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Evaluating the Gender Wage Gap in Georgia, 2004 – 2011*

by

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ABSTRACT

This paper evaluates the gender wage gap among wage workers along the wage distribution in Georgia between 2004 and 2011, based on the recentered influence function (RIF) decomposition approach developed in Firpo, Fortin, and Lemieux (2009). We find that the gender wage gap decreases along the wage distribution, from 0.64 log points to 0.54 log points. Endowment differences explain between 22 percent and 61 percent of the observed gender wage gap, with the explained proportion declining as we move to the top of the distribution. The primary contributors are the differences in the work hours, industrial composition, and employment in the state sector. A substantial portion of the gap, however, remains unexplained, and can be attributed to the differences in returns, especially in the industrial premia.

The gender wage gap consistently declined between 2004 and 2011. However, the gap remains large, with women earning 45 percent less than men in 2011. The reduction in the gender wage gap between 2004 and 2007, and the switch from a glass-ceiling shape for the gender gap distribution to a sticky-floor shape, was driven by the rising returns in the state sector for men at the bottom, and by women at the top of the wage distribution. Between 2009 and 2011, the decline in the gender wage gap can be explained by the decrease in men's working hours, which was larger than the decrease in women's working hours. We assess the robustness of our findings using the statistical matching decomposition method developed in Ñopo (2008) in order to address the possibility that the high degree of industrial segregation may bias our results. The Ñopo decomposition results enrich our understanding of the factors that underlie the gender wage gap but do not alter our key findings, and in fact support their robustness.

INTRODUCTION

The collapse of the socialist system initiated an unprecedented social and economic transformation of the economies of the Central and Eastern Europe and former Soviet Union. The shifts that emerged in the gender balance were particularly salient because of the region's socialist legacy of gender equality. On the one hand, the deregulation of the wage setting system put an upward pressure on the gender wage gap. On the other hand, stronger market competition and the expansion of female-dominated service sector pulled it down (Giddings, 2002). These forces, in combination with the differences in the institutional mechanisms aimed at supporting gender balance, made the net movements in the gender wage gap context-specific.

In this paper, we evaluate the magnitude and evolution of the gender wage gap in Georgia between 2004 and 2011. Following the Rose Revolution of 2003, the Georgian government implemented a series of sweeping reforms, which ranged from restructuring the public sector and privatizing state-owned enterprises, to ridding higher education system of corruption, to sharply reducing the costs associated with conducting business (Papava, 2012). During this period, the Georgian economy expanded at an average annual rate of 6.1%. The 2008 financial crisis and the August War with Russia dealt a double blow to the Georgian economy, contracting it by 4%; however the aggregate output recovered and by 2011 the GDP growth reached 7%. The growth in aggregate output was associated with shifts in the output composition of the Georgian economy, with industry and especially services expanding at the expense of agriculture. Despite these positive changes, the labor market situation remains weak with pervasive unemployment and underemployment (World Bank, 2009). Importantly, earnings inequality remains high (Habibov, 2012).

The dynamics of the gender balance that accompanied Georgia's economic transformation are multifaceted. During the early transition, the gender gap appears to have deteriorated (Yemtsov 2001). However, the economic collapse also engendered coping strategies among women that raised their labor force participation rate in the first part of the 1990s whereas the corresponding rate for men declined during the same period. Jashi (2008) finds that, although Georgian women still face formidable barriers to economic, political and social opportunities, their access to these opportunities has improved. The finding of a decrease in the gender wage gap during the early 2000s further corroborates this argument, at least with respect to the labor

markets (Khitarishvili, 2009). In recent years, the Georgian government has taken a number of steps aimed at addressing the gender imbalance. Among these the key step has been passing of the Gender Equality Law in March of 2010, whose goal is to improve women's security and political participation and gender-based labor market equality. The Law was a culmination of a number of steps that originated with the establishment of the Gender Equality Advisory Council under the Parliament Speaker's office in 2004 and of the Government Commission on Gender Equality in 2005. The Commission drafted the *National Action Plan for Strengthening Gender Equality*. In 2006, these two entities formulated the "The State Concept on Gender Equality", which became the basis of the 2010 Gender Equality Law.

The contribution of this paper is twofold. This is the first study that establishes the gender wage gap dynamics that evolved in Georgia after the Rose Revolution of 2003. Second, the gender wage gap and its evolution are analyzed along the wage distribution and then evaluated in the context of changing patterns in earnings inequality (WB, 2009; Habibov, 2012).

The empirical evidence documenting the evolution of the gender wage gap in the transition region paints a mixed picture[1]. Recent literature has increasingly recognized the importance of evaluating the gender wage gap along the wage distribution. Ganguli and Terrell (2005) find that the gender wage gap fell in Ukraine between 1986 and 2003 and that this decline was primarily caused by the drop in the gender wage gap at the bottom of the distribution. Pignatti (2011) assesses a more recent 2003 – 2007 period in Ukraine and finds the evidence of a further decline however mostly in the upper part of the distribution, highlighting a shift that appears to have taken place between the two periods. The findings in Pham and Reilly (2007) reveal a decrease in the gender wage gap in Vietnam between 1993 and 2002 and find that the drop is particularly pronounced at the top of the distribution, similar to the more recent period in Ukraine. Kecmanovic and Barrett (2011) find that the gender wage gap in Serbia declined during 2001 – 2005 and in that case the fall appears to be uniform across the wage distribution. In contrast to the declines in Ukraine, Vietnam and Serbia, Pastore and Verashchagina (2011) demonstrate that the gender wage gap in Belarus more than doubled between 1996 and 2006 and

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[1] Some examples include Brainerd (1998), Newell and Reilly (1996), Reilly (1999), Arabsheibani and Lau (1999), Glinskaya and Mroz (2000), Gerry et al. (2004), Cheidvasser and Benitez Silva (2007), Kazakova (2007), Johnes and Tanaka (2008), and Anderson and Pomfret (2003).

did so mostly at the bottom of the distribution. Chi and Li (2008) evaluate the case of China between 1987 and 2004 and find that the gender wage gap increased during this time, also primarily at the bottom of the distribution. Hence, the empirical evidence reveals a range of gender wage gap outcomes in the transition region, likely a result of peculiarities in the interplay between economic and institutional developments.

Our analysis employs the Recentered-Influence-Function (RIF) decomposition approach developed in Firpo, Fortin and Lemieux (2009) (FFL). The approach has two important advantages. The first is that it allows an evaluation of the impact of explanatory variables on unconditional quantiles. The second advantage is that unlike other popular methods that decompose the gender wage gap along the wage distribution (Juhn, Murphy, and Pierce 1993; Machado and Mata 2005), the RIF approach allows for the decomposition into the endowment (composition, or explained) component and the returns (structural, or unexplained) component for each of the explanatory variables. The latter characteristic makes it directly comparable to the Oaxaca Blinder approach at the mean of the distribution (Firpo, et al. 2009, Oaxaca 1973, Blinder 1973). On the other hand, a major limitation of the FFL approach is that it assumes that men's and women's wage distribution share a common support in their characteristics. In many settings, especially in the economies exhibiting high occupational and industrial segregation, men's and women's characteristics may not perfectly overlap. To assess the extent to which this possibility might be a problem in the Georgian context, we estimate the model using the decomposition approach developed in Ñopo (2008). In this approach, statistical matching is used to separate the sample of men and women into the individuals who share a common support and those who do not. The decomposition then includes the components which are defined over the common support and those that capture the differences between the characteristics of individuals in and out of the common support.

The rest of the paper is structured as follows. In section 2 we present data summary, which analyzes the changes that took place in the characteristics of the Georgian workers and present a preliminary gender wage gap assessment. Section 3 briefly describes the RIF decomposition method developed in Firpo, Fortin and Lemieux (2009) and the matching decomposition approach developed in Ñopo (2008). Section 4 presents the results, and is followed by Conclusions.

2. DATA SUMMARY

We use the Georgian Household Budget Survey (HBS) data for 2004 – 2011 and exclude the data from 2008, when the Georgian economy experienced the double shock of the financial crisis and the August war with Russia. The HBS is a quarterly survey of households, which follows a rotating panel design. Households remain in the sample for four quarters before being replaced by a new cohort.

Our sample includes 25 – 55 year-old wage workers with positive income, which results in 35,765 observations (18,640 men and 17,125 women). We limit the sample to this age group in order to avoid the issues of early retirement and schooling. Wage workers comprise 36.63% of the labor force and their proportion increased from 36.18% in 2004 to 39.66% in 2011. In addition to unemployed and wage workers, labor force includes self-employed workers, employers, farmers and unpaid workers. We evaluate the gender gap only among wage workers because their process of wage determination is likely to be different from other employment categories (Garcia-Mainar and Montuenga-Gomez, 2005). Moreover, the quality of earnings data is likely to be higher for wage workers than for self-employed individuals (Benedek and Orsolya, 2009; Johansson, 2005) although Torosyan (2011) finds that in Georgia the degree of underreporting is in fact similar between the two groups.

The earnings data in the survey are available in the form of contractual and actual wages from primary employment, contractual and actual wages from secondary employment, profits, bonuses, and in-kind payments. We use contractual monthly wages from primary employment, convert them into 2005 constant Georgian Lari (GEL) using the official consumer price index (CPI), and use the natural log of these wages as our dependent variable. We use monthly rather than hourly wages due to the lack of the data on the precise number of hours worked. In order to mitigate the likely overestimation in the gender wage gap (Brainerd, 1998), we include in the estimation the variable that corresponds to the question asking respondents to identify the blocks of time worked.

The explanatory variables in the model include the level of educational attainment, age, age squared, marital status, nationality, urban dummy variable, dummy variable for residing in

the capital city Tbilisi, skill level[2], state sector dummy, industrial dummy variables, the categorical variable representing the blocks of time worked, and quarterly dummy variables.

As Table 1 demonstrates, compared to their male counterparts, female wage workers are older, more likely to be single and to live in urban areas or in Tbilisi. This picture potentially reflects greater constraints for entering wage employment experienced by married women of prime child-bearing age, especially in rural parts of Georgia. Moreover, compared to men, who are more evenly spread out across different industries, women are concentrated in education, health care and social work, with 48.11% of women employed in these industries. Furthermore, proportionately more women work in the state sector compared to men. The remuneration in these industries and in the state sector is below the economy-wide average (Table 2). However, the jobs in these sectors are perceived to offer greater flexibility and stability, the characteristics which are presumably more valued by women due to their reproductive role and household responsibilities (Schmid, 2010). The preference for greater flexibility may also be seen in women working fewer hours than men: only 34.52% of women work for 40 hours or more, compared to 53.37% of men. We must note that speculation in respect to industrial composition and working hours has to be made with caution due to the role that employers' choice to hire women over men may play in determining these outcomes. Possibly as a way of overcoming the labor market constraints that they face, women in Georgia are more educated than men and proportionately more of them are engaged in high-skilled white-collar occupations, a pattern also observed in other countries of the transition region (World Bank, 2012). The proportions of ethnic Georgians among female and male wage workers are similar.

We also find that between 2004 and 2011, male wage workers became younger, reflecting either changing demographic characteristics or declining importance of experience in wage employment. Proportionately more men in 2011 were engaged in seasonal work and fewer men were engaged in jobs that required them to work 40 hours or more. We observe a drop in the proportion of men working in the state sector, driven by the apparent contraction of state sector employment between 2009 and 2011. Indeed, all primarily state-financed industries (e. g. public

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[2] Skill corresponds to four occupational categories based on the ISCO-88 single-digit occupation coding: $1 - 3 =$ high-skilled white-collar (e.g. teachers, physicians, engineers); $4 - 5 =$ low-skilled white-collar (e.g. office clerks, sales and customer service personnel); $6 - 7 =$ high-skilled blue-collar (e.g. machine operators and skilled agricultural workers), and $8 - 9 =$ low-skilled blue-collar (e.g. drivers, movers).

administration and defense, education, health and social work, and culture) contracted relative to other industries. On the other hand, the proportion of men in construction and finance industries increased, reflecting the expansion of these industries during this period. The decline in the level of educational attainment and in the proportion of high-skilled white-collar occupations appears to reflect the changes in the structure of the Georgian economy. It is also noteworthy that proportionately fewer men live in Tbilisi, pointing at the expansion of wage employment opportunities in other parts of Georgia.

Women share some of the changes with men. In 2011 proportionately fewer women worked in the state sector compared to 2004 and the magnitude of the decline was more substantial for women than for men. However, women did not experience a sizable drop in educational attainment. Moreover, whereas women, too, experienced a decline in the proportion of high-skilled white-collar occupations, it was associated with an increase in the proportion of low-skilled white-collar occupations (rather than in low-skilled blue collar occupations, as was the case with men). These findings highlight that, whereas male wage employment on average has expanded in the direction of blue-collar occupations, women remained in white-collar occupations that require more than secondary education. This conjecture is further supported by the finding that most of the reshuffling in the industrial composition of female wage employment took place among service industries. In particular, whereas the culture industry expanded, other service industries, such as public administration and defense, health and social work, and education contracted. Unlike men, whose average work hours decreased, women's work hours increased, as evidenced by the rise in the proportion of women working 40 hours or more from 22.9% in 2004 to 31.3% in 2011.

Table 1 Summary Statistics.

