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Occupational Distribution and Wages by Gender and Nationality in Russia

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Bachelor of Arts

Submitted in partial fulfilment of the requirements for

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OCCUPATIONAL DISTRIBUTION AND WAGES IN RUSSIA

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Abstract: There are many reasons why earnings differ among individuals. Some factors are related to underlying productivity such as education and experience. Other factors are related to how society rewards the type of work or worker. For example, those in professional occupations or in industries highly valued by consumers produce highly valuable output and are paid more. The gender and ethnicity of an individual also influences earnings and there are many possible explanations for differences due to these demographic characteristics. Occupational crowding and a taste for discrimination have been proposed as non-productivity based explanations. In this paper, I examine gender and ethnic differences in Russia. I use 2000 longitudinal data on approximately 3,000 workers to examine occupational structure and earnings differences. As a result of significant differences in employment and education environments, I expect the role of occupations may continue to exert different influences on earnings. After analyzing descriptive statistics in pay and log wage regressions and decomposing the variables using the Oaxaca decomposition, I find that the significant differences in gender earnings, which are significantly influenced by unexplained factors.

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Both individual characteristics and the economic environment in which one works influence earnings and the degree of inequality in a society. An individual's earnings have been shown to depend on many variables including age, occupation, gender, ethnicity and education. Institutional and social characteristics, including the nature of educational access or discrimination, can play a role in determining earnings as well. Earnings are not equally distributed in any society, and both the level and distribution of earnings depend on an individual's demographic characteristics, education and type of work (Gottschalk and Smeeding, 1997).

A vast amount of literature has developed to attempt to explain the distribution of earnings in a market system and how this distribution responds to various institutional characteristics or market failures. In a market's most basic sense, firms are willing to pay a particular wage when the worker is perceived to be "worth it" in both an objective and subjective sense. Workers compare wage offers and opportunities while they are obtaining education and when selecting jobs. The key factors are the productivity of workers, the choices workers and employers make, and institutional constraints that shape the choice set for workers or firms.

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The economic and political transition of countries has become extremely important when discussing the economic efficiency and success of the Russian Federation and Eastern Europe. Countries wishing to attain European Union status must readily prove their economic worth and stability. Theoretical studies by Aghion and Commander (1999) and Ferreria (1999) inform us that earnings distributions in transition economies will likely become more widely spread because of newly formed privatized sectors. Clearly, through an increase in the variety of employment and pay in a transitional

country, wages and employment terms are more likely to differ. Without the assurance of occupational stability and increased competition for occupations, some workers may be at the lower extreme of the earnings distribution or even without work. On the other hand, the greater opportunity for innovation, entrepreneurship, professional growth, and rewards from market success promote possible higher earnings as well. Nevertheless, I would expect earnings to be influenced by underlying productivity of the workers and institutional and societal characteristics. In the case of Russia, I find a country in a continual state of transition, moving from a centrally planned to free market economy. This paper compares current gender and ethnic differences in occupational distribution and wages in Russia.

Using the United Nations Occupational Coding system for consistent occupation categories and data on over 3,000 Russian workers available through the Luxembourg Income Study, I study pay differences by gender and by comparing Russians versus Non-Russians. After estimating descriptive statistics and log wage regressions, I compare earnings by gender and ethnicity and find significant differences in both occupational distribution and pay. Using a decomposition methodology, I will discuss the extent to which pay differences are explainable and unexplainable as well as and the role of occupational crowding.

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Literature

The Neoclassical theory of distribution suggests one fundamental determinant of earnings is the worker's human capital. Every firm is faced with the decision whether to hire a laborer or not. Each hired laborer is hired based on the whether the company feels

he or she is worth it. A firm decides if he or she is worth it if his or her marginal benefits are greater than the marginal costs. Furthermore, the firm will continue to hire laborers if their marginal product of labor, the output produced given one more unit of input, until the demand for workers is equivalent to the supply of workers. A firm that hires too many workers may cause crowding in the company; therefore, the productivity of each worker decreases. Thus, firms must be able to maximize productivity and revenue through the most accurate balance of labor and capital. This will provide the optimal level of output at the lowest cost. The marginal product of labor generally has diminishing returns as well because not all laborers have equal worth or productivity. Diminishing marginal productivity is due to the fact that at least one factor, for example capital, is held constant. As a result, the first laborer hired may produce thirteen units of output while the second laborer may only produce ten. The law of diminishing returns and the returns to scale are generally unique for each company. As pointed out by typical Mincerian labor demand functions (Mincer 1974, 1993), the amount of human capital a worker possesses expands through increases in education or training leading to improvements in the worker's marginal product of labor productivity. When human capital varies between genders or ethnic groups, wages will vary as well. The correlation exists that greater differences in human capital create greater disparities in pay. Undoubtedly, one would assume that the more educated a person became, the higher his or her earnings would be relative to someone receiving little or no education. While unusual circumstances exist, the human capital theory generally holds true.

