force for these two countries. Labor market of the Soviet Union serves as a reference point for this comparison. The data from Household Budget Surveys is utilized for this analysis.

Returns to education levels are examined in both countries. We find no evidence of increase in returns to higher education in Ukraine following the decentralization of the wage setting system. However, higher educated workers in Lithuania were able to benefit from the transition.

The second part of this dissertation focuses on evolution of the gender wage gap. We decompose gender wage gap using Oaxaca decomposition as well as Juhn, Murphy, and Pierce decomposition. We consistently find that it is the "unexplained" component that is single handedly responsible for the gender wage differential in both countries.

CHAPTER I

INTRODUCTION

As a result of the break up of the Soviet Union and transition to a market economy, Eastern European countries and former Soviet Republics experienced significant political, economic, and social changes. 15 years into transition, these countries are still a subject of extensive research. Several broad paths of economic transition have been identified. While the Eastern European and Baltic states constitute the more successful group of reforming countries, Southern European and former Soviet Republics have proven to be less successful. A significant portion of research work is on countries of Eastern Europe and Russia, which in part is attributed to greater availability of data. Much less is known about other transitional economies especially the former non-Russian republics of the Soviet Union. Moreover, while much has been learned so far about the macroeconomic aspects of the transition, less is known about the social and labor market aspects.

To fill the gap, this dissertation will concentrate on the two former Soviet Republics of Ukraine and Lithuania. The purpose of this work is to study how different institutional, social, and policy factors, affect labor markets outcomes. These factors also include wage-setting mechanisms in these two countries. Specifically, changes in returns to human capital and gender wage differentials will be examined and compared for the two countries. As such, changes in the overall wage structures resulting from different institutional and economic arrangements and its effect on gender wage differentials will be investigated.

Motivation

15 years ago, the labor markets of Ukraine and Lithuania were characterized by the same institutional arrangements since the two countries were a part of the Soviet Union. With independence and different transition paths, the labor market institutions of Ukraine and Lithuania have become very dissimilar. Moreover, Lithuania as one the new European Union (EU) members adopted a set of reforms generally followed by Central European countries and Baltic States. Ukraine, on the other hand, followed a different transition path more consistent with the general path of former Soviet Union (FSU) republics[1].

The market reforms, including labor market and social policies, in different FSU countries and Central and Eastern European countries varied substantially. They were administered at different speeds, with different degrees of consistency, and focused on different issues. As such, macroeconomic stabilization was achieved at different times.

As a result of economic and political reforms, labor markets of transitional countries experienced major restructuring. The main changes that took place include the emergence and subsequent growth of the private sector, high unemployment previously unknown, and declining labor force participation rates, especially among women. In the Central European Countries and Baltic States, growth of the private sector as well as small private business was relatively fast. However, private sector output accounts for only less than half of the GDP in most FSU countries.

[1] Although Lithuania was a republic of the FSU, it was part of the Soviet Union only for about 40 years. Its path of transition is also more consistent with that of Central and Eastern European countries.

In the more successful group of countries, unemployment is higher, especially among the young and less educated. On the other hand, in the less successful group of countries, unemployment is lower. In the later group of countries, the older and more educated are disproportionately represented among the unemployed. There is increasing demand for workers of "new" professions such as finance, accounting, and management while the need for specialists trained to work in the Soviet-type, now outdated establishments, decreased significantly. Consequently, certain skills and experience obtained during the old times became obsolete.

In addition, legal and institutional frameworks changed substantially. While Eastern European and Baltic countries implemented policies to ensure that wages in lower paid occupations do not decrease much below wages in higher paid occupations, FSU countries instituted policies to promote free and unregulated competition in the labor market. At the same time, while most of the FSU countries kept extensive social benefits (often to be paid by the employer), other transitional economies adopted social benefit policies which cover smaller groups of recipients but provide higher levels of benefits. The experiences of the two countries–Ukraine and Lithuania–which represented two different approaches to economic and labor market transition, can be used to study how different courses of policies affect labor market outcomes of the populations in those countries. In other words, this could serve as a good natural experiment in the sense that the two countries started out at the same point as part of the FSU. As mentioned above, the labor market outcomes examined in this dissertation are returns to education and gender wage differentials.

Comparison of these labor market outcomes resulting from different institutional policies such as wage setting mechanisms, minimum wage policies, social benefits, and other labor market regulations will provide an opportunity to see how different approaches to the regulation of economic and labor market institutions affect the welfare of different population groups. Since a number of these policies, such as the allowed length of and compensation during maternity leave are not gender neutral and are likely to affect males and females differently; gender aspects of labor market outcomes are given special attention.

Accordingly, the first part of this dissertation focuses on studying how different economic policies relative to the common point of departure of artificially compressed wages affected the returns to different levels of education in the two countries. In other words, we seek to explore the following questions: Do higher educated workers benefit disproportionately more from the transition since wages are no longer set according to specific wage grids that are uniform across the economy? Are the benefits relatively larger for Lithuania, which followed a more structured transitional approach? With the emergence of the private sector, where wage setting is different from that in the public sector, are there differences in returns to education across sectors? Since the private sector is more developed in Lithuania, do these results differ across the two countries? Further, is there a difference in returns to education for those who acquired their human capital under the socialist system and those who have "new" education that is more consistent with the demands of the market economy? How do these results differ between the two countries given that the Lithuanian economy seems to be more consistent with Western developed economies?

While there is an extensive body of research that focuses on changes in returns to human capital in Central and Eastern European countries in transition, not much is known about Lithuania and specifically Ukraine. It has been demonstrated numerous times in the existing research on the subject that when the wage structure is no longer compressed by state policy, more educated workers experience disproportionate increases in their relative wages. This trend is expected in Lithuania where economic and labor market institutions are similar to Central European countries. However, a different outcome is expected in Ukraine. As will be shown in detail later, the demand for and supply of human capital is different in Ukraine. Ukraine is also characterized by different economic and labor market institutions relative to Central European countries and Lithuania in particular.

Our analysis indicates that the returns to education in Ukraine are well below that in developed market economies. This is especially true for higher education. Further, contrary to what one would expect, returns to education declined over time. According to the Ukrainian Ministry of Foreign Affairs, about five million Ukrainian workers are employed abroad where the wages are higher. Therefore, this wage setting system, coupled with other institutional arrangements, may result into further brain drain. Moreover, relatively low returns to education may result into decreased demand for education by younger Ukrainians leading to the deterioration of the human capital stock. On the other hand, returns to education are relatively higher for higher levels of education in Lithuania. This is consistent with most Central European and other Baltic states.

In addition, contrary to expectations, we find that in both countries wages in the public sector are higher relative to the private sector. Moreover, returns to education in the private sector are also relatively lower in both countries.

The second part of the dissertation focuses on gender wage differentials. Did the different labor market policies adopted in the two countries result in different economic outcomes for females relative to males? In other words, are the labor market policies adopted by the two countries gender neutral or gender specific?

The importance of understanding the dynamics of female/male wage differentials lies in the fact that it affects the position of females in society. Low gender wage ratios increase the economic dependence of women on men as well as help push single mothers into poverty, which has an adverse impact on children. These effects are likely exacerbated in Ukraine and Lithuania where divorce rates are higher than even in other transitional economies. The divorce rate in Ukraine is almost 3.4 per thousand people while the average for all Eastern European countries[2] is 2.5.[3] In Lithuania, 80 percent of divorced couples have children[4] who, in Eastern Europe, traditionally stay with the mothers. The number of children born to mothers who never marry and therefore do not receive alimony payments also increased tremendously. In Lithuania 4 to 6 percent of children were born out of wedlock during the Soviet times. This number increased to 7 percent in 1990 and to 22.6 percent in 2000.[5] In Ukraine this number increased from 11.2 in 1990 to 17.3 percent in 2000.[6]

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[2] Currently, all of the Eastern European countries are in transition to a market economy. Any statistic for Eastern European countries is therefore equivalent to statistics for transitional economies.
[3] Since population in Eastern European countries is generally old, if divorce rates were computed using the percentage of marriages ending up in divorce then the rates would be much higher.
[4](UNDP 2000)
[5] (UNDP 2000)
[6] (State Statistics Committee of Ukraine 2003)

Female/male wage differentials also affect the economic well-being of female retirees. Pensions consist of basic and supplementary parts where the latter is based on the person's wages before retirement. At the same time, females account for more than two-thirds of the population over age of 65 in both countries.[7] As a result, a big segment of retirees is driven into poverty.

This dissertation will contribute to the existing literature by helping to understand how different policy approaches to economic transition affect economic outcomes – returns to education and gender wage differentials-in Ukraine and Lithuania. Our findings can also be generalized to compare the two common approaches to transformation to a market economy adopted by Central European and Baltic countries vis-à-vis FSU countries.

Much less is known about social and labor market aspects of economic transition of FSU countries. Our detailed investigation of returns to human capital and gender wage differentials in Ukraine attempts to expand this less developed part of transitional literature. Moreover, while some findings in this dissertation for Ukraine are different from other studies that focus on similar research questions, they are not counterintuitive. On the contrary, once the composition of and policies regulating the labor market are well studied and understood, the results are not surprising and shed more light on the path of economic transition followed by the FSU countries.

The remainder of this dissertation is structured as follows. The remaining part of this Chapter describes institutional details of labor markets of the former Soviet Union, which describes the common starting point for economic transition in Ukraine and

[7] (United Nations Economic Commission for Europe 2003)

Lithuania. This is followed by a brief overview of the two countries as case studies. Chapters II and III focus on the institutional and policy evolution of labor markets of the two countries in the post-Soviet era. Chapter IV provides an overview of the micro level data used to answer the research questions posed in this dissertation. Changes in returns to human capital resulting from the institutional arrangements and labor market polices described in Chapters II and III are investigated in detail in Chapter V. Chapter VI studies the effect of these policies on gender wage differentials in Ukraine and Lithuania. Finally, Chapter VII provides a summary of results and concludes the dissertation.

Labor Policies and Institutions of the Soviet Union

Labor market institutions of the Former Soviet Union were quite different from those in the Western countries. Under the Soviet economic system, priority was given to heavy industries and the defense sector. As such, other sectors of the economy were allocated what remained of the national resources after allocations to the above mentioned sectors. The relative importance of different economic sectors was determined by central planners and not by the market. Employment in terms of location and occupation were also determined by central planners.[8]

Unemployment was at the minimum because being unemployed was a criminal offense during some periods of the Soviet history. Even during times when being unemployed was not a criminal offense, it was considered socially unacceptable. Labor mobility was also very limited due to required housing registration and shortages. The

[8] The exact number of employees in each enterprise and each grade and job cell within the enterprise was determined by the planners. See Brainerd (1998) for details on Soviet labor policies.

one-enterprise town system also restricted labor mobility under the centrally planned economy.

Female labor force participation (LFP) was very high. Initially it was forced to support the growing industrialization of the Soviet Union and to promote female emancipation. To encourage female LFP, there were free kindergartens, day care centers, and summer resorts for children (Brainerd 2000). Katz (2002), however, points out that the female working life was 5 years shorter than that of men, women worked shorter hours on average, and women on maternity leave, which was extended to 18 months in 1982, were considered to be "at work."

Formally, the Soviet constitution ensured equal rights for men and women in all spheres of the labor market. "The equal pay for equal work" provision was introduced in Soviet Labor Code in 1922 (Politbureau SSSR 1922). This provision, together with specific wage grids, prevented open discrimination in the labor market. However, discriminatory promotional practices were present and accounted for a part of the gender wage differential (Jurajda 2001; Newell and Reilly 1996). Instead of ensuring real equal opportunities, the main emphasis was placed on women's social protection through extensive benefits and assistance tied to child birth and child care, labor benefits and special measures to support women with children, and restricting usage of female labor for heavy and harmful work (Zhurzhenko 1998). According to Katz (2002), Soviet women spent more time performing paid work than women in developed Western economies. Further, Katz (2002) points out that they spent relatively more time on unpaid household work. Among those employed in industry, women spent twenty-nine hours a week on average on housework while men spent only eleven hours. This

disproportionate amount of time spent on housework, together with extensive benefits, had an adverse affect on women's careers (Katz 2002). Consequently, employers viewed female workers as being less devoted to the enterprise. That view led to lower earnings and much fewer promotions among females.

There was a difference in male and female employment by economic sector. Women constituted 80 percent of the health sector, 75 percent of the education sector, and over 70 percent in light industry. Men dominated heavy industry, mining, and energy sectors of the economy (Katz 2002). Occupational segregation existed but predominantly female occupations were different from those in major industrialized countries. A striking difference from Western industrialized countries is that women in the FSU region dominated the medical professions and were well represented in technical professions such as engineering. Still, according to some researchers, occupational segregation was low compared to major industrialized capitalist nations (Brainerd 2000; Newell and Reilly 1996). Nevertheless, a number of researchers find that occupational segregation accounted for a significant part of the gender wage differential (Ogloblin 1999). Vertical segmentation, implying that women occupy lower positions within the same economic sectors, was present. Within organizations, relatively few women were promoted to positions of authority such as managers or foremen (Katz 2002).

Wages were set by central planners as a multiple of the base wage (the wage of the lowest grade occupation with the lowest education and lowest tenure). There was not much variation between different occupational groups. Top managers usually earned two times as much as the average manual worker. This ratio is 20:1 in the United States (Brainerd 1998). Workers were also paid bonuses from plan fulfillment. There were

very narrow wage differentials between occupations with wages being higher for manual workers who generally have a primary education. Returns to education were generally low for both men and women, possibly because of the high overall level of education and oversupply of human capital (Newell and Reilly 1996). At the same time, a significant part of work compensation was in the form of non-wage benefits which did not significantly vary with pay. Enterprises provided workers with free vacations at resorts, day care and other child services, health care services, and at times even distributed free goods (Brainerd 1998).

Although women were disproportionately represented in the lower paid occupations, there was a relatively high female/male wage ratio since there was not much variation in wages and the minimum wage was kept relatively high by international standards (Brainerd 1998). The female/male wage ratio is believed to have been 0.7 on average (Newell and Reilly 1996). As Katz (2002) and Filler and Hanousek (2002) point out, we can only "believe" since official statistics on the gender wage gap were published only once in the history of the USSR, in 1989, and then only in the form of tables of distribution in wage brackets of men and women.

The estimated gender wage ratio of 0.7 is likely to be an underestimate since wages were reported monthly in the Soviet Union, and possibly women worked fewer hours throughout the year due to their domestic responsibilities. In addition, the Soviet Statistical Department included plan fulfillment bonuses in their reported monthly wages, and these bonuses most often went to men (Robinson 1998). Finally, as was mentioned previously, non-pecuniary benefits accounted for a large part of the compensation for work. As women were entitled to more extensive benefits than men, the female/male

wage ratio of monetary compensation should be expected to be smaller than the overall compensation ratio.

Ukraine and Lithuania as Case Studies

Lithuania and Ukraine are two former republics of the Soviet Union, and are the two countries that will be analyzed in this dissertation. As mentioned earlier, the countries represent two different broad paths of economic transition.[9]

Lithuania is a small country of about four million people located on the Baltic Sea. It was annexed for the last time by the Soviet Union in 1945 following the end of World War II. Ukraine, on the other hand, is a larger country of about fifty million people bordering Russia, Belarus, Poland, Romania, and Bulgaria. The eastern part of Ukraine became a member of the USSR in 1918. The western part of Ukraine was annexed from Poland in 1945. Lithuania became independent in 1990 and Ukraine in 1991 when their transformation to a free market economy began.

Ukraine and Lithuania had very similar labor markets 15 years ago. Both countries had strong industrial and agricultural sectors, homogenous populations with similar labor market characteristics, and the same labor market policies since both were Soviet republics at that time. However, since the beginning of the transition, Ukraine and Lithuania have taken very different paths with respect to political and economic restructuring, including labor market reforms. There are two general paths of transition identified in the literature. Central European and Baltic countries constitute one group

[9] See Pavlova and Rohozynsky (2005) for a discussion on labor markets of different transitional countries as well as different transition paths.

while countries of the FSU constitute another. Lithuania belongs to the first group of countries, which are now members of the EU and are regarded as more successful reformers. The initial decline in GDP levels in these countries was accompanied by large layoff of workers while those who remained employed were able to maintain relatively decent income. At the same time, the unemployed were supported by a relatively generous social safety net. In FSU countries, including Ukraine, despite massive drops in GDP, unemployment remained at relatively low levels. The adjustment took the form of lower real wages (see Table 1). Labor relations were governed by the old Soviet norms restricting the ability of enterprises to fire redundant employees. Consequently, it was cheaper for employers to cut hours and/or wages leading to the phenomenon of artificially low unemployment.

Table 1. Employment and GDP dynamics in Lithuania and Ukraine, Average Growth

	Ukraine		**Lithuania**	
	GDP	**Employment**	**GDP**	**Employment**
1994	-23.0	-3.8	-9.8	-5.8
1995	-12.2	3.0	3.3	-1.9
1996	-10.0	-2.1	4.7	-0.7
1997	-3.0	-2.7	7.0	-5.7
1998	-1.9	-1.1	7.3	0.8
1999	-0.2	-1.6	-1.8	1.0
2000	5.9	-3.3	4.0	n/a
2001	9.2	-0.9	6.5	-2.1
2002	4.8	n/a	6.7	-0.3
2003	5.5	n/a	6.0	n/a

Source: (EBRD 2003)

In addition, high payroll and social security taxes, which employers had to pay in Ukraine and other FSU countries, made it unprofitable for the enterprises to pay higher wages. High wages bills and the inability to fire excessive labor force from stagnating enterprises led to large wage arrears in those countries[10] as well as low labor force mobility that slowed down enterprise restructuring. This phenomenon was especially pronounced in such sectors of the economy as metallurgy, mining, and machine building (EBRD 2003). The concentration of such enterprises is especially high in Ukraine. As a result, enterprise restructuring, creation of new workplaces, and re-education of the labor force was taking place at a very slow pace compare to central European and Baltic countries. Without vibrant new enterprises, and with the closing of some enterprises, labor moved to low-productivity sectors of the economy.

While Central European and Baltic countries have undergone social reforms restricting qualification for benefits while ensuring decent benefit amount, the Ukrainian labor code still closely resembles the old Soviet labor code. Persons still qualify for unemployment and other welfare benefits on the basis of being part of a certain demographic group,[11] and the size of the benefits is still unreasonably small. In addition, the Ukrainian government is running arrears on payment of social benefits making them virtually non-existent. Women are still entitled to generous maternity leaves of 3 years. Further, there are limitations on the types of work that can be performed by women, especially expectant mothers.

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[10] Ukraine along with Russia, Kazakhstan, and Croatia is among countries with the highest level of wage arrears while this phenomenon is virtually non-existent in Lithuania, Latvia, Estonia, Hungary, and Czech Republic. It is discussed in Earle and Sabirianova (2002) that wage arrears run by firms are a signal to the government of the inability of these firms to pay high payroll taxes.

[11] For example under current law every unmarried mother of a child under six receives some help from the government regardless of her income.

Countries that are more successful with the reforms, and are further along the transition process, experienced a greater shift in labor demand towards more skill and education. These more successful countries, including Lithuania, were able to attract more Foreign Direct Investment (FDI) leading to relatively higher demand for skill. In contrast, labor markets of the FSU countries are characterized by relatively low demand for skilled labor. Export revenues in Ukraine and other FSU countries rely almost exclusively on natural resources despite low labor costs. In addition, the rate of technical and organizational enterprise restructuring is relatively low (EBRD 2003). This may have limited the demand for skilled labor.

As a result of different policies, labor markets in Ukraine and Lithuania are now diverse and, of course, both differ from the Soviet labor market. The following two chapters of the dissertation describe labor markets of the two countries in more detail. The main aspects of the two labor markets and how they differ from the Soviet labor market are summarized in the Appendix A.

CHAPTER II

THE LABOR MARKET IN UKRAINE IN THE POST-SOVIET ERA

As mentioned in the introductory Chapter of the dissertation, our focus is to explore the effect of contrasting labor market policies on returns to human capital and gender wage differentials. The analysis looks at two case studies–Ukraine and Lithuania. To that end, this Chapter will provide a brief overview of the Ukrainian labor market following the economic transition. This Chapter will describe the key elements of the composition of the labor force as well as selected key labor market policies.

Composition of the Labor Force

The Ukrainian labor force is declining due to aging and to a general population decrease.[12] Women comprise about half of the labor force. According to the official statistics, LFP rates are relatively high (between 88 and 95 percent) with no apparent difference between genders (Table 2). However, these figures can be misleading because some persons who are officially employed are working very few hours or on administrative leaves. In addition, the aggregate Figure does not reveal the differences in LFP rates of females of different age groups.

[12] Population decrease in Ukraine is caused by high levels of emigration, low birth rates, and high death rates.

Table 2. Ukraine: Labor Force, Employed, and Unemployed by Gender

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Labor Force									
Total (thousands of persons)	25,562	26,111	26,085	25,935	22,747	23,127	22,755	22701.7	22,614
Females (thousands of persons)	12,763	12,921	13,237	13,179	11,013	11,230	11,076	11088.8	11,053
Males (thousands of persons)	12,798	13,189	12,848	12,755	11,733	11,896	11,678	11612.9	11,562
Females (% of the total labor force)	50%	49%	51%	51%	48%	49%	49%	49%	49%
Males (% of the total labor force)	50%	51%	49%	49%	52%	51%	51%	51%	51%
Employed									
Total (thousands of persons)	24,125	24,114	23,755	22,998	20,048	20,419	20,238	20,400	20,555
Females (thousands of persons)	12,132	11,981	12,124	11,757	9,750	9,915	9,863	9,984	10,084
Males (thousands of persons)	11,992	12,132	11,631	11,240	10,298	10,504	10,374	10,416	10,470
Total (% of the total labor force)	94%	92%	91%	89%	88%	88%	89%	90%	91%
Females (% of the female labor force)	95%	93%	92%	89%	89%	88%	89%	90%	91%
Males (%of the male labor force)	94%	92%	91%	88%	88%	88%	89%	90%	91%
Unemployed (based on the ILO definition)									
Total (thousands of persons)	1,437	1,998	2,330	2937.1	2698.8	2707.6	2516.9	2301	2059.5
Females (thousands of persons)	631	940	1,113	1422	1263.3	1315.4	1213.1	1104.6	968.4
Males (thousands of persons)	806	1,057	1,216	1515.1	1435.5	1392.2	1303.8	1196.4	1091.1
Total (% of the total labor force)	6%	8%	9%	11%	12%	12%	11%	10%	9%
Females (% of the female labor force)	5%	7%	8%	11%	11%	12%	11%	10%	9%
Males (%of the male labor force)	6%	8%	9%	12%	12%	12%	11%	10%	9%

Source: (State Statistics Committee of Ukraine 2003)

The Ukrainian labor force is highly educated. The results of the national census conducted in 2001 indicate that 29 percent of the population has obtained post-secondary education.[13] However, the post-Soviet era in Ukraine has seen changes in the demand for different types of post secondary-education. For example, there has been a relative increase in the demand for university education compared to vocational training. The number of university students has doubled in the last decade, while it is not ascertained that all children go to primary school. Most of the increase in university students has been absorbed by small private colleges that emerged after the collapse of the Soviet Union. Anecdotal evidence suggests rampant corruption in these colleges. The admission criteria or standards are unclear and questionable. As such, it is reasonable to expect the quality of higher education to have gone down compared to the Soviet era.

A disproportionately large number of people are employed in industry[14] and agriculture reflecting the fact that Ukraine was the industrial and agricultural base of the Soviet Union. This composition of the economy also reflects the fact that the economic structure of Ukraine still retains features of the FSU.

The Ukrainian statistics ministry does not report the number of males and females in different occupations. The closest statistic available is a number of males and females by industry (Table 3). The Duncan Index calculated using these data is 0.31 but this number can be deceiving.[15] There is gender segregation within industries which is not captured by the broad classification used in the Table. For example, in the industrial

[13] Ukrainian Ministry of Statistics does not report population by educational level rather by number of pupils enrolled in different educational institutions. The Figure from the Census above includes also those who have incomplete postsecondary education.
[14] In this context industry is a term used by the Ukrainian Ministry of Statistics to refer to broad production of goods including heavy industrial production as well as manufacturing.
[15] See Table 3 for the computation of Duncan Index.

sector males dominate priority sectors such as fuel and ferrous metals. Females dominate in light industries. Also, in science and scientific services the majority of scientists are men while majority of workers who perform services are women (Zhurzhenko 1998).

Table 3. Ukraine: Employed Population by Industry and Sex in 2001 (percent)

	Males	**Females**
	100	**100**
Industry	29.9	22.1
Agriculture	22.4	11.8
Forestry	1.4	0.3
Fishing	0.4	0.1
Transportation	8.6	4.0
Communications	1.5	2.6
Construction	6.9	2.3
Trade	3.2	4.6
Restaurant Services	0.3	0.8
Technical Services	0.5	0.3
Small Scale Food Processing	0.5	0.3
Information and Computing Services	0.1	0.1
Geology, Exploring of Minerals	0.3	0.2
Not-Industrial kinds of household services of population	0.5	0.5
Housing Services	1.2	1.6
Utilities	3.9	2.4
Domestic Services	0.2	0.5
Health and Social Services	3.4	16.3
Education	6.6	18.5
Culture	1.0	2.3
Art	0.3	0.3
Science and Scientific Administration	1.6	1.4
Finance, credit, and Insurance	0.8	1.6
Government	4.7	5.4
Duncan Index: 1/2sum|Fi/F-Mi/M|	**0.31**	

Source: (State Statistics Committee of Ukraine 2002)

The number of males and females by occupation is available from the International Labor Organization (ILO) statistics (Table 4). Despite the fact that the nine broadest occupational definitions are used, the Duncan Indexes calculated are almost 40 percent.

Table 4. Ukraine: Employed Population by Occupation and Sex

	1999		**2000**		**2001**	
	men	**women**	**men**	**women**	**men**	**women**
Legislators and Senior Officials	62%	38%	64%	36%	63%	37%
Professionals	34%	66%	35%	65%	36%	64%
Technicians, Associate Professionals	39%	61%	39%	61%	37%	63%
Clerks	13%	87%	11%	89%	11%	89%
Service, Shop, Market Sales Workers	29%	71%	29%	71%	30%	70%
Skilled Agriculture, Fishery Workers	37%	63%	38%	62%	39%	61%
Craft and Related Trade Workers	82%	18%	83%	17%	84%	16%
Plant Operators, Assemblers	80%	20%	80%	20%	78%	22%
Elementary Occupations	48%	52%	47%	53%	47%	53%
Duncan Index-1/2*sum|Fi/F-Mi-M|	**37%**		**38%**		**37%**	

Source: ILO Statistics

The private sector in Ukraine grew slower relative to other economies in transition. By the middle of the 1990s the private sector accounted for about half of the GDP while this Figure was about 70 percent for more advanced transition economies including Lithuania. Privatization began at a later stage of transformation and focused primarily on large industrial enterprises (EBRD 2003). Moreover, as a result of the privatization process, monopolization of the economy by nomenclatura[16] took place (Zhurzhenko 1998). The literature distinguishes between de facto and de novo firms with the former being previously existing and privatized firms and the later are newly created

[16] The term nomenclatura was used for the high level Communist Party members who were very powerful and well connected during the Soviet times. Currently, economic power is disproportionately concentrated in the hands of the old party leaders and the individuals connected to them.

(Konings and Walsh 1999). In Ukraine, the creation of de novo firms has been relatively slow.

Ukraine has one of the largest informal sectors among transitional economies. Its size is estimated to be equal to half of the size of the official economy by Schneider and Burger (2005) and equal to the full size of the official economy by Kaufman and Kaliberda (1996). Moreover, according to Schneider and Burger (2005), 41 percent of the labor force was employed in the informal sector in 1999.

The presence of a large informal sector implies that the official labor market statistics could be distorted. The officially unemployed, underemployed or economically inactive could be actually employed in the informal sector constituting unofficial or informal employment. In part, the unofficial employment is a reaction of enterprises to the restrictions imposed on them by government regarding firing redundant employees, employer contribution to social benefit taxes, etc. The unofficially employed have no legal protection. They can be hired or fired at any time, without any contract, severance pay or social benefits.

The official unemployment rates in Ukraine are about 10 percent with no significant differences between males and females (Table 2). However, these statistics are only an approximation of the real unemployment rate. Some of those who declare themselves unemployed are actually employed in the informal sector. On the other hand, the economy is characterized by hidden unemployment. Hidden unemployed include those individuals who work fewer weeks or hours than desired or work for no compensation. In October 1997, an estimated 12 percent of workers in total national

employment worked part time. The majority did so not because of the desire to work shorter hours but due to the initiative by enterprise management (ILO 1997).

Another unemployment phenomenon specific for Ukraine is that workers with higher education are over represented among the unemployed. Possible reasons for this unemployment composition include low demand for skills, oversupply of highly educated persons, and skill mismatches. Schools prepare workers with the skills better suited for the old economy and which are obsolete in the new market. The most vulnerable group of people are the older highly educated women, who cannot find new jobs because they are considered overqualified, and not easily trainable (ILO 1997).

Labor Market Policies

Wages as well as bonuses and indexations are set by collective bargaining agreements. The government, in a negotiation with trade unions[17] in which all unions are invited to participate, establishes wage coefficients[18] in each industrial sector in the form of a General Collective Bargaining Agreement. This agreement is followed by regional and enterprise level agreements (Bureau of Democracy 2002). These agreements set wage coefficients for different categories of workers and branches of industry on the basis of the minimum wage, which therefore plays the major role in the entire wage structure of the economy. This wage setting mechanism has two aims: to prevent wage inflation and to decrease wage differentials between different industries and sectors of the economy.

[17] Trade Unions is the term used for labor unions
[18] Wage coefficients refer to the multiples of minimum wage used to determine the range of wages in different sectors of the economy.

In reality, sometimes an informal agreement takes place between an employer and an employee regarding wages, hours of work, and the part of wage to be paid "in envelopes". Wages in the informal sector are set by an informal agreement between an employer and employee and all wages are paid under the Table.

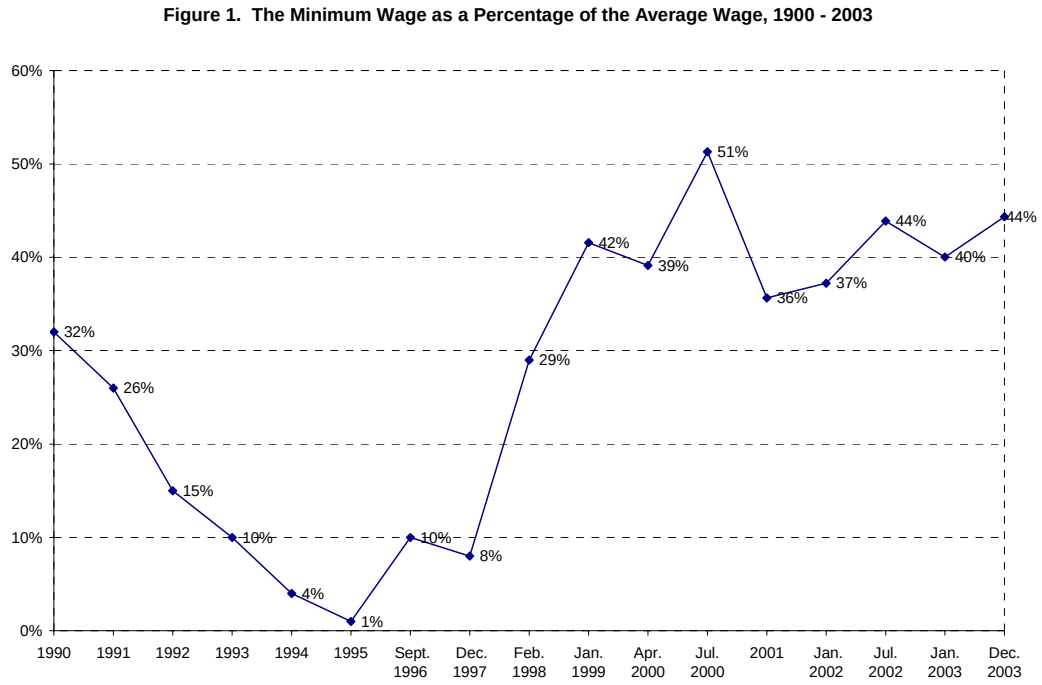
The minimum wage is decided by the Cabinet of Ministers. There is still no input from unions and employers in deciding how high the minimum wage should be. Therefore, the minimum wage has no relation to the subsistence minimum, no indexation mechanism, and no negotiated level (ILO 1999). By the mid-nineties the minimum wage fell to a fraction of the average wage. The decline in the minimum wage influenced not only workers at the bottom of the wage tariff system but also all other categories of workers whose wages are determined on the basis of the minimum wage. Because social benefits are also linked to the minimum wage, its decline in real terms heavily eroded the real value of unemployment benefits and other social benefits. However, starting in 1996, the minimum wage began to recover, reaching almost 50 percent of the average wage by 2000 and staying at about 40 percent of the average wage after that (Figure 1).

Different unemployment policies were instituted during the transitional period. The majority of these policies are passive, including early retirement and unemployment benefits to the unemployed. Being unemployed, and within eighteen months of the official retirement age, an individual is placed for an early retirement. At the same time, a very small proportion of the population is covered by active policies such as labor market training and professional orientation (ILO 1999).

In accordance with employment protection policy, an employer has to pay severance pay for half a year in case of employment termination. Under these

circumstances, the majority of Ukrainian employers find it rational to keep an excessive workforce at their enterprise while greatly reducing hours and sending their employees on unpaid leaves (Verhovna Rada of Ukraine 2003). Ironically, there are benefits for workers under this arrangement. In order to be eligible for a larger pension, one has to have an uninterrupted work career.

Figure 1. Ukraine: The Minimum Wage as a Percentage of the Average Wage



CHAPTER III

THE LABOR MARKET IN LITHUANIA IN THE POST-SOVIET ERA

Similar to the description of the Ukrainian labor market provided in the preceding Chapter, this Chapter provides a brief overview of the Lithuanian labor market. The Chapter will describe key elements of the labor force composition as well as major policies implemented since the attainment of independence. The policies described in this Chapter were part of the country's transition to a market economy. As mentioned earlier, we hypothesize that contrasting policies implemented in Ukraine and Lithuania account for the variation in labor market outcomes observed in the two countries.