	Men					Women				
	2004	2007	2009	2011	2004-2011	2004	2007	2009	2011	2004-2011
Age categories										
25 – 34	0.289	0.331	0.347	0.374	0.336	0.237	0.264	0.277	0.266	0.26
35 – 44	0.366	0.315	0.302	0.3	0.32	0.393	0.357	0.333	0.35	0.359
45 - 55	0.345	0.353	0.351	0.326	0.344	0.37	0.379	0.39	0.385	0.381
Education										
Secondary and below	0.261	0.282	0.314	0.325	0.296	0.151	0.133	0.15	0.149	0.146
Vocational	0.255	0.206	0.176	0.188	0.206	0.268	0.244	0.216	0.252	0.246
Higher education	0.484	0.512	0.509	0.487	0.498	0.581	0.623	0.634	0.599	0.608
Marriage										
unmarried	0.181	0.223	0.191	0.183	0.195	0.378	0.413	0.341	0.344	0.369
married	0.819	0.777	0.809	0.817	0.805	0.622	0.587	0.659	0.656	0.631
Nationality										
Non-Georgian	0.115	0.092	0.077	0.066	0.087	0.107	0.094	0.071	0.075	0.087
Georgian	0.885	0.908	0.923	0.934	0.913	0.893	0.906	0.929	0.925	0.913
Residence										
Rural	0.334	0.303	0.336	0.357	0.333	0.275	0.231	0.301	0.258	0.266
Urban	0.666	0.697	0.664	0.643	0.667	0.725	0.769	0.699	0.742	0.734
Capital city										
Not Tbilisi	0.611	0.542	0.606	0.652	0.603	0.569	0.515	0.591	0.577	0.563
Tbilisi	0.389	0.458	0.394	0.348	0.397	0.431	0.485	0.409	0.423	0.437
Working hours										
Less than 20 hours	0.033	0.034	0.048	0.051	0.041	0.098	0.134	0.15	0.167	0.136
21 – 40 hours	0.439	0.293	0.352	0.43	0.378	0.661	0.46	0.468	0.491	0.524
More than 40 hours	0.476	0.599	0.526	0.449	0.513	0.229	0.39	0.36	0.313	0.32
Seasonal hours	0.052	0.074	0.074	0.071	0.068	0.011	0.016	0.023	0.029	0.02

	Men					Women				
	2004	2007	2009	2011	2004-2011	2004	2007	2009	2011	2004-2011
Sector										
private	0.627	0.603	0.558	0.66	0.613	0.414	0.389	0.44	0.501	0.435
state	0.373	0.397	0.442	0.34	0.387	0.586	0.611	0.56	0.499	0.565
Occupation, by skill level										
low-skilled, blue-collar	0.217	0.231	0.285	0.313	0.262	0.06	0.068	0.074	0.082	0.071
high-skilled, blue-collar	0.188	0.211	0.15	0.139	0.172	0.048	0.038	0.03	0.037	0.038
low-skilled, white-collar	0.141	0.129	0.14	0.169	0.145	0.209	0.207	0.214	0.257	0.222
high-skilled, white-collar	0.455	0.429	0.426	0.379	0.421	0.683	0.687	0.682	0.625	0.669
Industry type										
Agriculture	0.053	0.05	0.043	0.042	0.047	0.01	0.014	0.013	0.012	0.012
Mining	0.011	0.013	0.027	0.038	0.022	0	0.001	0.004	0.006	0.003
Manufacturing	0.14	0.149	0.12	0.114	0.131	0.07	0.049	0.061	0.079	0.065
Utilities	0.062	0.035	0.052	0.057	0.051	0.011	0.008	0.014	0.009	0.01
Construction	0.073	0.154	0.098	0.11	0.109	0.001	0.017	0.002	0.006	0.007
Trade	0.12	0.109	0.103	0.131	0.116	0.112	0.142	0.129	0.128	0.127
Hotels and restaurants	0.012	0.011	0.015	0.011	0.012	0.032	0.029	0.034	0.034	0.032
Transport	0.106	0.11	0.132	0.092	0.11	0.042	0.022	0.04	0.031	0.034
Finance	0.018	0.025	0.019	0.034	0.024	0.025	0.034	0.031	0.021	0.028
Real estate	0.047	0.058	0.05	0.047	0.051	0.043	0.043	0.025	0.021	0.033
Public administration and	0.195	0.153	0.201	0.181	0.182	0.099	0.064	0.067	0.083	0.079
Education	0.07	0.056	0.064	0.065	0.063	0.359	0.328	0.35	0.321	0.34
Health and social work	0.025	0.024	0.027	0.024	0.025	0.126	0.177	0.138	0.133	0.143
Culture	0.058	0.052	0.047	0.046	0.05	0.054	0.048	0.064	0.073	0.06
Private households	0	0.002	0.002	0.009	0.004	0.013	0.021	0.027	0.04	0.025
International organizations	0.01	0.001	0	0.001	0.003	0.003	0.003	0.001	0.003	0.003

Notes: weighted proportions, unless indicated otherwise; all columns add up to one.

Table 2 provides a preliminary indication that demographic and employment characteristics matter in determining the magnitude of the gender wage gap. The overall raw gender wage gap in Georgia during 2004 – 2011 is substantial, with women earning 43% less than men (corresponding to a 0.56 log-point difference). It is particularly pronounced among the oldest group of 45-55-year-old individuals. The gap is higher among married individuals, likely due to the wage penalty that married women experience. It is higher among Georgians and among individuals with vocational education. Working in a rural area and, surprisingly, in the state sector are both associated with the higher gender wage gap. In terms of the work-hour and occupational arrangements, the gap is the highest among seasonal workers. It is noteworthy that the gender wage gap is equally high among high-skilled white-collar workers and low-skilled blue-collar workers. Among industries, it is the highest in trade and hotels and restaurants and the lowest in construction (negative), transport and international organizations.

Table 2 Wages expressed in 2005 constant GEL, by characteristic, gender and time period; relative wage gap and log point difference, by period.

	Men					Women					Relative wage gap[1]					Log point difference[2]				
	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11
Overall wages	184.7	272.8	325.8	298.8	266.1	94	152.6	191.7	190.5	152.8	0.49	0.44	0.41	0.36	0.43	0.68	0.58	0.53	0.45	0.555
Education																				
Secondary and below	149.6	200.3	228.9	224.6	196.6	94.7	109.5	127.9	122.3	112	0.37	0.45	0.44	0.46	0.43	0.46	0.6	0.58	0.608	0.563
Vocational	158.8	224.3	255.5	221.5	209.9	73.7	104.8	131.5	129.7	103.7	0.54	0.53	0.49	0.41	0.51	0.77	0.76	0.66	0.535	0.705
Higher education	217.3	332.3	409.9	378	332.2	103.1	180.5	227.3	233	184.5	0.53	0.46	0.45	0.38	0.44	0.75	0.61	0.59	0.484	0.588
Age group																				
25 - 34	217.2	279.9	333.3	320.2	287.3	105	159.5	219.7	218.7	176.1	0.52	0.43	0.34	0.32	0.39	0.73	0.56	0.42	0.381	0.489
35 - 44	177.5	274.1	326.4	314.4	265.3	88.9	159.7	191.3	190.5	151.7	0.5	0.42	0.41	0.39	0.43	0.69	0.54	0.53	0.501	0.559
45 - 55	165.1	265	317.9	259.8	247	92.3	141	172.2	171	138.5	0.44	0.47	0.46	0.34	0.44	0.58	0.63	0.61	0.418	0.579
Marriage																				
unmarried	192.1	247.4	304.9	285.7	251.5	109.2	168.3	212.3	219	168.5	0.43	0.32	0.3	0.23	0.33	0.56	0.39	0.36	0.266	0.401
married	183.1	280.1	330.7	301.7	269.8	84.7	141.5	181.1	175.5	143.9	0.54	0.49	0.45	0.42	0.47	0.77	0.68	0.6	0.542	0.629
Nationality																				
Non-Georgian	177.8	196.2	221.8	234.1	202.6	86.2	144.3	171.8	158.8	134.9	0.52	0.26	0.23	0.32	0.33	0.72	0.31	0.26	0.388	0.407
Georgian	185.6	280.6	334.4	303.4	271.9	94.9	153.4	193.2	193.1	154.4	0.49	0.45	0.42	0.36	0.43	0.67	0.6	0.55	0.452	0.566
Residence																				
rural	126.9	198.3	226.7	232.5	195.4	68.9	104.4	136.4	135.1	106.8	0.46	0.47	0.4	0.42	0.45	0.61	0.64	0.51	0.543	0.604
urban	213.6	305.3	376.1	335.6	301.1	103.5	167	215.5	209.7	170.1	0.52	0.45	0.43	0.38	0.44	0.72	0.6	0.56	0.47	0.571
Capital city																				
Not Tbilisi	147.7	223.9	261.3	246.8	217.9	76.4	114.8	152.1	148.9	117.4	0.48	0.49	0.42	0.4	0.46	0.66	0.67	0.54	0.505	0.618

	Men					Women					Relative wage gap[1]					Log point difference[2]				
	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11
Tbilisi	242.9	330.7	424.8	395.9	340.2	117.2	192.6	249	247.3	200.2	0.52	0.42	0.41	0.38	0.41	0.73	0.54	0.53	0.471	0.53
Work hours																				
Less than 20 hours	96.5	120.9	191.5	141.3	135.3	54.5	82.6	118.4	118.1	95.4	0.44	0.32	0.38	0.16	0.29	0.57	0.38	0.48	0.179	0.349
21 – 40 hours	160.9	264.2	305.9	289.6	242.4	87.5	141.2	184	186.2	138.2	0.46	0.47	0.4	0.36	0.43	0.61	0.63	0.51	0.442	0.562
More than 40 hours	212.5	292.4	364	342.1	298.6	129.6	192.5	235.7	243	202.1	0.39	0.34	0.35	0.29	0.32	0.49	0.42	0.43	0.342	0.39
Seasonal hours	186.1	218.2	235.7	192.7	221.2	90.7	95.3	138.8	112.7	109.1	0.51	0.56	0.41	0.42	0.51	0.72	0.83	0.53	0.536	0.707
Occupation, by skill level																				
low-skilled, blue-collar	167.5	197.2	264.1	237.4	215	81.6	91.8	135.3	126.6	108.4	0.51	0.53	0.49	0.47	0.5	0.72	0.76	0.67	0.629	0.685
high-skilled, blue-collar	162.4	223.1	231.3	225.3	212.1	91.8	96.9	132.3	115.9	103.1	0.43	0.57	0.43	0.49	0.51	0.57	0.83	0.56	0.665	0.721
low-skilled, white-collar	163.9	193	235.8	226.1	207.4	105.6	144.4	160.9	150.1	134.5	0.36	0.25	0.32	0.34	0.35	0.44	0.29	0.38	0.41	0.433
high-skilled, white-collar	208.6	362	429.9	408.7	339.4	91.7	164.1	210.1	219.8	166.8	0.56	0.55	0.51	0.46	0.51	0.82	0.79	0.72	0.62	0.71
Ownership																				
private	222.7	275.4	311.7	289.9	270.8	129	169.9	202.8	191.1	172.9	0.42	0.38	0.35	0.34	0.36	0.55	0.48	0.43	0.417	0.449
public	120.8	268.9	343.7	316	259.2	69.2	141.5	183	189.9	137.6	0.43	0.47	0.47	0.4	0.47	0.56	0.64	0.63	0.509	0.633
Industry																				
Agriculture	104.5	136.9	127.9	121	127.3	82.8	109.2	82.8	69.6	82.8	0.21	0.2	0.35	0.42	0.35	0.23	0.23	0.43	0.553	0.43
Mining	352.9	332.6	311.3	355.3	310.1	102.2	298	216.6	214.5		0.71	0.1	0.3	0.4	1	1.24	0.11	0.36	0.505	
Manufacturing	180.9	252.8	289.2	232.3	232.3	122.2	149.8	189.5	145.6	146.8	0.32	0.41	0.34	0.37	0.37	0.39	0.52	0.42	0.467	0.459
Utilities	184.9	296.7	321.4	312.2	261.4	227.8	144.6	232.5	267.1	238.5	-0.23	0.51	0.28	0.14	0.09	-0.21	0.72	0.32	0.156	0.092

	Men					Women					Relative wage gap[1]					Log point difference[2]				
	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11	2004	2007	2009	2011	04-11
Construction	243.8	316.7	338.6	293.5	292.2	329.7	296.1	359.1	265.4	294.1	-0.35	0.07	-0.06	0.1	-0.01	-0.3	0.07	-0.06	0.101	-0.006
Trade	187.4	237	300.6	291.4	255.1	120.4	138.2	166.9	172.3	152.2	0.36	0.42	0.44	0.41	0.4	0.44	0.54	0.59	0.525	0.516
Hotels and restaurants	227.6	238.4	336.2	270.8	257.3	138.5	191.5	175.2	137.4	146.2	0.39	0.2	0.48	0.49	0.43	0.5	0.22	0.65	0.678	0.565
Transport	219.5	240.8	312.2	311.1	268.8	99	307.6	287.5	281.8	220.5	0.55	-0.28	0.08	0.09	0.18	0.8	-0.24	0.08	0.099	0.198
Finance	301.9	577.5	473.1	466.7	473.9	170.2	444.8	324.5	434.6	325.3	0.44	0.23	0.31	0.07	0.31	0.57	0.26	0.38	0.071	0.376
Real estate	181.6	253.4	266.9	286.7	243	99.3	156.8	245.5	291.2	183.8	0.45	0.38	0.08	-0.02	0.24	0.6	0.48	0.08	-0.016	0.279
Public administration and defense	145.4	372.1	451	404.9	340.4	88.3	269.5	409.1	355.5	252.4	0.39	0.28	0.09	0.12	0.26	0.5	0.32	0.1	0.13	0.299
Education	109	137.2	248.4	168.2	153.3	74.9	100	142.7	151.1	109.8	0.31	0.27	0.43	0.1	0.28	0.38	0.32	0.55	0.107	0.334
Health and social work	168.5	166.3	312.4	233.9	223	67.7	129.3	173.2	181	128.4	0.6	0.22	0.45	0.23	0.42	0.91	0.25	0.59	0.256	0.552
Culture	208.7	237.4	253.9	279.5	237.8	80.2	139.2	198.8	168.9	161	0.62	0.41	0.22	0.4	0.32	0.96	0.53	0.24	0.504	0.39
Private households	87.7	134.3	189.7	202.6	189.9	160.4	127.7	166	154.6	153.2	-0.83	0.05	0.12	0.24	0.19	-0.6	0.05	0.13	0.27	0.215
International	599.8	151.5	1,832.80	484.3	485.5	192	495.5	353.9	505.6	537.6	0.68	-2.27	0.81	-0.04	-0.11	1.14	-1.18	1.64	-0.043	-0.10

Notes: [1] relative wage gap = $(W_m-W_v)/W_m$; [2] log point difference = $\ln(W_m/W_w)$; weighted means

Between 2004 and 2011, the gender wage gap contracted by almost 15 percentage points, from 45% (i.e., women earn 45% less than men) to just above 30%. A look at the evolution of the mean gender wage gap over time reveals a continuous decline in the gap; however, this continuity belies two distinct periods. During 2004 – 2007, the contraction in the gender wage gap was associated with an increase in the real wages of both men and women, with women's wages growing faster than men's wages. During 2009 – 2011, on the other hand, the contraction was associated with stagnant real wages of women and declining real wages of men.