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In a similar manner to firms hiring a worker if the marginal benefit is greater than or equal to the marginal cost, laborers face a decision when determining for how much

they are willing to work. Each laborer has a unique reservation wage; the least amount of money in which a person would take the job. For example, if a job is offered at $10 an hour and the reservation wage of the laborer is $11 an hour, he or she will not consider the job. Moreover, if the reservation wage is $10 or less, he or she will accept the position based solely on monetary compensation. Many factors influence a person's reservation wage such as gender, age, and family status; thus, it must be unique for every individual. This information is useful in the regression because the regression now becomes truncated because the wage will equal zero if the wage is less than the reservation wage.

Human capital attainment can lead to a cyclical effect on wages. For example, women may invest less in human capital attainments believing they will earn less than men. In addition, the length of the work day, the availability of child care, societal gender expectation, and planning for a family can all lead to women investing less in human capital. Such a gender difference in human capital then reinforces the gender pay difference. Under-investing in human capital through the creation of segmented labor markets also creates wage disparities between men and women (Taubman and Watchter, 1986).

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Other explanations of pay differences point to characteristics of the labor market instead of workers. For example, the presence of a taste for discrimination (Becker, 1971) may create an environment where laborers with equal or even greater ability to produce may not be paid their true marginal product as disutility may be attached to the worker by the employer, by coworkers or by customers. In each case, the employer behaves rationally. If the laborer can find an employer without a taste for discrimination,

then the laborer may receive his or her true marginal product. In such a case, segregation with discriminated workers only employed by non-discriminators is a possibility and segregated labor markets are created.

A variety of papers have explored occupational segregation, its causes and effects (Baunach, 2002; Nelson and Bridges, 1989). Many studies exist analyzing the Soviet wages dating back to 1944. Studies by Bergson (1944), Kirsch (1972), Pryor (1973), McAuley (1979), Bergson (1984) and Brainerd (1998) have all generally concluded that wages throughout Russia's timeline have been unequal. In fact, this is surprising for a country strongly advocating equality of pay; however, wage inequality during Communist times was analogous to that of many Western European countries as well as the United States (1998). Brainerd's study thoroughly affirms in the time period from 1991-1994 that "[…] wage inequality in Russia appears to have reached a level higher than that in the United States. Returns to education and occupation have increased, and within-group inequality has grown substantially. In addition, women's wages have declined relative to men's wages, and older workers suffered sharp relative wage declines" (1094). Studies analyzing the effects of wage distribution before and after transition have been difficult to establish for the lack of micro-level data and the Russian Longitudinal Monitoring Survey only began in July of 1992.

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Occupational differences have been shown to be important in studies assessing wage inequalities among blacks and whites in the United States economy; conclusive evidence suggests blacks are not only disproportionately not hired in large firms, but they also have a lower probability of attaining supervisory jobs (Mitra, 1999). Other studies have been performed to determine if occupational distribution explains pay differences by

gender. For example, empirical studies in the United States show with productivity-related characteristics held constant, blacks and women earn less than whites and men (Blau and Ferber, 1987).

One important methodology in the study of wage differences by gender or ethnicity is the use of decomposition. While there are many variants, the Oaxaca (1973) and Blinder (1973) method the most prominent and most frequently used in the field of economics. With the Oaxaca decomposition, overall pay difference is viewed as the result of both differences in the underlying productive capability of workers and in the way those productive characteristics are rewarded in the labor market. For example, women may possess lower human capital and this may explain the differences in pay between the genders. On the other hand, women may possess equivalent human capital characteristics as men but receive a lower change in wage rate.

Use of this methodology is common in the developed world. The four Asian dragons of Hong Kong, Singapore, South Korea, and Taiwan all evolved from a low-skilled labor-intensive market to a higher skilled manufacturing labor force and were examined using a decomposition approach to explain the differences in wages through worker characteristics. After analyzing all occupations and five aggregated groups in terms of both the within occupations and across occupations gap, Zveglich and Rodgers (2004) conclude, "women in Taiwan are not receiving equal pay for work of equal value". In a similar study, Melkas and Anker (1997) found, although occupational segregation decreased from 1970-1990 in the Finland, Norway, and Sweden, it is relatively high when compared to other industrialized nations. Although Nordic nations advocate strong socialist policies to promote gender equity, occupational segregation causes women to be

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concentrated in lower paying jobs resulting in pay disparity.

Transition and integration affect a country's economic and social structure. Miron Tegze (1999) concludes both a country's transition process along with its anticipated integration have underlying effects on a nation's economy. The former Eastern Soviet bloc, for example, faces the difficult task of moving from a centrally planned economy to a free market one. Employment and compensation mechanisms differed greatly from those seen today resulting in labor force dislocations and dramatic changes in the value of some work.