Composition of the Labor Force

The size of the Lithuanian labor force is slowly declining due to the rapid aging of the population. Women comprise almost half of the total labor force (Table 5). However, the female labor force participation rate is almost 10 percentage points lower than that of men for age groups between 20 and 24 years of age (Department of Statistics to the Government of the Republic of Lithuania 2003) which suggests withdrawal from the labor market during the child bearing period. The reasons for this apparent withdrawal are not clear. There are several plausible explanations; females might be voluntarily withdrawing from the labor market, they could be forced to go on maternity

leave by their employers, or could be financially forced to withdraw due to the high cost of child care which is no longer as subsidized by the state.

Table 5. Lithuania: Labor Force, Employed and Unemployed by Gender

	1998	1999	2000	2001	2002	2003
			Labor Force			
Total (thousands of persons)	1,716	1,705	1,671	1,635	1,630	1641
Females (thousands of persons)	823	835	826	805	801	810
Males (thousands of persons)	892	869	845	830	829	831
Females (% of the total labor force)	48%	49%	49%	49%	49%	49%
Males (% of the total labor force)	52%	51%	51%	51%	51%	51%
			Employed			
Total (% of the total labor force)	87%	85%	84%	83%	86%	88%
Females (% of female labor force)	88%	87%	86%	85%	87%	88%
Males (% of male labor force)	85%	84%	81%	80%	85%	87%
			Unemployed			
Total (% of the total labor force)	13%	15%	16%	17%	14%	12%
Females (% of female labor force)	12%	13%	14%	15%	13%	12%
Males (% of male labor force)	15%	16%	19%	20%	15%	13%

Source: (Department of Statistics to the Government of the Republic of Lithuania 2003)

Educational attainment of the Lithuanian labor force is relatively high. About 20 percent of the employed population has a university degree. Only 3 percent of the population has a primary or less than primary education. Women are more educated than men on average. For example, 24 percent of employed women had university degrees in 2001, compared to 16 percent of men (Department of Statistics to the Government of the Republic of Lithuania 2003).

Table 6 shows the occupational composition of the labor force. Duncan indexes for different occupations calculated by gender are about 35 percent for the period 1998 through 2001. Men are over-represented among skilled and unskilled manual workers, such as craftsmen, assemblers, and plant and machine operators. The share of men is also

relatively high among legislators, senior officers, and managers. Women, on the other hand, are over-represented as service workers, skilled and semi skilled professionals, and shop workers. However, they are underrepresented among entrepreneurs, accounting for only 40 percent in the newly created enterprises. Vertical segmentation is evident in some occupations. For example, in the teaching occupation, 86 percent of teachers in general schools are women. The number of women teachers declines as the level of educational institution increases. The majority of university teachers are men (Department of Statistics to the Government of the Republic of Lithuania 2003).

Table 6. Lithuania: Employed Population by Occupation and Sex

	1999		**2000**		**2001**	
	Males	Females	Males	Females	Males	Females
	100	**100**	**100**	**100**	**100**	**100**
Legislators, senior officers, managers	11.6	7.5	9.5	6.8	7.9	6.9
Professionals	8.2	19.9	8.2	20.4	9.1	21.7
Technicians, associate professionals	4.6	10.3	5.2	10.2	6.1	11.9
Clerks	1.7	7.4	1.8	7.7	1.4	7.2
Service workers, shop, sales workers	6.9	16.4	8.1	16.8	7.8	18.1
Skilled agricultural, fishery workers	17	14.4	18.1	14.1	17	11.2
Craft and related trade workers	22.5	10.3	23.4	9.8	24.7	10.6
Plant and machine assemblers	16.8	2.4	16.2	2.8	17.5	2.9
Elementary Occupations	10.4	11.3	9.3	11.2	7.9	9.4
Armed Forces	0.4	0.1	0.3	0	0.5	0
Duncan Index: 1/2sum|Fi/F-Mi/M|		**0.34**		**0.34**		**0.36**

Although the labor force participation rate in the new Lithuanian economy did not decrease significantly, there is evidence of a relatively high unemployment rate (Table 5). It is also important to note that the unemployment figures provided in Table 5 are probably understated. Slavic ethnic minorities are not considered unemployed because they do not have the same residency status.

At the beginning of the transition, enterprises had an incentive to reduce employment to correct the overstaffing inherited from the Soviet era. At the same time, as the economy restructures, there is a need for people with a different set of skills. In addition, work experience and job related skills acquired under the previous system become obsolete.

Since the beginning of the transition, unemployment rates for women have been lower than that of men (Table 5). Lithuania is unique in this respect among transitional countries. As a result of the feminization of the public sector discussed earlier, men are over-represented in the private sector of the economy. Further, the private sector is characterized by higher unemployment rates. Also, due to the restructuring of the labor market, there is increased demand for higher education. Those persons who did not acquire more than basic education now constitute the majority of the long-term unemployed (Department of Statistics to the Government of the Republic of Lithuania 2001).

Since the very beginning of the transition, there has been heavy restructuring and privatizing of the economy. The Lithuanian private sector is growing rapidly and accounting for the major share of employment (Department of Statistics to the Government of the Republic of Lithuania 2003). At the same time, the average size of an enterprise decreased. Almost all large industrial and building enterprises have been privatized and split into smaller units. Small and medium business enterprises (up to 50 employees) developed very intensively. Among 128,000 registered enterprises in Lithuania, 80 percent were small and medium enterprises. However, they employed only

23 percent of the employed population (Department of Statistics to the Government of the Republic of Lithuania 2003).

However, while some sectors of the economy became completely privatized, such as manufacturing and construction, some sectors remain completely public, such as education and health. This privatization pattern accounts for the fact that currently women are over-represented among public sector employees while men constitute the majority of workers in the private sector. Men were traditionally employed in manufacturing while women usually took jobs in education and health. Surprisingly, according to the official data, public sector employees receive higher wages than private sector employees (Table 7). This is likely due to the illegal employment activities taking place in the private sector where employees are paid "in envelopes" (Department of Statistics to the Government of the Republic of Lithuania 2001).

Table 7. Lithuania: Average Monthly Earnings by Economic Sector (litas)

	Whole Economy		Public Sector		Private Sector	
	Women	**Men**	**Women**	**Men**	**Women**	**Men**
1995	356	494	357	500	353	483
1996	534	709	546	756	487	619
1997	685	920	680	970	694	857
1998	886	1152	909	1234	842	1058
1999	968	1182	1020	1322	881	1066
2000	956	1170	980	1272	918	1087
2001	962	1181	989	1288	925	1109

Source: (Department of Statistics to the Government of the Republic of Lithuania 2003)

The shadow economy in Lithuania is smaller than in Ukraine, estimated at 30 percent of GDP in 1990 and for 20 percent of GDP in 1998 (Kaufman and Kaliberda 1996).

Labor Market Policies

Wages in the public sector are calculated according to a formula that takes into account occupation, rank, educational level, and years of service. In the private sector, however, wages are set by collective bargaining agreements at the enterprise level. In the wage setting process, employers are constrained by the minimum wage provision. Employers are also required to pay overtime wage rates for hours of work in excess of forty hours a week. The Lithuanian government kept the minimum wage at a relatively high level, and also relative to the average wage

The Lithuanian government has developed a comprehensive labor code that resembles labor codes of western countries and provides comprehensive coverage of different aspects of the labor market. The new labor code sets rules and guidelines regarding different types of employment contracts, wages, responsibilities of employers and employees, social protection, and safety and health of employees at work. The laws outlined in the labor code can be enforced in courts of law, which is different from the situation in less advanced transitional economies.

Social protection laws and benefits outlined in the new labor code, though not as extensive as those in the Soviet Union, are more generous that in the USA and resemble those in Western Europe. Every employee is guaranteed twenty eight days of annual leave for which he/she is paid by the employer. Maternity leave is no longer 3 years during which a new mother's job had to be saved by the employer and should be paid her salary. Currently maternity leave is 70 calendar days before the child birth and 56 calendar days after. There is still a number of provisions, however, regulating labor of

pregnant women, such as preventing employers from assigning heavy manual labor or long and inconvenient hours to expectant mothers. However, these provisions are more flexible than similar provisions in the old Soviet Code. The labor policy that does not give women excessive benefits over men is beneficial to women's position in the labor market since they are viewed as less costly employees.

In the USSR, individuals were given their jobs by the state. Some kind of affirmative action was implemented for females and ethnic minorities. Lithuanian legislation still in some respects gives priority to certain population groups and establishes employment quotas for them. Additionally, new active employment policies that focus on job creation, training programs, and better enforcement of the labor legislation have been put in place.

Lithuanian employers face a relatively high cost of dismissal. Employers can terminate workers if there are valid reasons for dismissal, including business needs and poor performance on the part of the worker, with the burden of proof being on the employer. An employer has to give two months advance notice prior to dismissal and offer one to three months of severance pay depending on tenure. Employment protection regulations are better enforced in large unionized firms. This implies the law affects firms differently depending on their size.

CHAPTER IV

THE DATA

The empirical analysis in this dissertation employs data from a series of household budget surveys. For Ukraine, the available data are from the surveys conducted in 1999, 2000, 2001, 2002, and 2003. The data for 1995 and 1996 are also available. However, about 30 percent of the respondents in those earlier years were affected by wage arrears. Consequently, given the survey design it is impossible to establish the salaries for one third of the respondents. In addition, wage arrears are not gender neutral. For these reasons, the earlier data for Ukraine is not used. For Lithuania, the data is available only for 2000. Consequently, we do a more detailed empirical analysis for Ukraine in the sense that we examine the effects of reforms over time.

Data for Ukraine are obtained from the Committee of Statistics of Ukraine. Data for Lithuania are obtained from the World Bank. Each survey consists of household level and individual level questions. Although the surveys in both countries were conducted following the common model provided by the World Bank, the scope of the surveys and specific questions are slightly different reflecting the initial lack of experience in conducting nationally representative surveys. For Ukraine the specific questions differ slightly across years reflecting the rapid change in the state of the economy.[19]

[19] For example, the legal form of business ownership changed over time following changes in the law. At the beginning of the transition, the most common form of business ownership was state ownership or partial state ownership. This changed following the privatization of state enterprises.

Our analysis is restricted to individuals of working age. This includes males between 20 and 60 years and females between 20 and 55 years, reflecting the legal pension age which differs across gender. Self-employed, students, entrepreneurs, and those working for no pay are excluded from the analysis. Table 8 presents means of demographic variables of the respondents across years for Ukraine. Table 9 presents the same information for Lithuania. Married respondents include those legally married and in civil unions for Lithuania and only those legally married for Ukraine. In Ukraine, the percentage of married individuals declines while the percentage of single and widowed or divorced individuals increases during the period of the analysis. It is important to note that information on marital status in Ukraine is not as detailed as that in Lithuania. For example, there is no information on couples in civil unions. Females constitute a disproportionately large share of the divorced or widowed, more so in Ukraine than in Lithuania.

The average age of respondents is almost 40 years. An average woman in the sample is slightly younger than the average man, reflecting the lower legal retirement age for women. Almost 40 percent of the respondents in Ukraine and fifty 6 percent in Lithuania are heads of their households. This is expected given that the average household size in both countries is slightly above three. The exact relationship between different household members is not defined in the Ukrainian survey. In some part of the analysis, the number of children younger than 7 years in the household is used as a proxy for the number of the individual's children under 7 years of age. On the other hand, the Lithuanian survey provides a pointer that links children and mothers in the same household. This allows us to obtain the number of kids under seven for each individual

mother in Lithuania. The number of individuals above pension age with no income other than the state pension is also imputed for each household since their presence can affect labor market decisions of the working members of the household.

Table 8. Ukraine: Means from household surveys 1999-2003 (unweighted data, age 20-60 (men) and 20-55 (women))

	1999	2000	2001	2002	2003
Marital Status					
Married	0.75	0.74	0.73	0.71	0.71
Men	0.79	0.77	0.76	0.74	0.74
Women	0.72	0.71	0.70	0.69	0.68
Single	0.14	0.14	0.15	0.16	0.16
Men	0.16	0.17	0.18	0.19	0.19
Women	0.12	0.12	0.12	0.12	0.12
Divorced/Widowed	0.11	0.12	0.12	0.13	0.14
Men	0.05	0.05	0.05	0.07	0.07
Women	0.16	0.17	0.18	0.19	0.20
Average Age	38.76	39.10	39.18	39.21	38.96
Men	39.81	39.91	39.99	39.81	39.49
Women	37.80	38.37	38.48	38.67	38.50
Head of Household	0.41	0.42	0.41	0.41	0.42
Men	0.48	0.48	0.47	0.46	0.47
Women	0.35	0.36	0.36	0.37	0.37
LFP = 1	0.68	0.68	0.69	0.69	0.66
Men	0.71	0.70	0.71	0.71	0.68
Women	0.66	0.67	0.67	0.67	0.63
Highest Level of Education Completed					
Elementary	0.11	0.08	0.08	0.07	0.07
Men	0.13	0.09	0.09	0.09	0.07
Women	0.09	0.06	0.06	0.06	0.06
Secondary	0.25	0.27	0.26	0.26	0.24
Men	0.26	0.27	0.27	0.26	0.24
Women	0.23	0.26	0.25	0.26	0.24
Vocational Training	0.17	0.19	0.21	0.20	0.25
Men	0.20	0.23	0.25	0.24	0.30
Women	0.14	0.16	0.17	0.16	0.20
Specialized Secondary	0.28	0.25	0.25	0.28	0.23
Men	0.23	0.21	0.21	0.22	0.19
Women	0.32	0.29	0.30	0.33	0.28
Higher	0.16	0.16	0.16	0.16	0.18
Men	0.15	0.16	0.15	0.15	0.17
Women	0.17	0.17	0.17	0.17	0.19

Table 8. Ukraine: Means from household surveys 1999-2003 (unweighted data, age 20-60 (men) and 20-55 (women)) continued

	1999	2000	2001	2002	2003
Household Characteristics					
Number of People in the Household	3.60	3.52	3.44	3.40	3.39
Men	3.62	3.56	3.47	3.43	3.42
Women	3.59	3.48	3.42	3.38	3.35
Number of Children less than 7	0.25	0.23	0.22	0.21	0.22
Men	0.24	0.22	0.21	0.19	0.20
Women	0.27	0.24	0.24	0.22	0.23
Number of Pensioners	0.27	0.16	0.15	0.17	0.17
Men	0.30	0.16	0.16	0.17	0.18
Women	0.24	0.15	0.13	0.16	0.16
Household Labor Income*	2079	2845	3880	4792	2703
Men	2089	2875	3990	4913	2776
Women	2070	2818	3784	4684	2639
Household Non-Labor Income*	428	550	703	948	503
Men	454	596	773	1012	538
Women	404	508	642	892	473
Total Household Income excluding respondent*	1482	1980	2680	3397	1911
Men	1318	1748	2396	3065	1708
Women	1631	2189	2928	3693	2091
Type of Residence					
City	0.35	0.36	0.36	0.37	0.38
Men	0.34	0.35	0.34	0.36	0.36
Women	0.37	0.38	0.37	0.39	0.40
Town	0.31	0.30	0.30	0.29	0.30
Men	0.31	0.30	0.30	0.29	0.30
Women	0.31	0.30	0.31	0.29	0.30
Rural	0.33	0.34	0.34	0.34	0.32
Men	0.35	0.35	0.36	0.36	0.33
Women	0.32	0.32	0.33	0.33	0.31

Table 8. Ukraine: Means from household surveys 1999-2003 (unweighted data, age 20-60 (men) and 20-55 (women)) continued

	1999	2000	2001	2002	2003
Geographic Region of Residence					
Kiev	0.03	0.04	0.05	0.05	0.05
Men	0.03	0.04	0.04	0.04	0.05
Women	0.03	0.05	0.05	0.05	0.05
South	0.14	0.13	0.13	0.13	0.14
Men	0.14	0.13	0.13	0.13	0.14
Women	0.14	0.13	0.13	0.13	0.14
West	0.24	0.24	0.24	0.23	0.23
Men	0.24	0.25	0.24	0.23	0.23
Women	0.23	0.23	0.23	0.23	0.23
East	0.25	0.26	0.26	0.25	0.25
Men	0.25	0.26	0.25	0.24	0.25
Women	0.26	0.27	0.27	0.25	0.25
North	0.13	0.13	0.12	0.13	0.13
Men	0.13	0.16	0.13	0.13	0.13
Women	0.13	0.13	0.12	0.13	0.12
Central	0.16	0.15	0.16	0.16	0.15
Men	0.16	0.13	0.16	0.16	0.15
Women	0.15	0.14	0.16	0.16	0.15
Crimea	0.05	0.05	0.05	0.05	0.05
Men	0.04	0.05	0.05	0.05	0.05
Women	0.05	0.05	0.05	0.05	0.05
Sample Size	11512	11162	10912	10919	11640
Men	5488	5298	5080	5152	5458
Women	6024	5864	5832	5767	6182

About 70 percent of the respondents of the working age are employed in Ukraine and about 80 percent in Lithuania. Labor force participation is not equal by gender and age group in the two countries. Figures 2 and 3 plot LFP rates by age group for Ukrainian males and females. These figures show more even patterns for males across the analysis period. For females, being in childbearing years greatly reduces probability of LFP. Only by the age of 40 to 45 male and female LFP rates converge. In Lithuania, LFP rates are higher for every age group compared to Ukraine over the period of analysis

(Figure 4). Employment of Lithuanian females exhibits a more similar pattern to that of males. About 90 percent of females between 25 and 30 are employed, which is much higher proportion than in any given year for Ukrainian females of the same age group. The female employment rate drops to 85 percent for the age group of 30 to 35, reflecting the older age of child bearing. For subsequent age groups the female employment rate is not much different from that of men. The differences in female employment patterns between the two countries are not surprising. The withdrawal of Ukrainian females from the labor market in their childbearing years might reflect more generous maternity leave policies with employers having to bear the costs. Consequently, employers regard younger females as too expensive/problematic to hire.

Table 9. Lithuania: Means of Household Survey 2000 (unweighted data, age 20-60 (men) and 20-55 (women))

Variable	All persons	Males	Females
Demographic Variables			
Married	0.74	0.8	0.67
Single	0.15	0.16	0.14
Divorced/Widowed	0.11	0.04	0.19
Average Age	39.78	40.36	39.19
Head of Household	0.56	0.65	0.46
LFP=1	0.84	0.84	0.83
Highest Level of Education Completed			
Elementary	0.13	0.17	0.08
Secondary	0.38	0.4	0.36
Secondary Special	0.31	0.28	0.35
University	0.18	0.15	0.21
Household Characteristics			
Number of People in the Household	3.53	3.59	3.46
Number of Children less than 7	0.24	0.27	0.22
Number of Pensioners	0.13	0.12	0.14
Household Labor Income	1096.86	1094.75	1098.98
Household Non-Labor Income	152.58	155.89	149.26
Sample Size	5176	2592	2584

Figure 2. Ukraine: Labor Force Participation by Age Group. Females 1999-2003

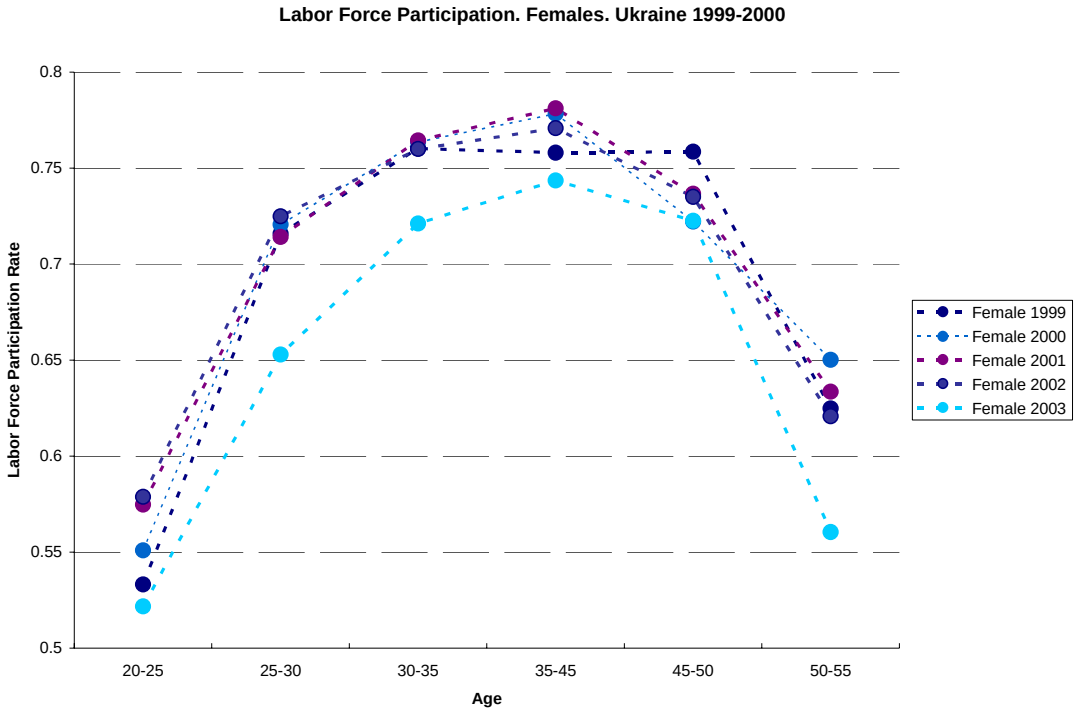


Figure 3. Ukraine: Labor Force Participation by Age Group. Males 1999-2003

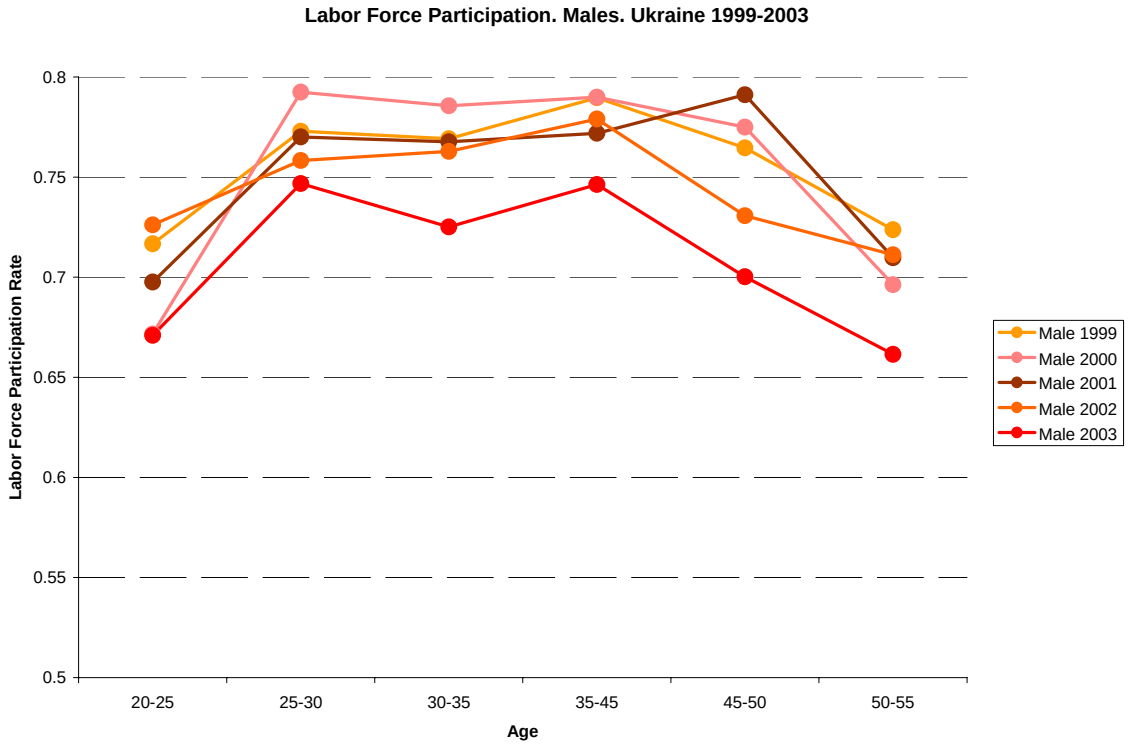
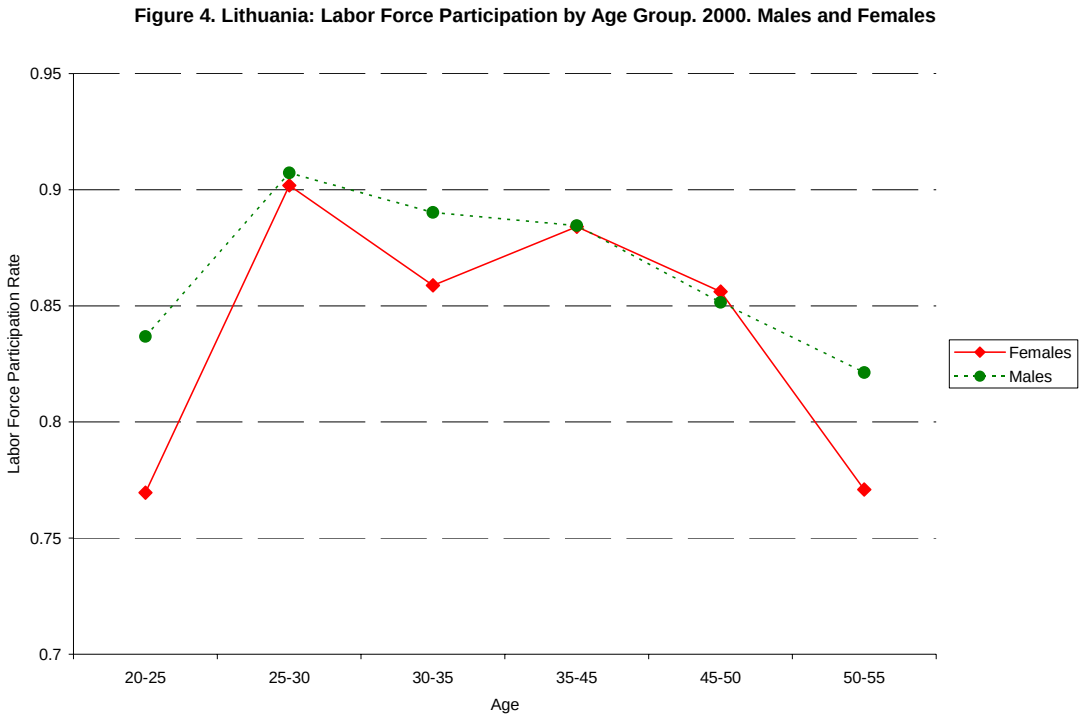


Figure 4. Lithuania: Labor Force Participation by Age Group. Males and Females 2000



The dataset used in the analysis also includes non-labor income sources. Total non-labor income of an individual includes alimony payments, stipends, pensions, grants, etc. Non-labor income of each household is calculated by summing non-labor incomes of the individual household members. Non-labor household income is on average about one-fifth and one-tenth of total household labor income in Ukraine and Lithuania respectively. Prior to the collapse of the Soviet Union about 15 years ago, transitional countries had socialist regimes. Consequently, residents of these countries did not have an opportunity to accumulate private assets that would provide them with sizable and stable non-labor income sources. Household labor income is a sum of wages of all

working household members. It is measured in Litas and Hryvnas in Lithuania and Ukraine respectively.

Education is coded by the highest level of education completed. In Ukraine, educational levels consist of elementary, general secondary; vocational; specialized secondary; incomplete higher; and completed higher education. Those who are defined to have elementary education consist of those with primary education or less. There are extremely few individuals with less than elementary education since until recently education through this level (8 years of schooling) was compulsory. Since labor market outcomes are equally bleak for those with elementary education or less, and since the latter group is very small, the two groups are combined. After the elementary level of education (first 8 years), one can continue and complete the general secondary level of education or get a vocational degree or specialized secondary degree. Specialized secondary degree requires 3 or 4 more years of education. General secondary school graduates can also obtain vocational or specialized degrees requiring 1 or 2 additional education years. General secondary degree graduates as well as secondary specialized degree graduates can also join a university to pursue a high education degree, which requires 5 to 6 years.

The educational system in Ukraine was reformed in 1999. Prior to 1999, general secondary education consisted of eleven grades and currently it consists of twelve grades after the reform. Also, bachelor degrees were introduced in 1999. A bachelor degree is awarded after 4 years of studying at a university. Starting in 2002, vocational and specialized secondary degrees are no longer among the educational categories. Instead, there is a separate question in the survey asking whether an individual has vocational

training or not. Educational institutions that used to provide specialized secondary education are currently referred to as colleges starting 2002 and their graduates hold bachelor degrees. For the sake of consistency, vocational training and bachelor degrees of the respondents after 2002 are referred to as vocational and specialized secondary degrees.

The educational system in Lithuania is slightly different from that in Ukraine. There is no distinction between vocational and secondary special degrees. Instead there is just one type of vocational training. The Lithuanian survey also does not included incomplete higher education as a category. It is assumed that those who have some higher education are included in secondary education and vocational groups.

In both countries, the majority of the population has general secondary or specialized secondary degrees. The percentage of the population who hold a university degree is about 20 percent throughout the period of the analysis. In both countries females are more educated than males. More females hold university and secondary special degrees while more males hold secondary or elementary education degrees.

The data on years of schooling is available. It is not used in the analysis however since individuals with the same years of education can hold different degrees, which results in differences in pay. Although the data on tenure is available, it is not used since it reflects total number of years worked rather than years worked in the most recent job. When tenure is recorded this way, it is highly correlated with age, making it hard to use both variables in the analysis. We use respondents' age to make inferences about tenure.

In Ukraine, the respondents are divided about equally between rural, urban, and town areas with a slightly bigger share residing in the cities.[20] Residents of eighteen administrative arrears are grouped into seven bigger regions: South, North, East, West, Central, Kiev, and Crimea. The arrears that became part of the same region are similar to each other in terms of geographic location, economic development, and ethnic and religious composition of the inhabitants. Appendix B describes how these regions were constructed. About 5 percent of the respondents live in Kiev, the capital city. Another 5 percent reside in the autonomous republic of Crimea, and the rest are divided evenly between the remaining regions. Not much change in the relative size of the regions is observed over the analysis period. For Lithuania, information on the respondent's region of residence is available but does not indicate the name of the region. The regions are coded numerically. Therefore, constructing broader regional categories was not possible.

Table 10 summarizes employment by industry and gender of Ukrainian respondents who work for wages because such information is only available for employed individuals. In Ukraine, classification of industries changed more than once during the analyzed period. Industry definitions are constructed across different years. The classification of industries is described in Appendix C. Surprisingly, the composition of employment by industry did not change significantly over the analyzed period. About 25 percent of the labor force is employed in industrial production and about 20 percent in agriculture. This lack of change in the proportion employed in industrial production and agriculture may be reflecting the slow pace of economic reforms in Ukraine.

[20] In this survey classification, "urban" is used to refer to cities or large urban centers.

Table 10. Ukraine: Summary of Industry at the Place of Employment (working population only, unweighted data, age 20-60 (men) and 20-55 women.

	1999	2000	2001	2002	2003
Industry	0.24	0.24	0.23	0.26	0.25
Men	0.28	0.29	0.29	0.32	0.32
Women	0.20	0.19	0.19	0.20	0.19
Agriculture, Forestry	0.16	0.15	0.15	0.14	0.12
Men	0.21	0.20	0.19	0.19	0.16
Women	0.12	0.11	0.11	0.10	0.09
Construction	0.05	0.05	0.05	0.05	0.05
Men	0.08	0.07	0.08	0.08	0.08
Women	0.02	0.02	0.02	0.02	0.02
Transportation and Communications	0.10	0.10	0.09	0.09	0.09
Men	0.13	0.13	0.13	0.12	0.12
Women	0.06	0.07	0.06	0.06	0.06
Education, Culture	0.12	0.12	0.11	0.11	0.11
Men	0.06	0.06	0.06	0.05	0.05
Women	0.17	0.18	0.17	0.16	0.17
Health Care, Physical Culture, Social Security	0.09	0.09	0.10	0.09	0.09
Men	0.03	0.03	0.04	0.03	0.03
Women	0.15	0.15	0.16	0.15	0.15
Finance, Insurance, Credit, Pension Security	0.01	0.01	0.01	0.01	0.02
Men	0.00	0.01	0.00	0.01	0.01
Women	0.02	0.01	0.02	0.02	0.02
State	0.03	0.03	0.03	0.06	0.08
Men	0.02	0.02	0.02	0.07	0.09
Women	0.05	0.05	0.04	0.06	0.08
Municipal Utilities, Service Sphere	0.05	0.06	0.06	0.04	0.04
Men	0.06	0.06	0.05	0.03	0.04
Women	0.05	0.05	0.06	0.04	0.04
Trade, Public Catering, Input Supply	0.11	0.12	0.12	0.13	0.13
Men	0.07	0.08	0.08	0.09	0.09
Women	0.14	0.15	0.16	0.17	0.17
Other	0.04	0.04	0.04	0.01	0.01
Men	0.07	0.07	0.06	0.01	0.01
Women	0.02	0.03	0.02	0.02	0.02
Sample Size	7,852	7,611	7,522	7,516	7,650
Men	3,904	3,699	3,604	3,662	3,725
Women	3,948	3,912	3,918	3,854	3,925

Employment by industry calculated using the survey data (Table 10) is similar to that provided in Table 3. The figures in Table 3 are obtained from the Ukrainian

Ministry of Statistics and cover the entire country. This consistency between the two data sources gives us confidence that our survey sample is representative of the labor market situation in Ukraine. Besides, the survey data also indicates the presence of gender segregation as shown in the national statistics. Relatively more men are employed in industry and agriculture, while more women are employed in education, culture, and healthcare industries.

The Lithuanian survey uses different occupational classifications, which are consistent with the commonly used ILO definition (Table 11). A notable difference between the two countries is that a much larger share of Ukrainian workers is employed in agriculture. Table 11 indicates the presence of gender segregation. Females are relatively more in Scientific and Intellectual Professionals. Males are relatively more represented in blue color industrial jobs and among legislators and senior officials. More females in intellectual professions might be a result of the fact that females are relatively more educated than males in Lithuania.