Figure 1 Real wages and relative wage gap between 2004 and 2011.
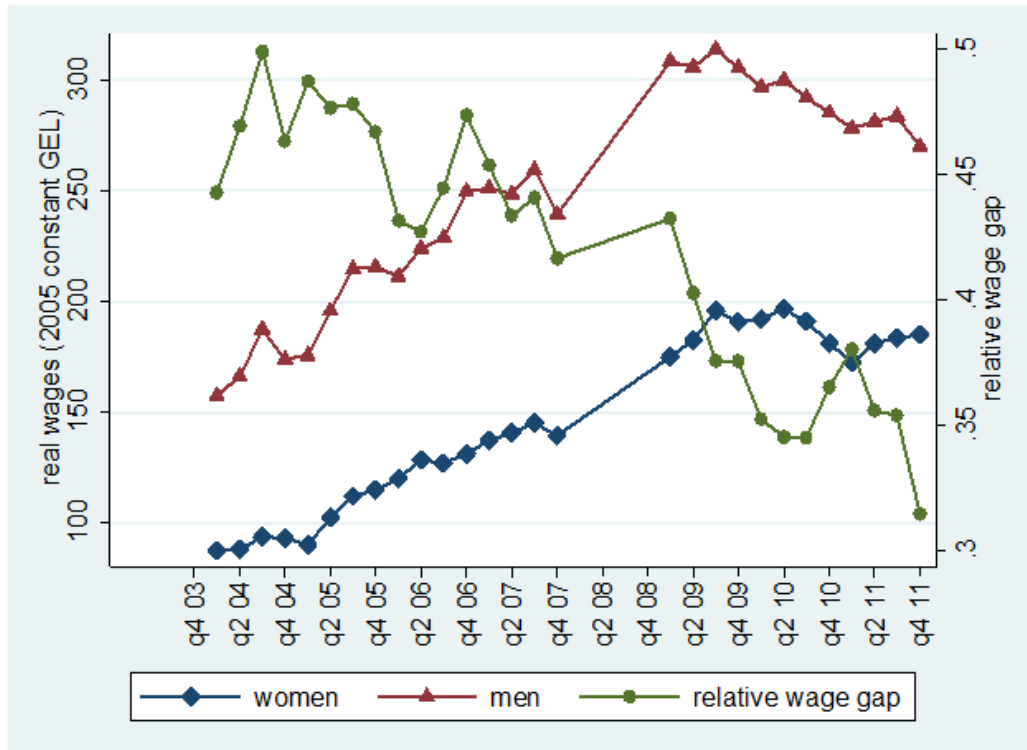
Moreover, although the gender wage contracted all along the wage distribution between 2004 and 2011, it experienced very different dynamics during the two periods. The gender wage gap distribution in 2004 appears to exhibit the glass ceiling effect in the form of a higher gender wage at the top of the wage distribution, as opposed to the sticky floor effect, revealed in the form of the higher gender wage gap at the bottom of the distribution (Christofides, Polycarpou, and Vrachimis, 2013). Between 2004 and 2007, the contraction in the mean gender wage gap was driven by the decrease at the top of the distribution, which outweighed the sharp rise in the

gender wage gap at the bottom of the distribution. This provides evidence of a sticky floor effect in 2007. Between 2009 and 2011, on the other hand, the decline in the gender wage gap is seen all along the wage distribution and especially at the two ends of the wage distribution. In fact, by 2011, the distribution of the gender wage gap appears to have an inverted U-curve shape, revealing the absence of glass-ceiling or sticky-floor effects.

These changes in the shape of the gender wage gap distribution reveal the presence of gender differences in the movement of real wages across the wage distribution. In order to evaluate the forces underlying these changes, we employ the RIF decomposition approach developed in Firpo, Fortin and Lemiuex (2009) and the statistical matching decomposition approach developed by Ñopo (2008), which we describe in the next section.

Figure 2 Gender wage gap along the wage distribution, by year.
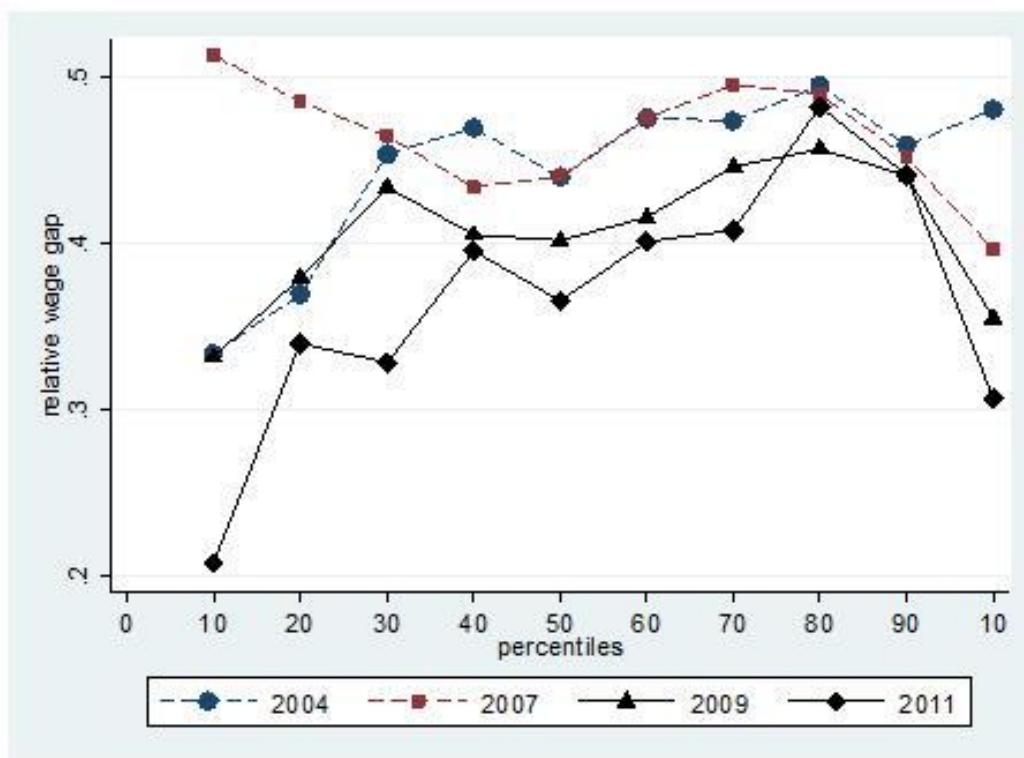
3. METHODOLOGY

The RIF decomposition method developed in Firpo, Fortin and Lemieux (2009) involves the regression of the recentered influence function of an unconditional quantile on the explanatory variables. The gender wage gap along the wage distribution in this approach can then be decomposed into the composition (endowment, or explained) effect and the wage structure (returns, or unexplained) effect with respect to each of the observable variables, equivalent to the Oaxaca-Blinder decomposition method (Firpo, Fortin, and Lemieux, 2007).

The RIF decomposition method involves several steps. First, at any quantile the wage gap is decomposed into the composition and wage structure components. This step can be expressed as:

$$v(Y_m) - v(Y_f) = [v(Y_m) - v(Y_c)] + [v(Y_c) - v(Y_f)], \qquad (1)$$

where $v(Y)$ is a quantile of a wage distribution Y; Y_m and Y_f are male and female wage distributions; and Y_c is the counterfactual distribution of the wages that women would earn if they had the same returns to their characteristics as men do.

Therefore, the first component of the decomposition can be viewed as the composition portion of the gap due to the differences in endowments and the second component as the wage structure effect due to the differences in the returns. The wage structure component includes the effects of the differences unaccounted for due to data unavailability (e.g., job flexibility), unobservable gender differences (such as personality differences, e.g. Nyhus and Pons, 2012), and differences stemming from employer discrimination.

The counterfactual Y_c is derived by reweighing Y_m so that $Y_c = \theta Y_m$, where $\theta_i = \frac{1-p(X_i)}{p(X_i)} \frac{p}{1-p}$ with $p(X_i)$ being the probability of an individual being a male given X_i and p being the proportion of males in the sample.

In the second step, quantiles are linearly approximated using the recentered influence function as $\widehat{RIF}(Y_k; \hat{q}_\tau) = X_k \hat{\beta}_k, k = m, f, c$, where $\widehat{RIF}(Y_k; \hat{q}_\tau)$ represents the RIF estimate of the τth quantile and $\hat{\beta}_k$ is the unconditional marginal effect of X_k on the quantile q_τ. Then, the quantile decomposition can be expressed as:

$$\hat{q}_\tau(Y_m) - \hat{q}_\tau(Y_f) = \left\{\bar{X}_f(\hat{\beta}_c - \hat{\beta}_f) + \hat{R}_{\tau s}\right\} + \left\{(\bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_c) + \hat{R}_{\tau c}\right\}, \qquad (2)$$

where $\hat{R}_{\tau s}$ and $\hat{R}_{\tau c}$ are the approximation error of the structure and composition effects.

Given the high degree of industrial and occupational segregation in Georgia, especially among women (Table 1), we consider the possibility that if the female and male supports do not overlap, the model may be misspecified. To address this possibility we use the approach developed by Ñopo (2008), which utilizes statistical matching to separate men and women into groups that shares a common support and groups (one for each gender) that include individuals whose characteristics do not match those of the opposite gender. The total gap can then be decomposed into the composition (endowment, Δ_x) and wage structure (returns, Δ_o) components analogous to the Oaxaca-Blinder counterparts but defined only over the common support, and the components, which are attributed to the differences in the characteristics between individuals who were matched and those who were not. In particular, Δ_m corresponds to the contribution of the differences in the characteristics of males who were matched to female characteristics (and hence share the support with them) and those who were not matched with female characteristics (and hence are not in the common support). Similarly, Δ_f corresponds to the contribution of the differences in the characteristics of females who were matched to male characteristics and those who were not matched with male characteristics. Hence the total gap Δ is $\Delta_x + \Delta_m + \Delta_f + \Delta_o$.

4. RESULTS

FFL: 2004 – 2011 gender wage gap decomposition

The conditional mean findings for 2004 – 2011 indeed confirm the presence of a substantial gender wage gap in Georgia. The log point differential at the mean is 0.59, which corresponds to the relative wage gap of 45% (i.e., women earn 45% less than man). About 42% of this gap (0.24 log points) can be attributed to the explanatory variables (Table 3). Women's higher level of educational attainment and concentration in high-skilled white collar occupations, in particular, work in their favor and reduce the gender wage gap. On the other hand, women's wages are pulled down by their shorter working hours, and concentration in the state sector[3] and in lower-

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[3] Public administration and defense, education, and culture and sports are predominantly state financed.

paying industries (Table 1). In particular, men's greater concentration in the construction, transport and public administration contributed the most to the gender wage gap.

The components of the unexplained portion of the gap due to the differences in the wage structure also illuminate some of the forces underlying the gap. In particular, we find that the differences in the returns to marriage contribute prominently to the gap. At the mean, it is men's positive returns to marriage that are driving this result (women's returns are negative but insignificant), potentially revealing the differences in the choices married men and women make with respect to their work and/or in the way employers perceive married workers based on their gender. Moreover, the return from living in urban areas is lower for women than it is for men. Similarly, being an ethnic Georgian results in a much lower premium for women than for men, indicating that nationality-based inequality is lower for women than for men. Moreover, wage premia in the trade, education and health sectors are particularly low for women compared to men, contributing the most to the unexplained portion of the gender wage gap. It is particularly noteworthy that education and health sectors appear to exhibit the greatest differences in the returns, given that these are the sectors employing predominantly women. On the other hand, whereas the returns to vocational education are higher for men, the returns to higher education are higher for women, reducing what could be an even larger unexplained portion of the gender wage gap. Finally, the returns to low-skill white-collar occupations (e.g., teacher assistants, administrative assistants) are higher for women than they are for men, and also exert downward pressure on the gender wage gap. Whether the sources of the gender differences in the returns stem from household decisions, firm choices or both, is a question that merits additional attention. For example, the negative female marriage premium may be a result of the greater flexibility in work hours that women choose but we do not account for. However, it can also be a result of employers penalizing married women if marriage is viewed as affecting the productivity of women due to their primary role as household caretakers. In sum, at the mean, the returns to most characteristics, except for education and skills, appear to benefit men more than women.

The gender wage gap remains substantial all along the wage distribution during 2004 - 2011, but we can discern a declining pattern as we move to the top of the distribution (Table 3). This implies that either women's endowments improve relative to men's, women's returns to endowments improve relative to men's, or both.

Table 3 FFL decomposition of the gender wage gap, 2004 – 2011, at the mean and selected quantiles.