Before transition in a centrally planned economy, the labor market was not as sensitive to increases in productivity. Centrally planned economies generally have set wages in which a laborer's wage is not measured by productivity; rather they are based on another laborer's wage. Centrally planned economies were not always effectively planned. For example, a firm may hire too many laborers, and the marginal product of labor for these additional workers will be zero or negative. In this instance, these additional laborers, in actuality, cause the firm to decrease productivity or lose revenue. In a centrally planned economy, the goal is to create a monetarily equal society; however, in a free market economy, there are more incentives for a laborer to be more productive and work harder than the person next to him or her. This additional productivity leads to overtime, raises, or professional growth. Increased incentive leads to laborers being more productive. In this case, the laborer gains by earning a higher wage, and the company gains by producing more output and generating more revenue.

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Many studies examine occupational disparities in countries in transition. A study performed by Michal Grejeck (2001) uses the Oaxaca decomposition to study the

widening pay gaps in Poland; two counterbalancing changes in this study have shown increased women's skills created less income equality while stronger discrimination practices created more. While considerable research has identified gender and ethnic differences in wages in transition economies, the issue of occupational crowding is not so greatly researched (Ogloblin, 1999; Jurijda, 2003). Similarly, Russia has tasks similar to Poland and the former Eastern Soviet bloc when transitioning from a centrally planned economy to one of free market.

The Soviet Union, once the United States' greatest adversary, continually faces the process of transitioning from a centrally planned economy to a free market. Russia during the Cold War was considered the homogeny of the East, and with the collapse of its political and economic systems, it makes for an interesting case study. Transitioning to a market economy generally brings rapid changes not only to the labor market, but to the wage distribution and to unemployment figures as a result. In Russia's case, Elizabeth Brainerd reports that "[…] household surveys taken before and after the transition indicate that overall wage inequality nearly doubled from 1991 to 1994 and has reached a level higher than that in the United States" (1998). Mass privatization and price liberalization in Russia may have created a freer economy; nonetheless, it also increased the wage disparity.

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Russia clearly had to face a drastic move from a stable economic condition with a theorized income distribution of equality to a free market capitalist structure, which dynamically changed the labor market. Michael Lokshin and Barry Popkin (1999) study the effects of transition using longitudinal data from 1992 to1996 and conclude through reduction of government subsidies, payments to the poor, and more equitable wages for

the mass population, the wage gap increased. When discussing Russia's political and economic transition, one should seriously consider its ethnic disputes throughout its transition.

Russia's ethnic conflicts before and after the collapses of the Soviet Union have been well documented and remain a predicament today. Ethnic disputes are important to consider for the economic success of a state or nation because ethnic homogeneity raises social capital which results in faster growth and more productivity from each worker (Easterly 2001). The Russian Federation is comprised of 89 constituent units, and 32 of the 89 constituent are designated for one or more ethnic minority groups covering over 53% of the Russian territory (Hale 2002). Each minority ethnic or nationality group in Russia has unique interests and demands which often come into conflict. Cultural distinctiveness poses a dilemma for politicians because the one ethnic group may strongly desire a policy while another ethnic group will threaten the lives of the politicians if the policy is enacted. Thus, bribes and corruption have continually increased throughout the Russian Federation causing numerous ethnic disputes (Hale 2002). Furthermore, Chechnya's controversy over secession from the Russian Federation has resulted in years of bloodshed and ethnic controversy. Overall one should consider that, based on the Russian Federation's ethno-federal instability, it would be an ideal candidate for collapse along the same patterns as the USSR, Yugoslavia, and Czechoslovakia (Hale 2002). Inevitably, the wage gap now exists in Russia in its transition to a free market economy, and with former Soviet Union being the United States' biggest military threat nearly sixteen years ago, the transition makes for an interesting study.

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Data

As with any empirical study, the quality of data is imperative. The data used in my study comes from the Luxembourg Income Study (LIS) database. The LIS is a homogenized collection of national household surveys uniformly fit to facilitate cross-country comparative analysis. Growing since 1983, the LIS has now accumulated data on thirty different nations. Its parent project, the Luxembourg Employment Study (LES), began in 1994 later and homogenizes labor force characteristics for comparative research. My study uses Wave V, 2000, Russian statistics. The Luxembourg Income Study garnered their Russian data from the Russian Longitudinal Monitoring Survey covering 9,074 individuals over the age of fourteen. The purpose of the Russian Longitudinal Monitoring Survey is to evaluate the success of economic reforms in Russia by surveying Russian households; moreover, the Russian Longitudinal Monitoring Survey can measure the efficiency of the market as well as the effects on household consumption and individual health. The sample size includes 3,245 fulltime workers.