Table 11. Lithuania: Summary of Current Occupation at the Place of Employment (working population only, unweighted data, age 20-60 (men) and 20-55 (women)

Occupation	All Persons	Males	Females
Legislators and Senior Officials	0.07	0.08	0.05
Scientific and Intellectual professionals	0.15	0.09	0.22
Medium Level Technicians and Professionals	0.10	0.07	0.13
Office Workers	0.06	0.03	0.09
Service Workers and Shop and Market Sales Workers	0.12	0.06	0.18
Agricultural Workers, Farmers, and Fishermen	0.01	0.02	0.01
Operators and craftsmen of mechanic arts and other trades	0.20	0.27	0.12
Operators of Installations and machinery and assemblers	0.11	0.20	0.03
Non-Qualified Workers	0.17	0.17	0.17
Armed Forces	0.00	0.01	0.00
Public Sector	0.45	0.37	0.53
Private Sector	0.55	0.63	0.47
Sample Size	4319	2164	2155

The Ukrainian legal forms of business ownership changed intermittently during the analyzed period. Different forms of business ownership relevant to the time of the analysis are described in Appendix D. Table 12 summarizes type of business ownership at the place of employment. The size of the public sector decreased from 56 percent in 1995 to 50 percent in 2003. The proportion of persons working in cooperatives fell from 19 to 8 percent. At the same time the proportion of people employed in companies owned by private individuals increased from 8 to 20 percent. These numbers reflect the undergoing privatization process in Ukraine. Comparatively, the size of public sector in Ukraine is larger than that in Lithuania. The size of the public sector in Lithuania and Ukraine in year 2000 was 45 percent and 53 percent respectively.

Table 12. Ukraine: Summary of Type of Ownership at the Place of Employment (working population only, unweighted data, age 20-60 (men) and 20-55 women

Ownership of the place of employment	**1999**	**2000**	**2001**	**2002**	**2003**
State	0.56	0.53	0.51	0.48	0.50
Men	0.50	0.44	0.44	0.41	0.42
Women	0.62	0.61	0.58	0.54	0.58
Working Collective or Cooperative	0.19	0.15	0.12	0.10	0.08
Men	0.23	0.19	0.15	0.11	0.09
Women	0.15	0.12	0.10	0.09	0.06
Stock Company	0.16	0.18	0.19	0.21	0.20
Men	0.17	0.22	0.23	0.24	0.24
Women	0.14	0.15	0.16	0.17	0.16
Rented Company	0.01	0.01	0.01	0.01	0.01
Men	0.01	0.01	0.02	0.02	0.02
Women	0.01	0.01	0.01	0.01	0.01
Foreign Ownership	0.01	0.01	0.01	0.01	0.01
Men	0.01	0.01	0.01	0.01	0.01
Women	0.01	0.00	0.01	0.01	0.01
Private Ownership	0.08	0.12	0.15	0.19	0.20
Men	0.09	0.12	0.15	0.21	0.22
Women	0.08	0.11	0.15	0.18	0.19
Sample Size	7852	7611	7522	7516	7650
Men	3904	3699	3604	3662	3725
Women	3948	3912	3918	3854	3925

CHAPTER V

RETURNS TO HUMAN CAPITAL

The purpose of this Chapter is to address the first research question and investigate how, as a result of institutional policies and social factors, returns to different levels of education in Ukraine changed over the period of 1999 through 2003. Additionally, we compare returns to education in Ukraine and Lithuania for the year 2000. Following the emergence and growth of the private sector, where the wage setting mechanism is different from that in public sector, returns to different levels of education across sectors are compared. Returns to various levels of education for those with "old education," i.e., education obtained under the Soviet system are compared to returns for those with "new education." The "new education" is believed to be more consistent with the demands of the market economy. Returns to levels of education for Lithuania and Ukraine in 2000 are compared to investigate the effect of different labor market policies implemented in the two economies.

This Chapter is structured in as follows: the first subsection presents the background and a brief literature review on returns to education in transitional countries. In the second subsection, we discuss the empirical methodology. We present and discuss empirical results on returns to education in Ukraine in subsection three. This is followed by a comparison of returns to education in Ukraine and Lithuania in 2000. Subsection five investigates differences in returns to education across sectors. In subsection six,

returns to the "new" and "old" education are examined. Finally, the Chapter concludes by looking at how policy and social factors led to the observed changes in the returns to education and how these results differ between the two countries.

Background

One of the central themes of transitional economic research focuses on changes in returns to human capital. Compared to other countries, returns to education were low[21] prior to the transition for several reasons. Wage differentials were kept artificially low in accordance with the equalization policies of the Communist Party. As mentioned previously, wages were set using specific wage grids. In order to meet high demand for manual labor, caused in part by the low degree of automation, government and enterprises used wages as an incentive mechanism to attract workers to these jobs. Generally, wage grids were set higher for manual blue-collar jobs than for white-collar jobs requiring higher levels of education. At the same time, workers regarded higher education and white-collar jobs as more prestigious and would accept lower wages for these jobs (Benitez-Silva and Cheidvasser 2000). There are very few studies on the Soviet labor market due to the lack of available micro-level data and the results of these studies may be distorted by the sample selection problem.[22]

[21] Returns to education were low in comparison to Western economies

[22] Two existing studies use surveys conducted on samples of immigrants from the Soviet Union. Offer and Vinokur (1992) use a sample of immigrants who traveled from the USSR to Israel in the early 1970. Gregory and Kohlhase (1988) use an emigrants' survey based on the Soviet Interview Project. Katz (1999) uses a survey conducted in 1989 in a single Soviet city of Taganrog which is dominated by heavy industry and whose population is not representative of the whole country in terms of earnings, educational attainment, and occupation.

A number of studies demonstrate that since the beginning of the transition, wage rewards to skill/higher education have increased. Orazem and Vodopivec (1995) and Stanovnik (1997) find increase in returns to higher education in Slovenia; Flanagan (Wage structures in the transition of the czech economy 1995) and Svejnar (1998) in Czech Republic; Brainerd (1998) and Sabirianova (2002) and Gorodnichenko and Sabirianova (2005) in Russia and Ukraine; Rutkowski (1996) and Rutkowski (1997) in Poland; Jones and Ilayperuma (2005) in Bulgaria; Halpern and Korosi (1997) in Hungary; Anderson and Pomfret (2000) in Kyrgyz Republic; Noorkiv, Orazem, Puur and Vodopivec (1998) for Estonia and Hazans (2003) for Latvia. Pastore and Veraschagina (2006) find a moderate increase in Belarus. Some of the earlier studies are summarized in Svejnar (1998).

Freeman and Oostendorp (2005) used an ILO survey on wages in 161 occupations in over 150 countries and found a sizeable increase in skill differentials favoring skilled workers in countries moving from planned to market economies.[23] In fact, to the best of my knowledge there are only two studies that do not find an increase in returns to higher education/skill in transition economies: Benitez-Silva and Cheidvasser (2000) for Russia,[24] and Krstic and Reilly (2003) for Serbia.

There is no uniform opinion on the reasons for this observed increase. Moreover, the explanation across different transitional economies need not be the same as it can be caused by different factors. Some research has focused on legal, regulatory, and institutional factors that lead to adjustment of wages to market levels. For instance, it is generally agreed that when institutional mechanisms of wage determination change and

[23] See Fleisher et al. (2005) for a detailed review.
[24] However, interestingly, Gorodnichenko and Sabirianova (2005) use exactly the same data and find an increase in returns to years of education.

wages are no longer artificially suppressed by government, returns to higher education and skill are expected to increase. Another explanation was proposed by Schultz (1975) who suggested that highly educated individuals are better able to adjust to changing opportunities and obtain higher rewards.

Other causes of higher returns to higher education discussed in the existing literature on the subject include technological change, openness to trade, and shift in demand for final goods resulting from the restructuring of the economy.

Moreover, the transition process has been taking place for about 15 years now, and two general phases in the movement of relative wages are identified in the literature. The first stage reflects the initial adjustment from controlled wage setting to the system where wages depend on market processes and worker productivity. In the second stage, once that adjustment has taken place, the growth of relative wages for educated/skilled workers slows down and the overall wage structure resembles that in a developed economy. The lengths of the two phases are determined, in part, by the speed, consistency, and quality of the economic, institutional, and legal reforms (Munich, Svejnar, and Terrell 2005; Sabirianova-Peter 2003).

Economic indicators suggest that Lithuania, relative to Ukraine, is a faster reformer. Additionally, the quality of reforms in terms of consistency and essence of the policies is superior in Lithuania relative to Ukraine. Consequently, Lithuania is expected to be in the second phase of the wage adjustment process mentioned above. On the other hand, it is more likely that Ukraine is in the first phase of the adjustment. This would suggest that returns to higher education are relatively higher in Lithuania. In the next

subsection of the Chapter, we present the empirical methodology, including the choice of variables used in the analysis, given the limitations of the data available.

Empirical Methodology

To investigate the returns to education in Ukraine and Lithuania, the common approach is followed, and four different specifications of a Mincerian earning equation are estimated for each year and for each country, as follows:

$$\ln w_i = \beta X_i + \delta EDUC_i + \lambda AGE + \gamma AGE_i^2 + u_i \qquad (1)$$

This first basic human capital specification (HCS) regresses log of monthly wages on educational categorical variable EDUC,[25] experience measured by AGE, and a vector X of other control variables expected to affect earnings including demographic variables, regional, and type of residence dummies.

There are two different approaches to measuring education-by highest degree completed and by total years of education. The latter approach advocated by Layard and Psacharopoulos (1974) assumes a constant rate of return to an additional year of education. The former approach advocated by Heckman, Layne-Farrar, and Todd (1995) allows the rate of return to differ by level of education completed reflecting the "sheepskin" hypothesis. In light of the fact that number of total years of education is self-reported and therefore prone to recall error, different degrees can be represented by

[25] Categorical educational variables are slightly different in Ukraine and Lithuania since in Lithuania the educational system was reformed to correspond to the EU system. While in Ukraine where the educational system still resembles the Soviet system there are vocational and secondary special educational categories, in Lithuania there is only category called vocational training. Also, incomplete higher educational category (those who start tertiary education but do not complete it) is not present. See Data section for the complete description of the data and educational systems.

the same years of education; and there is a strong presence of "sheepskin" effect in transitional economies. Therefore, we measure education using the highest degree completed.[26]

Even though the data on tenure are available, it is missing for a large number of respondents and is self reported, which makes it prone to error. Some researchers used imputed years of tenure which are usually computed as "AGE minus 7 minus total years of education." Total years of education are imputed from the highest degree completed. However, this measure is not at all precise because the same level of education can require a different number of years of education. For example, a university degree in medicine or law requires 1 or 2 more years to complete than other university degrees. Moreover, the number seven in this imputation refers to the fact that generally children start their school at seven. However, a number of children end up starting school at 6 depending on the month of their birth date.

In addition, women in the USSR were allowed up to 3 years of maternity leave per child. Further, in a lot of surveys including the Ukrainian survey used in this dissertation, only information on the number of children in the household is available. Information on the exact family relations within the household is not available and, therefore, it is impossible to adjust female years of tenure for maternity leave. For these reasons, age of respondents is used as a proxy for years worked. It is important to note however that age is a proxy for the total number of years worked and not the number of years worked at the last job.

In this simple specification we do not control for industry, occupation, and sectoral effects. Therefore, we expect our estimate for returns to education to capture the

[26] These approaches are also discussed in Munich et al. (2005).

effect of these omitted variables since they are likely correlated with the level of education.

The second specification is augmented specification (AS) and it includes a vector, OIS, consisting of occupational, industry, and sector dummies.[27] Equation (2) provides the general specification of this augmented regression model.

$$\ln w_i = \beta X_i + \delta EDUC_i + \lambda AGE_i + \gamma AGE_i^2 + \phi OIS_i + u_i \qquad (2)$$

Going one step further than most of the researchers in the transitional human capital literature, the possibility that participation in the labor market is not random or that E(u_i \in sample) ≠ 0 is accounted for. To correct for the potential sample selection bias, we use the Heckman (1979) two step estimation procedure. The first step estimates an equation that determines the labor market status of an individual. Estimates of this first step equation are used to construct a selection correction term that is included in the earnings regression to obtain consistent estimates. The labor force participation equation is as follows:

$$Y_i^* = x_i \beta + e_i \qquad (3)$$

where:

Y_i^* = 1 if individual i is in the labor force and to 0 otherwise

x_i is a vector of characteristics that affect participation in the labor force

β– vector of coefficients

$e_i \sim (0, \sigma^2)$

[27] Ukrainian data contains information on industry of employment while no information on occupation. On the contrary, Lithuanian data contains information on occupation but not on industry. Data from both countries contains information on firm ownership even though ownership categories are different reflecting different state of the economy in the two countries. See Data section for the detailed description of these variables.

Based on the assumption that the error term is normally distributed, the probability that a person is in the labor force is

$$P(\varepsilon_i > -x_i\beta) = \Phi\left[\frac{x_i\beta}{\sigma}\right] \tag{4}$$

and the likelihood function is

$$L(\beta) = \left[P(x_i\beta)\right]^{y_i}\left[1 - P(x_i\beta\right]^{(1-y_i)} \tag{5}$$

Once the selection correction is included in log earnings equations, (1) and (2) become

$$\ln w_i = \beta X \ + \delta EDUC_i + \lambda AGE + \gamma AGE_i^2 + \lambda c + u_i \tag{6}$$

$$\ln w_i = \beta X \ + \delta EDUC_i + \lambda AGE + \gamma AGE_i^2 + \phi OIS + \lambda c + u_i \tag{7}$$

Where

λ is the selection correction term.

c is the covariance between the error term in the wage and labor force selection equations.[28]

One of the criticisms of Heckman's two step procedure is that the second stage earning equation estimates are often subject to multicollinearity, which has an adverse impact on the robustness of the two-step estimator. In particular, multicollinearity becomes a problem if the explanatory variables are highly correlated with the inverse Mills ratio. This is common in applications where the set of variables in the selection and earnings equations overlap significantly and the excluded set of variables are not a strong predictor of participation (Munich, Svejnar, and Terrell 2005). To correct for selection bias while avoiding the multicollinearity problem, the variables in the participation equation are carefully selected and are not the same as variables in the earning equation.

[28] For details on this methodology, see Reimers (1984).

The variables used to explain the probability of working include the number of children in the household under the age of 7, number of retirees in the household over the age of 65, geographic region of residence, non-labor income as well as a variable indicating whether the respondent is the head of the household.

With the transition to capitalism, state subsidized day care facilities are no longer available while private facilities are very costly. Due to the costly private day care facilities together with policies encouraging child bearing[29] and extensive social benefits inherited by Ukraine from the Soviet Union (see previous chapters), the transition had a negative impact on female participation in the labor market (Bettio and Platenga 2004). It has also been argued that, politically and socially, the transition period is marked by increasing advocacy of family values on the part of society. According to (Heinen and Wator 2006), women's roles are now seen as child and home care takers. In her work on post-soviet identities of women in Ukraine, Zhurzhenko (2001) identifies house wife as one of the two main polar identities. For these reasons, the presence of very young children in the household is expected to have a strong negative effect on female labor force participation. The effect is expected to be less pronounced in Lithuania since the instituted maternity leaves are shorter and are not paid by the employer.

As was mentioned previously, transitional countries including Ukraine and Lithuania are characterized by rapidly aging populations. In the majority of families, several generations share the same dwelling. Since the beginning of the transition, the real value of state pensions for retirees decreased dramatically. By 2002, the minimum pension in Ukraine was less than $10 (50 Hryvna) per month. At the same time, an

[29] During the Soviet Union and currently, Ukraine and Lithuania are faced with very low birth rates. The policies instituted range from prohibiting abortions and the use of contraceptives during the 1950s and 1960s to monetary benefits and longer vacations for those who have children.

absolute majority of the retired population do not have private savings since under the design of the old system, individuals were supposed to rely exclusively on their pensions.[30] In addition, the medical care is no longer free and its cost is rising rapidly. For these reasons the presence of retirees in the household creates financial and caretaking responsibilities for other household members. Usually, caretaking responsibilities are shared disproportionately more by females. Thus, presence of retirees in the household is expected to have a negative effect on female labor force participation similar to that of young children. Again, the magnitude of the effect is expected to be smaller for Lithuanian females due more generous real valued payments.

Another very important determinant of labor market participation is unemployment. Geographical regions are included to control for differences in regional unemployment rates. Some authors use industry unemployment rates in the selection equation. The data we have does not contain information on the industry of last job for the unemployed. However, in Ukraine specific industries tend to be concentrated in particular regions. For that reason, regional unemployment rates are used as a proxy for industry unemployment rates.

Another commonly used determinant of the decision to work is a person's non-labor income. In transitional economies, however, an absolute majority of the population does not have the amount or sources of non-labor income. This is contrary to developed countries where a substantial portion of the population receives non-labor income from

[30] In the absence of market economy, working population relied exclusively on wages and fringe benefits determined by the state that were enough for basic consumption. There were no private capital accumulation or investment possibilities. Once retired, individuals relied on state pensions and fringe benefits. The value of state pensions even though lower than wages, was enough to provide for consumption possibilities similar to that of working population. In addition, fringe benefits included free and accessible medical care as well as heavily subsidized prices for medications.

trust funds, rental income, etc. Among the most common sources of non-labor income of people in transitional economies are government payments such as stipends, grants, and alimonies. These payments alone are usually too little to really sustain the recipients and to seriously affect their decision to work. However, the decision of an individual to engage in labor market activities is likely to depend on the total income within the household, which constitutes non-labor income to that individual. Consequently, the non-labor income of an individual is defined as a total income of other household members.

Returns to Education in Ukraine, 1999-2003

Tables 13 through 18 summarize returns to education obtained using the four specifications outlined above for Ukraine 1999-2003. The reference group is secondary education level. Although it is common elementary education level to be the reference group, secondary education level is used since there are too few persons with elementary education in our sample. Hence, selecting elementary education level as a reference group can present of excluding a zero vector. In Ukraine, returns to all levels of education relative to secondary education decreased between 1999 and 2003. Most notable, and contrary to what is observed in most of the transitional countries, is the decrease in returns to higher education. Using the HCS and AS estimation methods, the results indicate that a university graduate received 66 percent more on average than a secondary school graduate in 1999 and only 42 percent more on average in 2003 (Tables 13 and 16).

Table 13. Ukraine: Returns to Education. Human Capital Specification 1999-2003. Males and Females

VARIABLE	1999 Coefficient (Standard Error)	2000 Coefficient (Standard Error)	2001 Coefficient (Standard Error)	2002 Coefficient (Standard Error)	2003 Coefficient (Standard Error)
OLS Human Capital Specification					
ELEMENTARY EDUCATION	-0.26*	-0.142*	-0.221*	-0.104**	-0.239*
	(0.058)	(0.052)	(0.046)	(0.045)	(0.045)
VOCATIONAL TRAINING	0.090*	0.126*	0.113*	0.115*	-0.001
	(0.044)	(0.033)	(0.029)	(0.026)	(0.024)
SECONDARY SPECIAL	0.262**	0.324*	0.253*	0.245*	0.154*
	(0.038)	(0.031)	(0.027)	(0.024)	(0.024)
INCOMPLETE HIGHER	0.269**	0.308*	0.215*	0.349*	0.235*
	(0.082)	(0.055)	(0.053)	(0.091)	(0.063)
HIGHER EDUCATION	0.656**	0.635*	0.505*	0.468*	0.422*
	(0.043)	(0.033)	(0.029)	(0.027)	(0.025)
Human Capital Specification. Two Stage Heckman Estimation					
ELEMENTARY EDUCATION	-0.122*	-0.132*	-0.204*	-0.096**	-0.170*
	(0.043)	(0.044)	(0.041)	(0.039)	(0.040)
VOCATIONAL TRAINING	0.095*	0.097*	0.091*	0.094*	0.020
	(0.032)	(0.028)	(0.025)	(0.023)	(0.021)
SECONDARY SPECIAL	0.185*	0.230*	0.196*	0.186*	0.144*
	(0.029)	(0.026)	(0.024)	(0.021)	(0.022)
INCOMPLETE HIGHER	0.237*	0.230*	0.186*	0.246*	0.243*
	(0.062)	(0.046)	(0.047)	(0.081)	(0.057)
HIGHER EDUCATION	0.466*	0.479*	0.449*	0.412*	0.404*
	(0.034)	(0.028)	(0.026)	(0.024)	(0.022)

Note: * means significant at 99% level, ** at 95% level, *** at 90% level
Note: Other regressors for the OLS estimation also include – type of residence, geographic region, marital status, gender, age, age squared. The complete results of the OLS estimation are presented in the Appendix Table E1.
Note: Other regressors for the Two Stage Heckman estimation also include-type of residence, geographic region, marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household, geographical region. The complete results of the OLS estimation are presented in the Appendix Table E5.

The decrease is much less pronounced when selection into the labor market is accounted for. The corresponding numbers are 47 and 40 percent, respectively. Using AS, the trend remains unchanged. Returns to higher education drop from 54 to 39

percent and from 44 to 43 percent when selection into the labor market is accounted for. The effects of selection into the labor market are much more pronounced in the beginning of the analysis period. In1999 the difference in returns to higher education using HCS was almost 20 percentage points. This difference reduced to only 2 percentage points by 2003. A similar trend is observed when the augmented specification is used. This trend suggests that in 2003 higher education was no longer an important factor affecting probability of a person being employed. While the probability of working was about 10 percent higher for persons with higher education in 1999, it was actually 4 percent lower in 2003 compared to those with only secondary education.

Returns to vocational and secondary special levels of education decreased also although the decrease is less pronounced relative to university degrees. This trend is not completely unexpected. Munich, Svejnar, and Terrell (2005) for Czech Republic and Anderson, Pomfred, and Usseinova (2004) for Kyrgyzstan demonstrate similar results. However, not consistent with findings of other authors, the relative decline in returns to vocational education is less pronounced compared to higher education.

Over time, changes in returns to levels of education differ between males and females. For females, returns to all levels of education regardless of model specification used, decreased over the analyzed period. On the contrary, males experienced a mild increase in returns to vocational training and secondary special education while the decrease in returns to higher education is less pronounced. Relative earnings of a female with a university diploma dropped by 31 percent over the analyzed period without when selection into the labor market is controlled for and 13 percent when selection into the labor market is controlled for.

Table 14. Ukraine: Returns to Education. Human Capital Specification 1999-2003. Males Only

Variable	1999 Coefficient (Standard Error)	2000 Coefficient (Standard Error)	2001 Coefficient (Standard Error)	2002 Coefficient (Standard Error)	2003 Coefficient (Standard Error)
OLS Human Capital Specification					
ELEMENTARY	-0.334*	-0.042	-0.208*	-0.112***	-0.237*
EDUCATION	(0.081)	(0.075)	(0.067)	(0.061)	(0.067)
VOCATIONAL	0.030	0.109**	0.111*	0.189*	0.020*
TRAINING	(0.062)	(0.048)	(0.042)	(0.037)	(0.035)
	0.189*	0.343*	0.260*	0.287*	0.218*
SECONDARY SPECIAL	(0.059)	(0.048)	(0.043)	(0.038)	(0.039)
	0.105	0.394*	0.205**	0.416**	0.208**
INCOMPLETE HIGHER	(0.130)	(0.084)	(0.091)	(0.170)	(0.105)
	0.608*	0.605*	0.483*	0.443*	0.433*
HIGHER EDUCATION	(0.066)	(0.051)	(0.047)	(0.041)	(0.039)
Human Capital Specification. Two Stage Heckman Estimation					
ELEMENTARY	-0.225*	-0.088	-0.209*	-0.118**	-0.213*
EDUCATION	(0.061)	(0.064)	(0.059)	(0.054)	(0.059)
VOCATIONAL	0.024	0.103**	0.090**	0.145*	0.053***
TRAINING	(0.047)	(0.041)	(0.038)	(0.033)	(0.031)
	0.104*	0.282*	0.232*	0.227*	0.223*
SECONDARY SPECIAL	(0.046)	(0.042)	(0.039)	(0.034)	(0.035)
	0.114	0.334*	0.184**	0.266***	0.238* *
INCOMPLETE HIGHER	(0.101)	(0.073)	(0.083)	(0.154)	(0.093)
	0.429*	0.488*	0.447*	0.398*	0.431*
HIGHER EDUCATION	(0.053)	(0.045)	(0.043)	(0.037)	(0.035)

Note: * means significant at 99% level, ** at 95% level, *** at 90% level

Note: Other regressors for the OLS estimation also include – type of residence, geographic region, marital status, age, age squared. The complete results of the OLS estimation are presented in the Appendix Table A2.

Note: Other regressors for the Two Stage Heckman estimation also include-type of residence, geographic region, marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household, geographical region. The complete results of the OLS estimation are presented in the Appendix Table A6

Table 15. Ukraine: Returns to Education. Human Capital Specification 1999-2003. Females Only

	1999	2000	2001	2002	2003
Variable	**Coefficient (Standard Error)**	**Coefficient (Standard Error)**	**Coefficient (Standard Error)**	**Coefficient (Standard Error)**	**Coefficient (Standard Error)**
OLS Human Capital Specification					
ELEMENTARY EDUCATION	-0.127 (0.082)	-0.234* (0.071)	-0.214* (0.064)	0.015 (0.066)	-0.234* (0.058)
VOCATIONAL TRAINING	0.163* (0.062)	0.120* (0.043)	0.107* (0.038)	0.013* (0.036)	-0.014 (0.032)
SECONDARY SPECIAL	0.332* (0.049)	0.232* (0.037)	0.233* (0.033)	0.209* (0.030)	0.097* (0.029)
INCOMPLETE HIGHER	0.426* (103)	0.182* (0.065)	0.185* (0.061)	0.328* (0.101)	0.249* (0.074)
HIGHER EDUCATION	0.712* (0.055)	0.568* (0.040)	0.501* (0.036)	0.485* (0.034)	0.400* (0.031)
Human Capital Specification. Two Stage Heckman Estimation					
ELEMENTARY EDUCATION	0.019 (0.060)	-0.141** (0.059)	-0.173* (0.055)	0.020 (0.057)	-0.149* (0.052)
VOCATIONAL TRAINING	0.154* (0.046)	0.115* (0.037)	0.101* (0.034)	0.009* (0.032)	-0.003 (0.029)
SECONDARY SPECIAL	0.250* (0.0337)	0.193* (0.032)	0.151* (0.029)	0.158* (0.026)	0.080* (0.026)
INCOMPLETE HIGHER	0.368* (0.076)	0.118** (0.056)	0.161* (0.053)	0.252* (0.090)	0.238* (0.068)
HIGHER EDUCATION	0.500* (0.042)	0.471* (0.035)	0.426* (0.032)	0.422* (0.030)	0.371* (0.028)

Note: * means significant at 99% level, ** at 95% level, *** at 90% level

Note: Other regressors for the OLS estimation also include – type of residence, geographic region, marital status, age, age squared. The complete results of the OLS estimation are presented in the Appendix Table E3.

Note: Other regressors for the Two Stage Heckman estimation also include-type of residence, geographic region, marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household, geographical region. The complete results of the OLS estimation are presented in the Appendix Table E7

When industry and ownership controls are included, the corresponding decreases are 22 and 11 percent. On the other hand, for a university educated male, the relative drop in earnings was 18 percent without controlling for selection into the labor market

and 0 percent when controlling for selection into the labor market. Adding industry and ownership controls the corresponding decreases are 10 and 1 percent. These results also demonstrate that higher education has a smaller effect on selection into the labor market in 2003 compared to 1999 and the difference is more pronounced for females.

Looking at Tables E6 and E7 that present the full estimation results, it can be observed that that presence of young children and pensioners in the household has increasingly negative effect on the probability of females being employed. Over protective policies for female employees in conjunction with luck of state subsidized childcare facilities are likely responsible for this observed effect.

At the same time, the effect of presence of small children in the household is the opposite for males-positive and increasing over time. On the other hand, the presence of pensioners has the same effect on the selection into the labor market for males and females. Being head of the household has positive effect on the probability of being employed for both males and females. The magnitude of the effect is increasing over the analysis period. However, the magnitude of the effect and its increase is stronger for males than for females.

It is interesting to note that in 1999 the return to a university degree was higher for females than males using either specification. Moreover, the magnitude of the returns was comparable to more successful transitional countries. For example, the return to a university degree relative to having only basic education for females was 44 percent in Poland in 1997 (Adamchik and Bedi 2003) and 56 percent in Serbia in 1999 (Krstic and Reilly 2003) while in Ukraine the corresponding number for 1999 was 59 percent. In Czech Republic, return to a university degree relative to basic education for females in

1996 was 65 percent while the corresponding number for Ukrainian females in 1999 was 71 percent. However, by 2003 Ukrainian women with university degrees received relatively less than Ukrainian males as well as their CEE female counterparts

Table 16. Ukraine: Returns to Education. Augmented Specification 1999-2003. Males and Females

	1999	2000	2001	2002	2003
VARIABLE	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)
Augmented Specification. OLS					
ELEMENTARY	-0.001*	-0.001*	-0.000*	-0.000*	-0.000*
EDUCATION	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VOCATIONAL	-0.152*	-0.028	-0.098**	-0.023	-0.136*
TRAINING	(0.053)	(0.048)	(0.043)	(0.041)	(0.041)
SECONDARY	0.055	0.106*	0.097*	0.093*	-0.017
SPECIAL	(0.041)	(0.030)	(0.027)	(0.024)	(0.022)
INCOMPLETE	0.199*	0.230*	0.214*	0.213*	0.131*
HIGHER	(0.036)	(0.028)	(0.025)	(0.022)	(0.022)
HIGHER	0.156**	0.244*	0.173*	0.320*	0.199*
EDUCATION	(0.076)	(0.049)	(0.049)	(0.084)	(0.058)
Augmented Specification. Two Stage Heckman Estimation					
ELEMENTARY	-0.099**	-0.041**	-0.111*	-0.021	-0.084**
EDUCATION	(0.041)	(0.042)	(0.038)	(0.036)	(0.037)
VOCATIONAL	0.071**	0.111*	0.081*	0.072*	0.010
TRAINING	(0.032)	(0.026)	(0.024)	(0.022)	(0.020)
SECONDARY	0.153*	0.211*	0.182*	0.172*	0.140*
SPECIAL	(0.028)	(0.024)	(0.022)	(0.020)	(0.020)
INCOMPLETE	0.173*	0.234*	0.170*	0.221*	0.216*
HIGHER	(0.059)	(0.043)	(0.044)	(0.077)	(0.053)
HIGHER	0.465*	0.519*	0.470*	0.437*	0.411*
EDUCATION	(0.034)	(0.028)	(0.026)	(0.023)	(0.022)

Note: * means significant at 99% level, ** at 95% level, *** at 90% level

Note: Other regressors for the OLS estimation also include – type of residence, geographic region, marital status, gender, age, age squared, industry and sector controls. The complete results of the OLS estimation are presented in the Appendix Table E9.

Note: Other regressors for the Two Stage Heckman estimation also include-type of residence, geographic region, marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household, geographical region. The complete results of the OLS estimation are presented in the Appendix Table E13.

Table 17. Ukraine: Returns to Education. Augmented Specification 1999-2003. Males Only

VARIABLE	1999 Coefficient (Standard Error)	2000 Coefficient (Standard Error)	2001 Coefficient (Standard Error)	2002 Coefficient (Standard Error)	2003 Coefficient (Standard Error)
OLS Augmented Specification					
ELEMENTARY	-0.217*	0.076	-0.086	-0.044	-0.119***
EDUCATION	(0.074)	(0.069)	(0.061)	(0.055)	(0.061)
VOCATIONAL	0.001	0.117*	0.085**	0.157*	-0.002
TRAINING	(0.057)	(0.043)	(0.038)	(0.033)	(0.032)
	0.136	0.281*	0.198*	0.239*	0.177*
SECONDARY SPECIAL	(0.054)	(0.044)	(0.040)	(0.034)	(0.035)
	0.024	0.316*	0.121	0.401*	0.175***
INCOMPLETE HIGHER	(0.119)	(0.077)	(0.084)	(0.154)	(0.096)
	0.509*	0.600*	0.454*	0.446*	0.409*
HIGHER EDUCATION	(0.063)	(0.048)	(0.045)	(0.038)	(0.037)
Augmented Specification. Two Stage Heckman Estimation					
ELEMENTARY	-0.186*	0.004	-0.100***	-0.037	-0.105**
EDUCATION	(0.058)	(0.060)	(0.054)	(0.049)	(0.054)
VOCATIONAL	-0.008	0.117**	0.072**	0.121*	0.027
TRAINING	(0.045)	(0.038)	(0.035)	(0.030)	(0.028)
	0.065	0.250*	0.183*	0.187*	0.187*
SECONDARY SPECIAL	(0.044)	(0.039)	(0.036)	(0.031)	(0.032)
	0.082	0.276*	0.119	0.265***	0.193**
INCOMPLETE HIGHER	(0.094)	(0.068)	(0.076)	(0.138)	(0.086)
	0.441*	0.543*	0.461*	0.419*	0.427*
HIGHER EDUCATION	(0.052)	(0.044)	(0.041)	(0.036)	(0.033)

Note: * means significant at 99% level, ** at 95% level, *** at 90% level

Note: Other regressors for the OLS estimation also include – type of residence, geographic region, marital status, age, age squared, industry and sector controls. The complete results of the OLS estimation are presented in the Appendix Table E10.

Note: Other regressors for the Two Stage Heckman estimation also include-type of residence, geographic region, marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household, geographical region. The complete results of the OLS estimation are presented in the Appendix Table E14.

Table 18. Ukraine: Returns to Education. Augmented Specification 1999-2003. Females Only

	1999	2000	2001	2002	2003
VARIABLE	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)
Augmented Specification. OLS					
ELEMENTARY	-0.045	-0.138*	-0.118**	0.084	-0.155*
EDUCATION	(0.076)	(0.067)	(0.060)	(0.063)	(0.055)
VOCATIONAL	0.109***	0.108*	0.100*	0.008	-0.027
TRAINING	(0.058)	(0.041)	(0.036)	(0.034)	(0.030)
SECONDARY	0.249*	0.185*	0.205*	0.190*	0.084*
SPECIAL	(0,047)	(0.035)	(0.031)	(0.028)	(0.028)
INCOMPLETE	0.299*	0.169*	0.162*	0.287*	0.212*
HIGHER	(0.097)	(0.062)	(0.057)	(0.096)	(0.071)
HIGHER	0.587*	0.544*	0.474*	0.483*	0.371*
EDUCATION	(0.054)	(0.039)	(0.035)	(0.034)	(0.031)
Augmented Specification. Two Stage Heckman Estimation					
ELEMENTARY	0.032	-0.076	-0.111**	0.068	-0.086***
EDUCATION	(0.058)	(0.057)	(0.052)	(0.055)	(0.05)
VOCATIONAL	0.149*	0.120*	0.096*	-0.004	-0.005
TRAINING	(0.045)	(0.036)	(0.032)	(0.03)	(0.028)
SECONDARY	0.223*	0.185*	0.163*	0.159*	0.095*
SPECIAL	(0.036)	(0.030)	(0.027)	(0.025)	(0.025)
INCOMPLETE	0.305*	0.171*	0.171*	0.207**	0.224*
HIGHER	(0.075)	(0.053)	(0.050)	(0.086)	(0.065)
HIGHER	0.497*	0.508*	0.450*	0.450*	0.385*
EDUCATION	(0.043)	(0.034)	(0.031)	(0.03)	(0.028)

Note: * means significant at 99% level, ** at 95% level, *** at 90% level
Note: Other regressors for the OLS estimation also include – type of residence, geographic region, marital status, age, age squared, industry and sector controls. The complete results of the OLS estimation are presented in the Appendix Table E11.
Note: Other regressors for the Two Stage Heckman estimation also include-type of residence, geographic region, marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household, geographical region. The complete results of the OLS estimation are presented in the Appendix Table E15

While returns to higher education in 1999 are consistent with results from other transitional economies, the subsequent decrease is not consistent with other authors' findings. The first year of the analysis period refers to the middle of the transitional

period.[31] However, the Ukrainian transition to the market system began only in 1992 and initial macroeconomic stabilization was achieved only in 1996.[32] Therefore, in 1999, Ukraine was at a stage in the transition similar to1995-1996 in Central Europe and Baltic states. As such, returns to education in 1999 were comparable to returns to education in other transitional economies a couple of years earlier. This reflects that Ukraine was undergoing initial stages of wage adjustment as discussed by Munich, Svejnar, and Terrell (2005) and Fleisher, Sabirianova, and Wang (2005). To the best of our knowledge, there are no studies that estimate returns to levels of education in Ukraine in the pre-transition period.