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Vocational [1]	-0.0008	-0.001	-0.000	0.000	-0.002	-0.001	0.0216**	0.033	0.024	0.018	0.022*	0.012
	(0.0010)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.0092)	(0.022)	(0.015)	(0.013)	(0.012)	(0.012)
Higher education	-0.0234***	-0.014**	-0.019***	-0.024***	-0.025***	-0.027***	-0.0683***	-0.111**	-0.121***	-0.044	-0.061*	-0.089**
	(0.0033)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)	(0.0224)	(0.049)	(0.036)	(0.031)	(0.032)	(0.035)
Age	-0.0272**	-0.052**	-0.035**	-0.014	-0.019	-0.043**	0.2638	1.947	0.286	-0.781	0.282	0.768
	(0.0120)	(0.026)	(0.017)	(0.015)	(0.017)	(0.019)	(0.5890)	(1.255)	(0.893)	(0.742)	(0.818)	(1.178)
Agesq	0.0289**	0.058**	0.038**	0.016	0.020	0.041**	-0.1801	-1.327**	-0.249	0.394	-0.097	-0.277
	(0.0115)	(0.025)	(0.017)	(0.014)	(0.016)	(0.018)	(0.3106)	(0.668)	(0.474)	(0.392)	(0.430)	(0.611)
Marriage	0.0197***	0.013	0.018***	0.024***	0.019***	0.015**	0.0889***	0.046	0.072**	0.121***	0.099***	0.082**
	(0.0039)	(0.008)	(0.006)	(0.005)	(0.005)	(0.006)	(0.0194)	(0.040)	(0.029)	(0.025)	(0.027)	(0.036)
High-skill blue collar [2]	0.0109***	0.011	0.020***	0.010**	0.005	0.004	0.0025	-0.002	0.004	0.002	0.002	-0.002
	(0.0031)	(0.007)	(0.005)	(0.004)	(0.004)	(0.003)	(0.0022)	(0.005)	(0.004)	(0.003)	(0.002)	(0.003)
Low-skill white collar	0.0027	-0.015***	-0.006*	0.006*	0.013***	0.011***	-0.0309***	-0.001	-0.026	-0.046***	-0.056***	-0.027*
	(0.0021)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)	(0.0098)	(0.024)	(0.017)	(0.014)	(0.013)	(0.015)
High-skill white collar	-0.0653***	-0.053***	-0.053***	-0.060***	-0.072***	-0.083***	-0.0312	-0.046	-0.031	-0.039	-0.046	-0.093*
	(0.0067)	(0.013)	(0.009)	(0.008)	(0.009)	(0.011)	(0.0294)	(0.074)	(0.048)	(0.038)	(0.040)	(0.049)
Mining [3]	0.0114***	0.022***	0.014***	0.011***	0.006***	0.001	0.0012***	0.003***	0.001**	0.001	0.000	0.000

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	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.0015)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.0004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Manufacturing	0.0175***	0.049***	0.024***	0.015***	0.002	-0.008***	0.0120**	0.036***	0.001	0.005	0.003	0.009
	(0.0031)	(0.009)	(0.005)	(0.003)	(0.002)	(0.003)	(0.0048)	(0.012)	(0.008)	(0.007)	(0.005)	(0.005)
Utilities	0.0159***	0.037***	0.020***	0.013***	0.004**	0.002	-0.0016	0.006**	-0.001	-0.003*	-0.006***	-0.005*
	(0.0023)	(0.006)	(0.003)	(0.002)	(0.002)	(0.003)	(0.0012)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Construction	0.0498***	0.102***	0.058***	0.049***	0.024***	0.010**	0.0005	0.004***	0.002**	0.001	-0.001	-0.005*
	(0.0046)	(0.012)	(0.007)	(0.005)	(0.004)	(0.004)	(0.0008)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Trade	-0.0030	-0.008	-0.004	-0.003	-0.001	0.000	0.0394***	0.081***	0.031**	0.033***	0.020**	0.021*
	(0.0020)	(0.005)	(0.002)	(0.002)	(0.001)	(0.000)	(0.0093)	(0.023)	(0.016)	(0.013)	(0.009)	(0.012)
Hotels and restaurants	-0.0055***	-0.011**	-0.007***	-0.005***	-0.002	0.001	0.0055	0.009	0.002	0.005	0.002	0.002
	(0.0018)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.0034)	(0.008)	(0.005)	(0.004)	(0.004)	(0.005)
Transport	0.0409***	0.087***	0.053***	0.041***	0.013***	0.004	0.0080**	0.032***	0.015***	0.008**	-0.004	-0.016***
	(0.0044)	(0.011)	(0.006)	(0.004)	(0.003)	(0.004)	(0.0033)	(0.007)	(0.005)	(0.004)	(0.003)	(0.006)
Finance	-0.0021	-0.002	-0.002	-0.002	-0.002	-0.001	0.0055	0.020***	0.013***	0.007*	-0.004	-0.022***
	(0.0022)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.0034)	(0.006)	(0.004)	(0.004)	(0.004)	(0.007)
Real estate	0.0042***	0.015***	0.007***	0.003**	-0.001	-0.003**	0.0127***	0.035***	0.021***	0.011***	-0.001	-0.002
	(0.0013)	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)	(0.0034)	(0.008)	(0.005)	(0.004)	(0.004)	(0.005)
Public administration and defense	0.0662***	0.104***	0.062***	0.061***	0.067***	0.037***	0.0198***	0.079***	0.032***	0.018**	0.005	-0.043***

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.0064)	(0.015)	(0.008)	(0.006)	(0.007)	(0.006)	(0.0068)	(0.017)	(0.011)	(0.009)	(0.008)	(0.011)
Education	0.0165	-0.064	0.026	0.045***	0.056***	0.075***	0.0463*	0.083	-0.015	0.006	0.025	0.068**
	(0.0145)	(0.046)	(0.023)	(0.015)	(0.016)	(0.015)	(0.0272)	(0.076)	(0.047)	(0.036)	(0.029)	(0.033)
Health and social work	-0.0098	-0.037*	-0.019	-0.002	0.006	0.016	0.0479***	0.106***	0.050**	0.028*	0.013	0.019
	(0.0079)	(0.022)	(0.012)	(0.008)	(0.009)	(0.010)	(0.0133)	(0.035)	(0.022)	(0.016)	(0.014)	(0.017)
Culture	-0.0020*	-0.007*	-0.003*	-0.002	0.000	0.001	0.0118**	0.046***	0.018**	0.007	-0.009	-0.013*
	(0.0011)	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)	(0.0053)	(0.013)	(0.008)	(0.007)	(0.006)	(0.007)
Private households	-0.0038*	-0.012	-0.009***	-0.004	0.005***	0.004***	0.0038	0.013	0.008	0.000	-0.008**	0.005*
	(0.0023)	(0.007)	(0.004)	(0.004)	(0.002)	(0.002)	(0.0031)	(0.009)	(0.005)	(0.005)	(0.003)	(0.003)
International org.	0.0014	0.002	0.001	0.002	0.001	0.001	0.0003	0.003**	0.002**	0.002**	0.000	-0.003
	(0.0011)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0008)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
State	0.0299***	0.037***	0.027***	0.022***	0.023***	0.030***	-0.0172	-0.037	-0.004	-0.000	0.024	0.028
	(0.0042)	(0.009)	(0.006)	(0.005)	(0.005)	(0.006)	(0.0203)	(0.043)	(0.029)	(0.025)	(0.028)	(0.038)
Urban	-0.0061***	-0.012***	-0.009***	-0.005***	-0.004**	-0.003*	0.0532***	0.114**	0.062*	0.078***	0.056**	0.011
	(0.0014)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.0204)	(0.051)	(0.034)	(0.027)	(0.025)	(0.031)
Tbilisi	-0.0082***	-0.007***	-0.009***	-0.010***	-0.008***	-0.006***	-0.0005	0.025	0.040**	0.014	-0.025	-0.078***
	(0.0024)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.0133)	(0.027)	(0.020)	(0.017)	(0.019)	(0.026)
Georgian	0.0000	-0.000	0.000	0.000	0.000	0.000	0.1202***	0.045	0.219***	0.200***	0.119**	0.019
	(0.0002)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.0381)	(0.085)	(0.060)	(0.051)	(0.050)	(0.058)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
21 – 40 hours[4]	-0.0603***	-0.143***	-0.085***	-0.043***	-0.020***	-0.012**	0.0567**	0.230***	0.133***	0.055**	-0.039*	-0.078***
	(0.0065)	(0.020)	(0.010)	(0.006)	(0.005)	(0.005)	(0.0234)	(0.073)	(0.038)	(0.024)	(0.021)	(0.022)
40 + hours	0.1178***	0.240***	0.157***	0.096***	0.060***	0.038***	0.0141	0.154***	0.065***	0.015	-0.043***	-0.101***
	(0.0091)	(0.027)	(0.014)	(0.008)	(0.007)	(0.007)	(0.0158)	(0.047)	(0.025)	(0.017)	(0.016)	(0.019)
Seasonal hours	0.0187***	0.040***	0.024***	0.015***	0.007***	0.005**	0.0049***	0.012***	0.007***	0.006***	0.001	-0.002
	(0.0023)	(0.007)	(0.004)	(0.002)	(0.002)	(0.002)	(0.0014)	(0.004)	(0.002)	(0.002)	(0.001)	(0.002)
Quarters	0.0094**	0.013***	0.013***	0.009**	0.008**	0.005*	-0.0306	0.106	0.026	-0.160***	0.067	-0.119**
	(0.0038)	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.0423)	(0.112)	(0.073)	(0.055)	(0.050)	(0.060)
Total	0.2443***	0.392***	0.304***	0.265***	0.185***	0.116***	0.3483***	0.251***	0.319***	0.335***	0.405***	0.420***
	(0.0162)	(0.043)	(0.025)	(0.018)	(0.018)	(0.019)	(0.0188)	(0.054)	(0.031)	(0.022)	(0.023)	(0.028)
Predicted male wages	5.2823***	4.270***	4.800***	5.302***	5.825***	6.243***						
	(0.0110)	(0.020)	(0.014)	(0.013)	(0.014)	(0.016)						
Predicted female wages	4.6897***	3.628***	4.178***	4.702***	5.235***	5.708***						
	(0.0124)	(0.021)	(0.017)	(0.014)	(0.015)	(0.023)						
Difference	0.5926***	0.642***	0.622***	0.600***	0.590***	0.535***						
	(0.0154)	(0.028)	(0.021)	(0.018)	(0.020)	(0.026)						
Constant							-0.1318	-1.492**	-0.369	0.371	0.064	0.350
							(0.2923)	(0.636)	(0.448)	(0.368)	(0.400)	(0.581)

Notes: robust standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1; [1] secondary education or below is the reference group; [2] low-skill blue-collar occupations is the reference group; [3] agriculture is the reference group; [4] 20 hours or less is the reference group.

Indeed, we observe an improvement in endowments in the sense that the gender differences in endowments which are advantageous for women widen whereas the differences which are disadvantageous contract. In particular, the differences in the educational and skill levels (which benefit women's wages and contract the gap) are more pronounced at the top of the distribution. At the same time, the differences in the working hours (which contribute to the expansion of the gap) diminish as we move to the top of the distribution. Moreover, the differences in the industrial composition (that result in lower women's wages) become weaker as we move to the top of the distribution, an improvement expressed in terms of a smaller degree of industrial segregation at the top. Employment proportions in the construction, transport and public administration sectors are the primary drivers behind these changes and their contractionary effect outweighs the widening of the gap along the distribution due to the shifts in the education sector.

In addition to the improvements in endowments, we also observe changes in the returns to endowments which are beneficial to women at the top of the distribution, hence contracting the gap at the top. For example, women's returns to higher education are higher than men's throughout the wage distribution, and, while they drop in the middle of the distribution, they again increase at the 90th percentile. In addition, the returns to white-collar occupations are higher for women than for men at the top of the distribution. At the same time, in finance and public administration, although they start out below men's, women's returns rise relative to men's as we move to the right of the distribution so much so that they surpass men's returns at the 90th percentile. Similarly, women's returns from working more than 20 hours become closer to men's as we move to the top of the distribution, overcoming them by 75th percentile. These changes counteract the large difference between men and women's premia in the education sector at the 90th percentile. The latter result indicates that the gender differences in the education sector premia that we identified at the mean were driven by men's higher premium at the top of the wage distribution.

Hence, improvements in both endowments and in the returns jointly reduce the magnitude of the gender wage gap along the wage distribution. However, the improvements in the returns dominate the improvements in the endowments as the explained portion of the gender wage gap diminishes from 61% at the 10th percentile down to 22% at the 90th percentile. The

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reduction in the explained portion of the gap could in principle be attributed to employer's discrimination practices becoming stronger as we move to the top of the distribution. Indeed, given a large unexplained portion of the gap throughout the distribution, gender-based discrimination might in fact be prevalent along the entire distribution. However, the concurrent drop in the magnitude of the gender wage gap along the distribution reveals that the unexplained factors that contribute to the increase in the proportion of the unexplained gap are the factors that contract rather than expand the observed gap (as discrimination practices would). One possibility is that women at the top of the distribution are in a stronger position to negotiate better remuneration and are more competitive with men, a possibility that echoes the findings from other studies (Chi and Li, 2008).

FFL: Trends over time

Our goal in this section is to evaluate the forces behind the different dynamics that drove the decline in the gender wage gap during 2004 – 2007 and 2009 – 2011. We do so by analyzing the wage dynamics for men and women during each of the two periods.

During 2004 – 2007, women's real wages increased by 0.45 log points at the mean. However, the increases in real wages were the greatest at the 90th percentile and the lowest at the 10th percentile, revealing a widening wage inequality among women during this period (for the sake of convenience, we report the selected results in Table 8; detailed results are reported in Tables 4 - 7). On the other hand, during 2009 – 2011, real wages for women at the mean were stagnant, masking differences along the wage distribution. In particular, at the 10th percentile, the real wages grew at 0.12 log points whereas at the 75th percentile they shrank at 0.15 log points. Hence, during 2009 – 2011, women experienced a contraction in wage inequality (Table 8).

For men, between 2004 and 2007, real wages also increased although slightly slower than women's wages (Table 8). However, the distribution of the growth was the opposite of women's in that men's wages grew the fastest at the bottom and the slowest at the top of the distribution, resulting in a contractionary (as opposed to expansionary as is the case for women) effect on their wage inequality. On the other hand, during 2009 – 2011, men's wages declined all along the wage distribution and had left their wage distribution practically unchanged (Table 8).

Table 8 Changes in the wages of men and women, across the wage distribution.