For my dependent variable, I use wages per hour. Independent variables reflect worker characteristics including age, job tenure, gender and nationality. In terms of employment, I know the sector (public or private) and in which of 300 occupations in which the individual works. Using the United Nations Occupational Coding system (the ISIC Rev. 4) for consistent occupational categories, I narrow these occupations into nine industry categories. These categories include: CEOs/Top Managers (CEO), professionals (PROF), technical (TECH), clerks (CLERKS), service (SERVICE), agricultural (AGRI), craft (CRAFT), operators (OPERS), and low skilled workers (the omitted category). The occupations excluded in my nine general categories are workers in private households as

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well as military professions because of the high variability of these occupations.

The gender variable FEMALE, a dummy variable, assumes the value of 1 whenever the participant is a female. The female variable is a dummy variable in this case because it can only take two values. Since females typically earn less than males, I expect the female coefficient to be negative in my wage regressions. . Similarly, the variable NONRUS assumes the value 1 when the individual is not of Russian nationality. I would expect the non-Russian group to earn less than the Russian participants; therefore, I expect the non-Russian coefficient to be negative as well. Non-Russian participants may have limited choices in work given their educational status, legal status, or difficulties with the language barrier. In a similar manner, the variables SECTOR takes value 1 if the individual is employed in the public sector and a value 0 for private employment. I would expect the sector variable to be negative because given the transition from a centrally planned economy to a free market, I would expect the private sectors to dominate Russia's economy and I would expect Russia's public sector to be less subsidized and lower paid. TIME, or job tenure is expected to have a positive coefficient as I expect the longer a participant holds a job, the more he or she will be paid. This variable is measured in 4 increments, less than one year, one to three years, three to ten years, and over ten years. Similarly, I expect the coefficient for age and the education variables, Basic high school equivalent education (BASIC); secondary education (SECED); technical university (TECHUNI); traditional university education (TRADUNI); vocational education and apprenticeship (VOCED); and vocational education with some or completed secondary education (VOCSEC) to be positive since I predict an increase in wages earned from increases in both age and education. I expect

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higher educational attainments will result in progressively higher wage premiums.

While the initial sample includes over 4,000 households and over 9,000 individuals aged fourteen and over, I restrict my sample for the log wage regressions to workers with positive earnings who worked at least 20 hours and have all required data including occupation and education. The final sample size given these restrictions is 3,262 workers.

Methodology

In my paper, I use the LIS data to analyze differences in pay between males and females and Russians and Non-Russians and determine the extent to which occupational crowding seems to explain the differences.

First, I examine descriptive statistics including pay, hours of work and underlying factors in Russia. Next, I consider wages and the percent female in nine different occupational categories in the nation. By analyzing the percent female in each of the nine occupational categories, one can acquire a better understanding of which industries are more heavily female concentrated. At the same time I can compare this to the sample size along with the median wage.

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Next, I examine the influences on wages using log wage regressions. In this way, I investigate the influence of demographic, educational, and occupational characteristics on worker wages. The regression equation measures the relationship of a dependent variable, in this case log wage, to several chosen independent variables. Each of these independent variables has separate betas which may be positive or negative depending on its effect on the dependent variable. For example, a log wage regression may take this

form:

$$LnWage = \beta_0 + \beta_1(Age) + \beta_2(\#Children) + \beta_3(Time) + \beta_4(Female) + \beta_5(Sector) + \epsilon(Error\ Term)$$

The β_0 represents a coefficient while the β_1 represents a coefficient in front of the variable age. For example, if β_1 were equal to .10, an increase in a person's age one year would increase that person's LnWage by ten percent. Each independent variable will have a positive or negative coefficient in front of the variable determining the effect on the dependent variable. This includes 0/1 variables, such as male/female and Russian/Non-Russian. The log linear wage involves the logarithms of the dependent variable and the independent variables, and one of the most important features of the log relationship is that is the betas depict the change in Y with respect to the change in X. By testing the hypothesis that overall wage differentials are eliminated within occupational specific groups, I test for occupational crowding.

All individual coefficients in my regression model are examined through a significance test involving a null and alternative hypothesis which determines if the independent variable has a statistically significant effect on the dependent variable. Generally, if the null is true, the coefficient in front of the independent variable X is equal to zero and has no effect on the dependent variable Y. Furthermore, I designate in my table asterisks for the level of significance tests in all of my tables. Three asterisks confirm the coefficient is statistically significant at the 99% confidence interval; two asterisks confirm the coefficient is statistically significant at the 95% confidence interval; one asterisk confirms the coefficient is statistically significant at the 90% confidence interval. By examining the p-values in my regression, I could determine whether or not to

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reject the null hypothesis if the p-value were less than alpha. Alpha would be designated as .01 at the 99% confidence interval, .05 at the 95% confidence interval, and .1 at the 90% confidence interval.