Returns to Education: Ukraine vs. Lithuania 2000.

Tables 19 and 20 present results from specifications (1) through (4) with and without controlling for selection into the labor market for Lithuania. The results are similar to that obtained by Hazans (2003) using a different Lithuanian survey dataset.[33] In our analysis returns to higher education relative to secondary education are between 61 and 63 percent for different gender groups. Hazans (2003) study reports 59 percent for the pooled sample.

[31] Transitional period here refers to the overall transition of Eastern European and FSU countries and not specifically Ukrainian transition

[32]In Central Europe and Baltic states transition to a market economy began in 1989 and macroeconomic stabilization was achieved much faster.

[33] Hazans (2003) uses Lithuanian Labor Force Survey data. Specification of the wage equation used is similar to HCS specification without accounting for selection into the labor market. In addition to the same explanatory variables used in this work, Hazanas (2003) also includes controls for ethnicity, type of economic activity, and type of contracts. These variables are not available in the Household Budget Survey that we are using.

Table 19. Lithuania: Returns to Education. Human Capital Specification 2000

Variable	Males and Females	Males Only	Females Only
OLS Human Capital Specification			
ELEMENTARY	-0.184*	-0.195*	-0.116**
	(0.032)	(0.042)	(0.050)
SECONDARY SPECIAL	0.178*	0.154*	0.182*
	(0.020)	(0.031)	(0.026)
HIGHER EDUCATION	0.632*	0.606*	0.628*
	(0.024)	(0.038)	(0.029)
Human Capital Specification. Two Stage Heckman Estimation			
ELEMENTARY	-0.161*	-0.171*	-0.098**
	(0.030)	(0.039)	(0.047)
SECONDARY SPECIAL	0.176*	0.158*	0.173*
	(0.020)	(0.029)	(0.024)
HIGHER EDUCATION	0.620*	0.587*	0.629*
	(0.023)	(0.037)	(0.028)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Note: Other regressors for the OLS estimation also include – marital status, age, age squared. The complete results of the OLS estimation are presented in the Appendix Table E4.

Note: Other regressors for the Two Stage Heckman estimation also include-marital status, gender, age, age squared. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household. The complete results of the OLS estimation are presented in the Appendix Table E8

Returns to education levels are generally similar in Lithuania to that in Ukraine in 2000. For all four specifications of the earnings equation, the relative returns to elementary and secondary special education are slightly lower in Lithuania in 2000. Relative returns to higher education are identical to that in Ukraine using the simple Human Capital specification. However, unlike in the Ukrainian case, this number does not change when selection into the labor market is accounted for using either specification. (See Table 13 for the Ukrainian results and Table 19 for the Lithuanian results) These results imply different composition of the unemployed and dynamics of LFP decisions in the two countries. For Lithuania, the sample of workers whose wages are observed appears to be representative of the overall sample, while it is not the case in

Ukraine. Compared to Ukraine, the Lithuanian economy is characterized by a relatively high pace of enterprise restructuring, high wages, and high unemployment. In his detailed analysis of unemployment in the Lithuanian labor market, Rutkowski (2003) suggests that majority of the unemployed workers gain this status because of fast restructuring of the enterprises. Consistent with results of Rutkowski (2003) it is shown in the next Chapter that overall wages are high in Lithuania by transitional standards. The overall wage dispersion is low and positively skewed, which is in part attributed to the high minimum wage. Moreover, Rutkowski (2003) shows that growth in wages is higher than growth in productivity achieved by laying off the excessive labor force in the process of enterprise restructuring. Since the probability of being laid off is much higher in Lithuania, the observed characteristics of workers who became unemployed are expected to be more similar. Thus, especially given the compact and positively skewed wage distribution, large changes in wage outcomes will not be expected in the case where the currently unemployed became employed. In Ukraine, where enterprise restructuring is taking place at a much slower pace and the labor market overall is much less dynamic, the probability of being laid off is much less. It is expected that the unemployed have different characteristics than the employed.

The results of the Heckman two stage wage estimation are presented in the Tables E5 through E8. The "head of the household" variable is the only significant predictor of participation in the labor market in a full sample. Given the extremely small size of Lithuanian households, more than half of the respondents identified themselves as the head of the household (see Table 9). Moreover, given the small household size, being the head of the household is extremely correlated with age and the Lithuanian labor market is

characterized by high youth unemployment (see Chapter 3), thus explaining the result. On the contrary, in Ukraine, factors such as number of small children in the household, number of pensioners in the household, and geographic location, are also important determinants of being employed. At the same time, for Lithuanian females the coefficient for the number of children under seven in the household is significant only at 95 percent level and is much smaller in magnitude than the same coefficient in Ukraine.

Table 20. Lithuania: Returns to Education. Augmented Specification 2000

Variable	Males and Females	Males Only	Females Only
OLS Human Capital Specification			
ELEMENTARY	-0.108*	-0.109*	-0.054
	(0.030)	(0.040)	(0.050)
SECONDARY	0.073*	0.082*	0.052**
SPECIAL	(0.020)	(0.030)	(0.026)
HIGHER	0.346*	0.344*	0.322*
EDUCATION	(0.029)	(0.046)	(0.036)
Augmented Specification. Two Stage Heckman Estimation			
ELEMENTARY	-0.094*	-0.100*	-0.039
	(0.029)	(0.038)	(0.044)
SECONDARY	0.075*	0.086*	0.051**
SPECIAL	(0.019)	(0.029)	(0.025)
HIGHER	0.349*	0.345*	0.343*
EDUCATION	(0.028)	(0.044)	(0.034)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Note: Other regressors for the OLS estimation also include – marital status, age, age squared, and occupational controls. The complete results of the OLS estimation are presented in the Appendix Table E12.

Note: Other regressors for the Two Stage Heckman estimation also include-marital status, gender, age, age squared, and occupational controls. The regressors in the selection equation include – number of children in the household under 7, head of household, non-labor income, number of pensioners in the household. The complete results of the OLS estimation are presented in the Appendix Table E16

At the same time, the observed decline in relative returns to higher education when the effect of education in allocating workers into low or high-paying occupations is excluded is much higher than the corresponding decline resulting from the similar effect for industries in Ukraine. This implies that the premiums associated with different occupations in Lithuania are higher than premiums associated with different industries in Ukraine.

Lithuanian females received slightly higher returns to their educational levels than Lithuanian males in 2000.[34] However, when occupation is controlled for, returns equate across genders and males receive even slightly higher premiums for holding university degrees.[35] These results indicate that one of the positive effects of higher education for Lithuanian women is employment in higher paying occupations rather than higher pay within an occupation. Similar to the pooled specification estimation, there is no change in relative educational earning profiles by gender when selection into the labor market is controlled for.

Returns to Education across Sectors

In the previous section it was established that as transition in Ukraine progressed, returns to education and especially to higher education diminished and more so for women than for men. It was also established that returns to schooling in Lithuania are similar to that in Ukraine in 2000 when HCS is used. However, when selection into the labor market is controlled for, the results change in Ukraine. On the other hand, in

[34] This result is also consistent with Hazans (2003)
[35] This result is also consistent with Hazans (2003)

Lithuania controlling for selection does not change the results. The purpose of this section is to investigate whether returns to education are different between public and private sectors.[36]

While wages in the state sector are still set according to specific grids, these restrictions no longer apply to the wage setting process in the private sector. For that reason, returns to human capital in the private sector are expected to be higher.

In order to test this hypothesis, each country's sample is divided into two groups- those who work for the public sector and those employed in the private sector. As discussed in the data section, there are different types of business ownership in Ukraine. Any form of ownership other than public is considered to be private.

Tables 21 and 22 present the results of estimating the HCS equation for sub-samples consisting of males, females, and both genders combined for Ukraine. As evident from the results, in Ukraine initially returns to education are higher in the private sector but convergence is observed by the end of the period. Returns to education in both sectors decreased over the period of analysis. These results are somewhat counter intuitive since we would expect relatively higher and increasing returns to education in the private sector as transition progresses. Indeed, previous studies have indicated higher returns to education in the private sector relative to the public sector (see Munich, Svenjnar, and Terrell [2005a] for Czech Republic).

[36] Some researchers explore this issue one step further and subdivide non-public firms into privatized firms that existed under the old system as state firms and newly created de-novo firms (Boeri and Terrell 2002; Flanagan Wage structure in the transition of the Czech economy 1995; Konings and Walsh 1999; Munich, Svejnar, and Terrell 2005). Unfortunately, this information is not available in my dataset

Table 21. Ukraine: Returns to Education. Public Sector. 1999- 2003

	1999	2000	2001	2002	2003
			Males and Females		
ELEMENTARY EDUCATION	-0.179*	0.135*8	-0.134**	-0.032	-0.211*
	(0.067)	(0.067)	(0.064)	(0.063)	(0.059)
VOCATIONAL TRAINING	0.040	0.155*	0.034	0.123*	0.044
	(0.050)	(0.040)	(0.035)	(0.033)	(0.029)
SECONDARY SPECIAL	0.197*	0.243*	0.167*	0.204*	0.126*
	(0.042)	(0.035)	(0.059)	(0.029)	(0.027)
INCOMOPLETE HIGHER	0.211**	0.221*	0.170*	0.270*	0.182*
	(0.087)	(0.057)	(0.059)	(0.098)	(0.068)
HIGHER EDUCATION	0.526*	0.527*	0.377*	0.453*	0.388*
	(0.044)	(0.036)	(0.032)	(0.031)	(0.027)
			Males		
ELEMENTARY EDUCATION	-0.264*	-0.048	-0.072	0.033	-0.255**
	(0.097)	(0.108)	(0.106)	(0.100)	(0.101)
VOCATIONAL TRAINING	0.026	0.250*	0.030	0.167*	0.046
	(0.071)	(0.066)	(0.057)	(0.053)	(0.045)
SECONDARY SPECIAL	0.166*	0.323*	0.171*	0.242*	0.162*
	(0.066)	(0.063)	(0.056)	(0.052)	(0.048)
INCOMOPLETE HIGHER	-0.045**	0.435*	0.153	0.254	0.173
	(0.147)	(0.103)	(0.112)	(0.205)	(0.124)
HIGHER EDUCATION	0.458*	0.578*	0.352*	0.430*	0.327*
	(0.068)	(0.063)	(0.057)	(0.053)	(0.046)
			Females		
ELEMENTARY EDUCATION	-0.056	-0.176*	-0.201*	-0.029	-0.166**
	(0.094)	(0.082)	(0.076)	(0.082)	(0.071)
VOCATIONAL TRAINING	0.044	0.092	0.047	0.073***	0.055
	(0.070)	(0.049)	(0.043)	(0.043)	(0.037)
SECONDARY SPECIAL	0.225*	0.195*	0.165*	0.188*	0.115*
	(0.054)	(0.040)	(0.035)	(0.034)	(0.032)
INCOMOPLETE HIGHER	0.384*	0.102	0.181*	0.265**	0.187**
	(0.106)	(0.066)	(0.065)	(0.102)	(0.078)
HIGHER EDUCATION	0.584*	0.499*	0.395*	0.475*	0.436*
	(0.057)	(0.042)	(0.037)	(0.035)	(0.033)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Note: Other regressors also include – type of residence, geographic region, marital status, gender, age, age squared.

Earnings experience in public and private sectors differed for males and females. Females experienced higher returns to university degrees than males in the public sector. This is not surprising since law enforcement is stricter in public sector. The general decrease in returns to higher education in the public sector over the analysis period is from 58 to 44 percent for females and from 46 to 33 percent for males. In the private sector the earnings of educated females were lower at the start of the analysis period and deteriorated faster than that for males. In 2003, a university educated female employed in the private sector received only 28 percent more on average than her secondary school educated counterpart. On the other hand, the corresponding number for males was 47 percent. The higher returns to education for females in the public sector relative to those in the private sector could be attributed, in part, to more discriminatory practices in the private sector. Further, public sector wages are still determined by wage grids, which makes it harder to discriminate.[37]

Comparing relative returns to levels of education in Lithuania in 2000, those with university degrees or elementary education faired slightly better in the public sector. Relative returns for males are slightly higher except for those with elementary education employed in the private sector. Lithuanian university graduates received higher relative premiums compared to Ukrainian university graduates in either sector while the situation is reversed for those with secondary special degrees.

[37] It is much harder to openly discriminate against females in the public sector since as mentioned previously wages are set according to specific wage grids that take into account occupation, grade within occupation, educational level, and tenure. At the same time, labor law enforcement is harder in the private sector. It is much easier for example to pay "in envelopes".

Table 22. Ukraine: Returns to Education. Private Sector. 1999- 2003

	1999	2000	2001	2002	2003
			Males and Females		
	-		-		
ELEMENTARY	0.217**	-0.110	0.156**	-0.087	-0.213*
EDUCATION	(0.089)	(0.076)	(0.064)	(0.061)	(0.063)
VOCATIONAL	0.140**	0.062	0.163*	0.090**	-0.023*
TRAINING	(0.070)	(0.049)	(0.043)	(0.037)	(0.036)
	0.269*	0.274*	0.270*	0.233*	0.141*
SECONDARY SPECIAL	(0.064)	(0.0474)	(0.042)	(0.036)	(0.038)
INCOMOPLETE	0.201	0.292*	0.187**	0.421*	0.255*
HIGHER	(0.142)	(0.094)	(0.085)	(0.153)	(0.105)
	0.618*	0.558*	0.540*	0.377*	0.388*
HIGHER EDUCATION	(0.082)	(0.056)	(0.051)	(0.044)	(0.042)
			Males		
	-				-
ELEMENTARY	0.259**	-0.020*	0.175**	-0.122*	0.192**
EDUCATION	(0.118)	(0.099)	(0.084)	(0.076)	(0.085)
VOCATIONAL	0.057*	0.023	0.156*	0.191*	0.015*
TRAINING	(0.093)	(0.065)	(0.057)	(0.048)	(0.048)
	0.175**	0.301*	0.283*	0.286*	0.234*
SECONDARY SPECIAL	(0.092)	(0.068)	(0.061)	(0.051)	(0.054)
INCOMOPLETE	0.211	0.306**	0.188	0.573**	0.190
HIGHER	(0.198)	(0.127)	(0.134)	(0.258)	(0.156)
	-0.619*	0.568*	0.531*	0.362*	0.465*
HIGHER EDUCATION	(0.116)	(0.077)	(0.073)	(0.059)	(0.059)
			Females		
					-
ELEMENTARY	-0.126	-0.240**	-0.126	0.083	0.236**
EDUCATION	(0.136)	(0.118)	(0.100)	(0.100)	(0.092)
VOCATIONAL	0.286*	0.143***	0.156**	-0.068	-0.064
TRAINING	(0.108)*	(0.074)	(0.063)	(0.057)	(0.053)
	0.383*	0.233*	0.254*	0.178*	0.035
SECONDARY SPECIAL	(0.089)	(0.065)	(0.057)	(0.050)	(0.051)
INCOMOPLETE	0.231**	0.250*	0.126*	0.368**	0.318**
HIGHER	(0.204)	(0.138)	(0.107)	(0.186)	(0.022)
	0.640*	0.562*	0.534*	0.390*	0.280*
HIGHER EDUCATION	(0.114)	(0.080)	(0.070)	(0.065)	(0.059)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Note: Other regressors also include – type of residence, geographic region, marital status, gender, age, age squared.

Table 23. Lithuania: Returns to Education. Public vs. Private Sector. 2000

	Males and Females	Males	Females
		Public Sector	
ELEMENTARY EDUCATION	-0.150*	-0.134**	-0.160*
	(0.046)	(0.064)	(0.070)
SECONDARY SPECIAL	0.166*	0.159*	0.167*
	(0.027)	(0.044)	(0.035)
HIGHER EDUCATION	0.667*	0.709*	0.641*
	(0.029)	(0.049)	(0.036)
		Private Sector	
ELEMENTARY EDUCATION	-0.344*	-0.385*	-0.233*
	(0.045)	(0.057)	(0.071)
SECONDARY SPECIAL	0.203*	0.197*	0.184*
	(0.030)	(0.043)	(0.040)
HIGHER EDUCATION	0.664*	0.676*	0.615*
	(0.040)	(0.058)	(0.053)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level
Note: Other regressors also include – marital status, gender, age, age squared.

Comparison in Returns to Soviet vs. Market System Education

One hypothesis about returns to education in transitional economies is based on the belief that wage structures were compressed by the planners to achieve an equalized distribution of income. Consequently, education was undervalued in the communist system. Therefore, once wage determination is left to the market forces, returns to education should increase following the adjustment of wages to marginal products. Another hypothesis is that education and training acquired under communist rule are inadequate in a new market economy. Skills/education acquired under communism were too specialized and usually trained workers for specific production processes and were

not easily transferable across jobs, industries, and occupations (Boeri and Terrell 2002). Following this hypothesis, returns to education should decline in transition. However, following the transformation of the economy, there are changes in educational systems of transitional countries including introduction of new fields of the study such as finance, marketing as well as different academic curricula. Assuming that educational systems adjusted well to fit labor demands of the new market economies, the second hypothesis implies that individuals educated and trained under different systems would receive different returns to their education. Older workers educated and trained under the communist system are expected to receive lower returns to their education than their younger counterparts.

To test these hypotheses, the sample is subdivided into three different cohorts. The first cohort consists of those born before 1965, and represents those with "old" education. The youngest members of this cohort are 34 years old in the beginning and 38 years old in the end of the analysis period and were 27 years old when the economic transition began. Consequently, even those who pursued university education completed before the collapse of the former Soviet Union. Members of the second cohort include those born between 1965 and 1975. This group is mixed. Some members studied under the old curriculum, some had studied under programs where some "new" courses were already introduced. The third cohort consists of those born after 1975 representing those with the "new" education. This cohort includes those trained in "new" fields such as accounting, management, and marketing. A HCS equation is estimated for all three cohorts.

Returns to education across all cohorts have decreased in Ukraine (Tables 24-26). Females in all groups experienced greater decline than males in the same cohorts. While the youngest cohort regardless of gender continues to remain the least paid despite their "new" education, this group also experienced the smallest relative decline in returns to their education over the analysis period. The greatest decline to all types of education is experienced by females, regardless of the cohort. Among the levels of education, it is university degree that lost the most value. The difference between relative returns to different types of education decreases over the analysis period for all age groups. The results are consistent with the results of earlier sections of this dissertation. The most striking result is the decrease in relative returns to higher education especially for females in the first cohort. There is no strong evidence that younger workers benefited disproportionately from being educated under a new market system. This result is consistent with results of previous similar studies. Munich, Svejnar, and Terrel (2005) find that there is no difference in returns to "new" and "old" education in Czech Republic; Noorkiv, et al. (1998) for Estonia; Filler, et al. Filer, Jurajda, and Planovsky (1999) for Czech Republic and Slovakia; and Campos and Jolliffe (2002) for Hungary. However, the above mentioned research finds that younger workers do not benefit disproportionately from changes in returns to their "new" education because members of all age groups experienced increases in return to their education. On the contrary, our results indicate that in Ukraine members of all cohorts lost in terms of relative returns to education over analysis period including the youngest group.

Table 24. Ukraine: Returns to Education by Cohort. Males and Females. 1999-2003

	1999	2000	2001	2002	2003
			Cohort 1		
ELEMENTARY	-0.213*	-0.164*	-0.197*	-0.113**	-0.219*
EDUCATION	(0.002)	(0.005)	(0.000)	(0.038)	(0.000)
VOCATIONAL	0.121**	0.122*	0.113*	0.111*	0.023
TRAINING	(0.026)	(0.001)	(0.001)	(0.000)	(0.415)
SECONDARY	0.307*	0.297*	0.249*	0.257*	0.159*
SPECIAL	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INCOMPLETE	0.234***	0.302*	0.223*	0.405*	0.196**
HIGHER	(0.057)	(0.000)	(0.001)	(0.001)	(0.035)
HIGHER	0.718*	0.588*	0.517*	0.510*	0.427*
EDUCATION	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
			Cohort 2		
ELEMENTARY EDUCATION	-0.367**	-0.149	-0.326*	-0.091	-0.200***
	(0.012)	(0.282)	(0.005)	(0.386)	(0.064)
VOCATIONAL	-0.004	-0.022	0.075	0.026	-0.078
TRAINING	(0.972)	(0.789)	(0.293)	(0.671)	(0.194)
SECONDARY	0.233**	0.215*	0.232*	0.202*	0.158**
SPECIAL	(0.027)	(0.008)	(0.001)	(0.001)	(0.010)
INCOMPLETE	0.181	0.196***	0.307*	0.343***	0.434*
HIGHER	(0.247)	(0.085)	(0.007)	(0.046)	(0.005)
HIGHER	0.423*	0.515*	0.455*	0.282*	0.403*
EDUCATION	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
			Cohort 3		
ELEMENTARY	-0.309**	0.157	-0.305**	-0.112	-0.405*
EDUCATION	(0.034)	(0.514)	(0.049)	(0.325)	(0.000)
VOCATIONAL	0.026	0.123	0.146	0.275*	-0.031
TRAINING	(0.796)	(0.406)	(0.183)	(0.000)	(0.633)
SECONDARY	0.086	0.251**	0.288**	0.190**	0.102
SPECIAL	(0.35)	(0.090)	(0.014)	(0.013)	(0.116)
INCOMPLETE	0.414**	0.373	0.061	0.131	0.176**
HIGHER	(0.015)	(0.058)	(0.663)	(0.549)	(0.095)
HIGHER	0.531*	0.737	0.348***	0.297**	0.349*
EDUCATION	(0.000)	(0.072)	(0.081)	(0.016)	(0.000)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level
Other regressors include type of residence, geographic region, marital status, gender, age, age squared

Table 25. Ukraine: Returns to Education by Cohort. Males Only. 1999-2003

	1999	2000	2001	2002	2003
			Cohort 1		
ELEMENTARY EDUCATION	-0.243**	-0.052	-0.155**	-0.072	-0.215**
	(0.016)	(0.533)	(0.048)	(0.340)	(0.013)
VOCATIONAL TRAINING	0.086	0.117**	0.120**	0.189*	0.058
	(0.276)	(0.030)	(0.013)	(0.000)	(0.167)
SECONDARY SPECIAL	0.232*	0.342*	0.243*	0.314*	0.237*
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
INCOMPLETE HIGHER	0.149	0.434*	0.262**	0.319	0.168
	(0.426)	(0.000)	(0.028)	(0.117)	(0.298)
HIGHER EDUCATION	0.654*	0.583*	0.483*	0.472*	0.449*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
			Cohort 1		
ELEMENTARY EDUCATION	-0.603*	-0.015	-0.373**	-0.058	-0.188
	(0.002)	(0.939)	(0.015)	(0.689)	(0.235)
VOCATIONAL TRAINING	-0.190	0.067	-0.015	0.089	-0.072
	(0.189)	(0.583)	(0.880)	(0.298)	(0.427)
SECONDARY SPECIAL	0.120	0.388*	0.148	0.176***	0.236**
	(0.403)	(0.003)	(0.160)	(0.063)	(0.016)
INCOMPLETE HIGHER	-0.113	0.340***	0.193	0.559	0.404
	(0.650)	(0.068)	(0.287)	(0.103)	(0.126)
HIGHER EDUCATION	0.344***	0.655*	0.415*	0.288*	0.407*
	(0.065)	(0.000)	(0.000)	(0.005)	(0.000)
			Cohort 1		
ELEMENTARY EDUCATION	-0.443**	0.013	-0.361	-0.362**	-0.450*
	(0.024)	(0.970)	(0.116)	(0.011)	(0.001)
VOCATIONAL TRAINING	0.005	0.076	0.147	0.347*	-0.031
	(0.970)	(0.718)	(0.357)	(0.000)	(0.699)
SECONDARY SPECIAL	0.090	0.369**	0.598*	0.244**	0.073
	(0.521)	(0.096)	(0.002)	(0.026)	(0.425)
INCOMPLETE HIGHER	0.289	0.611**	0.012	0.307	0.116
	(0.267)	(0.043)	(0.960)	(0.690)	(0.457)
HIGHER EDUCATION	0.612*	1.480**	0.340	0.298***	0.308*
	(0.000)	(0.023)	(0.298)	(0.095)	(0.004)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level
Other regressors include type of residence, geographic region, marital status, gender, age, age squared

Table 26. Ukraine: Returns to Education by Cohort. Females Only. 1999-2003

	1999	2000	2001	2002	2003
			Cohort 1		
ELEMENTARY EDUCATION	-0.148	-0.257*	-0.243*	-0.049	-0.235*
	(0.121)	(0.001)	(0.001)	(0.544)	(0.001)
VOCATIONAL TRAINING	0.153**	0.144*	0.086**	0.019	-0.01
	(0.041)	(0.003)	(0.046)	(0.644)	(0.788)
SECONDARY SPECIAL	0.373*	0.263*	0.231*	0.218*	0.098*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)
INCOMPLETE HIGHER	0.334	0.216*	0.154**	0.489*	0.239**
	(0.035)	(0.006)	(0.048)	(0.001)	(0.024)
HIGHER EDUCATION	0.781*	0.599*	0.515*	0.533*	0.397*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
			Cohort 2		
ELEMENTARY EDUCATION	0.033	-0.293	-0.165	-0.170	-0.224
	(0.887)	(0.130)	(0.356)	(0.264)	(0.116)
VOCATIONAL TRAINING	0.304	-0.043	0.166	-0.053	-0.048
	(0.105)	(0.685)	(0.104)	(0.553)	(0.522)
SECONDARY SPECIAL	0.403**	0.029	0.286*	0.180**	0.073
	(0.012)	(0.765)	(0.003)	(0.017)	(0.323)
INCOMPLETE HIGHER	0.438**	0.020	0.343**	0.200	0.435**
	(0.036)	(0.882)	(0.016)	(0.270)	(0.012)
HIGHER EDUCATION	0.528*	0.342*	0.462*	0.261*	0.382*
	(0.005)	(0.001)	(0.000)	(0.002)	(0.000)
			Cohort 3		
ELEMENTARY EDUCATION	-0.058	0.573***	-0.068	0.495***	-0.185
	(0.794)	(0.083)	(0.746)	(0.010)	(0.263)
VOCATIONAL TRAINING	0.024	0.205	0.170	0.103	0.023
	(0.869)	(0.331)	(0.250)	(0.412)	(0.821)
SECONDARY SPECIAL	0.075	0.212	0.113	0.158	0.136
	(0.546)	(0.305)	(0.417)	(0.125)	(0.136)
INCOMPLETE HIGHER	0.470**	0.135	0.047	0.160	0.242***
	(0.037)	(0.603)	(0.768)	(0.471)	(0.089)
HIGHER EDUCATION	0.470*	-0.100	0.411***	0.349**	0.428*
	(0.001)	(0.848)	(0.085)	(0.035)	(0.000)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Other regressors include type of residence, geographic region, marital status, gender, age, age squared

Table 27. Lithuania: Returns to Education by Age Group. Males and Females. 2000

	Males and Females	Males	Females
		Cohort 1	
ELEMENTARY EDUCATION	-0.326* (0.055)	-0.382* (0.07)	-0.189* (0.089)
SECONDARY SPECIAL	0.152* (0.046)	0.133* (0.067)	0.163* (0.061)
HIGHER EDUCATION	0.616* (0.061)	0.670* (0.094)	0.572* (0.078)
		Cohort 2	
ELEMENTARY EDUCATION	-0.418* (0.095)	-0.464* (0.124)	-0.191 (0.153)
SECONDARY SPECIAL	0.201* (0.040)	0.225* (0.061)	0.158* (0.051)
HIGHER EDUCATION	0.732* (0.049)	0.746* (0.079)	0.709* (0.059)
		Cohort 3	
ELEMENTARY EDUCATION	-0.171* (0.058)	-0.199* (0.075)	-0.195*** (0.089)
SECONDARY SPECIAL	0.166* (0.051)	0.097* (0.074)	0.214* (0.068)
HIGHER EDUCATION	0.598* (0.057)	0.603* (0.080)	0.533* (0.077)

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

How do returns to education compare in Lithuania and Ukraine in 2000? Estimation results for Lithuania are presented in Table 27. Unlike in Ukraine, the members of the first cohort (oldest workers) in Lithuania have the lowest return to their university education while members of the third cohort (youngest workers with "new" education) have the highest. Hence, there is evidence that "new" higher education in Lithuania pays more than "old" education. Consistent with Ukrainian results, males of all

cohorts have higher return to university education. However, the gender difference between returns to higher education is larger in Ukraine.

Chapter Conclusion

Among the findings of the previous sections, an overall decrease in return to human capital is counterintuitive. The returns to human capital uniformly decrease for all age groups and across all sectors. The most striking result is the decrease in returns to university education in Ukraine over the analysis period. It is contrary to the belief that returns to education should increase once wages are no longer determined by planners. This also is not consistent with what is observed in a number of transitional economies (see the beginning of this Chapter for the list of literature). Why do returns to higher education decline over the period of 1999 to 2003 in Ukraine?

According to economic theory, returns to education are determined by the forces of supply and demand. On the supply side of human capital, the Ukrainian population is well educated. In my sample, about 20 percent of respondents have higher education. The national Ukrainian Census of 2001 indicates that 29 percent of the population had at least some post-secondary education. These figures compare favorably to the OECD average of university graduates of 23 percent (OECD 2003). Moreover, as mentioned previously, the pursuit of higher education is increasing disproportionately. The number of university students has doubled in the last decade.[38] In comparison, the proportion of the population with tertiary education is smaller in a number of more successful transitional economies where there is documented increase in returns to higher education.

[38] (State Statistics Committee of Ukraine 2003)

For example, in Czech Republic, a country that exhibited large and rapid increase in returns to higher education (Munich, Svejnar, and Terrell 2005 b), the proportion of the population with tertiary education is only 12 percent.

While the quality of education in countries of the former Communist block was questioned, the results of the Third International Math and Science Study (TIMSS) demonstrate favorable performance by students from nine former socialist countries including Ukraine (Micklewright 1999).[39] Children in Ukraine achieved mean scores in both math and science that were above the international average and ahead of children in such countries as England, Germany, and the United States.

On the demand side, several factors affect demand for human capital. First, technological change has been associated with increased demand for skilled labor. Given Ukraine's earlier isolation, abundance of educated labor, and increase of technological innovation around the world, increase in demand for skilled labor could be expected as the country opened up to foreign competition and investment. However, Foreign Direct Investment (FDI) rates have been low in Ukraine throughout the transition period even compared to other transitional economies. This negatively affects technological change and the associated shift in demand for skills. Statistics provide little evidence of the shift towards skill-intensive exports. On the contrary, Ukrainian export revenues consist almost exclusively of natural resources and raw materials despite the low wage cost (EBRD 2003)

Second, there is international evidence that upward shift in demand for skills occurs as a result of technological progress not necessarily related to trade (Berman, Bound, and Machin 1998; Richardson 1995). In comparison to other transitional

[39] TIMSS is based at Boston College, http://timss.bc.edu, accessed May 2004

countries, there was a disproportionately high concentration of heavy industrial enterprises and agricultural production in Ukraine. Consequently, at the beginning of the transition, the Ukrainian economy was dominated by huge and frequently inefficient socialist industrial enterprises more so than other transitional countries. The privatization process not only started later but also was proceeding at the lower speed. For example, 65 percent of the Lithuanian economy was privatized by 1995 relative to 45 percent of the Ukrainian economy. Moreover, as numerous accounts indicate, the privatization process in Ukraine was extremely corrupt allowing the few to acquire the country's wealth. At the very beginning of transition, these large industrial enterprises faced soft budget constraints where unprofitable enterprises were given government subsidies not to close. Thus, enterprises did not have incentives to compete and implement new technological and structural changes but rather stay unprofitable to keep receiving state funds.

Third, there is an argument put forth by Sabirianova-Peter (2003) that "in a transforming economy, organizational changes are not necessarily related to technological development and could have an independent effect on skill prices." She states that in a process of economic transition with old socialist firms transforming into new market entities there is suddenly an increasing need for "market-needed" professionals such as accountants, marketers, tax advisors, financial planners, etc. As a result of the increased demand for these "new" skilled occupations, skilled workers are expected to earn higher wages. However, in Ukraine there is little evidence of old socialist firms transforming into market organizations with "different incentives,

management practices, ownership control, and organizational innovations." [40] Share of industry and agriculture in GDP still remains high, resembling the Soviet economy. There is also no evidence of much labor reallocation from "old" to "new" economic sectors (Table 12). As Konings and Walsh (1999) conclude, Ukraine is still only in the beginning of the restructuring process.

Other than forces of demand and supply, institutional factors such as various labor market policies play an important role in wage determination. As was discussed in earlier chapters of the dissertation, Ukrainian employers face high payroll taxes, high benefit payments, and high costs associated with laying of workers. Consequently, Ukrainian firms do not have incentives to lay off excess labor and pay higher salaries to the remaining workers. Instead, there are financial incentives encouraging labor hoarding and low wage payment, which further impedes technological and organizational change and demand for higher education and skills.

Earlier work by Brainerd (1998) suggested that the degree of overall wage dispersion in Ukraine is high relative to other transitional economies where the overall wage dispersion was measured as a ratio of minimum to average wage. However, this ratio increased substantially after 1996 (See Figure 1) and is now comparable to other transitional economies. Most importantly, in the Ukrainian economy minimum wage acts not only as a lower boundary on wages but also a base wage in the overall wage system. Wages as well as social benefits in the overall economy are tied to the minimum wage. Therefore, the minimum wage plays a role of an equalizing wage policy, which further prevents increase in returns to higher education. In summary, abundance of highly educated workers in conjunction with lack of apparent technological and organizational

[40] This terminology is borrowed from Sabirianova Peter (2003)

change, institutional factors that take away firms' incentives to compete by advancing production process, and absence of appropriate labor market policies resulted in relatively low and declining returns to human capital.