Log point difference	Mean	10th	25th	50th	75th	90th
Women, 2004 - 2007	-0.452***	-0.347***	-0.496***	-0.536***	-0.455***	-0.537***
	(0.042)	(0.061)	(0.052)	(0.047)	(0.056)	(0.074)
Women, 2009 - 2011	0.006	-0.120***	-0.042	0.051	0.154***	0.036
	(0.034)	(0.045)	(0.042)	(0.039)	(0.032)	(0.076)
Men, 2004 - 2007	-0.445***	-0.637***	-0.426***	-0.505***	-0.420***	-0.408***
	(0.038)	(0.061)	(0.046)	(0.049)	(0.047)	(0.063)
Men, 2009 - 2011	0.097***	0.106	0.127***	0.008	0.129***	0.125***
	(0.032)	(0.076)	(0.038)	(0.040)	(0.040)	(0.040)

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Hence, in terms of the mechanics of the gender wage gap contraction, during 2004 – 2007, the reduction in the gap at the mean was driven by the drop in the gap at the top of the distribution due to the faster growth in female wages compared to male wages at the 90th percentile. This effect outweighed the increase in the gender wage gap at the bottom of the distribution that resulted from a substantially slower growth in female wages compared to male wages at the 10th percentile. On the other hand, during 2009 – 2011, the gap contraction was driven by the decline in men's real wages throughout the distribution, compounded by the increase in women's wages at the 10th percentile. It is also noteworthy that the reduction in women's wages at the 75th percentile was very close to the reduction in men's wages at the 75th percentile, resulting in little change in the gender wage gap at that point of the distribution.

2004 – 2007

Between 2004 and 2007, for both men and women the explained portion of the change in the wages is minimal. For women, between 2004 and 2007 the only pronounced endowment effect was due to the decrease in the proportion of women working 21 – 40 hours and an increase in the proportion of women working 40 hours or more although these two factors outweighed each other. It is the changes in the returns (or the unexplained component) that played the most important role. The main driver of the rise in female wages appears to be the increase in the returns to the state sector, benefitting women at the top of the distribution the most. Furthermore, women's returns to education grew the fastest at the 75th percentile, as did the premia in transportation and in public administration. In addition, women's marriage penalty appears to have contracted between 2004 and 2007. These forces were strong enough to pull female wages

up despite the decrease in the premium in the education sector in the middle of the distribution and the decrease in the returns from being an ethnic Georgian. Hence, the expansion in the female wage inequality that took place between 2004 and 2007 was largely driven by the rising returns to education, as well as rising wages in the state sector and particularly so in the public administration and defense (Table 4).

Table 4 FLL Decomposition between 2004 and 2007, for women.

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Vocational [1]	-0.001	0.001	-0.001	-0.003	-0.001	-0.002	-0.002	0.019	0.032	-0.019	-0.016	-0.005
	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.023)	(0.049)	(0.036)	(0.030)	(0.034)	(0.046)
Higher education	-0.014	-0.016	-0.016	-0.014	-0.008	-0.009	-0.072	-0.071	-0.015	0.019	-0.207**	-0.180
	(0.009)	(0.011)	(0.011)	(0.010)	(0.007)	(0.008)	(0.067)	(0.130)	(0.096)	(0.081)	(0.095)	(0.140)
Age	-0.000	-0.001	-0.001	-0.000	-0.000	0.001	0.929	3.771	1.872	0.642	2.450	-3.521
	(0.005)	(0.014)	(0.024)	(0.010)	(0.005)	(0.012)	(1.632)	(2.871)	(2.355)	(1.963)	(2.338)	(3.391)
Agesq	0.001	0.002	0.005	0.002	0.001	-0.002	-0.456	-1.989	-0.988	-0.252	-1.103	1.708
	(0.004)	(0.012)	(0.023)	(0.009)	(0.005)	(0.012)	(0.863)	(1.519)	(1.251)	(1.033)	(1.227)	(1.772)
Marriage	-0.004	-0.001	-0.002	-0.003	-0.007	-0.004	-0.085**	-0.099	-0.055	-0.078	-0.175***	-0.122
	(0.003)	(0.002)	(0.002)	(0.004)	(0.006)	(0.004)	(0.042)	(0.074)	(0.060)	(0.052)	(0.058)	(0.081)
High-skill blue collar [2]	0.001	0.003	0.002	0.000	0.001	0.001	0.006	-0.002	0.002	0.002	0.006	0.007
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)	(0.005)	(0.013)	(0.010)	(0.008)	(0.009)	(0.010)
Low-skill white collar	0.000	0.000	0.000	0.000	0.000	0.000	-0.013	-0.021	-0.069	-0.001	0.016	-0.004
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.001)	(0.027)	(0.068)	(0.043)	(0.033)	(0.038)	(0.053)
High-skill white collar	-0.001	-0.000	-0.001	-0.001	-0.001	-0.001	-0.116	-0.212	-0.293*	-0.090	0.003	-0.085
	(0.006)	(0.003)	(0.005)	(0.004)	(0.009)	(0.009)	(0.091)	(0.266)	(0.153)	(0.105)	(0.116)	(0.144)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Mining[3]	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.001	-0.001	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Manufacturing	-0.002	-0.001	-0.000	0.001	-0.005	-0.003	0.003	0.004	0.012	0.015	-0.020	-0.009
	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.005)	(0.010)	(0.019)	(0.015)	(0.014)	(0.016)	(0.016)
Utilities	0.002	0.000	0.001	0.002	0.002	0.002	0.008**	0.001	0.004	0.005	0.008	0.014*
	(0.003)	(0.001)	(0.002)	(0.003)	(0.003)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.005)	(0.008)
Construction	-0.013**	-0.001	-0.002	-0.007	-0.012	-0.023	0.011	-0.006	0.007	0.007	0.008	0.021
	(0.006)	(0.004)	(0.004)	(0.005)	(0.008)	(0.016)	(0.008)	(0.008)	(0.009)	(0.007)	(0.009)	(0.019)
Trade	0.003	0.001	0.001	0.002	0.006	0.004	0.031	-0.023	0.048	0.049	0.022	0.003
	(0.005)	(0.005)	(0.005)	(0.006)	(0.009)	(0.008)	(0.030)	(0.056)	(0.045)	(0.041)	(0.047)	(0.053)
Hotels and restaurants	0.000	0.000	0.000	0.000	-0.000	0.000	-0.002	-0.010	0.001	0.001	-0.020	-0.007
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.007)	(0.011)	(0.009)	(0.009)	(0.013)	(0.016)
Transport	-0.002	-0.003	0.001	-0.002	-0.003	-0.007	-0.012	-0.007	-0.002	-0.008	-0.022**	-0.030
	(0.003)	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.008)	(0.009)	(0.008)	(0.007)	(0.011)	(0.018)
Finance	-0.003	0.000	0.001	-0.002	-0.003	-0.009	-0.006	0.004	0.004	0.005	-0.015	-0.032
	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)	(0.011)	(0.010)	(0.014)	(0.011)	(0.010)	(0.013)	(0.024)
Real estate	0.000	0.000	0.000	0.000	0.000	-0.000	0.010	-0.001	0.021	0.010	-0.009	0.019
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.012)	(0.020)	(0.018)	(0.014)	(0.016)	(0.021)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Public administration and defense	-0.003	-0.001	-0.005	0.001	-0.002	-0.002	-0.016	0.003	-0.001	-0.005	-0.049**	-0.045
	(0.005)	(0.007)	(0.007)	(0.007)	(0.009)	(0.008)	(0.014)	(0.026)	(0.021)	(0.019)	(0.024)	(0.030)
Education	-0.006	-0.007	-0.002	-0.002	-0.011	-0.006	0.129*	0.037	0.171*	0.184**	0.097	0.160
	(0.007)	(0.008)	(0.006)	(0.006)	(0.012)	(0.008)	(0.067)	(0.131)	(0.102)	(0.091)	(0.101)	(0.103)
Health and social work	0.021*	0.026*	0.021	0.015	0.022	0.015	0.013	0.005	0.022	0.040	-0.043	0.001
	(0.012)	(0.015)	(0.013)	(0.012)	(0.016)	(0.013)	(0.038)	(0.076)	(0.057)	(0.051)	(0.057)	(0.060)
Culture	-0.001	-0.002	-0.003	-0.002	-0.001	0.000	0.006	-0.008	-0.000	0.007	-0.002	0.008
	(0.003)	(0.005)	(0.006)	(0.003)	(0.002)	(0.002)	(0.011)	(0.021)	(0.017)	(0.015)	(0.017)	(0.018)
Private households	-0.000	-0.000	0.001	-0.001	-0.000	-0.001	0.007	0.000	0.007	0.009	-0.004	0.012
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.006)	(0.010)	(0.009)	(0.008)	(0.010)	(0.009)
International org.	0.000	0.000	0.000	0.000	-0.000	0.000	0.001	0.005	0.003	0.001	-0.000	-0.003
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)	(0.004)
State	0.011	0.003	0.010	0.014	0.016	0.017	-0.214***	-0.089	-0.166**	-0.251***	-0.312***	-0.301**
	(0.013)	(0.005)	(0.011)	(0.015)	(0.017)	(0.018)	(0.066)	(0.113)	(0.081)	(0.069)	(0.085)	(0.128)
Urban	-0.001	0.004	-0.001	-0.004	0.002	0.004	0.005	-0.071	0.019	0.086	-0.086	-0.089
	(0.002)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.057)	(0.114)	(0.090)	(0.076)	(0.076)	(0.089)
Tbilisi	-0.010	-0.009	-0.003	-0.001	-0.019	-0.018	0.011	0.091	-0.069	-0.091*	0.096*	0.015

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.006)	(0.007)	(0.004)	(0.004)	(0.012)	(0.011)	(0.040)	(0.070)	(0.058)	(0.051)	(0.057)	(0.078)
Georgian	-0.001	0.000	0.001	-0.000	-0.002	-0.003	0.248***	0.221	0.213*	0.075	0.183	0.333*
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.005)	(0.087)	(0.157)	(0.127)	(0.117)	(0.130)	(0.170)
21 – 40 hours[4]	0.068***	0.117***	0.091***	0.058***	0.031**	0.025*	-0.012	-0.090	0.060	-0.002	-0.032	-0.014
	(0.017)	(0.030)	(0.025)	(0.021)	(0.014)	(0.014)	(0.045)	(0.105)	(0.070)	(0.054)	(0.045)	(0.047)
40 + hours	-0.101***	-0.113***	-0.103***	-0.094***	-0.090***	-0.058***	0.020	-0.102	0.006	0.038	0.042	0.028
	(0.020)	(0.028)	(0.024)	(0.023)	(0.020)	(0.020)	(0.045)	(0.093)	(0.063)	(0.053)	(0.052)	(0.063)
Seasonal hours	-0.001	-0.001	-0.002	-0.002	-0.001	0.000	0.000	-0.006	-0.000	0.002	0.001	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.004)	(0.007)	(0.006)	(0.005)	(0.005)	(0.004)
Quarters	0.033	0.032	0.078***	0.100***	0.079**	-0.007	0.031	-0.016	0.041	0.048*	-0.013	-0.031
	(0.021)	(0.027)	(0.027)	(0.030)	(0.033)	(0.038)	(0.023)	(0.055)	(0.040)	(0.028)	(0.035)	(0.050)
Total	-0.022	0.033	0.072*	0.057	-0.010	-0.086	-0.430***	-0.381***	-0.567***	-0.593***	-0.445***	-0.451***
	(0.034)	(0.036)	(0.037)	(0.042)	(0.049)	(0.055)	(0.041)	(0.065)	(0.056)	(0.052)	(0.061)	(0.083)
Predicted 2004 wages	4.260***	3.426***	3.762***	4.215***	4.731***	5.170***						
	(0.026)	(0.031)	(0.031)	(0.033)	(0.035)	(0.041)						
Predicted 2007 wages	4.713***	3.773***	4.258***	4.751***	5.185***	5.707***						
	(0.033)	(0.052)	(0.042)	(0.033)	(0.043)	(0.062)						
Difference	-0.452***	-0.347***	-0.496***	-0.536***	-0.455***	-0.537***						

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.042)	(0.061)	(0.052)	(0.047)	(0.056)	(0.074)						
Constant							-0.893	-1.718	-1.451	-1.042	-1.248	1.699
							(0.797)	(1.429)	(1.159)	(0.986)	(1.159)	(1.642)

Notes: robust standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1; [1] secondary education or below is the reference group; [2] low-skill blue-collar occupations is the reference group; [3] agriculture is the reference group; [4] 20 hours or less is the reference group.

For men, the endowment effect between 2004 and 2007 also primarily manifested itself in the rise in the working hours, especially at the bottom of the distribution (Table 6). In addition, the increase in the proportion of men in construction pulled up men's wages throughout the distribution, although the increase at the bottom was once again more pronounced. Increase in the proportion of males living in Tbilisi between 2004 and 2007 pulled up men's wages all along the wage distribution.

Nevertheless, similar to women, it is the changes in the returns that played an even bigger role in explaining the increase in men's wages during this period. Some of the forces that lifted men's wages were shared with women, in particular the rise in the state sector premium and in the premium to working in public administration. In fact, the returns to the state sector increased throughout the distribution, although, in men's case, these forces were particularly strong at the bottom of men's wage distribution (potentially because male state sector employees are more likely to be located closer to the middle of the male wage distribution, rather than the top, as is the case among women). Men's premium in the public administration sector also increased especially in the middle of the wage distribution. Other forces were unique to men. In particular, the rise in the returns to working more hours was pronounced only for men at the bottom of the distribution. Together, these forces lifted the wages of men earning below the median.

At the top of the distribution, similar to women, the increase in the returns to high-skill white-collar occupations (relative to low-skill blue-collar occupations) was particularly pronounced. However, this increase was dampened by the drop in the returns to vocational and higher education at the 90th percentile, which contrasts with the rise in the returns to higher education among women. Finally, the reduction in the premium for working in the education sector pushed men's wages down throughout the wage distribution, partially explaining why men's wages didn't grow as fast as women's wages along the distribution.

In sum, the forces that contributed to rising wages but contracting inequality in men's wage distribution between 2004 and 2007 were the increase in men's working hours and the increase in the proportion of men working in the construction sector, combined with the rise in the returns to the state sector. These three factors pulled up the male wages at the bottom of their wage distribution. The increases in the premium to working in public administration and in the returns to high-skill white-collar occupations at the top of the distribution, which would have

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substantially increased wages in that part of the distribution, were partially negated by the drop in the returns to vocational and higher education at the 90th percentile. It is noteworthy that men's wages did not rise as much as women's wages as a result of a more complex combination of changes than was experienced by women.

Table 5 FLL Decomposition between 2009 and 2011, for women.