. The most common decomposition is the Oaxaca-Ransom Decomposition (Oaxaca 1973) where the gender difference is divided between a portion attributed to differences in the levels of productivity-influencing variables and a portion attributed to differences in the way these productivity factors are rewarded for men and women (Oaxaca 1973). In this sense, one would be able to garner a better understanding of what part of the income gap is explained by productivity characteristics and what part of the gap is unexplained, possibly through employee, employer, or consumer tastes for discrimination.

To avoid selection bias reflecting the choices of non-labor force participants, I use a Heckman correction. Heckman's (1976, 1979) created a two-step estimator for specified selection models. A Heckman correction is most frequently used in empirical models especially in micro econometrics when estimating wage equations or consumer expenditures (Greene 2000). The variables determined to influence the likelihood of labor market participation are AGE, FEMALE and Number of Children. The results of this probit model were then used to generate the inverse mills ratio and used to avoid bias in the log wage model. The Heckman model begins with two equations to indicate a woman's reservation wage based on exogenous traits such as marital status and number of children and to indicate the market wage for women with exogenous productive characteristics including education and work experience. Therefore, the omitted group of laborers not working are those receiving below their reservation wages. When I correct

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for selection bias, I will obtain a better estimate of the effect of exogenous variable such as education, experience, etc. The two equations are modeled as:

$$Wr = \beta 0 + \beta\,(\text{Hours}) + \beta(\text{Marital. Status}) + \beta\,(\#\text{ of Children}) + \epsilon(\text{Error Term})$$

$$Wm = \beta 0 + \beta(\text{Education}) + \beta(\text{Work Experience}) + \epsilon(\text{Error Term})$$

Finally, I examine the role of ethnicity among workers in the Russia during a time of transition. Using both log wage regressions and tests of occupational crowding, I examine the ability to explain the pay gap between Russian nationals and non-Russians working in Russia

Statistical Analysis

Table 1 reports the median hourly wage for full time workers by gender in Russian. Men clearly have a higher median wage with a greater standard deviation at 5.42 rubles and 11.46, respectively. On the other hand, the women's median wage is lower at 4.27 rubles, but the standard deviation is smaller at 7.80, which demonstrates less dispersion in the wage. Specifically, by dividing the females' wage into the males' wage, females earned 77.8% of male wage on average in Russia..

In terms of hours of work, males reported working longer hours than females and along with a greater standard deviation than females. The average work week for the Russians in my sample was approximately 48.70 hours while the approximate average hours weekly worked for females was 43.51 hours. Both the average hours worked for males and females are extremely high. Since I am examining earnings defined as wages per hour, this would generate greater differences in total earnings between the genders. Working more hours can also contribute to overtime pay as well as possible opportunities

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for raises and professional growth.

The percentage of full time workers who are not of Russian nationality is also shown on Table 1. In Russia nearly 26% of my sampled workers are not of Russian nationality. Moreover, members of Non-Russian nationality comprise almost 15% of the male sample, and members of Non-Russian nationality comprise a little over 11% of the female sample.

Approximately 23% of males and approximately 30% of females worked in the public sector in Russia. The environments surrounding wage determination and other benefits may be different in the public and private sector so the study will control for this factor. In addition, the choice of more women to work in the public sector may be a realization of female workers making the best decision in the face of a variety of conditions. For instance, public sector occupations may be more accommodating for child care, having birth, and hours worked than in the private sector. Thus, it may be a more preferable decision for a woman to choose an occupation in the public sector. Overall, the benefits in the public sector may be more accommodating to women. While I cannot be sure if it is the type of work, the pay, or the work environment that drives females toward public employment, this trend is clear when comparing the genders in Russia.

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The education system in Russia slightly resembles that of many other countries, including the United States. Similar to the United States, after an equivalent high school education, there are many different opportunities in Russia for both broad and specific education. More specifically, there are tractor driving, accounting, and typing schools, but Russia also has universities, technical universities, and trade universities along with graduate and medical schools. Clearly, at the university, secondary, and vocational

levels, there are a variety of types of professional schools and specific university programs.

The descriptive statistics on education verify that the education obtained by workers in Russia is quite different. One difficulty may be that the wording used in the survey may not be interpreted uniformly in each area. Thus, degrees completed in what is considered a vocational university may actually be a regular university or a technical university. It is interesting to note the patterns of the education system in Russia when dividing the statistics by male and female. For example, a larger percentage of men, 40.32%, have some type of basic or general education as compared to only 31.91% of females. Furthermore, a higher percentages of men are concentrated in the university and vocational/university education sectors rather than the technical and trade universities. 25.63% of men in Russia have received a university degree compared to only 10.90% of women. In addition, 22.39% of men have received a vocational education compared to only 12.85% of females in Russia. These percentages are atypical of what one would normally expect in transition countries; Brainerd (1998), Jurijda (2003), and Grajeck (2001) have all reported females receiving higher levels of vocational education as compared to males.