Another seemingly counterintuitive finding is the higher returns to education in the Lithuanian public sector. Public sector wages are set according to specific grids, while in the private sector the only restriction is the minimum wage legislation. However, in my sample, about one-third of those employed in the private sector report wages below the official minimum wage line. This is likely due to illegal activities in the private sector where employees are paid "in envelopes." This result, although seemingly counterintuitive, is in line with Lithuanian official wage statistics which also indicate higher salaries in the public sector.

Our results also indicate that Ukrainian females experienced a disproportionate decrease in returns to human capital compared to Ukrainian males and that relative position of Ukrainian females is worse than that of Lithuanian females. There are different factors that account for this difference. As discussed earlier, Ukrainian females are still entitled to maternity leave of 3 years while Lithuanian females are entitled only to 70 days before child birth and 56 fifty-six days after. There are still a number of limitations on the type of work females can perform in Ukraine. In Lithuania, even though still in existence, these limitations are fewer and more flexible. Definitely, although aimed at encouraging child birth and protecting females from hard work, this legislation makes females less attractive and costly employees. The effects of this legislation are exacerbated further by higher costs of dismissal faced by employers in both countries. Consistent with this hypothesis is the observed disproportionately large

drop in returns education for females between 30 and 50 years old. In addition, as discussed in the previous Chapter, Lithuania experienced a more uneven privatization pattern, where traditionally male sectors such as manufacturing and construction, were privatized while traditionally female sectors such as education and health were not. However, Lithuanian females actually benefited from this arrangement since wages in general and returns to education are higher in the public sector.

CHAPTER VI

GENDER WAGE DIFFERENTIALS IN UKRAINE AND LITHUANIA

Introduction

As was discussed in the first Chapter, the Soviet government was committed to gender equality in the labor market. Government policies such as generous maternity leave, extensive benefits, free child care and other facilities, and equal rights in the work place facilitated high rates of female labor force participation.[41] Even though there was some documented discrimination against females in the work place and females were over represented in industries such as education and health, Soviet females (including females in Ukraine and Lithuania) fared relatively well in terms of relative wages by international standards.[42]

Since the breakup of the Soviet Union and the beginning of the transition to a market economy, Lithuania and Ukraine have adopted different economic policies as discussed in detail in Chapters II and III. These policies likely affected men and women differently and the outcomes may differ across countries. The purpose of this Chapter is to investigate whether, as a result of different policies, women shared a disproportionately heavier burden of the transition and how gender specific labor market outcomes differ between the two countries. Given the similar economic structure and

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[42] See Brainerd (1998) Chapter III "Women in Transition: Changes in Gender Wage Differentials in Eastern Europe and the Former Soviet Union" Figure 1.

labor market institutions of the two countries before the transition and different reforms implemented by the two countries after the collapse of the former Soviet Union, it should be expected that gender-specific labor market outcomes differed in Lithuania and Ukraine.

This Chapter focuses on relative wages and the overall wage structures and does not consider other labor market outcomes such as employment and occupational segregation. However, it is important to point out that issues of unemployment and occupational segregation do impact women in transition but they are beyond the scope of this dissertation.

Relative Female Wages in Ukraine and Lithuania

The changes in the mean and median female/male wage ratios over time are illustrated in Table 28. Women's relative wage decreased in Ukraine and increased in Lithuania. In fact, the relative female/male wage ratio of 0.84 in Lithuania appears to be comparable to those observed in Scandinavian countries. However, this ratio fell from 0.78 in 1999 to 0.70 in 2003 in Ukraine.[43]

A similar picture is observed in Figure 5 which depicts changes in a female dummy variable in the estimated log wage equations 1, 2, 3, and 4 that pool male and female observations together. The absolute value of the gender penalty using this

[43] Reilly and Newell (2000) investigate gender pay gap in a number of transitional Eastern European countries and FSU republics. Lithuanian females rank favorably compared to other transitional countries in the sample using female/male wage ratio. The only two countries who have higher female/male wage ratio are former Yugoslavia and Slovenia. In the end of the analysis period, Ukrainian gender wage ratio is among the lowest in the sample. The only countries with lower ratios are Bulgaria in 1997 and Russia in 1996.

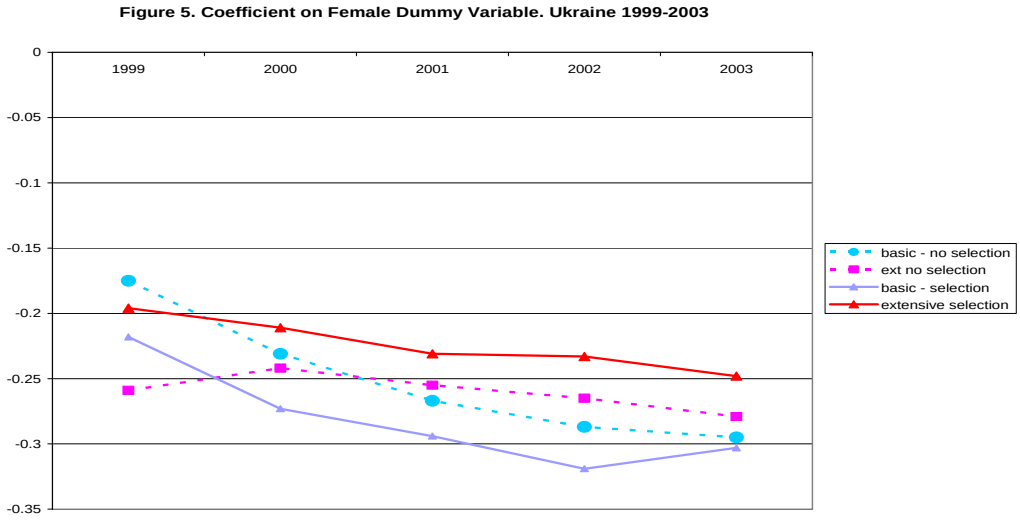
measure increases for Ukraine, reaching about 0.3 by the end of the analyzed period regardless of which specification is used.

Table 28. Female/Male Wage Ratios and Position of Women in the Male Wage Distribution

	Ukraine					Lithuania
	1999	**2000**	**2001**	**2002**	**2003**	**2000**
Mean wage, local currency/month	1194	1680	2259	2804	1674	658
Men	1342	1948	2659	3253	1973	716
Women	1048	1426	1891	2377	1390	600
Female/Male	0.78	0.73	0.71	0.73	0.7	0.84
Median wage, local currency/month	957	1320	1775	2263	1350	530
Men	1038	1511	2109	2737	1650	600
Women	899	1200	1608	2034	1190	500
Female/Male	0.87	0.79	0.76	0.74	0.72	0.83
Position of mean female in male wage distribution*	44.42	43.32	40.74	40.05	38.19	47.98
Position of median female in male wage distribution*	43.10	40.28	37.10	36.90	34.00	48
Sample size	7852	7611	7520	7516	7650	4324
Men	3904	3699	3602	3662	3725	2168
Women	3948	3912	3918	3854	3925	2156

* Calculated by assigning each woman a percentile ranking in the male wage distribution, and finding the mean of median of those rankings

Figure 5. Coefficient on Female Dummy Variable. Ukraine 1999-2003



In Lithuania, in the year 2000, the absolute value of the female dummy was 0.18 for the basic HCS and 0.2 for the AS comparing favorably to the corresponding absolute values of 0.236 and 0.24 in Ukraine (See Figure 6).

Figure 6. Coefficient on Female Dummy Variable. Ukraine vs. Lithuania 2000

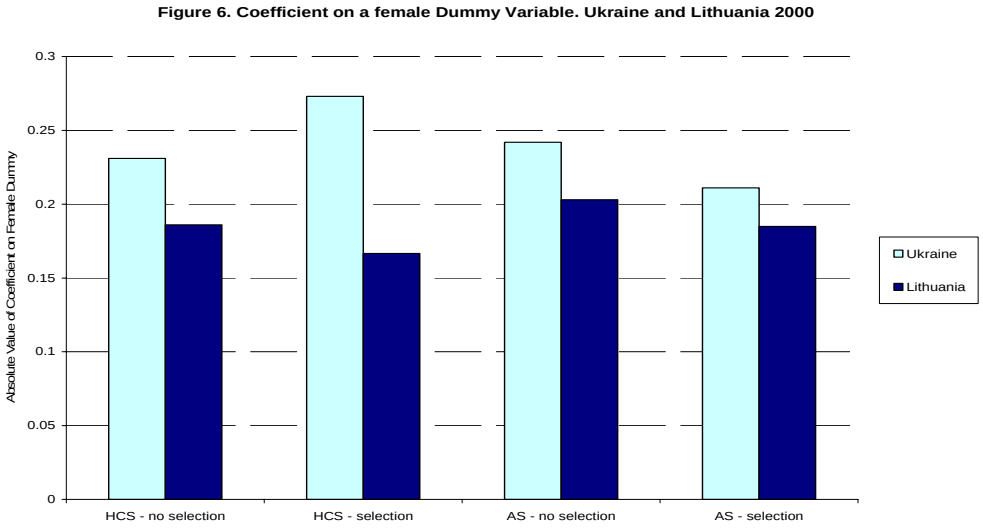


Table 28 also reports positions of mean/median female wages in the male wage distribution. The position of the mean/median female in the male wage distribution is calculated by assigning each woman a percentile ranking in the male wage distribution and calculating the ranking of the mean/median female. Blau and Kahn (1996) used this approach to compare international differences in gender wage differentials between the United States and several Western European countries. Brainerd (1998) also used this approach to compare differences in gender wage differentials for a sample of Central and Eastern European countries. This statistic reflects both labor market skills and discrimination. A female with a salary that falls in a certain percentile of a male wage distribution is perceived by employers to be comparable to a male with a salary in that percentile. In other words, if a median female falls in the 20th percentile of the male wage distribution then a median female is perceived to be equivalent to the male in the 20th percentile of the male wage distribution. This could be because the median female has observed labor market skills and characteristics comparable to that of a male in the 20th percentile of the male wage distribution or for other reasons such as discrimination. A decline in the position of a median female in the male wage distribution over time would indicate that either observed skills have declined or that discrimination has increased (i.e., the median female is valued by employers as a male in a lower percentile of the male wage distribution). At the same time, a change in the overall wage structure would have an impact on the position of females in the overall male wage distribution. Since wages of females usually fall in the lower parts of the overall wage distribution, an increase in the overall wage dispersion would have an adverse effect on female wages.

The position of the mean and median Ukrainian female in the male wage distribution deteriorated from the 44th and 43rd percentile in 1999 to 38th and 34th percentile in 2003, respectively. However, despite this decrease, the position of a mean and median female in the male wage distribution is relatively high compared to other countries.[44] Nevertheless, as Brainerd (1998) notes, a relatively high ranking of the mean female in the male wage distribution can correspond to a relatively low female/male wage ratios if the overall wage dispersion is relatively high. In fact, in her analysis of gender wage differentials in a number of Eastern European countries, Brainerd (1998) finds that the dispersion of the overall wage structure is the single most important factor responsible for the decrease of relative wages in Russian and Ukraine for the period of 1991-1994. However, she demonstrates no change in ranking of mean/median female in the overall wage distribution. Since, on the contrary, a decrease in the relative female wages and the simultaneous deterioration of the ranking of the mean/median female is observed, it is unlikely that the overall dispersion of wages is responsible for the worsening of female relative wages. Moreover, the downward movement of female wages in the wage distribution suggests that valuation of females by employers has decreased. There are several reasons as to why females can be perceived by employers as "less desirable" employees. The labor market characteristics of females could have

[44] For example, for a sample of Western European countries and the United States in 1980s, Blau and Khan (1996) report the mean female percentile in male wage distribution to be between 33.6 in Italy and 19.6 in Norway. Brainerd (1998) performed a similar analysis for a sample of Eastern and Central European countries as well as for Russia and Ukraine. She reports mean/median female percentiles in male wage distribution to be between 54.6 and 54.3 for Kyrgyz Republic and 19.0 and 27.1 for Czech Republic respectively. Using data from December of 1994, Brainerd (1998) reports that a median Ukrainian female is ranked the same as a male in 28.7th percentile of a male wage distribution while mean female is ranked the same as a male in 35.3th percentile of a male wage distribution.

decreased over the analysis period. At the same time, the tastes for discrimination by employers could have increased or employers can exercise such tastes more freely due to the weakened law enforcement. Finally, the institutional policies involving gender specific social protection (such as described in Chapters II and III) can lead to lower valuation of female workers.

However, relatively lower or decreasing labor market qualifications of women are unlikely to explain the decreasing female/male average wage ratio in Ukraine. As summary statistics presented earlier indicate, women compare favorably to men with respect to their labor market characteristics. Moreover, a higher proportion of women in both countries have higher education than men (Tables 8 and 9).

The position of the mean/median female is even slightly higher in Lithuania where mean female wage is ranked by employers in the 48th percentile of the male wage distribution while the median female wage is ranked in the 47th percentile. However, a relatively high mean/median female percentile ranking, in conjunction with relatively high gender wage ratio, suggests a more compressed overall wage structure in Lithuania compared to Ukraine.

The purpose of the analysis in this Chapter is to determine what accounts for the deterioration relative female wages in Ukraine during the period of the "late transition". We also examine why relative wages of Lithuanian females are higher than that of Ukrainian females in 2000. To understand the mechanisms through which the institutional arrangements and labor market policies lead to the observed wage outcomes, two different methods are used. First, the Oaxaca decomposition technique is employed. This method decomposes the average gender wage gap into two components-differences

in labor market characteristics and differences in treatment, which may in part be attributed to discrimination.

Labor market policies can also affect relative wages indirectly by changing the overall wage structure. Consequently, the change in wage structures and the policies leading to such change are examined. Next, the Juhn, Murhpy, and Pierce (1993) decomposition technique is used to decompose the gender wage gap over time.

Oaxaca Decomposition: Empirical Methodology

Becker (1971) defined a competitive market discrimination coefficient for labor as the difference between the observed wage ratio and the wage ratio that would prevail in the absence of discrimination. Oaxaca (1973) expressed it in percentage terms as

$$D = \frac{\overline{W}_m / \overline{W}_f - MP_m / MP_f}{MP_m / MP_f} \tag{8}$$

Where: the two groups are males and females, $\overline{W}_m / \overline{W}_f$ is the observed male-female average wage ratio, and MP_m / MP_f is the ratio of the average male-female marginal products, which is equivalent to the average wage ratio in the absence of discrimination. The observed wage differential can be expressed using the logarithmic form of equation (5) as given in equation (6) below:

$$\ln \overline{W}^m - \ln \overline{W}^f = \ln MP^m - \ln MP^f + \ln(D+1)\,. \tag{9}$$

Equation (6) breaks down the difference between the mean female and the mean male wage in two parts. The first two terms on the left-hand side indicate the part of the gender wage gap that is due to differences in male and female productivity. The third term represents the unexplained part of the gender wage gap, which is often attributed to discrimination. .

In general, lnW can be estimated as:

$$\ln W_i = X_i \beta + e_i \tag{10}$$

Where:

W- earnings
X – vector of observable characteristics
β-coefficients
ε-Error term $\varepsilon_i \sim N(0, \sigma_\varepsilon)$

Wage equations for women and men separately are presented in equations (11) and (12) respectively.

$$\ln W_f = X_f \beta_f + e_f \tag{11}$$

$$\ln W_m = X_m \beta_m + e_m \tag{12}$$

The difference between mean log wages of males and females can be decomposed in the following way.

$$\overline{lnW_m} - \overline{lnW_f} = \overline{X_m}\hat{\beta}_m - \overline{X_f}\hat{\beta}_f = \overline{X_m}\hat{\beta}_m - \overline{X_f}\hat{\beta}_m + \overline{X_f}\hat{\beta}_m - \overline{X}_f\hat{\beta}_f$$

$$= (\overline{X_m} - \overline{X_f})\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\overline{X_f} \tag{13}$$

or

$$\overline{lnW_m} - \overline{lnW_f} = (\overline{X_m} - \overline{X_f})\hat{\beta}_f + (\hat{\beta}_m - \hat{\beta}_f)\overline{X}_m \tag{14}$$

The first term on the right-hand sides of equations (13) and (14) represents estimates of $\ln MP^m - \ln MP^f$, the second term represents the unequal treatment coefficient.

For the purposes of this analysis, the general wage equation (10) is estimated differently using four specifications described in detail in the previous Chapter. These are human capital and augmented specifications with and without correction for the selection into the labor market. When wage equations are estimated with correction for the labor force participation, the general wage equation becomes

$$\ln W_i = X_i \beta + \lambda c + e_i \tag{15}$$

Where:

λ – selection correction term

c – covariance between the error terms in the earnings and labor market status equations.

Consequently, female and male wage equations corrected for labor market participation become:

$$\ln W_f = X_f \beta_f + \lambda_f c_f + e_f \tag{16}$$

$$\ln W_m = X_m \beta_m + \lambda_m c_m + e_m \tag{17}$$

Hence, the difference between mean log wages of males and females can be decomposed in the following way:

$$\overline{lnW_m} - \overline{lnW_f} = \overline{X_m}\hat{\beta}_m - \overline{X_f}\hat{\beta}_f + \hat{c}_m\overline{\lambda}_m - \hat{c}_f\overline{\lambda}_f = \overline{X_m}\hat{\beta}_m - \overline{X_f}\hat{\beta}_m + \overline{X_f}\hat{\beta}_m - \overline{X}_f\hat{\beta}_f +$$

$$\hat{c}_m\overline{\lambda}_m - \hat{c}_f\overline{\lambda}_f = (\overline{X_m} - \overline{X_f})\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\overline{X_f} + \hat{c}_m\overline{\lambda}_m - \hat{c}_f\overline{\lambda}_f \tag{18}$$

or

$$\overline{lnW_m} - \overline{lnW_f} = (\overline{X_m} - \overline{X_f})\hat{\beta}_f + (\hat{\beta}_m - \hat{\beta}_f)\overline{X}_m + \hat{c}_m\overline{\lambda}_m - \hat{c}_f\hat{\lambda}_f \tag{19}$$

The third term represents the difference in selectivity bias which is used to obtain the percentage difference in wage offers faced by persons with the characteristics of the average wage earner among males and females (Reimers 1984).

Equations (16) and (17) assume that the male wage structure prevails in the absence of discrimination, while equations (18) and (19) assume that the female wage structure prevails in the absence of discrimination.

However, none of the two assumptions above with respect to the wage structure is realistic. While the discriminated group (presumably females in this case) is undervalued, the preferred group is overvalued. Moreover, it is the undervaluation of the discriminated group that pays for overvaluation of the preferred group (Cotton 1988). As described in Becker (1971), in the absence of discrimination the two groups would be perfect substitutes in production and the only reason for a difference in wages would be different productivity characteristics. Therefore, in the absence of discrimination the two wage structures would be equal i.e $\beta^m = \beta^f = \beta^*$. Where β^* represents a vector of coefficients in a nondiscriminatory wage structure. The average wage differential using the non-discriminatory wage structure, overvaluation of one group and undervaluation of the other group, can be expressed as:

$$\ln \overline{W}^m - \ln \overline{W}^f = \beta * (\overline{X}^m - \overline{X}^f) + \overline{X}^m (\beta^m - \beta^*) + \overline{X}^f (\beta^* - \beta^f) \qquad (20)$$

or

$$\ln \overline{W}^m - \ln \overline{W}^f = \beta * (\overline{X}^m - \overline{X}^f) + \overline{X}^m (\beta^m - \beta^*) + \overline{X}^f (\beta^* - \beta^f) + \hat{c}_m \overline{\lambda}_m - \hat{c}_f \hat{\lambda}_f \qquad (21)$$

when selection into the labor market is accounted for.

This decomposition consists of four components. The first component represents the difference in wages resulting from productive characteristics of the two groups, the

second component represents the advantage of preferred group (males), the third component represents the disadvantage of the discriminated group (Cotton 1988), and the fourth component represents the difference in the selectivity bias. Unfortunately, β^* is unobserved and must be estimated. The estimation of β^* is based on assumptions about the nature of the nondiscriminatory wage structure. Different research studies assume different wage structures to be non-discriminatory. The "true" wage structure was approximated by equally weighting the parameters obtained from the male and female regressions (Bedi and Garg 2000; Reimers 1984). Neumark (1988) suggests obtaining the non-discriminatory wage structure by estimation of a wage regression over the pooled sample. Cotton (1988) weighs white and black wage structures by the proportion of white and black males in the civilian male labor force. Following (Bedi and Garg 2000; Neumark 1988; Reimers 1984) the non-discriminatory wage structure is obtained by estimating a regression over a pooled sample.

Oaxaca Decomposition: Results–Ukraine 1999-2003

Estimations of 1 through 4 are used to decompose gender wage differentials. The results of Oaxaca decomposition using Human Capital Specification (HCS) and Augmented Specification (AS) with and without accounting for the selection into the labor market for Ukraine are presented in Table 29. Consistent with the previous results, the gender wage gap increased in Ukraine over the analysis period from 0.067 to 0.243.[45] Regardless of which specification is used, the difference in characteristics component is

[45] Reilly and Newell (2000) report comparable gender log wage ratio of 0.186 for Ukraine in 1996.

actually negative for all years, implying that females on average have better labor market qualifications than males. When selection into the labor market is not accounted for, the male advantage component is zero while the female disadvantage component is large and increasing from year to year, single-handedly contributing to the gender wage differential. This implies that the difference in average male/female wages is primarily caused by the unexplained portion of the gender wage differential. This result still holds when selection into the labor market is accounted for. The female disadvantage component becomes larger in magnitude and still is the main component contributing to the gender wage differential. Our results are also robust to the different specification of the earnings equation i.e. HCS versus AS.

Table 29. Ukraine: Results of Oaxaca Decomposition. 1999-2003

	LnWm-LnWf	Difference in characteristics	Male Advantage	Female Disadvantage		LnWm-LnWf	Difference in characteristics	Male Advantage	Female Disadvantage	Selection Component
		Human Capital Specification				**Human Capital Specification with Selection into the Labor Market**				
1999	0.067	-0.108	0.000	0.175	1999	0.067	-0.074	-0.098	0.218	0.021
2000	0.151	-0.080	0.000	0.231	2000	0.151	-0.059	-0.625	0.325	0.509
2001	0.194	-0.073	0.000	0.267	2001	0.194	-0.074	0.486	-0.175	-0.043
2002	0.202	-0.085	0.000	0.288	2002	0.151	-0.065	-0.048	0.758	-0.493
2003	0.243	-0.052	0.000	0.295	2003	0.243	-0.052	0.443	-0.106	-0.042
		Augmented Specification				**Augmented Specification with Selection into the Labor Market**				
1999	0.067	-0.192	0.000	0.259	1999	0.067	-0.094	-0.088	0.204	0.045
2000	0.151	0.090	0.000	0.241	2000	0.151	-0.023	-0.023	0.258	-0.061
2001	0.194	-0.006	0.000	0.255	2001	0.194	-0.005	-0.034	0.264	-0.031
2002	0.202	-0.063	0.000	0.265	2002	0.202	-0.016	-0.042	0.248	0.013
2003	0.243	-0.036	0.000	0.279	2003	0.243	0.003	-0.033	0.287	-0.015

Regardless of which wage equation specification is used to compute the Oaxaca decomposition, female disadvantage component is the single most important component of the gender wage differential, as well as its growth over time. The female disadvantage component represents the unexplained part of the gender wage differential and hence can not be labeled simply as discrimination against women. While part of this component could be attributed to discrimination, the other part could be attributed to unobserved factors which affect productivity.

Oaxaca Decomposition: Results – Lithuania 2000

As demonstrated in Table 30, when the selection in the labor market is not accounted for, the results of the Oaxaca decomposition in Lithuania are similar to that in Ukraine. No matter which specification is used, the difference in characteristics is negative implying that women have "better" labor market characteristics on average than men. The male advantage component is negligible regardless of the specification used. The largest component explaining the average female/male wage differential is the female disadvantage, implying that the unexplained portion of the gender wage differential is the major cause of the difference in gender wage outcomes. However, unlike in Ukraine, when selection into the labor market is accounted for, the actual gender wage gap changes very little: it decreases by 0.003 using HCS and by 0.011 using AS (Table 32). At the same time, the female disadvantage component becomes slightly smaller, implying there is a positive selection of Lithuanian females into the labor market. When HCS is used, the female disadvantage component is smaller relative to the

AS regardless of selection into the labor market (0.186 vs. 0.203 and 0.177 and 0.192, Table 32), implying that there is gender segregation in allocating workers into low or high-paying occupations. This finding is consistent with the results presented in the previous Chapter, where it was shown that there are significant wage premiums being associated with higher paying occupations in Lithuania.

Table 30. Results of Oaxaca Decomposition. Lithuania 2000

	LnWm-LnWf	Difference in characteristics	Male Advantage	Female Disadvantage	Selection Component
HCS	0.102	-0.083	0.000	0.186	
HCS with Selection into the Labor Market	0.102	-0.077	-0.002	0.177	0.003
AS	0.102	-0.100	0.000	0.203	
AS with Selection into the Labor Market	0.102	-0.092	-0.009	0.192	0.011

The results of Oaxaca decomposition in Ukraine and Lithuania in 2000 demonstrate small differences. The log wage differential is slightly higher in Ukraine than in Lithuania in 2000 (0.151 vs. 0.102). The differences in average characteristics between genders in the two countries are both a small in magnitude and have negative signs. This implies that in both countries females on average are more endowed in terms of their observable labor market characteristics than males and that these differences can therefore not explain gender wage differentials. The male advantage component is zero or almost zero in both countries. On the other hand, the female disadvantage component is the single most important component account for gender wage gap in both countries. However, the female disadvantage component is larger in Ukraine, accounting for a

larger (compared to Lithuania) average gender wage gap. The selectivity bias is very small and positive in Lithuania while there is no clear pattern of the sign or magnitude of the bias in Ukraine. Why is the Ukrainian female disadvantage component greater in Ukraine than that in Lithuania? While females in both countries are well endowed with respect to their education and skill, Ukrainian females are underpaid more relative to males than Lithuanian females. At least part of the answer can be attributed to the fact that Ukraine still maintains more generous gender non-neutral policies, i.e generous maternity benefits, etc., as was discussed in the previous chapters. These policies cause females to be more expensive employees than males in the eyes of employers. It is likely that by paying females less, employers are compensating for the additional cost associated with hiring female workers.

As was mentioned previously, Lithuanian females are disproportionately employed in the public sector where wages are more regulated by wage grids, making it harder to discriminate. Moreover, Lithuanian women also benefit from the fact that the labor laws are better enforced in the public sector, making it harder to pay below legally set limits and discriminate on the basis of gender.

Changes in the Overall Wage Structure

By decomposing the gender wage gap into characteristics and treatment related components, it was established that relative labor market characteristics play little role in explaining the gender wage gap. Moreover, it is the treatment or the unexplained part of the gender wage differential that is solely responsible for the difference in male and

female average wages. The next part of this Chapter attempts to uncover how differences in the overall wage structures affect the gender wage differentials and whether changes in the wage structure in Ukraine over the analysis period have contributed to the worsening of the relative female wages in that country. Since women are disproportionately represented among the low-wage workers, they are expected to be penalized more by the overall wage dispersion.

Table 31 presents different measures of the overall log wage distribution. Regardless of which measure is used, the results indicate that the wage structure in Ukraine narrowed significantly over the analysis period. Interestingly, the comparison of Table 31 to the similar results of Brainerd (1998) indicates that in 1999 wage dispersion was far lower than what was reported for 1994 (which represented the post-reform period with relatively high wage dispersion in Brainerd's work). At the same time, in 2003 the ratio of log wages in the $90^{th}/10^{th}$ percentile in the male distribution was the same as in 1991 (which represented the pre-reform period with relatively low wage distribution). As was explained in detail earlier in this Chapter, since women in Ukraine occupy the lower part of the wage distribution, compression of the wage structure should have a positive effect on relative female wages. The relative female wages in Ukraine, however, have decreased over the analysis period. As will be shown later, even though narrowing of the overall wage distribution contributed to a smaller average gender wage gap, this effect was more than offset by movement of women down the male wage distribution. The same measures presented in the Table 32 demonstrate that the log wage distribution in Lithuania is more compressed compared to Ukraine not only in 2000 but also 1999 and 2001-2003.

Table 31. Summary Measures of the Log Wage Distribution. Ukraine 1999-2003

	1999	2000	2001	2002	2003
Males					
90-10 log wage differential	1.53	1.37	1.29	1.26	1.25
variance of log wages	2.19	1.34	1.08	0.91	0.81
skewness	-1.78	-1.12	-1.13	-1.18	-1.27
kurtosis	7.46	4.58	5.34	5.44	5.98
Females					
90-10 log wage differential	1.71	1.51	1.40	1.36	1.34
variance of log wages	1.48	0.85	0.64	0.60	0.49
skewness	-1.97	-1.32	-1.43	-1.46	-1.28
kurtosis	8.96	5.88	7.40	7.70	7.33
Males and Females					
90-10 log wage differential	1.62	1.44	1.35	1.31	1.30
variance of log wages	1.83	1.09	0.86	0.76	0.66
skewness	-1.86	-1.15	-1.16	-1.20	-1.15
kurtosis	8.18	5.11	6.09	6.20	6.32

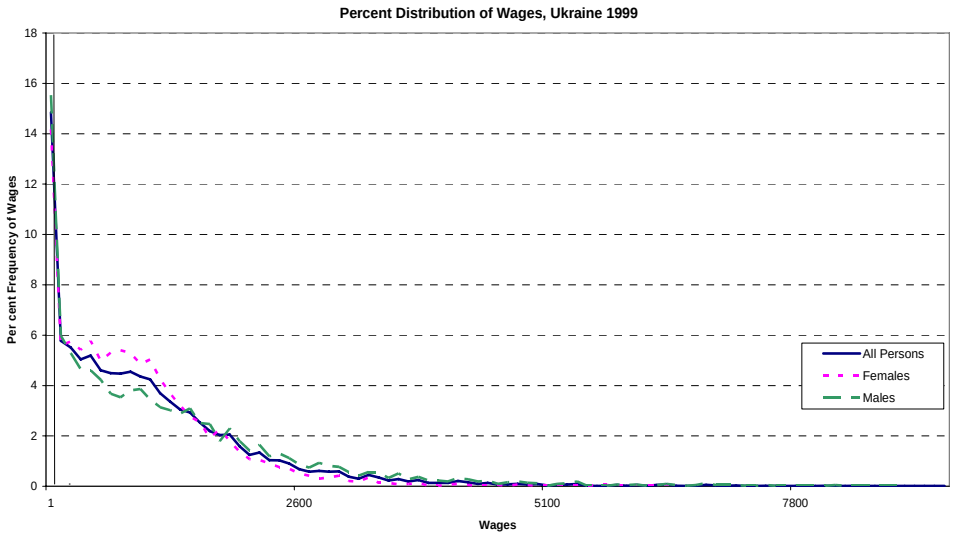
Table 32. Summary Measures of the Log Wage Distribution. Lithuania 2000

	Males	Females	Males and Females
90-10 log wage differential	1.31	1.23	1.27
variance of log wages	0.49	0.34	0.42
skewness	-0.50	-0.58	-0.49
kurtosis	5.09	6.17	5.55

Figures 7 through 11 take a closer look at the overall wage distribution in Ukraine. In every single year of the analysis period except for 2002, 90 percent of all wages are in the first four quintiles of the overall wage distribution. This implies that wages of a large majority of the Ukrainian labor force are within a relatively narrow range, while there is less than 10 percent of the labor force that receives relatively high wages. The average wage in the first three quintiles is between $40 and $60 per month, while the average wage in the twentieth quintile is between $2,500 and $3,500 per month

across the time period. Therefore, with the exception of the small group of individuals who are earning relatively high wages even by the Western standards, the majority of males and females earn relatively low wages with a small variance within the group, contributing to the relatively high ranking of mean/median female in the male wage distribution.

Figure 7. Percent Distribution of Wages. Ukraine 1999



Even though the relative position of a mean/median female in the male wage distribution is high by international standards, it was shown previously that it has declined between 1999 and 2003. Interestingly, while the female frequency percent distribution of wages (Figure 7) show only a tiny peak at a relatively low wage in 1999, there are sizeable and apparent peaks in frequency of a certain low wage value after that year. Moreover, in 1999 male and female frequency percent distribution of wages were almost identical, after that year the female distribution shows higher than male frequencies at the lower wage values while this trend reverses at the higher wage values.