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Vocational [1]	0.003	0.005	0.002	0.005	0.002	-0.002	-0.024	-0.079*	-0.022	-0.012	-0.007	0.006
	(0.003)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.019)	(0.044)	(0.035)	(0.027)	(0.019)	(0.028)
Higher education	0.012	0.016	0.019	0.011	0.009	0.010	0.004	0.097	0.118	0.005	0.029	-0.079
	(0.008)	(0.012)	(0.014)	(0.008)	(0.007)	(0.007)	(0.047)	(0.099)	(0.082)	(0.067)	(0.051)	(0.090)
Age	-0.001	0.002	-0.004	-0.003	-0.001	0.000	0.352	1.194	2.780	-1.252	0.031	-2.104
	(0.007)	(0.010)	(0.022)	(0.014)	(0.007)	(0.003)	(1.269)	(1.790)	(1.801)	(1.588)	(1.302)	(3.642)
Agesq	0.001	-0.001	0.002	0.001	0.001	-0.000	-0.095	-0.502	-1.304	0.733	0.080	1.056
	(0.007)	(0.011)	(0.020)	(0.012)	(0.007)	(0.002)	(0.665)	(0.951)	(0.958)	(0.838)	(0.679)	(1.880)
Marriage	0.000	0.000	0.000	-0.000	-0.000	0.000	0.023	0.022	0.039	0.020	0.012	0.148
	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.037)	(0.055)	(0.051)	(0.048)	(0.039)	(0.102)
High-skill blue collar[2]	-0.001	-0.002	-0.001	-0.001	-0.000	0.000	0.008	0.005	0.007	0.014**	-0.000	-0.006
	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.005)	(0.010)	(0.008)	(0.007)	(0.005)	(0.008)
Low-skill white collar	-0.005	-0.014	-0.010	-0.001	-0.003	-0.002	0.014	0.002	0.006	-0.003	0.019	0.022
	(0.003)	(0.009)	(0.007)	(0.003)	(0.003)	(0.005)	(0.025)	(0.058)	(0.043)	(0.031)	(0.024)	(0.053)
High-skill	0.021**	0.019*	0.026**	0.019**	0.025**	0.017*	0.005	-0.096	0.043	0.025	0.142**	-0.108

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	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
white collar												
	(0.009)	(0.012)	(0.012)	(0.008)	(0.010)	(0.009)	(0.063)	(0.151)	(0.104)	(0.078)	(0.060)	(0.146)
Mining[3]	-0.001	-0.002	-0.002	-0.001	-0.001	-0.000	0.001	0.002	-0.000	-0.002	0.001	0.002
	(0.002)	(0.004)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Manufacturing	-0.004	-0.014	-0.007	-0.004	-0.003	0.007	-0.001	0.016	-0.019	-0.003	0.020**	0.014
	(0.003)	(0.011)	(0.006)	(0.003)	(0.003)	(0.005)	(0.013)	(0.035)	(0.022)	(0.015)	(0.010)	(0.016)
Utilities	0.002	0.004	0.003	0.002	0.003	-0.001	-0.003	-0.001	-0.002	-0.001	-0.000	-0.014
	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)	(0.001)	(0.002)	(0.004)	(0.003)	(0.003)	(0.002)	(0.010)
Construction	-0.003	-0.002	-0.002	-0.002	-0.005	-0.006	0.003	-0.000	0.002	0.001	0.006	-0.000
	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)	(0.005)	(0.003)	(0.004)	(0.003)	(0.002)	(0.004)	(0.009)
Trade	0.000	0.000	0.000	0.000	0.000	-0.000	0.001	0.041	-0.026	-0.008	0.009	0.015
	(0.003)	(0.011)	(0.003)	(0.001)	(0.001)	(0.004)	(0.021)	(0.059)	(0.037)	(0.024)	(0.016)	(0.034)
Hotels and restaurants	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	0.005	0.001	0.004	0.003	0.004
	(0.002)	(0.006)	(0.003)	(0.002)	(0.001)	(0.001)	(0.006)	(0.015)	(0.011)	(0.008)	(0.005)	(0.009)
Transport	0.004	0.005	0.002	0.005	0.005	0.003	-0.004	-0.005	-0.014	0.005	0.009	-0.020
	(0.005)	(0.006)	(0.003)	(0.005)	(0.005)	(0.004)	(0.007)	(0.014)	(0.010)	(0.009)	(0.007)	(0.022)
Finance	0.007	0.008	0.005	0.006	0.008	0.006	0.002	0.020	0.008	0.006	0.008*	-0.009

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.005)	(0.006)	(0.004)	(0.004)	(0.006)	(0.005)	(0.006)	(0.012)	(0.007)	(0.005)	(0.004)	(0.013)
Real estate	0.001	0.003	0.001	-0.000	0.001	0.002	0.005	0.013	0.003	-0.003	0.007	0.027**
	(0.002)	(0.005)	(0.002)	(0.001)	(0.001)	(0.003)	(0.006)	(0.011)	(0.007)	(0.006)	(0.005)	(0.013)
Public administration and defense	-0.016	-0.012	-0.010	-0.012	-0.017	-0.028	0.016	0.010	0.001	0.005	0.036**	0.025
	(0.012)	(0.010)	(0.008)	(0.009)	(0.013)	(0.021)	(0.016)	(0.039)	(0.025)	(0.018)	(0.014)	(0.036)
Education	0.001	0.008	-0.000	-0.000	-0.007	-0.006	-0.027	-0.052	-0.087	-0.019	-0.052	0.053
	(0.003)	(0.011)	(0.006)	(0.004)	(0.006)	(0.006)	(0.055)	(0.151)	(0.095)	(0.065)	(0.041)	(0.082)
Health and social work	0.000	0.001	-0.001	-0.000	-0.001	-0.001	-0.013	-0.027	-0.059	-0.018	-0.009	0.054
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.003)	(0.023)	(0.062)	(0.040)	(0.027)	(0.017)	(0.039)
Culture	-0.002	-0.005	-0.001	0.000	-0.001	-0.001	0.001	0.007	-0.013	-0.014	0.003	0.028
	(0.002)	(0.007)	(0.002)	(0.001)	(0.001)	(0.002)	(0.013)	(0.034)	(0.023)	(0.016)	(0.011)	(0.024)
Private households	-0.003	-0.011	-0.005	-0.004	-0.002	0.006	0.002	0.018	-0.002	0.002	0.004	0.008
	(0.003)	(0.008)	(0.005)	(0.003)	(0.002)	(0.004)	(0.008)	(0.019)	(0.014)	(0.010)	(0.008)	(0.011)
International org.	-0.003	-0.003	-0.003	-0.003	-0.002	-0.005	0.001	0.003	0.003	0.003	0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
State	-0.006	0.007	0.001	-0.004	-0.010*	-0.018*	-0.042	0.039	-0.045	-0.015	-0.055	-0.040
	(0.004)	(0.007)	(0.005)	(0.004)	(0.005)	(0.009)	(0.043)	(0.067)	(0.059)	(0.052)	(0.044)	(0.104)
Urban	-0.003	-0.005	-0.007	0.000	-0.002	-0.002	0.045	0.101	0.097	0.029	0.047	-0.005
	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)	(0.003)	(0.045)	(0.088)	(0.074)	(0.060)	(0.042)	(0.082)
Tbilisi	-0.004	-0.003	-0.004	-0.004	-0.003	-0.005	-0.027	-0.054	0.007	-0.062*	0.054*	-0.047
	(0.007)	(0.005)	(0.007)	(0.007)	(0.006)	(0.009)	(0.028)	(0.041)	(0.039)	(0.036)	(0.028)	(0.078)
Georgian	-0.000	-0.001	-0.001	-0.000	-0.000	0.000	-0.004	0.015	-0.176	0.103	-0.016	0.009
	(0.001)	(0.002)	(0.004)	(0.000)	(0.001)	(0.001)	(0.084)	(0.140)	(0.127)	(0.116)	(0.091)	(0.143)
21 – 40 hours[4]	-0.006	-0.009	-0.009	-0.005	-0.005	-0.002	-0.009	0.039	0.089	-0.012	0.016	-0.100*
	(0.006)	(0.009)	(0.009)	(0.005)	(0.004)	(0.002)	(0.034)	(0.071)	(0.054)	(0.042)	(0.026)	(0.058)
40 + hours	0.020**	0.024**	0.026**	0.017**	0.017**	0.013**	-0.030	0.009	0.029	-0.024	0.022	-0.097**
	(0.009)	(0.012)	(0.012)	(0.008)	(0.008)	(0.007)	(0.024)	(0.049)	(0.037)	(0.031)	(0.022)	(0.047)
Seasonal hours	-0.002	-0.002	-0.002	-0.001	-0.002	-0.001	0.008*	0.014	0.012*	0.002	0.005	-0.001
	(0.002)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.004)	(0.009)	(0.007)	(0.005)	(0.003)	(0.005)
Quarters	-0.029**	0.028	-0.073***	-0.063***	-0.086***	-0.040	0.034*	0.027	0.096***	0.014	0.015	-0.026
	(0.014)	(0.030)	(0.026)	(0.018)	(0.022)	(0.029)	(0.018)	(0.030)	(0.024)	(0.024)	(0.015)	(0.041)
Total	-0.019	0.043	-0.055	-0.041	-0.079**	-0.055	0.025	-0.163***	0.013	0.092**	0.233***	0.091

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.027)	(0.038)	(0.036)	(0.028)	(0.034)	(0.044)	(0.031)	(0.054)	(0.046)	(0.039)	(0.038)	(0.076)
Predicted 2009 wages	4.982***	4.060***	4.518***	5.038***	5.446***	5.928***						
	(0.020)	(0.032)	(0.029)	(0.021)	(0.024)	(0.035)						
Predicted 2011 wages	4.976***	4.180***	4.560***	4.987***	5.292***	5.892***						
	(0.027)	(0.031)	(0.030)	(0.033)	(0.021)	(0.068)						
Difference	0.006	-0.120***	-0.042	0.051	0.154***	0.036						
	(0.034)	(0.045)	(0.042)	(0.039)	(0.032)	(0.076)						
Constant							-0.220	-1.045	-1.556*	0.570	-0.206	1.276
							(0.633)	(0.966)	(0.885)	(0.778)	(0.640)	(1.791)

Notes: robust standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1; [1] secondary education or below is the reference group; [2] low-skill blue-collar occupations is the reference group; [3] agriculture is the reference group; [4] 20 hours or less is the reference group.

Table 6 FLL Decomposition between 2004 and 2007, for men.

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Vocational [1]	-0.000	-0.003	0.000	-0.002	0.001	0.003	0.010	0.018	0.008	0.004	-0.001	0.042*
	(0.003)	(0.006)	(0.004)	(0.004)	(0.003)	(0.004)	(0.017)	(0.033)	(0.024)	(0.025)	(0.020)	(0.022)
Higher education	-0.005	-0.002	-0.003	-0.006	-0.005	-0.010	0.035	0.048	-0.057	0.010	0.022	0.169**
	(0.006)	(0.004)	(0.004)	(0.006)	(0.005)	(0.010)	(0.046)	(0.081)	(0.062)	(0.068)	(0.060)	(0.073)
Age	-0.003	-0.010	-0.001	-0.002	-0.002	-0.006	-2.507*	-2.601	-1.711	-1.545	-2.949	-4.270*
	(0.009)	(0.027)	(0.006)	(0.007)	(0.007)	(0.019)	(1.418)	(2.730)	(1.906)	(2.021)	(1.865)	(2.525)
Agesq	0.001	0.004	0.000	0.001	0.000	0.003	1.218*	1.269	0.920	0.749	1.380	1.938
	(0.005)	(0.020)	(0.003)	(0.004)	(0.003)	(0.014)	(0.738)	(1.445)	(0.989)	(1.037)	(0.972)	(1.310)
Marriage	0.003	0.004	0.002	0.004	0.005	0.003	-0.057	-0.152	-0.081	0.000	0.066	-0.088
	(0.003)	(0.005)	(0.003)	(0.004)	(0.004)	(0.005)	(0.063)	(0.125)	(0.083)	(0.091)	(0.079)	(0.111)
High-skill blue collar [2]	-0.001	-0.005	-0.001	-0.001	0.002	0.001	-0.025	-0.003	-0.045*	-0.031	-0.043*	-0.009
	(0.002)	(0.005)	(0.002)	(0.002)	(0.003)	(0.002)	(0.018)	(0.035)	(0.026)	(0.028)	(0.024)	(0.026)
Low-skill white collar	0.000	0.002	-0.001	0.000	-0.000	-0.000	0.003	-0.025	-0.021	0.031	0.013	0.003
	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.013)	(0.026)	(0.020)	(0.020)	(0.017)	(0.019)
High-skill white collar	0.005	0.004	0.003	0.006	0.004	0.005	-0.102**	-0.096	-0.065	-0.068	-0.177***	-0.194***
	(0.006)	(0.005)	(0.004)	(0.007)	(0.005)	(0.006)	(0.040)	(0.074)	(0.049)	(0.056)	(0.054)	(0.070)