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On the contrary, women are clearly more represented in technical and trade schools when compared to men in Russia. 24.03% of women have obtained the technical university classification and 23.66% have a trade school education. Men, however, are less represented with only 16.77% completing a technical university education and 18.47% completing a trade school education. These trade schools may be considered as technical, music, or art schools; schools such as these have specified programs and

different requirements. The trade school university is the most equally represented in terms of male and female, with the difference being only 5.19 percentage points higher for the women.

Table 2 depicts differences in wages and how they might be influenced by occupation as well as what many may consider the stereotypical female categorizations. The data shown represent the median hourly wage and average workweek length in each of the nine created occupational groups, CEOs –CEOs and top managers, PROFS – professionals, TECH – technical specialists, SERVICE – service providers, AGRI – semiskilled agricultural workers, CLERKS – clerks and semiskilled assistants, CRAFT – semiskilled crafts workers, OPERS – lower skilled machinery and technical operators and LOWSK – low skilled workers in any industry. I see that the greatest concentration of females in Russia is in CLERKS and SERVICE, with a high representation in professionals; professionals are the specified occupation with the highest median wage. In addition, there is a high concentration of females in TECH positions with 50.37% being the percentage of females in the occupational category. One surprising piece of information is the low median wage for the CEOs and top professionals as standardized by the United Nations Occupational Coding system. The CEOs category has a median wage of 3.96 and has the second highest average in weekly hours worked right behind the service industry. On the other hand, the highest paid median wage is the professionals which has a median wage of 6.55 and has a 67.70% concentration of females. It is also interesting to note that the professionals overall have the highest median wage but the lowest average weekly hours worked. The craft occupation has the next highest median wage of 6.51 with one of the lowest concentrations of females at 14.17%. The only

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representation of females which is lower is in the agricultural industry, but the sample size of that industry is a meager twenty-two. As one would expect, the agricultural occupation and the low-skilled workers have the lowest median wages of 2.41 and 1.51, respectively. In essence, CEOs may have lower average returns because of the potential risk involved and the contraction of the Russian economy. One might expect the earnings of CEOs to be considerably high; however, the probability of complete failure and earnings of zero is also relatively high. Therefore, the averages a lower median wage. The percentage of Non-Russians working in each specified industry remains relatively constant. The highest percentage is in agricultural; however, as mentioned before, the sample size in the agricultural occupation is twenty-two. In the largest sample size, the technical occupations with a size of 706, has the lowest representation of Non-Russians at 8.83%. Table 2 also illustrates the differences in median wages by gender in each of the nine occupational categories. Two of the most interesting median wage statistics are in the PROFS and CRAFT where the male median wage is considerably higher than the female median wage. Women only earn 64.4% compared to men in the PROFS category, and women only earn 67.65% compared to men in the CRAFTS occupational category.

Table 3 begins the process of analyzing why male and female wage rates may be different. By examining separate regression models for males and females, I am able to examine differences in the returns to various factors. The lambda in the model represents the Heckman correction for sample selection bias so that differences in labor force participation of males and females do not translate into differences in earnings.

The proposed model including all of my independent variables is:

$$LnWage = \beta_0(Constant) + \beta_1(Age) - \beta_2(Age\text{^}2) + \beta_3(SECED) + \beta_4(SECVOC) +$$

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β_5(TRADED) + β_5(UNIED) + β_6 (VOCED) – β_7(NONRUS) + β_8(CEO) + β_9(PROFS) + β_{10}(TECHS) + β_{11}(CLERKS) + β_{12}(SERVICE) + β_{13}(OPERS) – β_{14}(SECTOR) + β_{15}(TIME) – β_{16}(TIME^2) + β_{17}(LAMBDA) €(Error Term)

Female CEOs, PROFS, TECHS, CLERKS, CRAFTS, AND OPERS in Russia earn a larger change in wages compared to their male counterparts. In addition, the clerical position for females earns a larger change in wages while the male's change in wage is smaller and statistically insignificant. Males in the SERVICE industry, however, earn a greater change in wage than females at .733 compared to .325. Males AND FEMALES in semiskilled occupations like CRAFTS and OPERS did receive an increase in wage compared to those in LOWSK occupations.

In Table 4, I continue to investigate if occupational crowding by gender can explain the gender pay gap. A test of occupational crowding uses a pooled sample of male and female workers in each region. I estimate a log wage model extremely similar to that presented in Table 3. The only modification for the pooled model is that a FEMALE dummy variable is added to the model to detect the influence of gender, ceteris paribus. Since ten regressions were conducted to examine the overall influence of gender in each occupation, only the coefficient of the gender variable has been reported in the table. Results find that the coefficient on FEMALE is statistically significant and negative in overall. The coefficient is significant at the 99% confidence level. Once controlling for education, job experience and occupation, one can observe a female with a certain set of characteristics on average earns 29.1% less than a male with the same characteristics.