Figure 8. Percent Distribution of Wages. Ukraine 2000

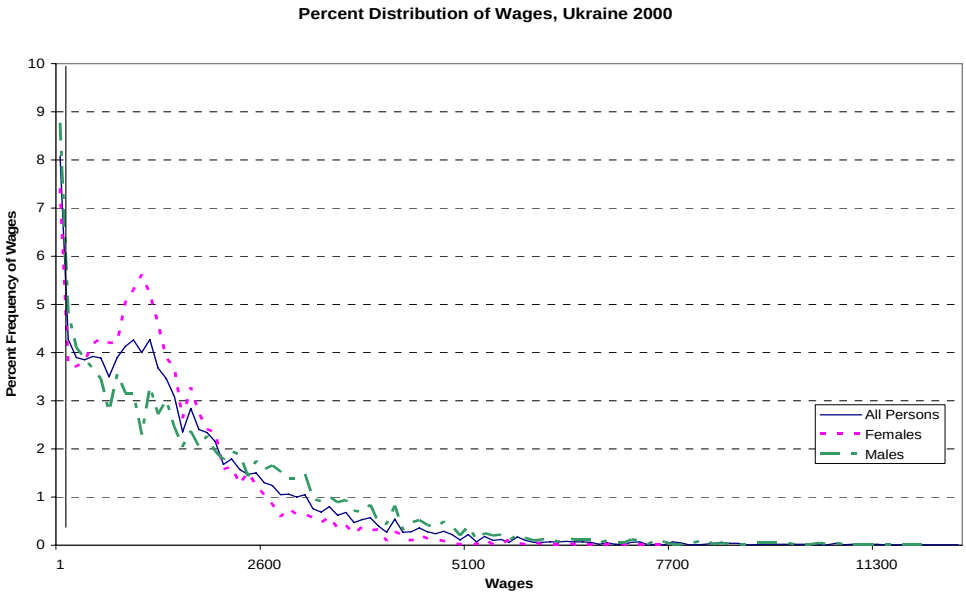


Figure 9. Percent Distribution of Wages. Ukraine 2001

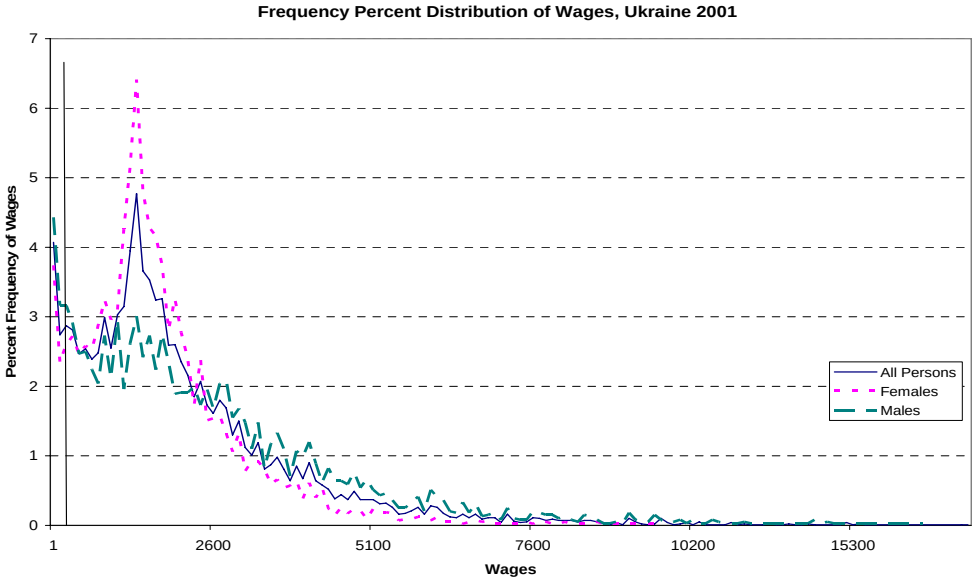


Figure 10. Percent Distribution of Wages. Ukraine 2002

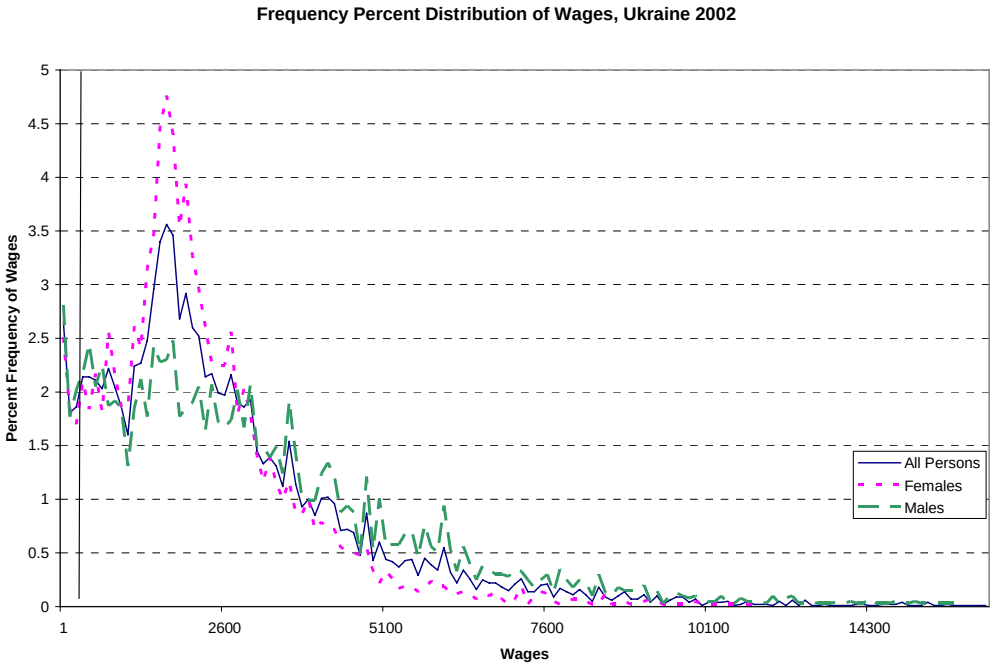
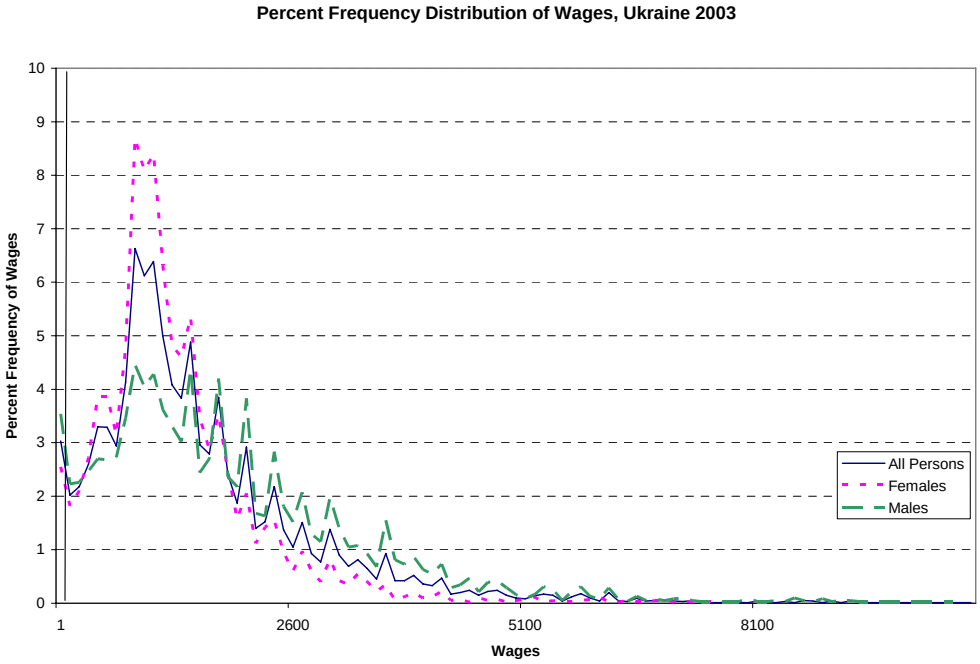


Figure 11. Percent Distribution of Wages. Ukraine 2003



Distribution of wages in Lithuania actually exhibits some similarities to the wage distribution in Ukraine after 2000. 90 percent of all wages also fall within the first four quintiles of the wage distribution. Relative to Ukraine, there is even less variation within the narrow range where the wages of the majority of Lithuanian individuals fall. This explains the relatively high position of mean/median females in the male wage distribution. In general, the frequency percent distribution of Lithuanian wages is similar to that of Ukraine. The Lithuanian frequency percent distribution has a large peak of twenty five percent of all wages at 650 litas (about $216) per month. However, there are no significant differences between male and female distributions in Lithuania. In fact, the two distributions (male and female) are almost identical.

Figure 12. Percent Distribution of Wages. Lithuania 2000

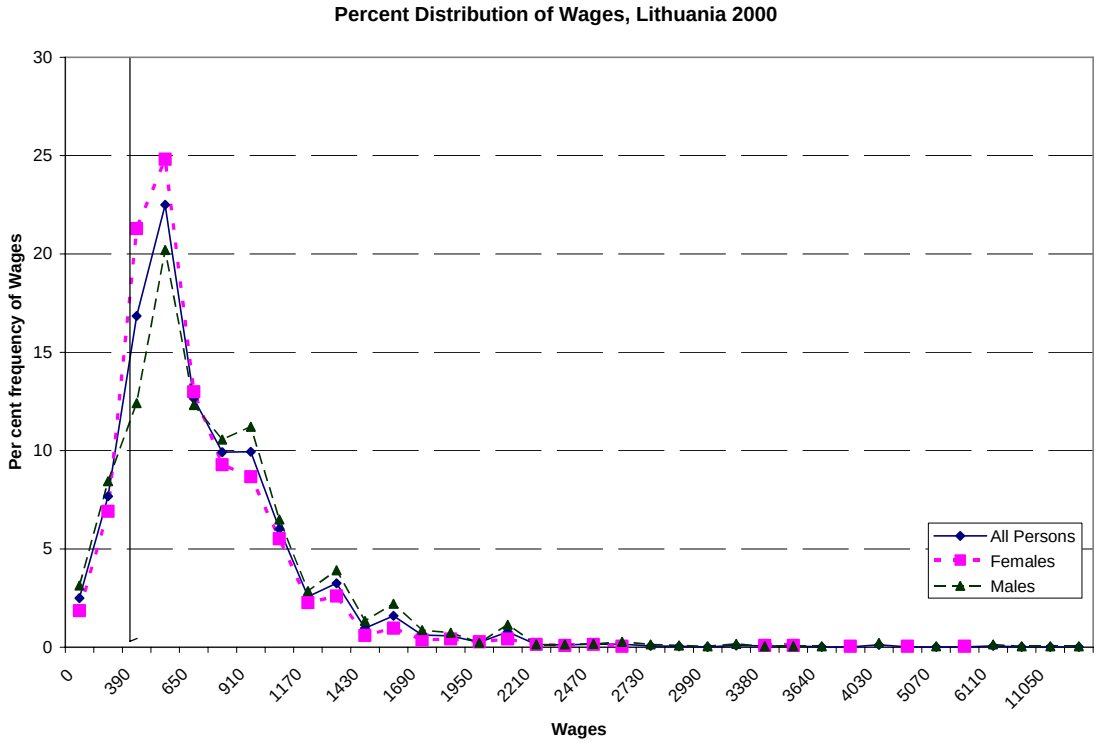


Table 33 presents the summary for the top 5 percent of wage earners. The summary statistics allow us to examine whether there are any differences in characteristics between the top 5 percent and the rest of the population. Two-thirds of the highest wage earners live in urban areas. Very few persons among the top 5 percent of wage earners live in rural areas. About one-fifth live in Kiev, the capital city, even though the proportion living in Kiev decreased slightly over the analysis period. About 90 percent of the high wage earners are married and less than half (about 40 percent) have higher education. Very few have elementary education. About 40 percent are employed in industry and about half are working in the public sector.

The proportion of top wage earners working for private firms is considerably higher than that of the overall sample. The average age of high wage earners is 40 years old. Only about 20 percent are female. Although there is an increase in the proportion of those between 20 and 25 years old among the high wage earners, this group is not dominated by younger people who have adopted "new" capitalist ways of life. This observation is supported further by the fact that only 40 percent of the highest earning people have higher education. Overall, the high wage earners in Ukraine do not seem to fit the expected profile of a young successful male capitalist.

Table 33. Characteristics of the Highest Five Percent of Wage Earners. Ukraine, 1999-2003

	1999	2000	2001	2002	2003
Type of Residence					
City	0.66	0.61	0.61	0.65	0.65
Rural	0.06	0.07	0.06	0.06	0.05
Kiev	0.17	0.21	0.22	0.20	0.15
Marital Status					
Married	0.90	0.89	0.87	0.83	0.89
Education Level					
Elementary	0.03	0.01	0.00	0.01	0.01
Vocational Training	0.16	0.15	0.16	0.16	0.19
Secondary	0.14	0.11	0.16	0.15	0.10
Secondary Special	0.23	0.25	0.25	0.24	0.22
Higher	0.40	0.42	0.40	0.43	0.45
Age					
Age	39.38	39.97	40.41	40.29	39.94
Age between 25 and 29	0.10	0.13	0.10	0.13	0.14
Age between 30 and 34	0.14	0.13	0.12	0.13	0.13
Age between 35 and 39	0.24	0.17	0.16	0.13	0.14
Age between 40 and 44	0.21	0.21	0.26	0.24	0.21
Age between 45 and 49	0.16	0.17	0.17	0.18	0.17
Age between 50 and 54	0.08	0.12	0.11	0.12	0.13
Age between 55 and 60	0.03	0.04	0.03	0.04	0.05
Industry of Employment					
Industry	0.42	0.45	0.47	0.42	0.40
Type of Ownership at the Place of Employment					
State	0.47	0.43	0.41	0.46	0.51
Private Ownership	0.16	0.14	0.16	0.22	0.19
Stock Company	0.22	0.34	0.33	0.25	0.25
Monthly Wages	4578	6118	8584	9256	5478
Sample Size	393	381	377	376	383

Why did the wage structure in Ukraine become narrower over the analysis period? At the first glance it seems counterintuitive since, with the decentralization of wages, we would expect to see just the opposite. As the wage grids prevalent in socialist systems are removed, wages are expected to adjust in favor of the highly educated/skilled according marginal products. Moreover, a number of studies document a widening wage distribution for a number of transitional economies (Brainerd 1998; Reilly and Newell

2000). The Ukrainian case is likely to be different for several reasons. First, institutional policies in Ukraine differ from those in Central and Eastern Europe. As discussed in Chapter II, the minimum wage policy adopted is such that all the wages in the economy are artificially tied to the minimum wage, thus preventing high wage dispersion. At the same time, loss of bargaining power by trade unions is expected to further contribute to this phenomenon. Finally, high payroll taxes take away the incentive of enterprises to pay high wages. In addition, as discussed earlier, a low degree of integration into the world economy as well as a relatively slow pace of transition, are expected to contribute to the narrowing of the wage distribution.

The observed decrease in the position of a mean/median Ukrainian female in the male wage distribution, as well as the demonstrated compression of the wage structure, suggests that over the analysis period the worsening of the relative female wage position in the labor market is unlikely to be explained by the changes in the overall wage structure. Moreover, this fact suggests that the worsening of the relative wage outcomes for females in the Ukrainian labor market, at least in part, can be attributed to increasing discrimination or changes in gender differences in labor market productive characteristics or to gender-specific policies. To empirically examine the factors that contributed to the worsening of the gender wage gap in Ukraine, we use the Juhn, Murphy, and Pierce Decomposition. Below is a brief description of the methodology and the results of this analysis.

Juhn, Murphy, and Pierce Decomposition: Empirical Methodology

This method decomposes changes in gender wage differentials into change in gender specific factors such as discrimination and labor market characteristics, as well as changes in gender neutral factors such as changes in differences in the overall wage structure, including returns to observed and unobserved skill. The male wage structure is used as a wage structure that would apply to both genders in the absence of discrimination. While the Juhn, Murphy, and Pierce (1993) decomposition is an extension to the Oaxaca (1973) decomposition, the unexplained component is decomposed further by the former method.

Suppose that a male wage equation for year t is:

$$W_t^m = X_t^m \beta_t^m + \sigma_t^m \Theta_t^m \tag{22}$$

Where

W_t^m - is the log of male monthly wages in time period t
X_t^m - is a vector of explanatory variables
β_t^m - vector of male coefficients
σ_t^m - standard deviation of the residuals of the male wage equation
Θ_t^m -standardized residual of the male wage regression with mean=0 and variance=1 or

$\Theta_t^m = e_t^m / \sigma_t^m$.

Writing the wage equation in this way illustrates the two components that comprise the residual, the percentile that an individual occupies in the residual distribution, Θ_t^m, and the spread of the residual distribution itself, σ_t^m. In this case, it represents residual wage inequality for males. Assuming females are paid in accordance to the male wage structure, the constructed female wage equation becomes:

$$W_t^f = X_t^f \beta_t^m + \sigma_t^m \Theta_t^f \tag{23}$$

Where

W_t^f -is the log of female monthly wages in time period t
X_t^f -is a vector of explanatory variables
β_t^m - vector of male coefficients
σ_t^m - standard deviation of the residuals of the male wage equation
Θ_t^f -standardized residual of the female wage regression, i.e. $\Theta_t^f = e_t^f / \sigma_t^m$

Consequently, the wage gap at time t can be rewritten as

$$D_t = W_t^m - W_t^f = (X_t^m - X_t^f)\beta_t^m + (\Theta_t^m - \Theta_t^f)\sigma_t^m \tag{24}$$

The gender wage gap in equation (24) contains the effects of differences in observed characteristics based on the male reward structure, and effects of differences in the standardized residual, weighted by residual male inequality or money value per unit difference.

Following Blau and Kahn (1996), the change in the wage gap over the period from t_1 to t_2 can be decomposed as follows.

$$\begin{aligned} D_{t2} - D_t &= [(X_{t2}^m - X_{t2}^f) - (X_t^m - X_t^f)]\beta_{t2}^m + (X_t^m - X_t^f)(\beta_{t2}^m - \beta_{t1}^m) \\ &+ [(\Theta_{t2}^m - \Theta_{t2}^f) - (\Theta_t^m - \Theta_t^f)]\sigma_{t2}^m + (\Theta_t^m - \Theta_t^f)(\sigma_{t2}^m - \sigma_{t1}^m) \end{aligned} \tag{25}$$

The first term reflects differences in the gender wage resulting from differences in the observed characteristics over time. Blau and Khan (1996) labeled this term "observed-X's effect". The second term reflects the differences in rewards to the observed skills of men. This term has been labeled "Observed- prices effect." It describes the effect of changes in rewards to labor market skills on the Ukrainian gender wage gap. As Brainerd (1998) notes, in socialist countries, returns to skill were compressed artificially, making it reasonable to expect that as wage setting is decentralized, rewards to observed skills

should increase. The third term reflects the effect of difference in the relative position of women in the male wage distribution. The position of women in the male wage distribution will improve if their unobserved skills improve or if discrimination against them decreases. Consequently, the wage gap will decrease. The fourth term labeled "unobserved prices" reflects the widening of the male residual distribution while holding mean female ranking in the male residual distribution constant. An increase in male residual inequality would imply a widening of the gender wage gap. The "Observed prices effect," together with the "unobserved prices effect," reflects changes in the relative wage structure over time. This argument is based on the idea that in the absence of labor market discrimination, the wage structure faced by men also applies to women (Rueckert 2002). The next subsection focuses on the empirical results of the Juhn, Murphy, and Pierce decomposition for Ukraine.

Juhn, Murphy, and Pierce Decomposition: Estimation Results

Table 34 presents the results of the Juhn, Murphy, and Pierce decomposition in order to uncover what contributed to changes in the gender wage gap between 1999 and 2003 in Ukraine. Our results show that the gender wage gap in Ukraine increased by 0.175 log points. Contrary to some previous research including Brainerd (1998) and Reilly and Newell (2000), these results suggest that the "unobserved prices effect" reduces the Ukrainian gender wage gap overtime. The change in "observed prices," is positive, but relatively small, and does not contribute substantially to the widening of the gender wage gap over time. Among the gender specific components of the wage gap, the

change in observed labor market characteristics is also relatively small, while it is the large change in relative wage positions of men and women that is solely responsible for the increase in the gender wage gap in the Ukraine. These results are consistent with the results of the Oaxaca decomposition. It is really the "unexplained" portion of the gender wage gap which contributes the most to the magnitude of the gap and to its increase over the analysis period. Moreover, the downward movement of women in the wage distribution implies a decline of valuation of women's characteristics by employers.

Table 34. Ukraine: Juhn, Murphy, and Pierce Decomposition in gender Wage Differential, 1999-2003

	Human Capital Specification	**Augmented Specification**
Observed change in gender gap (log wages)*	0.175	0.175
Differences in Observed Labor Market Qualifications	0.033	0.058
Differences in Observed Prices	0.020	0.085
Differences in Relative Wage Positions of Men and Women	0.184	0.116
Differences in Residual Inequality	-0.061	-0.084

* Change in gender wage gap is calculated as : (LnWm-LnWf)2003-(LnWm-LnWf)1999

What is striking is how different this result is from what other research focusing on Ukraine has found. Overall, Ukraine did not get as much attention as other Eastern European and FSU countries in the transitional literature. To the best of our knowledge there are only two analyses focusing on gender wage differentials in transition where Ukraine is included in the sample of countries being studied. Reilly and Newell (2000) use the Oaxaca decomposition methodology only. On the other hand, Brainerd (1998) uses the Juhn, Murphy, and Pierce decomposition and finds that the widening of the wage structure is solely responsible for the worsening of the relative position of Ukrainian

females between 1991 and 1994. However, in her work, 1994 is supposed to represent the post-reform period. The period of 1991-1994 represents the very early stage of the Ukrainian transition, as the macroeconomic stabilization was achieved only in 1996. During that time, the main focus of the government was on macroeconomic issues and not on social or labor market reforms. This period was also characterized by the initial decentralization of the wage structure following the emergence of the private sector where wage controls did not apply. Our analysis focuses on a later period of transition after macroeconomic stabilization and enactment of social and labor market policies. The ratio of minimum wage to average wage, frequently used a proxy for measuring the overall distribution of wages, declined dramatically between 1990 and 1996 inline with what Brainerd (1998) shows but increases afterwards to the levels of EU countries. This reflects the initial widening and subsequent contraction of the wage structure in the late transition (see Figure 1). Moreover, while Brainerd (1998) reports an increase in 90/10 log wage differentials, as well as in variance of log wages, my results for the subsequent period of 1999-2003 demonstrate a decline in the overall wage dispersion no matter which measure is used (see Table 33). The difference in our results can be attributed to the fact that the periods of analysis are different and are characterized by different labor market environments and therefore different overall wage distribution.

Chapter Conclusion

During the analysis period, wage setting and minimum wage policies resulted in narrowing of the overall wage structure in Ukraine. While compression of the overall

wage structure contributed to improvement of the relative average gender wage ratio, it was more than offset by the deterioration of the female position in the male wage distribution. What explains this deterioration in the valuation of females by Ukrainian employers over time? Observed relative labor market characteristics of women do not explain this change since they actually improved over the analysis period (Table 10). Our results also demonstrate that relative female characteristics play no part in explaining the gender wage gap. On the contrary, the different treatment by employers is a more plausible explanation. Both, males and females are subject to extensive benefits and labor protective policies. However, women are entitled to more generous benefits including maternity benefits. Consequently, they are viewed as more expensive employees than males. Thus, employers have an incentive to pay lower wages to females to "compensate" for the higher costs associated with female workers. Moreover, as demonstrated in several research studies, and as my data shows, women in transitional economies are likely to withdraw from the labor market during childbearing for much longer periods of time than their Western counterparts. As such, the employers might choose not to invest in their female employees in anticipation of shorter female tenure.

The data used in this analysis does not contain information on hours worked. The wages used are monthly wages unadjusted for hours worked. It was shown than even during the Soviet Union females worked shorter hours than males and were perceived by employers as less devoted to the enterprise. There is sociological research mentioned in Chapter V which demonstrates a revival of societal attitudes towards women devoting more time to families and household activities rather than to market work. On the contrary, the primary responsibility of men is perceived to be providing for the family.

There is also anecdotal evidence that with transition men devote disproportionate number of hours to market work compare to women. These trends would undoubtedly contribute to lower wages received by women.

In addition, not only labor market policies but also the enforcement of these policies contributes to the observed labor market outcomes. While Ukraine does have "Equal Pay for Equal Work" legislation on the books, the question remains on how this legislation is actually enforced. Ukraine is ranked poorly on enforcing the rule of law, which may be contributing to the lower relative wages that women receive.

CHAPTER VII

CONCLUSION

The purpose of this dissertation was to investigate how different labor market policies in Lithuania and Ukraine affected labor market outcomes in these two countries. The specific focus of this analysis was on returns to education and gender wage differentials. Nationally representative data from both countries was used to conduct the analysis.

We found that returns to education in Ukraine have decreased. Especially pronounced and counterintuitive is the decrease in returns to higher education. As described in the conclusion of Chapter V, there are multiple factors that might have contributed to this outcome. Ukraine is characterized by the low demand for and high increasing supply of highly educated people. At the same time, high minimum wage policy together with minimum wage acting as a base wage for the whole economy resulted in a very compressed wage structure and thus little variation of wages by education. Lithuanian females faired better than their Ukrainian counterparts. Gender wage differential has increased in Ukraine between 1999 and 2003. Relative average female wage is higher in Lithuania in 2000. Oaxaca decomposition and Juhn, Murphy, and Pierce decomposition were used. While observed labor market characteristics do not explain the observed gender wage gap, Oaxaca decomposition technique reveals that it is the treatment or the unexplained part which is the single most important component in explaining the difference in relative female wages in both

countries. However, this component has larger magnitude in Ukraine. The likely explanation of this difference is the presence of more extensive social benefits and employment protection programs in Ukraine. Positive selection bias is observed in Lithuania while there is no clear pattern of selection bias in Ukraine. At the same time, there is observed gender segregation in allocation workers into low and high paying industries in Lithuania while there is no clear patter of that in Ukraine. These results point out to the fact that Lithuania is a more successful reformer further along in transition process.

As a result of minimum wage and wage setting policies where all wages are set as multiples of the minimum wage, the overall distribution of wages narrowed in Ukraine over the course of analysis period. To investigate the decrease in Ukrainian gender wage differential, Juhn, Murphy, and Pierce decomposition is used. This technique decomposes average gender wage differential into gender specific factors such as discrimination and labor market characteristics, as well s into changes in gender neutral factors such as changes in differences in the overall wage structure. The results of this decomposition reveal that the compression of the overall wages contributed to the improvement of the relative average gender wage ratio. However, this result was more than offset by the downward movement of females in the wage distribution. There are several explanations as to why this downward movement is observed. Generous social benefits including maternity benefits result in females being more "expensive" employees for the enterprise leading to lower relative female wages. At the same time, the data used does not contain information on hours. There is evidence that females devote less hours to the market work which may also explain the deterioration of relative wages unadjusted

for hours. Finally, with the weaker law enforcement in Ukraine, the employers who have tastes for gender find it easier to exercise their tastes than previously.

APPENDIX A

Comparison of Demographic and Institutional Characteristics as well as Labor Market Policies in USSR, Lithuania, and Ukraine.

Composition of the Labor Force and Labor Market Characteristics

Institutional or Demographic Characteristic	Soviet Union	Lithuania	Ukraine
Labor Force Participation	- very high for both men and women - females working age is 5 years shorts than males	- women comprise slightly more than half of the labor force - LFP is lower for females in childbearing ages	-relatively high for both men and women - women constitute about 50 percent of the labor force
Educational Attainment	-high for males and females - segregation by field of study	- high for males and females - women on the average have more years of schooling	-high for males and females with disproportionate demand for higher education
Occupational attainment	- Duncan Index ~30%	-Duncan Index ~35% - Men are overrepresented among manual workers -Women are over represented as service workers and skilled professionals	- relatively large number of persons are employed in agriculture and industry -occupational segregation and vertical segmentation are present - Duncan Index ~ 40%
Public Sector	- Everything is in public sector - Industry is characterized by large enterprises. - Almost no small and medium size enterprises	- Majority of employees are female	- Larger share of employees are female
Private Sector	Non-Existent	- Growing rapidly - Most of the employees are men due to privatization of those industries that were predominantly male - Rapid development of small and medium size enterprises - Official wages are lower in the private sector	- grows at a relatively slow rate - slow growth of small business
Shadow Economy	Almost none	Moderate in size (~30 of the official GDP in 1994 and ~20% in 1998)	- estimated between 50 and 100 percent of the official GDP
Unemployment	Everybody was guaranteed a job	-relatively high - higher unemployment rates among men - workers with lower education are over represented among the unemployed	- relatively low (~10 %) - hard to estimate the exact Figure due to hidden unemployment

Comparison of Labor Market Policies

Policy	Soviet Union	Lithuania	Ukraine
Wage Setting	- set by central planners as a multiple of a base wage - very narrow wage differentials between different types of employees - low returns to education - Extensive non-wage benefits including free vacations, child care services and health services	- in public sector wages are still calculated according to the formula - in private sector wages are set by collective bargaining process -employers have to abide by the minimum wage regulation and pay overtime	- Wages are multiple of a minimum wage using specific industry and regional coefficients - minimum wage is set low
Minimum Wage	Set relatively low	- set relatively high (higher than in USSR)	- all wages are tied to minimum wage, therefore minimum wage influences not only those in the bottom of the wage distribution but the whole system of wages - was allowed to erode completely but started to recover in 1998
Social Benefits	- extensive. Especially for women including state assistance with child birth and child care, labor benefits, support of women with children, restrictions on usage of female labor in potentially harmful production	- Less than in USSR. On par with Western Europe - 28 days of vacation per year - Maternity leave is 70 days befor and 56 days after child birth	- extensive social benefits to some groups of the population - still generous maternity leaves and protective legislation for females
Employment Policy	- Jobs are provided by the state. Certain population groups are given priority	- recently, active employment policies were introduced focusing on job creation, worker training, and legal enforcement	- a lot of resemblance to the Soviet system - passive employment policies including early retirement and employment benefits - job training and professional orientation are available only for certain population groups
Employment Protection Regulation	- almost nobody ever gets fired	- Employer has to give a valid reason for dismissal - Employer has to give two months notice and pay one to three months of severance pay	- Employer has to give a valid reason for dismissal and pay severance for 6 months

APPENDIX B

Construction of Geographic Regions: Ukraine

Region:	**Administrative arrears that are part of the region**
South	Hersonska, Mikolaevska, Odeska, Zaporizhska
West	Volinska, Lvivska, Zakarpatska, Ivano-Frankivska, Ternopolska, Rivenska, Chernivetska
East	Luhanska, Donetska, Kharkivska, Dnipropetrovska, Chmelnitska
North	Sumska, Chernigovska, Kyievska, Poltavska
Central	Cherkaska, Kirovogradska, Vinitska, Zhitomirska
Crimea	Crimean peninsula and Sevastopol
Kiev	Kiev

APPENDIX C

Standardization of Industry Classification for Different Years: Ukraine

Classification of 1999-2000	Classification of 2001-2003
Industry	Mining, quarrying
	Manufacturing
	Electricity, gas, water, supply
Agriculture	Agriculture, hunting, Forestry
Forestry	Fishing
Construction	Construction
Transportation	Transportation and Communication
Communication	
Information and Computing	
Education	Education
Culture	
Art	
Science and Scientific Services	
Health, Physical Culture	Health and Social Work
Sport	
Social Services	
Finance, Credit, Insurance	Finance
Government Administration	Public Administration
Housing Services	Community, Social, and Personal Service Activities
Utilities	
Domestic Sphere	
Trade	Hotels and Restaurants Wholesale and Retail Trade
Restaurant Services	
Input Supply	
Output Marketing	
Business Activities	Real Estate, Rental, Business Activities
Law Enforcement and Armed Forces	Domestic Servants, Butlers
City Organizations	Extra-territorial organizations and bodies
Other	

APPENDIX D

Types of Ownership of Business: Ukraine 1999-2003

Form of Business Ownership 1999-2003	Definition of Business Ownership
State	Company owned by the state
Working Collective	Company owned by the working members in equal shares
Cooperative	Company owned by a group of individuals not necessarily in equal shares
Private Person (Citizen of Ukraine)	Company owned by a private individual who is a citizen of Ukraine
Private Person (Foreign Citizen)	Company is owned by a foreign individual who is not a citizen of Ukraine
Stock Company	Company is financed by issuing of stock
Rented Company	Means of production are rented from the state
Other	Other type of ownership

APPENDIX E

Detailed Empirical Results

Table E 1. OLS Estimates of Wage Equation for Ukraine 1999 – 2003: Human Capital Specification for Males and Females

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
	4.923*	5.403*	6.357*	6.753*	6.472*
INTERCEPT	(0.213)	(0.170)	(0.148)	(0.137)	(0.127)
	0.329*	0.183*	0.152*	0.145*	0.177*
CITY	(0.034)	(0.028)	(0.024)	(0.022)	(0.020)
	-0.709*	-0.634*	-0.490*	-0.529*	-0.483*
RURAL	(0.036)	(0.028)	(0.025)	(0.023)	(0.022)
	0.725*	0.646*	0.684*	0.588*	0.418*
KIEV	(0.082)	(0.059)	(0.049)	(0.045)	(0.042)
	0.285*	0.231*	0.290*	0.295*	0.249*
SOUTH	(0.051)	(0.041)	(0.035)	(0.033)	(0.031)
	0.252*	0.173*	0.218*	0.212*	0.171*
WEST	(0.046)	(0.036)	(0.031)	(0.029)	(0.028)
	0.349*	0.333*	0.364*	0.353*	0.295*
EAST	(0.045)	(0.036)	(0.031)	(0.029)	(0.027)
	0.188*	0.190*	0.262*	0.261*	0.241*
NORTH	(0.052)	(0.041)	(0.035)	(0.033)	(0.032)
	0.436*	0.278*	0.324*	0.408*	0.357*
CRIMEA	(0.074)	(0.059)	(0.052)	(0.046)	(0.043)
	0.062	0.079**	0.170*	0.107*	0.108*
MARRIED	(0.050)	(0.039)	(0.034)	(0.031)	(0.029)
	-0.055	0.054	0.097**	0.110*	0.068*
DIVORCED/WIDOWED	(0.065)	(0.050)	(0.043)	(0.039)	(0.036)
	-0.175*	-0.236*	-0.267*	-0.287*	-0.295*
FEMALE	(0.029)	(0.023)	(0.020)	(0.018)	(0.017)
	0.071*	0.065*	0.035*	0.032*	0.024*
AGE	(0.012)	(0.009)	(0.008)	(0.008)	(0.007)
	-0.001*	-0.001*	-0.001*	-0.000*	-0.000*
AGESQ	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.260*	-0.142*	-0.221*	-0.104**	-0.239*
ELEMENTARY EDUCATION	(0.058)	(0.052)	(0.046)	(0.045)	(0.045)
	0.090*	0.126*	0.113*	0.115*	-0.001
VOCATIONAL TRAINING	(0.044)	(0.033)	(0.029)	(0.026)	(0.024)
	0.262**	0.324*	0.253*	0.245*	0.154*
SECONDARY SPECIAL	(0.038)	(0.031)	(0.027)	(0.024)	(0.024)
	0.269**	0.308*	0.215*	0.349*	0.235*
INCOMPLETE HIGHER	(0.082)	(0.055)	(0.053)	(0.091)	(0.063)
	0.656**	0.635*	0.505*	0.468*	0.422*
HIGHER EDUCATION	(0.043)	(0.033)	(0.029)	(0.027)	(0.025)
# Obs.	7852	7611	7522	7516	7650
R-SQ	20%	24%	24%	25%	25%

Note: * means significant at 99% level, ** means significant at 95% level

Table E 2. OLS Estimates of Wage Equation. Ukraine 1999-2003. Human Capital Specification. Males Only