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	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Mining[3]	-0.002	-0.002	-0.001	-0.002	-0.001	-0.002	0.004	0.006	0.001	0.003	0.001	-0.001
	(0.005)	(0.006)	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.009)
Manufacturing	-0.003	-0.008	-0.003	-0.003	-0.001	-0.001	0.015	0.096*	0.020	0.002	-0.003	0.007
	(0.006)	(0.017)	(0.006)	(0.007)	(0.002)	(0.002)	(0.020)	(0.052)	(0.032)	(0.026)	(0.021)	(0.024)
Utilities	0.012**	0.030**	0.011*	0.011*	0.003	0.005	0.006	0.031**	0.008	0.007	-0.001	-0.006
	(0.006)	(0.015)	(0.006)	(0.006)	(0.004)	(0.005)	(0.006)	(0.014)	(0.009)	(0.008)	(0.007)	(0.011)
Construction	-0.049***	-0.086***	-0.040***	-0.055***	-0.038***	-0.027**	0.030	0.093*	0.014	0.025	0.031	0.005
	(0.014)	(0.028)	(0.014)	(0.016)	(0.012)	(0.013)	(0.022)	(0.049)	(0.030)	(0.027)	(0.025)	(0.030)
Trade	0.003	0.010	0.005	0.004	0.001	-0.000	0.016	0.088**	0.037	0.008	-0.004	-0.012
	(0.005)	(0.015)	(0.007)	(0.006)	(0.002)	(0.001)	(0.016)	(0.040)	(0.024)	(0.021)	(0.018)	(0.021)
Hotels and restaurants	0.001	0.001	0.001	0.001	0.000	0.000	0.004	0.008	0.005	0.001	0.004	0.003
	(0.003)	(0.005)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)	(0.006)
Transport	-0.002	-0.004	-0.002	-0.003	-0.001	-0.001	0.026	0.054	0.026	0.030	0.015	0.009
	(0.008)	(0.015)	(0.008)	(0.010)	(0.005)	(0.002)	(0.016)	(0.039)	(0.023)	(0.019)	(0.017)	(0.016)
Finance	-0.004	-0.006	-0.001	-0.004	-0.004	-0.009	0.003	0.017	0.000	0.007	0.007	0.020
	(0.005)	(0.007)	(0.002)	(0.006)	(0.006)	(0.011)	(0.009)	(0.013)	(0.008)	(0.007)	(0.009)	(0.017)
Real estate	-0.003	-0.012	-0.003	-0.003	-0.000	0.000	0.006	0.045**	-0.000	-0.004	-0.001	0.004
	(0.004)	(0.014)	(0.004)	(0.003)	(0.002)	(0.002)	(0.010)	(0.022)	(0.014)	(0.013)	(0.013)	(0.016)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Public administration and defense	0.013*	0.041*	0.013	0.003	0.004	0.009	-0.033	0.072	-0.008	-0.077***	-0.080***	-0.021
	(0.008)	(0.023)	(0.009)	(0.006)	(0.004)	(0.006)	(0.023)	(0.058)	(0.034)	(0.029)	(0.027)	(0.031)
Education	0.001	0.012	-0.002	-0.001	-0.000	-0.000	0.023**	0.056*	0.027*	0.018	0.013	0.024**
	(0.002)	(0.012)	(0.003)	(0.002)	(0.002)	(0.002)	(0.010)	(0.029)	(0.016)	(0.012)	(0.011)	(0.012)
Health and social work	0.000	0.001	-0.000	-0.000	-0.000	0.000	0.010	0.021	0.008	0.003	0.006	0.015
	(0.001)	(0.004)	(0.000)	(0.001)	(0.001)	(0.001)	(0.006)	(0.014)	(0.008)	(0.007)	(0.006)	(0.011)
Culture	0.001	0.004	-0.001	0.001	0.001	0.001	0.020*	0.043*	-0.006	0.020	0.021*	0.021
	(0.003)	(0.008)	(0.002)	(0.002)	(0.001)	(0.003)	(0.011)	(0.025)	(0.014)	(0.013)	(0.012)	(0.018)
Private households	-0.000	-0.003	-0.002	0.001	0.001	0.000	-0.000	0.003	0.003	-0.001	-0.001	-0.001
	(0.000)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)
International org.	0.009	0.009*	0.004	0.008*	0.008	0.005	0.001	0.000	-0.000	0.001	0.000	0.000
	(0.006)	(0.006)	(0.003)	(0.004)	(0.005)	(0.009)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
State	0.012	0.017	0.011	0.012	0.010	0.009	-0.195***	-0.269***	-0.234***	-0.213***	-0.134***	-0.084
	(0.013)	(0.019)	(0.012)	(0.012)	(0.011)	(0.010)	(0.035)	(0.068)	(0.047)	(0.046)	(0.043)	(0.057)
Urban	-0.004	-0.002	-0.008	-0.004	-0.001	-0.000	0.002	-0.056	0.055	-0.062	-0.040	-0.079
	(0.003)	(0.004)	(0.006)	(0.004)	(0.002)	(0.002)	(0.052)	(0.117)	(0.076)	(0.073)	(0.061)	(0.077)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Tbilisi	-0.019**	-0.019*	-0.020**	-0.022**	-0.029**	-0.018*	0.046	0.066	0.042	0.074	0.126**	0.087
	(0.009)	(0.011)	(0.010)	(0.011)	(0.013)	(0.010)	(0.037)	(0.062)	(0.047)	(0.053)	(0.051)	(0.071)
Georgian	-0.000	-0.001	-0.001	-0.003	0.001	0.001	0.048	0.394**	0.082	-0.021	-0.161	-0.141
	(0.001)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.081)	(0.153)	(0.131)	(0.122)	(0.105)	(0.130)
21 – 40 hours[4]	0.040***	0.030	0.042	0.048**	0.030**	0.009	-0.065	-0.327***	-0.140**	0.015	0.050	0.015
	(0.015)	(0.043)	(0.028)	(0.021)	(0.014)	(0.019)	(0.039)	(0.121)	(0.067)	(0.047)	(0.039)	(0.056)
40 + hours	-0.059***	-0.059	-0.063**	-0.068***	-0.041***	-0.028	-0.098	-0.600**	-0.269**	0.018	0.084	0.140
	(0.016)	(0.037)	(0.026)	(0.021)	(0.014)	(0.018)	(0.083)	(0.244)	(0.136)	(0.099)	(0.086)	(0.118)
Seasonal hours	-0.008*	-0.011	-0.011	-0.008	-0.005	0.002	-0.018	-0.064**	-0.029	-0.010	-0.001	-0.010
	(0.005)	(0.009)	(0.007)	(0.006)	(0.004)	(0.004)	(0.012)	(0.033)	(0.020)	(0.016)	(0.014)	(0.018)
Quarters	0.056**	0.038	0.056*	0.075**	0.160***	0.138***	0.044**	0.091***	-0.048*	0.015	-0.031	0.052
	(0.023)	(0.048)	(0.033)	(0.033)	(0.031)	(0.039)	(0.018)	(0.030)	(0.029)	(0.027)	(0.027)	(0.041)
Total	-0.004	-0.026	-0.016	-0.012	0.104**	0.095**	-0.441***	-0.610***	-0.410***	-0.493***	-0.523***	-0.503***
	(0.035)	(0.058)	(0.044)	(0.047)	(0.041)	(0.048)	(0.040)	(0.072)	(0.053)	(0.057)	(0.053)	(0.068)
Predicted 2004 wages	4.896***	3.833***	4.439***	4.882***	5.425***	5.825***						
	(0.027)	(0.047)	(0.032)	(0.035)	(0.032)	(0.042)						
Predicted 2007 wages	5.341***	4.469***	4.865***	5.387***	5.845***	6.233***						
	(0.027)	(0.039)	(0.032)	(0.034)	(0.035)	(0.047)						

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Difference	-0.445***	-0.637***	-0.426***	-0.505***	-0.420***	-0.408***						
	(0.038)	(0.061)	(0.046)	(0.049)	(0.047)	(0.063)						
Constant							1.089	1.061	1.050	0.496	1.266	1.858
							(0.684)	(1.321)	(0.957)	(0.991)	(0.900)	(1.222)

Notes: robust standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1; [1] secondary education or below is the reference group; [2] low-skill blue-collar occupations is the reference group; [3] agriculture is the reference group; [4] 20 hours or less is the reference group.

2009 – 2011

During 2009 – 2011, the endowment shifts that affected women's wages were the reduction in the proportion of high-skilled white-collar workers and the drop in their working hours, which pulled down their wages throughout the distribution (Table 5). However, once again it is the changes in the returns to characteristics that contribute the most to the observed gender wage gap. In particular, the increase in women's wages at the bottom of the distribution is driven by the rise in the returns to education at the 10th percentile. On the other hand, the drop in the observed wages at the 75th percentile is driven by the decrease in the returns to high-skilled white-collar occupations, as well as the drop in the premium to working in the public administration and to living in Tbilisi.

Similar to women, the decrease in working hours and the reduction in the proportion of high-skilled white-collar workers contributed to the reduction in men's wages along the wage distribution (Table 7). However, in the case of men, the additional factor pulling their wages down was the drop in the proportion of men working in transportation, especially at the bottom of their wage distribution. The wage gap between Georgians and non-Georgians contracted during this period. On the other hand, the premia in the state sector, mining sector and, somewhat surprisingly, culture sector (which includes sports) increased, but not enough to prevent men's wages from contracting.

Our findings hence suggest that the changes in the macroeconomic environment and potentially in the sectoral productivity (reflected in the changes in the industrial premia and in the returns to education and skills) played a more important role in influencing the wage trends than the changes in individual and employment characteristics.

Table 7 FLL Decomposition between 2009 and 2011, for men.

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Vocational [1]	-0.000	-0.001	-0.000	-0.000	0.000	0.000	0.015	0.051	0.016	0.027	0.008	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.012)	(0.043)	(0.020)	(0.018)	(0.015)	(0.011)
Higher education	0.005	0.006	0.004	0.006	0.005	0.003	0.003	0.008	-0.044	0.046	0.052	-0.029
	(0.005)	(0.006)	(0.004)	(0.006)	(0.006)	(0.004)	(0.030)	(0.095)	(0.045)	(0.047)	(0.043)	(0.038)
Age	0.020	0.034	0.009	0.015	0.011	0.042	0.463	-0.542	-0.033	0.034	1.488	1.447
	(0.017)	(0.032)	(0.013)	(0.016)	(0.015)	(0.033)	(1.047)	(2.946)	(1.536)	(1.512)	(1.546)	(1.601)
Agesq	-0.021	-0.037	-0.010	-0.015	-0.011	-0.042	-0.219	0.387	-0.031	0.060	-0.729	-0.777
	(0.017)	(0.033)	(0.013)	(0.016)	(0.015)	(0.032)	(0.537)	(1.542)	(0.790)	(0.770)	(0.787)	(0.831)
Marriage	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001	0.056	0.014	0.123*	0.058	0.098	0.053
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.001)	(0.052)	(0.147)	(0.072)	(0.075)	(0.076)	(0.074)
High-skill blue collar [2]	-0.000	0.001	0.000	-0.000	-0.000	-0.001	-0.010	-0.006	-0.010	-0.008	-0.005	-0.029***
	(0.000)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.010)	(0.032)	(0.014)	(0.014)	(0.011)	(0.011)
Low-skill white collar	0.002	-0.009	-0.002	0.007*	0.009*	0.003	0.007	-0.005	0.019	-0.002	0.001	-0.005
	(0.002)	(0.006)	(0.002)	(0.004)	(0.005)	(0.002)	(0.011)	(0.037)	(0.018)	(0.018)	(0.015)	(0.012)
High-skill white collar	0.013**	0.019*	0.012**	0.012**	0.012*	0.013*	-0.028	-0.036	0.010	-0.027	-0.008	-0.074*
	(0.006)	(0.010)	(0.006)	(0.006)	(0.006)	(0.007)	(0.025)	(0.068)	(0.033)	(0.036)	(0.037)	(0.041)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Mining[3]	-0.007	-0.023	-0.009	-0.004	-0.001	-0.002	-0.015**	-0.004	-0.017**	-0.024***	-0.017**	0.012*
	(0.005)	(0.016)	(0.006)	(0.003)	(0.001)	(0.002)	(0.006)	(0.020)	(0.008)	(0.008)	(0.008)	(0.007)
Manufacturing	0.003	0.010	0.004	0.002	-0.000	-0.000	-0.006	-0.002	-0.002	-0.007	0.002	0.022*
	(0.005)	(0.020)	(0.008)	(0.003)	(0.001)	(0.001)	(0.015)	(0.057)	(0.019)	(0.015)	(0.013)	(0.013)
Utilities	-0.003	-0.009	-0.004	-0.002	-0.001	0.000	-0.004	-0.000	-0.010	-0.012	0.008	0.005
	(0.005)	(0.018)	(0.007)	(0.004)	(0.001)	(0.001)	(0.008)	(0.031)	(0.011)	(0.009)	(0.009)	(0.009)
Construction	-0.007	-0.023	-0.009	-0.005	-0.001	-0.001	-0.011	-0.009	-0.010	-0.008	-0.005	0.006
	(0.007)	(0.024)	(0.010)	(0.005)	(0.001)	(0.001)	(0.014)	(0.054)	(0.019)	(0.014)	(0.012)	(0.013)
Trade	-0.010*	-0.047*	-0.016*	-0.004	0.001	0.003	-0.015	0.018	-0.021	-0.007	-0.017	0.002
	(0.006)	(0.025)	(0.009)	(0.003)	(0.002)	(0.002)	(0.018)	(0.066)	(0.023)	(0.018)	(0.016)	(0.017)
Hotels and restaurants	0.001	0.004	0.002	0.001	0.000	-0.000	-0.000	-0.007	-0.002	0.000	-0.001	0.001
	(0.002)	(0.005)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.008)	(0.004)	(0.003)	(0.003)	(0.003)
Transport	0.024***	0.081***	0.035***	0.017**	0.003	-0.002	-0.009	0.045	-0.007	-0.016	-0.003	0.002
	(0.008)	(0.029)	(0.012)	(0.007)	(0.003)	(0.003)	(0.013)	(0.049)	(0.017)	(0.014)	(0.012)	(0.012)
Finance	-0.010*	-0.024*	-0.011*	-0.008*	-0.005	-0.005	-0.001	-0.006	-0.006	0.006	0.003	0.001
	(0.006)	(0.014)	(0.006)	(0.005)	(0.004)	(0.004)	(0.007)	(0.019)	(0.008)	(0.009)	(0.010)	(0.013)
Real estate	0.001	0.005	0.001	0.000	-0.001	-0.001	-0.011	-0.005	-0.010	-0.011	-0.010	-0.011
	(0.002)	(0.016)	(0.004)	(0.000)	(0.002)	(0.003)	(0.007)	(0.023)	(0.010)	(0.009)	(0.008)	(0.009)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Public administration and defense	0.018	0.041	0.018	0.016	0.017	0.004	-0.019	0.034	-0.032	-0.057*	0.005	0.011
	(0.015)	(0.035)	(0.015)	(0.013)	(0.014)	(0.004)	(0.026)	(0.095)	(0.036)	(0.031)	(0.029)	(0.028)
Education	-0.000	-0.001	-0.000	0.000	0.000	0.000	0.001	0.011	-0.011	-0.016	0.015	0.025**
	(0.001)	(0.012)	(0.002)	(0.003)	(0.001)	(0.001)	(0.010)	(0.042)	(0.015)	(0.013)	(0.010)	(0.011)
Health and social work	0.001	0.007	0.001	-0.000	0.000	0.001	0.001	0.005	-0.005	0.000	0.009*	0.012*
	(0.002)	(0.012)	(0.002)	(0.001)	(0.001)	(0.001)	(0.004)	(0.015)	(0.007)	(0.005)	(0.005)	(0.007)
Culture	0.000	0.002	0.000	-0.000	-0.000	-0.000	-0.017**	-0.019	-0.017	-0.024**	-0.019**	-0.002
	(0.002)	(0.013)	(0.003)	(0.001)	(0.002)	(0.002)	(0.008)	(0.025)	(0.011)	(0.010)	(0.008)	(0.007)
Private households	-0.002	-0.008	-0.003	0.003	0.002*	0.001	-0.002	0.002	-0.001	-0.009**	-0.001	-0.001
	(0.001)	(0.007)	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.011)	(0.004)	(0.004)	(0.002)	(0.001)
International org.	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	0.001	-0.001	-0.001	-0.001	0.000	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
State	-0.007	-0.004	0.002	-0.004	-0.016**	-0.013**	-0.012	-0.123*	-0.009	0.074*	-0.039	-0.017
	(0.004)	(0.011)	(0.006)	(0.006)	(0.006)	(0.006)	(0.024)	(0.074)	(0.037)	(0.038)	(0.031)	(0.027)
Urban	0.003	0.005	0.002	0.004	0.004	0.003	0.068*	-0.072	-0.011	0.090*	0.111**	0.127**
	(0.003)	(0.005)	(0.002)	(0.004)	(0.004)	(0.003)	(0.037)	(0.120)	(0.058)	(0.052)	(0.049)	(0.053)