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A test of the occupational crowding hypothesis says that if the coefficient on

FEMALE is negative and statistically significant overall but becomes statistically insignificant or positive within industry or occupational groups, occupational crowding is the source of the difference in wage. In other words, if the FEMALE coefficient becomes statistically insignificant, then it is where a women works rather than just her gender that creates the wage gap.

Table 4 shows the coefficient on FEMALE in each occupation and overall. Again, after controlling for variable such as education, age, etc women earn 29.1% less than men; or women with the same characteristics earn the same as men with the exact same characteristics. By observing Table 4, the coefficients for CEOS, PROFS, and TECHS, are negative and statistically significant at the 99% confidence level. Females in the SERVICE industry went from a positive coefficient .325 which was statistically significant (Table 3), to a statistically insignificant number of -1.030. Thus, the FEMALE coefficient becomes statistically insignificant, and in fact it is where a women works rather than just her gender that creates the wage gap. OPERS also became positive and statistically insignificant when looking at the selected coefficients of occupation specific regressions.

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In Tables 5 and 7 I measure the pay gaps using the Oaxaca Decomposition. To reiterate, the importance of the Oaxaca Decomposition is to collect a thorough perception of what part of the income gap is explained by productivity characteristics and what part of the gap is unexplained. Table 5 computes the pay gap that can be explained by differences between men and women in the means of the independent variables as well as the pay gap determined by differences in the value of the coefficients on these variables, which measures the effect of these factors on the wages of males and females. This second component is considered the unexplained portion of the gap since it is not a result of

underlying characteristics of the workers.

The format of the breakdown I use is:

$$(\ln \underline{w}_m - \ln \underline{w}_f) = \beta_m(\underline{X}_m - \underline{X}_f) + \underline{X}_f(\beta_m - \beta_f) + (\Theta m \lambda m - \Theta f \lambda f)$$

$\underline{X}_m$ and $\underline{X}_f$ are average values of the independent variables for males and females respectively and β_m and β_f are the coefficients on the variables from gender specific regressions. The last part, $(\Theta m \lambda m - \Theta f \lambda f)$, uses the parameters of the probit model to measure the selectivity. As a result, this model is a measure of the pay gap by the explained factors, the unexplained factors, and selectivity factors. While the nondiscriminatory returns to workers have been estimated in various ways by various authors, I use Oaxaca's original formulation of treating female workers as if they were male. Alternative versions of the decomposition use different versions of β, treating β sometimes as the overpayment to males and sometimes as the underpayment to women.

While it is debatable, I include occupation in my model as an independent variable and attribute some of the pay gap to the occupation in which the worker is employed and how they are paid in that industry. While gender may play a role in the determination of the occupation of employment, occupation also captures skill level and the value to society of the worker's output and therefore is an important consideration. The extent of the unexplained gap would most likely increase without controls for occupation. Without evidence of occupational crowding, however, I cannot suggest that women's pay gaps are caused by their occupation. Positive values in the table indicate that the factor is contributing toward an understanding of the gap. A negative value is possible if I would expect the gap to be less than it actually is as a result of the factor. The pay gap in Russia has a negative overall value in the explained section of Table 5. Therefore, the pay gap is

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attributed primarily to unexplained factors. The differences in means of the variables suggest that women should actually be paid more than males with the same characteristics. The gap is due to unexplained differences in the returns to time and age more than any other factor.

Similarly, Table 7 has the explained and unexplained gaps broken down by occupation. While the gap is primarily explained by the differences of the independent mean characteristics in PROFS, TECHS, OPERS, AND LOWSK, the gap is primarily unexplained in CEOS, CLERKS, SERVICE, AGRI, and CRAFT.

Conclusions

The pay gap between male and female workers in Russia is quite substantial when analyzing the descriptive statistics, the log wage regression, and the Oaxaca Decomposition. Results illustrate that the median hourly wage for females is only 77.8% of the median wage for males. Further investigation shows considerable disparities in the median wage in the nine occupational categories, most notably PROFS and CRAFT. The median hourly wage for males in the PROFS occupational category is 9.30 rubles compared to 5.99 rubles an hour for women. Likewise, the median hourly wage for males in the CRAFT occupational category is 7.05 rubles while the females median hourly wage is 4.77. The median hourly wage for females is higher in the CLERKS occupational category, which is the most heavily dominated by women at 87.26%; however, the difference was the smallest of the nine occupational categories.