Variable	1999	2000	2001	2002	2003
	Estimate (Standard Error)				
INTERCEPT	5.246*	5.713*	6.485*	6.845*	6.486*
	(0.304)	(0.247)	(0.224)	(0.199)	(0.186)
CITY	0.383*	0.206*	0.174*	0.156*	0.219*
	(0.053)	(0.042)	(0.038)	(0.034)	(0.031)
RURAL	-0.881*	-0.735*	-0.617*	-0.668*	-0.622*
	(0.054)	(0.042)	(0.039)	(0.035)	(0.034)
KIEV	0.844*	0.810*	0.789*	0.702*	0.458*
	(0.124)	(0.090)	(0.079)	(0.070)	(0.056)
SOUTH	0.399*	0.365*	0.393*	0.426*	0.376*
	(0.077)	(0.062)	(0.056)	(0.049)	(0.047)
WEST	0.385*	0.277*	0.263*	0.234*	0.245*
	(0.070)	(0.054)	(0.049)	(0.044)	(0.044)
EAST	0.473*	0.510*	0.535*	0.471*	0.435*
	(0.069)	(0.054)	(0.049)	(0.044)	(0.043)
NORTH	0.265*	0.270*	0.344*	0.337*	0.348*
	(0.079)	(0.062)	(0.056)	(0.050)	(0.049)
CRIMEA	0.603*	0.480*	0.471*	0.477*	0.452*
	(0.117)	(0.089)	(0.082)	(0.071)	(0.068)
MARRIED	0.214*	0.234*	0.385*	0.263*	0.224*
	(0.076)	(0.061)	(0.053)	(0.047)	(0.043)
DIVORCED/WIDOWED	-0.149	-0.050	-0.061	0.061	-0.008
	(0.129)	(0.095)	(0.089)	(0.074)	(0.069)
AGE	0.053*	0.049*	0.022***	0.023**	0.017
	(0.017)	(0.014)	(0.012)	(0.011)	(0.010)
AGESQ	-0.001*	-0.001*	-0.000**	-0.000*	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ELEMENTARY EDUCATION	-0.334*	-0.042	-0.208*	-0.112***	-0.237*
	(0.081)	(0.075)	(0.067)	(0.061)	(0.067)
VOCATIONAL TRAINING	0.030	0.109**	0.111*	0.189*	0.020*
	(0.062)	(0.048)	(0.042)	(0.037)	(0.035)
SECONDARY SPECIAL	0.189*	0.343*	0.260*	0.287*	0.218*
	(0.059)	(0.048)	(0.043)	(0.038)	(0.039)
INCOMPLETE HIGHER	0.105	0.394*	0.205**	0.416**	0.208**
	(0.130)	(0.084)	(0.091)	(0.170)	(0.105)
HIGHER EDUCATION	0.608*	0.605*	0.483*	0.443*	0.433*
	(0.066)	(0.051)	(0.047)	(0.041)	(0.039)
# Obs.	3904	3699	3604	3662	3725
R-SQ	24%	27%	28%	29%	28%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 3. OLS Estimates of Wage Equation. Ukraine 1999 – 2003. Human Capital Specification. Females Only

Variable	1999	2000	2001	2002	2003
		Estimate (Standard Error)			
INTERCEPT	4.663*	5.927*	6.129*	6.601*	6.161*
	(0.0312)	(0.234)	(0.197)	(0.191)	(0.172)
CITY	0.278*	0.172*	0.140*	0.132*	0.138*
	(0.044)	(0.033)	(0.029)	(0.028)	(0.025)
RURAL	-0.521*	-0.470*	-0.346*	-0.384*	-0.332*
	(0.046)	(0.035)	(0.030)	(0.030)	(0.028)
KIEV	0.603*	0.502*	0.581*	0.468*	0.372*
	(0.106)	(0.069)	(0.060)	(0.057)	(0.051)
SOUTH	0.168**	0.148*	0.189*	0.165*	0.121*
	(0.067)	(0.050)	(0.043)	(0.042)	(0.038)
WEST	0.122**	0.157*	0.170*	0.181*	0.102*
	(0.060)	(0.045)	(0.039)	(0.037)	(0.035)
EAST	0.217*	0.225*	0.196*	0.231*	0.161*
	(0.058)	(0.044)	(0.038)	(0.037)	(0.034)
NORTH	0.108	0.130*	0.187*	0.186*	0.142*
	(0.067)	(0.050)	(0.044)	(0.041)	(0.039)
CRIMEA	0.272*	0.172**	0.185*	0.336*	0.271*
	(0.093)	(0.071)	(0.065)	(0.057)	(0.053)
MARRIED	-0.066	-0.047	-0.056	-0.051	-0.032
	(0.066)	(0.049)	(0.044)	(0.042)	(0.037)
DIVORCED/WIDOWED	-0.104	-0.019	-0.016	0.026	0.009
	(0.076)	(0.055)	(0.049)	(0.047)	(0.042)
AGE	0.074*	0.032**	0.040*	0.029*	0.031*
	(0.017)	(0.013)	(0.011)	(0.011)	(0.010)
AGE SQUARED	-0.001*	-0.000*	-0.000*	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ELEMENTARY EDUCATION	-0.127	-0.234*	-0.214*	0.015	-0.234*
	(0.082)	(0.071)	(0.064)	(0.066)	(0.058)
VOCATIONAL TRAINING	0.163*	0.120*	0.107*	0.013*	-0.014
	(0.062)	(0.043)	(0.038)	(0.036)	(0.032)
SECONDARY SPECIAL	0.332*	0.232*	0.233*	0.209*	0.097*
	(0.049)	(0.037)	(0.033)	(0.030)	(0.029)
INCOMPLETE HIGHER	0.426*	0.182*	0.185*	0.328*	0.249*
	(103)	(0.065)	(0.061)	(0.101)	(0.074)
HIGHER EDUCATION	0.712*	0.568*	0.501*	0.485*	0.400*
	(0.055)	(0.040)	(0.036)	(0.034)	(0.031)
# Obs.	3948	3912	3918	3854	3925
R-SQ	17%	21%	20%	20%	20%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 4. OLS Estimates of Wage Equation. Lithuania 2000. Human Capital Specification

	Males and Females	Males Only	Females Only
INTERCEPT	5.564* (0.19582)	5.839* (0.274)	4.988* (0.279)
MARRIED	0.164* (0.031)	0.359* (0.046)	-0.063* (0.041)
DIVORCED/WIDOWED	0.100** (0.0400)	-0.113* (0.082)	-0.020 (0.047)
FEMALE	-0.186* (0.0175)	N/A	N/A
AGE	-0.001 (0.007)	0.021** (0.010)	0.029* (0.011)
AGE SQUARED	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
ELEMENTARY	-0.184* (0.032)	-0.195* (0.042)	0.116** (0.050)
SECONDARY SPECIAL	0.178* (0.020)	0.154* (0.031)	0.182* (0.026)
HIGHER EDUCATION	0.632* (0.024)	0.606* (0.038)	0.628* (0.029)
# Obs.	4324	2168	2156
R-SQ	30%	29%	34%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 5. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Human Capital Specification. Males and Females

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
INTERCEPT	6.104*	6.619*	6.950*	7.372*	6.998*
	(0.168)	(0.150)	(0.136)	(0.126)	(0.118)
CITY	0.217*	0.127*	0.113*	0.105*	0.137*
	(0.027)	(0.023)	(0.021)	(0.020)	(0.019)
RURAL	-0.410*	-0.445*	-0.386*	-0.406*	-0.377*
	(0.027)	(0.024)	(0.022)	(0.020)	(0.020)
KIEV	0.550*	0.519*	0.523*	0.470*	0.254*
	(0.097)	(0.068)	(0.059)	(0.054)	(0.050)
SOUTH	0.156*	0.246*	0.278*	0.260*	0.167*
	(0.059)	(0.047)	(0.041)	(0.039)	(0.036)
WEST	0.216*	0.255*	0.288*	0.256*	0.119*
	(0.053)	(0.042)	(0.036)	(0.034)	(0.032)
EAST	0.172*	0.314*	0.301*	0.330*	0.162*
	(0.052)	(0.041)	(0.036)	(0.034)	(0.031)
NORTH	0.045	0.144*	0.204*	0.222*	0.143*
	(0.060)	(0.047)	(0.042)	(0.039)	(0.037)
CRIMEA	0.358*	0.329*	0.399*	0.4336*	0.314*
	(0.086)	(0.067)	(0.060)	(0.053)	(0.050)
MARRIED	0.101**	0.104*	0.162*	0.108*	0.153*
	(0.039)	(0.034)	(0.031)	(0.028)	(0.026)
DIVORCED/WIDOWED	0.012	0.048	0.073	0.106*	0.118*
	(0.051)	(0.043)	(0.040)	(0.036)	(0.032)
FEMALE	-0.267*	-0.325*	-0.336*	-0.343*	-0.356*
	(0.022)	(0.020)	(0.018)	(0.017)	(0.016)
AGE	0.057*	0.041*	0.035*	0.028*	0.026*
	(0.009)	(0.008)	(0.007)	(0.007)	(0.006)
AGE SQUARED	-0.001*	-0.001*	-0.000*	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ELEMENTARY EDUCATION	-0.122*	-0.132*	-0.204*	-0.096**	-0.170*
	(0.043)	(0.044)	(0.041)	(0.039)	(0.040)
VOCATIONAL TRAINING	0.095*	0.097*	0.091*	0.094*	0.020
	(0.032)	(0.028)	(0.025)	(0.023)	(0.021)
SECONDARY SPECIAL	0.185*	0.230*	0.196*	0.186*	0.144*
	(0.029)	(0.026)	(0.024)	(0.021)	(0.022)
INCOMPLETE HIGHER	0.237*	0.230*	0.186*	0.246*	0.243*
	(0.062)	(0.046)	(0.047)	(0.081)	(0.057)
HIGHER EDUCATION	0.466*	0.479*	0.449*	0.412*	0.404*
	(0.034)	(0.028)	(0.026)	(0.024)	(0.022)

Table E 5. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Human Capital Specification. Males and Females- continued

Selection Equation					
	0.499*	0.475*	0.500*	0.451*	0.328*
INTERCEPT	(0.034)	(0.036)	(0.037)	(0.036)	(0.036)
	-0.064*	-0.091*	-0.088*	-0.080*	-0.101*
NUMBER OF CHILDREN UNDER 7	(0.014)	(0.017)	(0.018)	(0.019)	(0.019)
	0.118*	0.162*	0.190*	0.161*	0.147*
HEAD OF HOUSEHOLD	(0.016)	(0.018)	(0.020)	(0.019)	(0.019)
	0.000*	0.000*	0.000*	0.000*	0.000*
NON-LABOR INCOME	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.101*	-0.097*	-0.043***	-0.087*	-0.130*
NUMBER OF PENSIONERS	(0.013)	(0.021)	(0.023)	(0.021)	(0.021)
	-0.079	0.031	0.117*	0.098	0.118***
KIEV	(0.071)	(0.070)	(0.070)	(0.067)	(0.063)
	-0.120*	-0.106**	-0.127*	-0.070	-0.000
SOUTH	(0.043)	(0.046)	(0.047)	(0.047)	(0.044)
	-0.215*	-0.192*	-0.245*	-0.190*	-0.083 ***
WEST	(0.038)	(0.040)	(0.042)	(0.041)	(0.040)
	-0.113*	-0.105*	-0.077	-0.113*	0.014
EAST	(0.038)	(0.040)	(0.041)	(0.041)	(0.040)
	-0.190*	-0.088*	-0.083	-0.051	-0.147*
CENTRAL	(0.042)	(0.044)	(0.045)	(0.044)	(0.043)
	-0.276*	-0.189*	-0.314*	-0.251*	-0.177*
CRIMEA	(0.060)	(0.063)	(0.065)	(0.062)	(0.060)
Lambda	-1.563	-1.143	-0.979	-0.930	-0.858

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 6. Wage Estimation with Heckman Correction. Ukraine 1999-2003. Human Capital Specification. Males Only

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
	6.005*	6.376*	6.805*	7.178*	6.868*
INTERCEPT	(0.243)	(0.221)	(0.210)	(0.186)	(0.173)
	0.228*	0.102*	0.125*	0.101*	0.158*
CITY	(0.043)	(0.037)	(0.035)	(0.032)	(0.029)
	-0.528*	-0.560*	-0.490*	-0.525*	-0.479*
RURAL	(0.042)	(0.037)	(0.035)	(0.031	(0.031)
	0.586*	0.560*	0.595*	0.521*	0.270*
KIEV	(0.146)	(0.110)	(0.093)	(0.084)	(0.078)
	0.202**	0.289*	0.365*	0.346*	0.229*
SOUTH	(0.089)	(0.074)	(0.065)	(0.058)	(0.056)
	0.310*	0.285*	0.328*	0.267*	0.156*
WEST	(0.079)	(0.064)	(0.057)	(0.051)	(0.050)
	0.243*	0.442*	0.437*	0.431*	0.256*
EAST	(0.078)	(0.063)	(0.056)	(0.051)	(0.050)
	0.085	0.170**	0.310*	0.315*	0.240*
NORTH	(0.091)	(0.073)	(0.065)	(0.058)	(0.057)
	0.540*	0.468*	0.507*	0.518*	0.345*
CRIMEA	(0.133)	(0.105)	(0.094)	(0.082)	(0.079)
	0.136**	0.160*	0.281*	0.187*	0.213*
MARRIED	(0.061)	(0.054)	(0.050)	(0.044)	(0.039)
	-0.091	-0.101*	-0.040	0.042	0.095
DIVORCED/WIDOWED	(0.097)	(0.083)	(0.081)	(0.067)	(0.060)
	0.060*	0.052*	0.035*	0.034*	0.026*
AGE	(0.013)	(0.012)	(0.011)	(0.010)	(0.009)
	-0.001*	-0.001*	-0.000*	-0.000*	-0.000*
AGE SQUARED	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ELEMENTARY	-0.225*	-0.088	-0.209*	-0.118**	-0.213*
EDUCATION	(0.061)	(0.064)	(0.059)	(0.054)	(0.059)
VOCATIONAL	0.024	0.103**	0.090**	0.145*	0.053***
TRAINING	(0.047)	(0.041)	(0.038)	(0.033)	(0.031)
	0.104*	0.282*	0.232*	0.227*	0.223*
SECONDARY SPECIAL	(0.046)	(0.042)	(0.039)	(0.034)	(0.035)
	0.114	0.334*	0.184**	0.266***	0.238* *
INCOMPLETE HIGHER	(0.101)	(0.073)	(0.083)	(0.154)	(0.093)
	0.429*	0.488*	0.447*	0.398*	0.431*
HIGHER EDUCATION	(0.053)	(0.045)	(0.043)	(0.037)	(0.035)

Table E 6. Wage Estimation with Heckman Correction. Ukraine 1999-2003. Human Capital Specification. Males Only-continued

	Selection Equation				
	0.541*	0.515*	0.483*	0.458*	0.337*
INTERCEPT	(0.050)	(0.053)	(0.055)	(0.054)	(0.052)
NUMBER OF CHILDREN	0.044**	0.077*	0.110*	0.114*	0.112*
UNDER 7	(0.025)	(0.027)	(0.032)	(0.034)	(0.030)
	0.078*	0.093*	0.164*	0.105*	0.102*
HEAD OF HOUSEHOLD	(0.024)	(0.027)	(0.030)	(0.029)	(0.028)
	0.000*	0.000*	0.000*	0.000*	0.000*
NON-LABOR INCOME	(0.000)	(0.000)	(000)	(0.000)	(0.000)
NUMBER OF	-0.163*	-0.139*	-0.136*	-0.134*	-0.214*
PENSIONERS	(0.019)	(0.029)	(0.033)	(0.031)	(0.029)
	-0.019	0.103	0.161	0.165	0.072
KIEV	(0.109)	(0.108)	(0.109)	(0.106)	(0.091)
	-0.086	-0.105	-0.108	-0.019	0.072
SOUTH	(0.062)	(0.067)	(0.069)	(0.068)	(0.065)
	-0.195*	-0.190*	-0.231*	-0.157*	-0.032
WEST	(0.056)	(0.059)	(0.061)	(0.060)	(0.058)
	-0.033	-0.125**	-0.011	-0.042	0.071
EAST	(0.056)	(0.058)	(0.061)	(0.060)	(0.058)
	-0.189*	-0.1437**	-0.062	-0.039	-0.125**
CENTRAL	(0.060)	(0.063)	(0.066)	(0.064)	(0.062)
	-0.312*	-0.228*	-0.252*	-0.293*	-0.168**
CRIMEA	(0.089)	(0.013)	(0.095)	(0.090)	(0.089)
Lambda	-1.637	-1.246	-1.042	-0.965	-0.938

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 7. Wage Estimation with Heckman Correction. Ukraine 1999-2003. Human Capital Specification. Females Only

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
	6.198*	6.730*	6.797*	7.433*	6.742*
INTERCEPT	(0.244)	(0.207)	(0.178)	(0.172)	(0.160)
	0.202*	0.138*	0.121*	0.114*	0.109*
CITY	(0.034)	(0.029)	(0.026)	(0.025)	(0.023)
	-0.270*	-0.3410*	-0.270*	-0.283*	-0.261*
RURAL	(0.035)	(0.030)	(0.027)	(0.026)	(0.025)
	0.509*	0.441*	0.457*	0.405*	0.251*
KIEV	(0.1244)	(0.080)	(0.070)	(0.067)	(0.060)
	0.109	0.182*	0.189*	0.171*	0.096**
SOUTH	(0.077)	(0.058)	(0.050)	(0.049)	(0.044)
	0.132***	0.225*	0.236*	0.227*	0.087**
WEST	(0.069)	(0.052)	(0.044	(0.043)	(0.040)
	0.095	0.188*	0.159*	0.224*	0.073***
EAST	(0.067)	(0.050)	(0.043)	(0.042)	(0.039)
	-0.008	0.107**	0.112**	0.139*	0.059
NORTH	(0.078)	(0.059)	(0.051)	(0.049)	(0.045)
	0.186***	0.196**	0.288*	0.348*	0.279*
CRIMEA	(0.108)	(0.083)	(0.074)	(0.067)	(0.061)
	0.044	0.007	0.010	0.014	0.034
MARRIED	(0.05)	(0.043)	(0.039)	(0.037)	(0.034)
	0.002	0.018	0.000	0.058	0.066***
DIVORCED/WIDOWED	(0.059)	(0.049)	(0.044)	(0.041)	(0.038)
	0.037*	0.018	0.030*	0.009*	0.025*
AGE	(0.013)	(0.011)	(0.009)	(0.010)	(0.009)
	-0.000*	-0.000	-0.000*	-0.000*	-0.000*
AGE SQUARED	(0.000)	(0.000)	(0.000)	().000)	(0.000)
ELEMENTARY	0.019	-0.141**	-0.173*	0.020	-0.149*
EDUCATION	(0.060)	(0.059)	(0.055)	(0.057)	(0.052)
VOCATIONAL	0.154*	0.115*	0.101*	0.009*	-0.003
TRAINING	(0.046)	(0.037)	(0.034)	(0.032)	(0.029)
	0.250*	0.193*	0.151*	0.158*	0.080*
SECONDARY SPECIAL	(0.0337)	(0.032)	(0.029)	(0.026)	(0.026)
	0.368*	0.118**	0.161*	0.252*	0.238*
INCOMPLETE HIGHER	(0.076)	(0.056)	(0.053)	(0.090)	(0.068)
	0.500*	0.471*	0.426*	0.422*	0.371*
HIGHER EDUCATION	(0.042)	(0.035)	(0.032)	(0.030)	(0.028)

Table E 7. Wage Estimation with Heckman Correction. Ukraine 1999-2003. Human Capital Specification. Females Only-continued

Selection Equation					
	0.426*	0.425*	0.497*	0.421*	0.306*
INTERCEPT	(0.046)	(0.049)	(0.052)	(0.051)	(0.050)
NUMBER OF	-0.147*	-0.254*	-0.242*	-0.241*	-0.306*
CHILDREN UNDER 7	(0.018)	(0.024)	(0.024)	(0.026)	(0.027)
HEAD OF	0.157*	0.235*	0.198*	0.209*	0.176*
HOUSEHOLD	(0.024)	(0.028)	(0.029)	(0.028)	(0.028)
	0.000*	0.000*	0.000*	0.000*	0.000*
NON-LABOR INCOME	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NUMBER OF	-0.039**	-0.075**	0.023	-0.065**	-0.059**
PENSIONERS	(0.019)	(0.030)	(0.033)	(0.029)	(0.030)
	-0.169***	-0.081*	0.103	0.040*	0.140*
KIEV	(0.096)	(0.089)	(0.094)	(0.089)	(0.088)
	-0.155*	-0.090	-0.133**	-0.123***	-0.073
SOUTH	(0.059)	(0.062)	(0.065)	(0.064)	(0.062)
	-0.214*	-0.200*	-0.250*	-0.230*	-0.120**
WEST	(0.053)	(0.056)	(0.059)	(0.057)	(0.056)
	-0.182*	-0.033	-0.125**	-0.189*	-0.049
EAST	(0.052)	(0.056)	(0.058)	(0.056)	(0.554)
	-0.186*	-0.042	-0.093	-0.065*	-0.167*
CENTRAL	(0.059)	(0.061)	(.063)	(0.062)	(0.061)
	-0.229*	-0.168***	-0.351	-0.210*	-0.188**
CRIMEA	(0.081)	(0.087)	(0.089)	(0.085)	(0.083)
Lambda	-1.440	-1.004	-0.860	-0.841	-0.730

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 8. Heckman Two Stage Wage Estimation. Lithuania 2000. Human Capital Specification

	Males and Females	Males Only	Females Only
INTERCEPT	5.731*	6.021*	5.254*
	(0.185)	(0.259)	(0.257)
MARRIED	0.126*	0.264*	-0.042
	(0.030)	(0.044)	(0.039)
DIVORCED/WIDOWED	0.048	-	-0.018
	(0.038)	0.130***	(0.045)
FEMALE	-0.166*		
	(0.017)	N/A	N/A
AGE	0.001	-0.019**	0.027*
	(0.007)	(0.009)	(0.010)
AGE SQUARED	-0.000*	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)
ELEMENTARY	-0.161*	-0.171*	-
	(0.030)	(0.039)	0.098**
SECONDARY SPECIAL	0.176*	0.158*	0.173*
	(0.020)	(0.029)	(0.024)
HIGHER EDUCATION	0.620*	0.587*	0.629*
	(0.023)	(0.037)	(0.028)
Selection Equation			
INTERCEPT	0.361*	0.034	0.580*
	(0.037)	(0.063)	(0.049)
NUMBER OF CHILDREN UNDER 7	0.028	0.173*	-
	(0.036)	(0.059)	0.117**
HEAD OF HOUSEHOLD	0.769*	0.978*	0.579*
	(0.040)	(0.061)	(0.055)
NON-LABOR INCOME	0.000*	0.001*	-0.000*
	(0.000)	(0.000)	(0.000)
NUMBER OF PENSIONERS	-	-0.111	-0.134*
	0.104**	(0.069)	(0.059)
Lambda	-0.524	-0.515	-0.493

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 9. OLS Estimates of Wage Equation. Ukraine 1999-2003. Augmented Specification. Males and Females

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
	5.096*	5.806*	6.602*	6.849*	6.664*
Intercept	(0.200)	(0.158)	(0.139)	(0.128)	(0.119)
	0.220*	0.100*	0.100*	0.097*	0.146*
CITY	(0.032)	(0.025)	(0.023)	(0.021)	(0.019)
	-0.222*	-0.236*	-0.162*	-0.223*	-0.197*
RURAL	(0.036)	(0.028)	(0.025)	(0.023)	(0.022)
	0.650*	0.611*	0.641*	0.540*	0.390*
KIEV	(0.076)	(0.052)	(0.046)	(0.042)	(0.039)
	0.295*	0.232*	0.260*	0.264*	0.217*
SOUTH	(0.047)	(0.037)	(0.033)	(0.030)	(0.028)
	0.154*	0.127*	0.154*	0.121*	0.085*
WEST	(0.043)	(0.033)	(0.029)	(0.027)	(0.026)
	0.299*	0.319*	0.312*	0.273*	0.226*
EAST	(0.042)	(0.033)	(0.029)	(0.027)	(0.025)
	0.158*	0.142*	0.208*	0.218*	0.202*
NORTH	(0.048)	(0.037)	(0.033)	(0.030)	(0.029)
	0.426*	0.304*	0.337*	0.376*	0.320*
CRIMEA	(0.069)	(0.053)	(0.049)	(0.042)	(0.040)
	0.086***	0.089**	0.149*	0.099*	0.091*
MARRIED	(0.046)	(0.036)	(0.032)	(0.029)	(0.026)
	-0.0367	0.043	0.091*	0.100*	0.065**
DIVORCED/WIDOWED	(0.060)	(0.045)	(0.040)	(0.036)	(0.033)
	-0.259*	-0.242*	-0.255*	-0.265*	-0.279*
AGE	(0.028)	(0.022)	(0.020)	(0.018)	(0.017)
	0.074	0.055*	0.036*	0.039*	0.028*
AGE SQUARED	(0.011)	(0.009)	(0.008)	(0.007)	(0.006)
	-0.001*	-0.001*	-0.000*	-0.000*	-0.000*
ELEMENTARY EDUC	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.152*	-0.028	-0.098**	-0.023	-0.136*
VOCATIONAL TRAINING	(0.053)	(0.048)	(0.043)	(0.041)	(0.041)
	0.055	0.106*	0.097*	0.093*	-0.017
SECONDARY SPECIAL	(0.041)	(0.030)	(0.027)	(0.024)	(0.022)
	0.199*	0.230*	0.214*	0.213*	0.131*
INCOMPLETE HIGHER	(0.036)	(0.028)	(0.025)	(0.022)	(0.022)
	0.156**	0.244*	0.173*	0.320*	0.199*
HIGHER EDUCATION	(0.076)	(0.049)	(0.049)	(0.084)	(0.058)
	0.543*	0.564*	0.477	0.465*	0.394*
AGRICULTURE, FORESTRY	(0.041)	(0.031)	(0.028)	(0.026)	(0.024)
	-1.073*	-0.790*	-0.842*	-0.762*	-0.804*
CONSTRUCTION	(0.052)	(0.042)	(0.037)	(0.033)	(0.032)
TRANSPORTATION AND	-0.082	-0.020	-0.140*	-0.042	-0.062
COMMUNICATIONS	(0.064)	(0.051)	(0.045)	(0.041)	(0.038)
	0.121	0.158*	0.044*	0.091*	0.028
EDUCATION, CULTURE	(0.050)	(0.038)	(0.035)	(0.032)	(0.030)

Table E 9. OLS Estimates of Wage Equation. Ukraine 1999-2003. Augmented Specification. Males and Females-continued

HEALTH CARE, PHYSICAL	-0.160	-0.286*	-0.347*	-0.340*	-0.344*
CULTURE, SOCIAL SECURITY	(0.052)	(0.040)	(0.037)	(0.034)	(0.032)
		-			
FINANCE, INSURANCE,	-0.008	0.077***	-0.278*	-0.288*	-0.358*
CREDIT, PENSION SECURITY	(0.055)	(0.042)	(0.037)	(0.035)	(0.033)
	0.293**	0.324*	0.105	0.017	0.022*
STATE	(0.0127)	(0.098)	(0.092)	(0.070)	(0.063)
MUNICIPAL UTILITIES,	0.213*	0.289*	-0.004	0.045	-0.027
SERVICE SPHERE	(0.077)	(0.060)	(0.056)	(0.039)	(0.033)
TRADE, PUBLIC CATERING,	-0.191*	-0.214*	-0.307*	-0.341*	-0.330*
INPUT SUPPLY	(0.062)	(0.046)	(0.042)	(0.047)	(0.042)
	-0.003	-0.094**	-0.166*	-0.151*	-0.176*
OTHER	(0.053)	(0.041)	(0.036)	(0.033)	(0.030)
WORKING COLLECTIVE OR	0.204*	0.268*	0.040*	-0.159**	-0.182*
COOPERATIVE	(0.068)	(0.052)	(0.049)	(0.071)	(0.066)
	-0.491*	-0.368*	-0.330*	-0.422*	-0.372*
STOCK COMPANY	(0.044)	(0.037)	(0.035)	(0.034)	(0.034)
	-0.086**	0.109*	-0.004*	-0.020	-0.087*
RENTAL COMPANY	(0.041)	(0.030)	(0.027)	(0.025)	(0.024)
	0.332**	-0.029	-0.091	0.151	-0.163
FOREIGN OWNERSIP	(0.140)	(0.093)	(0.076)	(0.072)	(0.073)
	0.468*	0.579*	0.224*	0.393*	0.250
PRIVATE OWNERSHIP	(0.155)	(0.120)	(0.104)	(0.090)	(0.101)
	0.054	0.017	-0.119*	-0.074*	-0.143*
OTHER	(0.055)	(0.038)	(0.032)	(0.029)	(0.026)
	-1.126**	-0.624*	-1.085*	-0.095	-0.263
BOOTHER	(0.458)	(0.165)	(0.163)	(0.351)	(0.233)
# Obs.	7852	7611	7522	7516	7650
R-SQ	32%	36%	35%	36%	36%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 10. OLS Estimates of Wage Equation. Ukraine 1999-2003. Augmented Specification. Males Only

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
	5.648*	5.822*	6.812*	6.943*	6.755*
Intercept	(0.284)	(0.230)	(0.209)	(0.183)	(0.172)
	0.234*	0.077*	0.103*	0.101*	0.182*
CITY	(0.049)	(0.039)	(0.036)	(0.032)	(0.029)
	-0.273*	-0.266*	-0.184*	-0.272*	-0.221*
RURAL	(0.055)	(0.043)	(0.040)	(0.035)	(0.035)
	0.735*	0.731*	0.715*	0.629*	0.430*
KIEV	(0.114)	(0.083)	(0.073)	(0.064)	(0.060)
	0.353*	0.339*	0.338*	0.393*	0.323*
SOUTH	(0.071)	(0.057)	(0.051)	(0.045)	(0.043)
	0.225*	0.166*	0.175*	0.124*	0.123*
WEST	(0.064)	(0.050)	(0.045)	(0.040)	(0.040)
	0.344*	0.431*	0.440*	0.368*	0.340*
EAST	(0.064)	(0.050)	(0.045)	(0.040)	(0.039)
	0.181**	0.162*	0.255*	0.274*	0.298*
NORTH	(0.072)	(0.057)	(0.052)	(0.045)	(0.045)
	0.569*	0.434*	0.444*	0.413*	0.363*
CRIMEA	(0.108)	(0.082)	(0.075)	(0.064)	(0.062)
	0.252*	0.204*	0.339*	0.217*	0.197*
MARRIED	(0.070)	(0.056)	(0.049)	(0.042)	(0.039)
	-0.1023	-0.038	-0.078	0.001	0.015
DIVORCED/WIDOWED	(0.118)	(0.087)	(0.082)	(0.067)	(0.063)
	0.051*	0.052*	0.023**	0.032*	0.020**
AGE	(0.015)	(0.012)	(0.011)	(0.010)	(0.009)
	-0.001*	-0.001*	-0.000**	-0.000*	-0.000**
AGE SQUARED	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.217*	0.076	-0.086	-0.044	-0.119***
ELEMENTARY EDUC	(0.074)	(0.069)	(0.061)	(0.055)	(0.061)
	0.001	0.117*	0.085**	0.157*	-0.002
VOCATIONAL TRAINING	(0.057)	(0.043)	(0.038)	(0.033)	(0.032)
	0.136	0.281*	0.198*	0.239*	0.177*
SECONDARY SPECIAL	(0.054)	(0.044)	(0.040)	(0.034)	(0.035)
	0.024	0.316*	0.121	0.401*	0.175***
INCOMPLETE HIGHER	(0.119)	(0.077)	(0.084)	(0.154)	(0.096)
	0.509*	0.600*	0.454*	0.446*	0.409*
HIGHER EDUCATION	(0.063)	(0.048)	(0.045)	(0.038)	(0.037)
	-1.157*	-0.893*	-0.958*	-0.762*	-0.841*
AGRICULTURE, FORESTRY	(0.074)	(0.060)	(0.052)	(0.045)	(0.045)
	-0.184**	-0.071	-0.219*	-0.085**	-0.069
CONSTRUCTION	(0.081)	(0.066)	(0.057)	(0.058)	(0.047)

Table E 10. OLS Estimates of Wage Equation. Ukraine 1999-2003. Augmented Specification. Males Only-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
TRANSPORTATION AND COMMUNICATIONS	-0.006	0.105**	-0.044	0.062	0.015
	(0.065)	(0.052)	(0.046)	(0.042)	(0.040)
EDUCATION, CULTURE	-0.367*	-0.498*	-0.503*	-0.465*	-0.518*
	(0.094)	(0.075)	(0.067)	(0.061)	(0.061)
HEALTH CARE, PHYSICAL CULTURE, SOCIAL SECURITY	-0.217**	-0.180***	-0.399*	-0.415*	-0.511*
	(0.121)	(0.093)	(0.077)	(0.071)	(0.070)
FINANCE, INSURANCE, CREDIT, PENSION SECURITY	0.111	0.311	-0.104	0.130	-0.046
	(0.310)	(0.191)	(0.237)	(0.158)	(0.119)
STATE	0.089	0.192	0.034	0.080	-0.017
	(0.148)	(0.120)	(0.102)	(0.055)	(0.049)
MUNICIPAL UTILITIES, SERVICE SPHERE	-0.308	-0.306*	-0.366*	-0.348*	-0.378*
	(0.089)	(0.068)	(0.065)	(0.076)	(0.063)
TRADE, PUBLIC CATERING, INPUT SUPPLY	-0.215**	-0.126***	-0.226*	-0.169*	-0.144*
	(0.089)	(0.067)	(0.060)	(0.052)	(0.049)
OTHER	0.047	0.244*	0.047	-0.250**	-0.257**
	(0.087)	(0.068)	(0.064)	(0.121)	(0.103)
WORKING COLLECTIVE OR COOPERATIVE	-0.607*	-0.363*	-0.320*	-0.557*	-0.468*
	(0.061)	(0.052)	(0.050)	(0.049)	(0.048)
STOCK COMPANY	-0.168*	0.099**	-0.010	-0.058***	-0.146*
	(0.057)	(0.043)	(0.039)	(0.035)	(0.033)
RENTAL COMPANY	0.481**	0.014	-0.102	0.130	-0.223**
	(0.210)	(0.134)	(0.106)	(0.100)	(0.094)
FOREIGN OWNERSIP	0.271	0.608*	0.483*	0.289**	0.281***
	(0.217)	(0.150)	(0.147)	(0.126)	(0.0627)
PRIVATE OWNERSHIP	0.078	0.022	-0.095**	-0.081**	-0.221*
	(0.080)	(0.055)	(0.046)	(0.040)	(0.037)
OTHER	-1.245*	-0.616*	-0.734*	0.099	-0.238
	(0.534)	(0.212)	(0.214)	(0.425)	(0.288)
# Obs.	3904	3699	3604	3662	3725
R-SQ	36%	40%	40%	43%	41%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 11. OLS Estimates of Wage Equation. Ukraine 1999-2003. Augmented Specification. Females Only