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
Tbilisi	0.014*	0.017*	0.015*	0.016*	0.010*	0.010*	0.015	0.057	0.038	0.015	-0.007	0.011
	(0.007)	(0.009)	(0.008)	(0.008)	(0.006)	(0.006)	(0.021)	(0.053)	(0.029)	(0.031)	(0.033)	(0.036)
Georgian	-0.002	-0.001	-0.002	-0.003	-0.002	-0.001	0.244***	0.466**	0.377***	0.241**	0.050	0.002
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.001)	(0.077)	(0.236)	(0.127)	(0.117)	(0.100)	(0.084)
21 – 40 hours[4]	-0.029***	-0.094***	-0.031***	-0.012**	-0.004	-0.004	-0.062	-0.289	-0.093	-0.096**	-0.024	-0.036
	(0.009)	(0.030)	(0.010)	(0.006)	(0.005)	(0.005)	(0.047)	(0.206)	(0.067)	(0.046)	(0.041)	(0.038)
40 + hours	0.041***	0.114***	0.045***	0.023***	0.017**	0.011*	-0.068	-0.338	-0.106	-0.118**	-0.011	-0.036
	(0.012)	(0.035)	(0.013)	(0.008)	(0.007)	(0.006)	(0.052)	(0.217)	(0.072)	(0.051)	(0.046)	(0.044)
Seasonal hours	0.001	0.003	0.001	0.001	0.000	0.000	0.003	-0.019	-0.001	-0.004	0.005	-0.001
	(0.003)	(0.007)	(0.003)	(0.002)	(0.001)	(0.001)	(0.009)	(0.039)	(0.013)	(0.010)	(0.008)	(0.007)
Quarters	0.013	0.033	0.131***	0.010	-0.011	0.017	-0.058**	-0.151**	-0.115***	-0.055*	-0.090***	-0.011
	(0.014)	(0.040)	(0.023)	(0.019)	(0.020)	(0.022)	(0.023)	(0.072)	(0.034)	(0.030)	(0.031)	(0.033)
Total	0.059**	0.096*	0.184***	0.071**	0.037	0.037	0.038	0.009	-0.057	-0.063	0.093**	0.088**
	(0.026)	(0.053)	(0.031)	(0.032)	(0.031)	(0.028)	(0.029)	(0.083)	(0.043)	(0.041)	(0.041)	(0.044)
Predicted 2009 wages	5.523***	4.560***	5.055***	5.557***	6.114***	6.417***						
	(0.018)	(0.038)	(0.021)	(0.023)	(0.025)	(0.023)						
Predicted 2011 wages	5.426***	4.454***	4.928***	5.548***	5.984***	6.292***						

	Endowment						Structure					
	mean	10th	25th	50th	75th	90th	mean	10th	25th	50th	75th	90th
	(0.026)	(0.066)	(0.032)	(0.033)	(0.032)	(0.033)						
Difference	0.097***	0.106	0.127***	0.008	0.129***	0.125***						
	(0.032)	(0.076)	(0.038)	(0.040)	(0.040)	(0.040)						
Constant							-0.272	0.545	-0.037	-0.211	-0.778	-0.622
							(0.520)	(1.501)	(0.764)	(0.749)	(0.757)	(0.773)

Notes: robust standard errors in parenthesis; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; [1] secondary education or below is the reference group; [2] low-skill blue-collar occupations is the reference group; [3] agriculture is the reference group; [4] 20 hours or less is the reference group.

Ñopo (2008) decomposition results

One potential problem with the RIF decomposition approach of Firpo, Fortin and Lemieux (2009) stems from its assumption that men and women share the same supports. As such, the FFL decomposition technique implicitly assumes that the coefficients of the earnings equations are similar between the individuals in and out of the common support. In the countries with high industrial and occupational segregation, however, male and female characteristics may not overlap, rendering the decomposition results invalid.

In this section, we present the results of the statistical matching decomposition technique developed in Ñopo (2008). We find that based on demographic characteristics and occupation, the wage structure (or unexplained) portion of the gap is higher than the total gap, indicating that women should be earning higher wages than men. This result echoes our FFL-based findings that, especially with respect to education and skills, women's qualifications generate higher wages. It is only after introducing industrial variables that the endowments are able to explain why women earn less than men, as women tend to work in industries with lower remuneration (Table 9). The addition of the state sector dummy and especially the introduction of the dummies for the hours of work further increases the endowment portion of the gap and decreases the wage structure part.

Table 9 Ñopo (2008) decomposition (relative gap expressed in terms of men's wages).

	educ	+age	+ marriage	+urban	+tbilisi	+georgian	+skills	+industry	+state	(Full set) +working hours	In %	FFL, mean, log points	FFL, mean, %	FFL mean, relative gap
Δ	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	0.426	1	0.593	1	0.447
Δ_0	0.452	0.445	0.455	0.458	0.458	0.457	0.458	0.279	0.281	0.249	0.586	0.348	0.588	0.263
Δ_F					0	-0.001	-0.001	0.01	0.017	0.036	0.084			
Δ_M						0	-0.002	-0.036	0.055	-0.085	0.199			
Δ_X	-0.026	-0.02	-0.029	-0.032	-0.032	-0.031	-0.029	0.173	0.183	0.225	0.529	0.244	0.412	0.184
% M	1	1	1	1	0.999	0.992	0.979	0.819	0.773	0.675				
% F	1	1	1	1	1	1	0.981	0.707	0.661	0.54				
Std. error	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.01	0.011	0.012		0.018		

The matching rate remains high up until we introduce industrial and skill dummies, confirming that industrial and occupational segregation is indeed an issue in the Georgian context. The rate drops further once the dummies for the state sector and working hours are added as matching variables. This increase in the size of the non-overlapping supports is associated with the growing importance of the differences in the characteristics of matched and unmatched individuals. In particular, based on the full-set specification (column 10, Table 9), the differences between matched and unmatched women's characteristics raise the gender wage gap by 8.4% (or 3.6 percentage points). This result suggests that women, whose characteristics could not be matched to men's, are earning less than women whose characteristics were matched (likely candidate being education sector, in particular pre-school and primary school teachers, who are almost exclusively female). On the other hand, the differences between matched and unmatched men's characteristics contract the gender wage gap by 19.9% (or 8.5 percentage points). This finding reveals that the men, whose characteristics could not be matched with women's, operate in lower paying industries than the men, whose characteristics were matched. Altogether, the differences due to non-overlapping supports contract the gender wage gap by 11.5% (or 4.9 percentage points).

However, the impact on the unexplained portion of the gap (attributed to the differences in the returns) is only marginal. Indeed, out of the 42.6% gender wage gap (i.e., women earn 42.6% less than men) estimated using Ñopo's method, 24.9% is due to the differences in the returns (unexplained). The analogous estimate of the gender wage gap using the FFL method is 44.7% at the mean (which corresponds to the 0.59 log points), of which 26.3% is due to the differences in the returns.

Hence, the portions of the gap attributed to the differences in the returns are very similar in the two methods. We do, however, obtain a richer characterization of the composition portion of the gap. Note that the composition portion of the gap when specified over the common support is considerably larger at 22.5% of the gender wage gap than the FFL mean estimate of 18.4%. This reveals that among the men and women who share common characteristics, endowment differences are in fact more important than the estimates based on the FFL method would suggest. However, as we have found, this result does not translate into higher wage structure portion of the gap. This is so because the portion of the explained gap attributed to the

differences between the characteristics of matched and unmatched individuals contracts the gender wage gap, primarily because the unmatched men are employed in the lower paying segments of the labor markets. Consequently, the total explained portion of the gap (which combines Δ_x, Δ_m and Δ_f) does not substantially change, however its composition differs. In sum, despite the considerable size of the non-overlapping supports, the results based on the Ñopo methodology and on the FFL methodology are very similar, supporting the robustness of the FFL findings.

CONCLUSIONS

Despite the dual shock of the 2008 financial crisis and the August War with Russia, the Georgian economy expanded between 2004 and 2011. However, its labor markets remained weak throughout this period and took a particularly strong hit as a result of the crisis, as women's real wages stagnated and men's declined. Throughout 2004 – 2011, the gender wage gap in Georgia declined however the gradual drop in the gap masks two qualitatively different periods separated by the crisis. Between 2004 and 2007, women's wages grew faster than men's whereas between 2009 and 2011 they did not contract as much as men's. Taken together, these findings suggest that, relative to men, women benefitted more (or lost less) from the changes that took place in the Georgian economy since 2004. Nevertheless a look at the changes in the distribution of wages reveals a more nuanced picture. Between 2004 and 2007, the gender wage gap contracted at the top but rose at the bottom of the distribution. This development was driven by the widening of the wage inequality among women and the contraction in the wage inequality among men. Between 2009 and 2011, on the other hand, the drop in the gender wage gap took place both at the bottom and at the top of the distribution. This change was due to the decline in men's wages throughout the distribution, compounded by an increase in women's real wages at the bottom of the distribution. Despite the sustained decline since 2004, the gender wag gap in Georgia remains sizable, with women earning 45% less than men in 2011.

In order to evaluate these shifts, we employ the RIF decomposition approach developed in Firpo, Fortin and Lemieux (2009). We find that during 2004 – 2011 the gender wage gap is the smallest among the top earners in Georgia, revealing no signs of the glass ceiling effect. The

endowment differences explain between 22% and 61% of the total gender wage gap during 2004 – 2011 with the composition portion declining as we move to the top of the distribution. The primary contributors to the gender wage gap are work hours, industrial composition and employment in the state sector. However, the role of these differences diminishes as we move to the right of the distribution indicating, among other things, that industrial segregation by gender is less of a problem among the high-earning men and women. The analysis of the structural portion of the gender wage gap provides further insights. Men's higher premia in the construction, trade, real estate, public administration and culture sectors contribute significantly to raising the gender wage gap, despite women's higher returns to education and premium in high-skill white-collar occupations. However, the returns to higher education and high-skilled occupations, as well as the premia in finance and public administration are higher for the top-earner women, playing a key role in explaining the decline in the gender wage gap. These findings reveal that top-earning women are at a double advantage of earning more than their lower-earning female counterparts and holding a stronger position relative to men in their income category.

Focusing on explaining the changes over time, we find that the reduction in the gender wage gap between 2004 and 2007 and the switch from a glass-ceiling type of the gender gap distribution to a sticky-floor type of the distribution was driven by the rising returns to the state sector and the growth in the returns to education among women at the top of the wage distribution. In addition, men's wages at the bottom of the distribution were buoyed by the rise in the construction sector premium, resulting in the faster growth and amplifying the increase in the gender wage gap at the bottom of the wage distribution. Between 2009 and 2011, on the other hand, the decline in the gender wage gap can be explained by the decrease in men's working hours, which was greater than the decrease in women's working hours. This development was compounded by the increase in women's returns to education at the 10th percentile, which further reduced the gender wage gap at the bottom of the distribution.

Similar to other transition and developing countries, Georgia is characterized by a high degree of gender segregation in industries. In order to assess the extent to which the presence of the non-overlapping supports in men and women's characteristics might alter our results, we employ the statistical matching decomposition method developed in Ñopo (2008). The results

indicate that, despite the presence of considerable non-overlapping supports, the portion of the gender wage gap that is unexplained remains largely unchanged, and hence so do our conclusions regarding the relative importance of the explained and unexplained components of the gap. The Ñopo decomposition results enrich our understanding of the factors that underlie the gender wage gap, but they do not change the main findings obtained using the FFL methodology, supporting their robustness.

The present analysis of the gender wage gap reflects the dynamics only among wage workers, which constitute about 40% of the employed workforce. The dynamics among self-employed individuals may be very different but no less important for establishing a more complete picture of the gender balance in the labor markets. A preliminary review of the data reveals that that the magnitude of the gender gap in total income is lower among self-employed individuals (as are the average wages for both men and women) compared to wage workers. This seems to suggest that, at a minimum, the constraints that wage workers face are indeed different from the constraints facing self-employed individuals. Furthermore, the present analysis does not explicitly take into account the differences in the employment rates of men and women and the time trends of these rates, which are likely to be important in influencing the gender wage gap. Our findings have revealed a range of changes that took place in the Georgian economy, which were associated with the decline in the gender wage gap. The extent to which these changes are a result of workers' choices given institutional and social constraints as opposed to employers' decisions is a question that merits further investigation.

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