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Using an Oaxaca decomposition, I found that the majority of the gender pay gap in the former Russia is attributed primarily to unexplained factors. When broken down by occupation, the gap is primarily explained by the differences of the independent mean

characteristics in PROFS, TECHS, OPERS, AND LOWSK, the gap is primarily unexplained in CEOS, CLERKS, SERVICE, AGRI, and CRAFT.

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Table 1. Descriptive Statistics

	Male	Female
Median wage	5.42	4.27
Std. Dev.	(11.46)	(7.80)
Hours Worked	48.706	43.51
Std. Dev.	(14.067)	(12.38)
Non-Russian	14.97%	11.01%
Public Employment	23.63%	30.16%
General Education	40.32%	31.91%
University	25.63%	10.90%
Vocational/University	22.39%	12.85%
Technical University	16.77%	24.03%
Trade University	18.47%	23.66%

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Table 2. Occupational Distribution and Earnings in Russia

	Median Wage	Avg Hours	% Female	% Non-Russian	n	Median Wage Female	Median Wage Male
CEOs	3.96	50.02	38.12	13.96	212	3.64	4.41
PROFS	6.55	41.20	67.70	10.63	578	5.99	9.30
TECH	5.42	46.23	50.37	8.83	706	4.88	5.97
SERVICE	4.05	51.33	75.95	13.87	275	3.10	3.82
AGRI	2.41	48.89	8.94	28.28	22	3.16	6.69
CLERKS	3.18	46.68	87.26	14.41	179	2.71	2.42
CRAFT	6.51	45.49	14.17	12.07	519	4.77	7.05
OPERS	3.08	47.99	28.12	14.57	353	4.33	3.16
LOWSK	1.51	46.88	47.06	17.30	201	1.16	2.14

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Table 3. Ln Wage Regressions by Gender

	Male	Female
Constant	-6.715**	0. 903***
AGE	0.124***	0.051***
AGESQ	-0.095***	-0.069***
SECED	.108*	-0.091
SEC/VOC	.158***	.088
TRAD/ED	.259**	.312***
UNIED	-0.145	-.034
VOCED	0.129***	-.095
NONGER	.020	-0.062
CEOS	.530***	.575***
PROFS	.698***	.761***
TECHS	.537***	.754***
CLERKS	.022	.436***
SERVICE	.733***	.325**
AGRI	.523	-.080
CRAFT	.556***	.682***
OPERS	.505***	.699***
SECTOR	-.265***	-0.439***
TIME	.017	.036
TIMESQ	-1.157	-.437
LAMBDA	12.852***	-1.432**
Rsquared	.128	.146
N	1582	1680

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Table 4. Selected Coefficients
Occupation Specific Regressions

	FEMALE		NONRUS
OVERALL	-0.291	***	-0.020
CEOs	-0.364	***	.374
PROFS	-0.376	***	0.142
TECH	-0.200	***	-0.049
CLERKS	.277		-0.226
SERVICE	-1.30		-0.193
AGRI	-4.044		.224
CRAFT	-0.243	*	0.049
OPERS	.513		-.170
LOW SK	-.610	*	-.068

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Table 5. Gender Pay Gap Decomposition

	Explained	Unexplained
Constant	0	5.812
Age & Time	-4.79269	47.89756
Education	0.032083	0.112358
Non-Russian	.0000555	0.012048
Occup	-0.00277	-0.07351
Lambda	0.698994	3.895743
Total	-4.06433	57.6562

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Table 6. Ln Wage Regressions by Nationality

	Russians		Non-Russians	
Constant	-.659	***	.165	
FEMALE	-.263	***	-.363	***
AGE	.080	***	-.052	*
AGESQ	-.085	***	-.054	
BASIC	.410	***	-.382	
SECED	-.005		-.391	
VOCED	-.222	***	-.353	*
VOCSEC	-.101		0	
UNIED	-.121		-.228	
TECHUNI	0		-.086	
TRADE	.252	***	.110	**
CEOS	.507	***	1.253	***
PROFS	.673	***	1.165	***
TECHS	.650	**	.871	***
CLERKS	.384	***	.452	
SERVICE	.512	***	.615	**
AGRI	.756	**	.490	
CRAFT	.619	***	.942	***
OPERS	.609	***	.904	***
SECTOR	-.291	***	-.452	
TIME	.011		.231	
TIMESQ	-.003		-6.475	
LAMBDA	1.368		.431	
Rsquared	.140		.271	
N	2274		488	

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Table 7. Decomposition by Occupation

	Explained	Unexplained
CEO	-113.6	739.1694
PROFS	34.51579	-407.72
TECHS	2.522989	-37.5502
CLERKS	-40.835	203.7239
SERVICE	-78.9551	220.3219
AGRI	-40.6711	99.49154
CRAFTS	-26.7215	235.6194
OPERS	7.898643	85.51475
LOWSK	66.3109	-275.326

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