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
	4.430*	5.742*	6.266*	6.616*	6.276*
Intercept	(0.297)	(0.226)	(0.188)	(0.184)	(0.167)
	0.290*	0.120*	0.098*	0.095*	0.112*
CITY	(0.041)	(0.031)	(0.028)	(0.027)	(0.024)
	-0.175*	-0.217*	-0.147*	-0.179*	-0.170*
RURAL	(0.047)	(0.036)	(0.031)	(0.031)	(0.028)
	0.563*	0.484*	0.573*	0.434*	0.349*
KIEV	(0.100)	(0.065)	(0.056)	(0.055)	(0.049)
	0.222*	0.122**	0.186*	0.139*	0.107*
SOUTH	(0.062)	(0.047)	(0.041)	(0.040)	(0.036)
	0.079	0.010**	0.140*	0.118*	0.055**
WEST	(0.056)	(0.043)	(0.036)	(0.035)	(0.033)
	0.231*	0.206*	0.186*	0.180*	0.122*
EAST	(0.055)	(0.042)	(0.036)	(0.035)	(0.032)
	0.123**	0.110**	0.167*	0.167*	0.117*
NORTH	(0.063)	(0.047)	(0.041)	(0.039)	(0.037)
	0.277*	0.178*	0.235*	0.323*	0.269*
CRIMEA	(0.087)	(0.067)	(0.061)	(0.055)	(0.051)
	-0.034	-0.024	-0.047	-0.028	-0.031
MARRIED	(0.062)	(0.046)	(0.041)	(0.040)	(0.035)
	-0.091	-0.008	0.002	0.047	0.008
DIVORCED/WIDOWED	(0.071)	(0.052)	(0.046)	(0.045)	(0.039)
	0.082*	0.042*	0.041*	0.037*	0.035*
AGE	(0.016)	(0.012)	(0.010)	(0.010)	(0.009)
	-0.001*	-0.000*	-0.000*	-0.000*	-0.000*
AGE SQUARED	(0.000)	(0.000)	(0.000)	(0.0016)	(0.000)
	-0.045	-0.138*	-0.118**	0.084	-0.155*
ELEMENTARY EDUC	(0.076)	(0.067)	(0.060)	(0.063)	(0.055)
	0.109***	0.108*	0.100*	0.008	-0.027
VOCATIONAL TRAINING	(0.058)	(0.041)	(0.036)	(0.034)	(0.030)
	0.249*	0.185*	0.205*	0.190*	0.084*
SECONDARY SPECIAL	(0,047)	(0.035)	(0.031)	(0.028)	(0.028)
	0.299*	0.169*	0.162*	0.287*	0.212*
INCOMPLETE HIGHER	(0.097)	(0.062)	(0.057)	(0.096)	(0.071)
	0.587*	0.544*	0.474*	0.483*	0.371*
HIGHER EDUCATION	(0.054)	(0.039)	(0.035)	(0.034)	(0.031)
	-0.926*	-0.592*	-0.634*	-0.692*	-0.677*
AGRICULTURE, FORESTRY	(0.077)	(0.061)	(0.052)	(0.049)	(0.046)
	0.061	0.023*	0.043	0.091	-0.022
CONSTRUCTION	(0.114)	(0.089)	(0.086)	(0.077)	(0.072)

Table E 11. OLS Estimates of Wage Equation. Ukraine 1999-2003. Augmented Specification. Females Only-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
TRANSPORTATION AND	0.337*	0.247*	0.183*	0.137*	0.071
COMMUNICATIONS	(0.080)	(0.058)	(0.0007)	(0.050)	(0.048)
	0.082	-0.134*	-0.209*	-0.234*	-0.205*
EDUCATION, CULTURE	(0.065)	(0.048)	(0.045)	(0.043)	(0.039)
HEALTH CARE, PHYSICAL	0.223*	0.037	-0.157*	-0.179*	-0.231*
CULTURE, SOCIAL SECURITY	(0.065)	(0.049)	(0.044)	(0.042)	(0.039)
FINANCE, INSURANCE, CREDIT,	0.493*	0.391*	0.245*	0.071	0.109
PENSION SECURITY	(0.134)	(0.109)	(0.093)	(0.076)	(0.071)
	0.421*	0.398*	0.056	0.029	0.012
STATE	(0.090)	(0.067)	(0.065)	(0.054)	(0.046)
MUNICIPAL UTILITIES, SERVICE	0.007	-0.070	-0.197*	-0.285*	-0.241*
SPHERE	(0.086)	(0.062)	(0.054)	(0.058)	(0.055)
TRADE, PUBLIC CATERING, INPUT	0.219*	-0.002	-0.054	-0.083***	-0.173*
SUPPLY	(0.067)	(0.051)	(0.045)	(0.042)	(0.039)
	0.394*	0.253*	-0.053	-0.065	-0.077
OTHER	(0.118)	(0.086)	(0.078)	(0.085)	(0.083)
WORKING COLLECTIVE OR	-0.293*	-0.359*	-0.315*	-0.259*	-0.240*
COOPERATIVE	(0.065)	(0.052)	(0.048)	(0.047)	(0.047)
	0.065	0.136*	0.028	0.028	-0.001
STOCK COMPANY	(0.059)	(0.043)	(0.038)	(0.036)	(0.034)
	0.126	-0.069*	-0.057	0.166	-0.053
RENTAL COMPANY	(0.186)	(0.129)	(0.109)	(0.104)	(0.120)
	0.750*	0.441**	-0.149	0.494*	0.224**
FOREIGN OWNERSIP	(0.220)	(0.216)	(0.147)	(0.127)	(1.33)
	0.046	0.020	-0.123*	-0.065	-0.031
PRIVATE OWNERSHIP	(0.076)	(0.052)	(0.045)	(0.041)	(0.037)
	-0.613	-0.561**	-1.736*	-0.804	-0.164
OTHER	(1.042)	(0.276)	(0.259)	(0.656)	(0.424)
# Obs.	3948	3912	3918	3854	3925
R-SQ	28%	31%	30%	29%	28%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 12. OLS Estimates of Wage Equation. Lithuania 2000. Augmented Specification

	Males and Females	Males Only	Females Only
INTERCEPT	5.386*	5.626*	4.863*
	(0.186)	(0.261)	(0.265)
MARRIED	0.130*	0.286*	-0.064***
	(0.029)	(0.044)	(0.039)
DIVORCED/WIDOWED	0.124*	-0.053	0.019
	(0.038)	(0.077)	(0.045)
FEMALE	-0.203*		
	(0.018)	N/A	N/A
AGE	0.006	-0.011	0.033*
	(0.006)	(0.009)	(0.010)
AGE SQUARED	-0.000*	0.000*	-0.000*
	(0.000)	(0.000)	(0.000)
ELEMENTARY EDUC	-0.108*	-0.109*	-0.054
	(0.030)	(0.040)	(0.050)
SECONDARY SPECIAL	0.073*	0.082*	0.052**
	(0.020)	(0.030)	(0.026)
HIGHER	0.346*	0.344*	0.322*
	(0.029)	(0.046)	(0.036)
LEGISLATORS AND SENIOR OFFICIALS	0.702*	0.749*	0.596*
	(0.040)	(0.059)	(0.055)
SCIENTIFIC AND INTELLECTUAL PROFESSIONALS	0.566*	0.557*	0.536*
	(0.035)	(0.060)	(0.041)
MEDIUM LEVEL TECHNICIALS AND PROFESSIONALS	0.503*	0.591*	0.434*
	(0.034)	(0.056)	(0.042)
OFFICE WORKERS	0.432*	0.389*	0.407*
	(0.038)	(0.075)	(0.043)
SERVICE WORKERS, FARMERS, AND FISHERMEN	0.263*	0.372*	0.171*
	(0.031)	(0.057)	(0.037)
AGRICULTURAL WORKERS, FARMERS, AND FISHERMEN	0.259*	0.325*	0.237***
	(0.074)	(0.095)	(0.125)
OPERATORS AND CRAFTSMEN OF MECHANIC ARTS AND OTHER TRADES	0.342*	0.339*	0.313*
	(0.027)	(0.039)	(0.041)
OPERATORS OF INSTALLATIONS AND MACHINERY AND ASSEMBLERS	0.417*	0.441*	0.357*
	(0.031)	(0.040)	(0.066)
PRIVATE SECTOR	-0.149*	-0.166*	-0.123*
	(0.018)	(0.027)	(0.024)
# Obs.	4324	2168	2156
R-SQ	40%	38%	42%

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 13. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Males and Females

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
	6.384*	6.605*	7.245*	7.415*	7.181*
INTERCEPT	(0.163)	(0.143)	(0.129)	(0.118)	(0.111)
	0.143*	0.056**	0.070*	0.075*	0.116*
CITY	(0.026)	(0.022)	(0.021)	(0.019)	(0.017)
	-0.144*	-0.205*	-0.142*	-0.177*	-0.164*
RURAL	(0.028)	(0.024)	(0.022)	(0.021)	(0.020)
	0.479*	0.470*	0.482*	0.431*	0.233*
KIEV	(0.090)	(0.062)	(0.054)	(0.050)	(0.046)
	0.147*	0.202*	0.246*	0.243*	0.136*
SOUTH	(0.055)	(0.044)	(0.038)	(0.036)	(0.033)
	0.153*	0.177*	0.223*	0.177*	0.045
WEST	(0.050)	(0.038)	(0.034)	(0.031)	(0.030)
	0.123**	0.248*	0.239*	0.254*	0.099*
EAST	(0.049)	(0.038)	(0.033)	(0.031)	(0.030)
	0.011*	0.083**	0.155*	0.190*	0.111*
NORTH	(0.056)	(0.044)	(0.039)	(0.036)	(0.034)
	0.351*	0.304*	0.400*	0.417*	0.286*
CRIMEA	(0.080)	(0.062)	(0.056)	(0.049)	(0.047)
	0.120*	0.082**	0.133*	0.106*	0.137*
MARRIED	(0.037)	(0.032)	(0.029)	(0.026)	(0.024)
	0.029	0.015**	0.051	0.089*	0.105*
DIVORCED/WIDOWED	(0.049)	(0.041)	(0.037)	(0.033)	(0.030)
	-0.253*	-0.262*	-0.269*	-0.268*	-0.29*
FEMALE	(0.023)	(0.020)	(0.018)	(0.017)	(0.016)
	-0.099**	-0.041**	-0.111*	-0.021	-0.084**
ELEMENTARY EDUC	(0.041)	(0.042)	(0.038)	(0.036)	(0.037)
	0.071**	0.111*	0.081*	0.072*	0.010
VOCATIONAL TRAINING	(0.032)	(0.026)	(0.024)	(0.022)	(0.020)
	0.153*	0.211*	0.182*	0.172*	0.140*
SECONDARY SPECIAL	(0.028)	(0.024)	(0.022)	(0.020)	(0.020)
	0.173*	0.234*	0.170*	0.221*	0.216*
INCOMPLETE HIGHER	(0.059)	(0.043)	(0.044)	(0.077)	(0.053)
	0.465*	0.519*	0.470*	0.437*	0.411*
HIGHER EDUCATION	(0.034)	(0.028)	(0.026)	(0.023)	(0.022)
	0.050*	0.046*	0.031*	0.034*	0.027*
AGE	(0.009)	(0.008)	(0.007)	(0.006)	(0.006)
	-0.001*	-0.001*	0.000*	0.000*	0.000*
AGE SQUARED	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.851*	-0.681*	-0.746*	-0.675*	-0.700*
AGRICULTURE, FORESTRY	(0.039)	(0.036)	(0.032)	(0.028)	(0.028)

Table E 13. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Males and Females-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
	-0.104**	-0.029**	-0.140*	-0.036	-0.054
CONSTRUCTION	(0.051)	(0.045)	(0.041)	(0.037)	(0.034)
TRANSPORTATION AND	0.022	0.083**	-0.001*	0.086*	0.024
COMMUNICATIONS	(0.040)	(0.034)	(0.032)	(0.029)	(0.028)
	-0.305*	-0.407*	-0.445*	-0.395*	-0.406*
EDUCATION, CULTURE	(0.043)	(0.036)	(0.034)	(0.032)	(0.030)
HEALTH CARE, PHYSICAL	-0.211*	-0.231*	-0.395*	-0.362*	-0.427*
CULTURE, SOCIAL SECURITY	(0.045)	(0.038)	(0.034)	(0.032)	(0.030)
FINANCE, INSURANCE, CREDIT,	0.100	0.215**	-0.025	-0.010	-0.022
PENSION SECURITY	(0.102)	(0.088)	(0.086)	(0.065)	(0.058)
	0.001	0.149*	-0.091***	-0.005	-0.051***
STATE	(0.064)	(0.054)	(0.051)	(0.035)	(0.031)
MUNICIPAL UTILITIES,	-0.256*	-0.225*	-0.318*	-0.374*	-0.318*
SERVICE SPHERE	(0.050)	(0.040)	(0.038)	(0.043)	(0.039)
TRADE, PUBLIC CATERING,	-0.085**	-0.152*	-0.236*	-0.185*	-0.205*
INPUT SUPPLY	(0.043)	(0.036)	(0.033)	(0.030)	(0.028)
	0.048	0.185*	-0.027	-0.130**	-0.125**
OTHER	(0.055)	(0.047)	(0.045)	(0.065)	(0.062)
WORKING COLLECTIVE OR	-0.296*	-0.269*	-0.282*	-0.301*	-0.291*
COOPERATIVE	(0.032)	(0.031)	(0.031)	(0.029)	(0.030)
	0.125*	0.059***	-0.063**	-0.037	-0.109*
PRIVATE OWNERSHIP	(0.045)	(0.034)	(0.030)	(0.026)	(0.024)
	0.532*	0.535*	0.388*	0.479*	0.252**
FOREIGN OWNERSIP	(0.131)	(0.108)	(0.104)	(0.081)	(0.092)
	0.019	0.123*	0.019	0.003	-0.051**
STOCK COMPANY	(0.033)	(0.027)	(0.025)	(0.023)	(0.021)
	0.396*	0.057	-0.094	0.080	-0.163**
RENTAL COMPANY	(0.115)	(0.080)	(0.068)	(0.065)	(0.065)
	-0.846**	-0.523*	-0.852*	-0.089	-0.321
OTHER	(0.338)	(0.145)	(0.145)	(0.289)	(0.209)
Selection Equation					
	-0.264*	0.464*	-0.322*	0.479*	0.337*
INTERCEPT	(0.034)	(0.036)	(0.065)	(0.037)	(0.036)
NUMBER OF CHILDREN UNDER	0.000*	-0.098*	0.000*	-0.094*	-0.105*
7	(0.015)	(0.017)	(0.000)	(0.020)	(0.019)
	-0.079*	0.175*	-0.083*	0.153*	0.148*
HEAD OF HOUSEHOLD	(0.017)	(0.019)	(0.018)	(0.020)	(0.019)
	0.13*	0.000*	0.190*	0.000*	0.000*
NON-LABOR INCOME	(0.000)	(0.000)	(0.020)	(0.000)	(0.000)

Table E 13. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Males and Females-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
	0.000*	-0.085*	0.000*	-0.097*	-0.119*
NUMBER OF PENSIONERS	(0.013)	(0.021)	(0.000)	(0.021)	(0.021)
	-0.107	0.055	-0.049**	0.115***	0.168*
KIEV	(0.072)	(0.068)	(0.023)	(0.068)	(0.064)
	-0.039**	-0.104**	0.160**	-0.065	-0.010*
SOUTH	(0.043)	(0.046)	(0.071)	(0.047)	(0.045)
	-0.121*	-0.183*	-0.120**	-0.210*	-0.100**
WEST	(0.039)	(0.041)	(0.047)	(0.041)	(0.040)
	-0.192**	-0.077***	-0.258*	-0.119**	0.024
EAST	(0.038)	(0.040)	(0.042)	(0.041)	(0.040)
	-0.080*	-0.070	-0.055	-0.067	-0.146**
CENTRAL	(0.042)	(0.044)	(0.042)	(0.045)	(0.044)
	-0.173*	-0.182*	-0.076***	-0.258*	-0.172**
CRIMEA	(0.060)	(0.063)	(0.045)	(0.062)	(0.060)
Lambda	-1.441	-1.040	-0.902	-0.848	-0.785

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 14. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Males Only

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
	6.476*	6.446*	7.172*	7.279*	7.099*
INTERCEPT	(0.235)	(0.207)	(0.195)	(0.170)	(0.16)
	0.141*	0.015	0.069	0.067**	0.141*
CITY	(0.041)	(0.035)	(0.033)	(0.030)	(0.027)
	-0.180*	-0.256*	-0.159*	-0.225*	-0.185*
RURAL	(0.044)	(0.037)	(0.035)	(0.031)	(0.031)
	0.492*	0.468*	0.516*	0.453*	0.253*
KIEV	(0.135)	(0.100)	(0.086)	(0.076)	(0.070)
	0.156**	0.242*	0.304*	0.330*	0.189*
SOUTH	(0.082)	(0.068)	(0.059)	(0.052)	(0.050)
	0.195*	0.184*	0.238*	0.156*	0.054
WEST	(0.073)	(0.058)	(0.052)	(0.046)	(0.046)
	0.139***	0.343*	0.334*	0.324*	0.178*
EAST	(0.073)	(0.058)	(0.052)	(0.046)	(0.045)
	0.025	0.062	0.225*	0.257*	0.199*
NORTH	(0.083)	(0.068)	(0.060)	(0.053)	(0.052)
	0.525*	0.417*	0.472*	0.461*	0.280*
CRIMEA	(0.122)	(0.096)	(0.086)	(0.074)	(0.072)
	0.169*	0.111**	0.219*	0.157*	0.185*
MARRIED	(0.057)	(0.051)	(0.046)	(0.040)	(0.036)
	-0.005	-0.133***	-0.078	-0.012	0.093***
DIVORCED/WIDOWED	(0.093)	(0.077)	(0.074)	(0.061)	(0.056)
	-0.186*	0.004	-0.100***	-0.037	-0.105**
ELEMENTARY EDUC	(0.058)	(0.060)	(0.054)	(0.049)	(0.054)
	-0.008	0.117**	0.072**	0.121*	0.027
VOCATIONAL TRAINING	(0.045)	(0.038)	(0.035)	(0.030)	(0.028)
	0.065	0.250*	0.183*	0.187*	0.187*
SECONDARY SPECIAL	(0.044)	(0.039)	(0.036)	(0.031)	(0.032)
	0.082	0.276*	0.119	0.265***	0.193**
INCOMPLETE HIGHER	(0.094)	(0.068)	(0.076)	(0.138)	(0.086)
	0.441*	0.543*	0.461*	0.419*	0.427*
HIGHER EDUCATION	(0.052)	(0.044)	(0.041)	(0.036)	(0.033)
	0.048*	0.055*	0.033*	0.039*	0.027*
AGE	(0.012)	(0.011)	(0.010)	(0.009)	(0.008)
	-0.001*	-0.001*	0.000*	-0.001*	0.000*
AGE SQUARED	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.937*	-0.753*	-0.856*	-0.711*	-0.746*
AGRICULTURE, FORESTRY	(0.057)	(0.051)	(0.046)	(0.039)	(0.039)
	-0.149**	-0.074	-0.176*	-0.065	-0.062
CONSTRUCTION	(0.068)	(0.059)	(0.052)	(0.046)	(0.043)

Table E 14. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Males Only-continued

	1999	2000	2001	2002	2003
Variable		**Estimate (Standard Error)**			
TRANSPORTATION AND COMMUNICATIONS	-0.045	0.039	-0.066	0.065***	0.016
	(0.054)	(0.047)	(0.043)	(0.039)	(0.037)
EDUCATION, CULTURE	-0.458*	-0.581*	-0.578*	-0.503*	-0.532*
	(0.079)	(0.067)	(0.062)	(0.057)	(0.056)
HEALTH CARE, PHYSICAL CULTURE, SOCIAL SECURITY	-0.342*	-0.307*	-0.489*	-0.461*	-0.534*
	(0.102)	(0.085)	(0.071)	(0.065)	(0.063)
FINANCE, INSURANCE, CREDIT, PENSION SECURITY	-0.122	0.216	-0.289	-0.019	-0.078
	(0.277)	(0.173)	(0.220)	(0.151)	(0.110)
STATE	-0.046	0.053	-0.109	0.011	-0.022
	(0.125)	(0.109)	(0.095)	(0.051)	(0.045)
MUNICIPAL UTILITIES, SERVICE SPHERE	-0.340*	-0.291*	-0.338*	-0.360*	-0.341*
	(0.072)	(0.059)	(0.059)	(0.072)	(0.058)
TRADE, PUBLIC CATERING, INPUT SUPPLY	-0.191*	-0.176*	-0.266*	-0.166*	-0.175*
	(0.074)	(0.059)	(0.055)	(0.048)	(0.045)
OTHER	-0.063	0.149**	-0.041	-0.135	-0.254*
	(0.073)	(0.063)	(0.060)	(0.112)	(0.095)
WORKING COLLECTIVE OR COOPERATIVE	-0.369*	-0.288*	-0.307*	-0.461*	-0.365*
	(0.046)	(0.044)	(0.043)	(0.043)	(0.042)
PRIVATE OWNERSHIP	0.108	0.112**	-0.054	-0.068***	-0.166*
	(0.066)	(0.049)	(0.042)	(0.037)	(0.034)
FOREIGN OWNERSIP	0.463*	0.569*	0.749*	0.326*	0.237***
	(0.18)	(0.136)	(0.156)	(0.115)	(0.141)
STOCK COMPANY	-0.049	0.119*	-0.001	-0.061***	-0.102*
	(0.047)	(0.038)	(0.035)	(0.032)	(0.03)
RENTAL COMPANY	0.477*	0.114	-0.09	0.065	-0.206**
	(0.186)	(0.115)	(0.094)	(0.091)	(0.082)
OTHER	-0.866**	-0.511*	-0.666*	-0.034	-0.266
	(0.388)	(0.175)	(0.197)	(0.386)	(0.25)
		Selection Equation			
INTERCEPT	0.508*	0.488*	0.467*	0.471*	0.322*
	(0.051)	(0.054)	(0.055)	(0.054)	(0.052)
NUMBER OF CHILDREN UNDER 7	0.025	0.074*	0.117*	0.098*	0.101*
	(0.025)	(0.027)	(0.032)	(0.034)	(0.031)
HEAD OF HOUSEHOLD	0.121*	0.112*	0.178*	0.105*	0.104*
	(0.025)	(0.027)	(0.030)	(0.030)	(0.028)
NON-LABOR INCOME	0.000*	0.000*	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NUMBER OF PENSIONERS	-0.162*	-0.112*	-0.139*	-0.141*	-0.183*
	(0.020)	(0.029)	(0.032)	(0.031)	(0.030)

Table E 14. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Males Only-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard Error)**				
	0.072	0.168	0.206***	0.223**	0.145
KIEV	(0.111)	(0.109)	(0.110)	(0.108)	(0.092)
	-0.094	-0.113***	-0.101	0.010	0.085
SOUTH	(0.063)	(0.068)	(0.069)	(0.068)	(0.065)
	-0.186*	-0.172*	-0.246*	-0.183*	-0.037
WEST	(0.056)	(0.059)	(0.061)	(0.060)	(0.058)
	0.015	-0.084	0.020	-0.029	0.097***
EAST	(0.057)	(0.058)	(0.062)	(0.060)	(0.058)
	-0.166*	-0.107***	-0.048	-0.048	-0.105***
CENTRAL	(0.061)	(0.064)	(0.066)	(0.064)	(0.063)
	-0.279*	-0.203**	-0.262*	-0.286*	-0.123
CRIMEA	(0.090)	(0.092)	(0.095)	(0.090)	(0.089)
Lambda	-1.486	-1.126	-0.960	-0.864	-0.836

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 15. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Females Only

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard)**				
	6.203*	6.667*	7.055*	7.403*	6.897*
INTERCEPT	(0.243)	(0.201)	(0.172)	(0.165)	(0.155)
	0.149*	0.082*	0.082*	0.083*	0.089*
CITY	(0.033)	(0.028)	(0.025)	(0.024)	(0.022)
	-0.103*	-0.175*	-0.123*	-0.132*	-0.136*
RURAL	(0.036)	(0.031)	(0.027)	(0.027)	(0.025)
	0.457*	0.433*	0.443*	0.381*	0.223*
KIEV	(0.118)	(0.076)	(0.066)	(0.064)	(0.057)
	0.129***	0.150*	0.184*	0.157*	0.075***
SOUTH	(0.073)	(0.055)	(0.047)	(0.047)	(0.042)
	0.112***	0.179*	0.206*	0.188*	0.044
WEST	(0.065)	(0.049)	(0.042)	(0.041)	(0.038)
	0.092	0.158*	0.137*	0.179*	0.031
EAST	(0.064)	(0.048)	(0.041)	(0.041)	(0.037)
	-0.010	0.084	0.095**	0.129*	0.037
NORTH	(0.074)	(0.055)	(0.048)	(0.047)	(0.043)
	0.182***	0.201**	0.319*	0.367*	0.275*
CRIMEA	(0.103)	(0.078)	(0.069)	(0.064)	(0.058)
	0.059	0.021	0.017	0.029	0.036
MARRIED	(0.049)	(0.041)	(0.037)	(0.035)	(0.032)
	0.011**	0.010	0.011	0.067***	0.057
DIVORCED/WIDOWED	(0.058)	(0.046)	(0.042)	(0.039)	(0.036)
	0.032	-0.076	-0.111**	0.068	-0.086***
ELEMENTARY EDUC	(0.058)	(0.057)	(0.052)	(0.055)	(0.05)
	0.149*	0.120*	0.096*	-0.004	-0.005
VOCATIONAL TRAINING	(0.045)	(0.036)	(0.032)	(0.03)	(0.028)
	0.223*	0.185*	0.163*	0.159*	0.095*
SECONDARY SPECIAL	(0.036)	(0.030)	(0.027)	(0.025)	(0.025)
	0.305*	0.171*	0.171*	0.207**	0.224*
INCOMPLETE HIGHER	(0.075)	(0.053)	(0.050)	(0.086)	(0.065)
	0.497*	0.508*	0.450*	0.450*	0.385*
HIGHER EDUCATION	(0.043)	(0.034)	(0.031)	(0.03)	(0.028)
	0.036*	0.024**	0.025*	0.017***	0.027*
AGE	(0.013)	(0.011)	(0.009)	(0.009)	(0.008)
	0.000	0.000***	0.000**	0.000	0.000*
AGE SQUARED	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	-0.669*	-0.513*	-0.543*	-0.529*	-0.545*
AGRICULTURE, FORESTRY	(0.055)	(0.050)	(0.045)	(0.041)	(0.041)
	-0.047	0.015	-0.014	0.084	-0.016
CONSTRUCTION	(0.090)	(0.078)	(0.078)	(0.067)	(0.066)

Table E 15. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Females Only-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard)**				
TRANSPORTATION AND COMMUNICATIONS	0.169*	0.155*	0.127**	0.152*	0.066
	(0.063)	(0.052)	(0.049)	(0.044)	(0.044)
EDUCATION, CULTURE	-0.121**	-0.270*	-0.317*	-0.281*	-0.284*
	(0.052)	(0.043)	(0.041)	(0.038)	(0.036)
HEALTH CARE, PHYSICAL CULTURE, SOCIAL SECURITY	-0.055	-0.124*	-0.284*	-0.258*	-0.311*
	(0.052)	(0.044)	(0.040)	(0.037)	(0.036)
FINANCE, INSURANCE, CREDIT, PENSION SECURITY	0.256**	0.260*	0.134	0.094	0.069
	(0.105)	(0.096)	(0.085)	(0.067)	(0.065)
STATE	0.134**	0.245*	-0.003	0.002	-0.042
	(0.072)	(0.061)	(0.059)	(0.048)	(0.042)
MUNICIPAL UTILITIES, SERVICE SPHERE	-0.085	-0.098***	-0.229*	-0.332*	-0.236*
	(0.068)	(0.054)	(0.048)	(0.052)	(0.051)
TRADE, PUBLIC CATERING, INPUT SUPPLY	0.032	-0.060	-0.142*	-0.126*	-0.192*
	(0.053)	(0.045)	(0.041)	(0.038)	(0.035)
OTHER	0.190**	0.207	-0.062	-0.064	0.014
	(0.095)	(0.076)	(0.069)	(0.075)	(0.079)
WORKING COLLECTIVE OR COOPERATIVE	-0.191*	-0.213*	-0.239*	-0.129*	-0.193*
	(0.047)	(0.043)	(0.043)	(0.039)	(0.041)
PRIVATE OWNERSHIP	0.169*	0.023	-0.058	0.001	-0.028
	(0.062)	(0.046)	(0.041)	(0.037)	(0.034)
FOREIGN OWNERSIP	0.594*	0.357**	-0.100	0.636*	0.302**
	(0.189)	(0.188)	(0.126)	(0.112)	(0.119)
STOCK COMPANY	0.115**	0.163*	0.054	0.080*	0.018
	(0.045)	(0.038)	(0.034)	(0.032)	(0.031)
RENTAL COMPANY	0.222	0.006	-0.124	0.074	-0.045
	(0.140)	(0.108)	(0.096)	(0.091)	(0.11)
OTHER	-0.783	-0.409	-1.492*	-0.953***	-0.421
	(0.884)	(0.26)	(0.212)	(0.564)	(0.429)
Selection Equation					
INTERCEPT	0.430*	0.428*	0.512*	0.457*	0.330*
	(0.047)	(0.049)	(0.052)	(0.051)	(0.050)
NUMBER OF CHILDREN UNDER 7	-0.150*	-0.266*	-0.237*	-0.239*	-0.294*
	(0.019)	(0.024)	(0.025)	(0.026)	(0.027)
HEAD OF HOUSEHOLD	0.146*	0.236*	0.182*	0.189*	0.174*
	(0.025)	(0.029)	(0.029)	(0.028)	(0.028)
NON-LABOR INCOME	0.000*	0.000*	0.000**	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NUMBER OF PENSIONERS	-0.051*	-0.074**	0.025	-0.068**	-0.059**
	(0.019)	(0.030)	(0.033)	(0.029)	(0.030)

Table E 15. Heckman Two Stage Wage Estimation. Ukraine 1999-2003. Augmented Specification. Females Only-continued

	1999	2000	2001	2002	2003
Variable	**Estimate (Standard)**				
	-0.160***	-0.075	0.118	0.015	0.161***
KIEV	(0.097)	(0.090)	(0.095)	(0.089)	(0.088)
	-0.148**	-0.083	-0.130**	-0.131**	-0.094
SOUTH	(0.059)	(0.063)	(0.065)	(0.064)	(0.062)
	-0.197*	-0.195*	-0.268*	-0.248*	-0.151*
WEST	(0.053)	(0.056)	(0.059)	(0.057)	(0.056)
	-0.162*	-0.089	-0.111	-0.213*	-0.055
EAST	(0.053)	(0.055)	(0.058)	(0.057)	(0.055)
	-0.176*	-0.035	-0.098	-0.080	-0.180*
CENTRAL	(0.058)	(0.062)	(0.063)	(0.062)	(0.061)
	-0.236*	-0.169***	-0.359*	-0.226*	-0.205**
CRIMEA	(0.082)	(0.088)	(0.089)	(0.085)	(0.083)
Lambda	-1.354	-0.936	-0.811	-0.806	-0.698

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

Table E 16. Heckman Two Stage Wage Estimation. Lithuania 2000. Augmented Specification.

	Males and Females	Males Only	Females Only
INTERCEPT	5.563*	5.825*	5.106*
	(0.177)	(0.249)	(0.244)
MARRIED	0.099*	0.216*	-0.048
	(0.028)	(0.042)	(0.037)
DIVORCED/WIDOWED	0.074**	-0.079	0.012
	(0.036)	(0.073)	(0.042)
FEMALE	-0.185*		
	(0.017)	N/A	N/A
AGE	0.006	-0.010	0.029*
	(0.006)	(0.009)	(0.010)
AGE SQUARED	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
ELEMENTARY EDUC	-0.094*	-0.100*	-0.039
	(0.029)	(0.038)	(0.044)
SECONDARY SPECIAL	0.075*	0.086*	0.051**
	(0.019)	(0.029)	(0.025)
HIGHER EDUCATION	0.349*	0.345*	0.343*
	(0.028)	(0.044)	(0.034)
LEGISLATORS AND SENIOR OFFICIALS	0.668*	0.687*	0.611*
	(0.039)	(0.057)	(0.051)
SCIENTIFIC AND INTELLECTUAL PROFESSIONALS	0.523*	0.490*	0.515*
	(0.033)	(0.058)	(0.039)
MEDIUM LEVEL TECHNICIALS AND PROFESSIONALS	0.475*	0.552*	0.420*
	(0.033)	(0.055)	(0.039)
OFFICE WORKERS	0.394*	0.341*	0.388*
	(0.037)	(0.072)	(0.040)
SERVICE WORKERS, FARMERS, AND FISHERMEN	0.223*	0.320*	0.149*
	(0.030)	(0.055)	(0.035)
AGRICULTURAL WORKERS, FARMERS, AND FISHERMEN	0.210	0.261*	0.235**
	(0.071)	(0.092)	(0.116)
OPERATORS AND CRAFTSMEN OF MECHANIC ARTS AND OTHER TRADES	0.304*	0.298*	0.287*
	(0.026)	(0.037)	(0.038)
OPERATORS OF INSTALLATIONS AND MACHINERY AND ASSEMBLERS	0.370*	0.392*	0.361*
	(0.030)	(0.038)	(0.061)
PRIVATE SECTOR	-0.120*	-0.146*	-0.089*
	(0.017)	(0.026)	(0.023)

Table E 16. Heckman Two Stage Wage Estimation. Lithuania 2000. Augmented Specification-continued

Selection Equation			
INTERCEPT	0.388*	0.066	0.595*
	(0.038)	(0.064)	(0.048)
NUMBER OF CHILDREN UNDER 7	0.043	0.184*	0.090**
	(0.036)	(0.060)	(0.047)
HEAD OF HOUSEHOLD	0.746*	0.954*	0.562*
	(0.040)	(0.063)	(0.055)
NON-LABOR INCOME	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
NUMBER OF PENSIONERS	-0.127*	-0.137***	-0.154**
	(0.045)	(0.072)	(0.060)
Lambda	-0.478	-0.445	-0.461

Note: * means significant at 99% level, ** means significant at 95% level, *** means significant at 90% level

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