

# Different Endowment or Remuneration? Exploring wage differentials in Switzerland

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## **Abstract**

This paper analysis wage differentials in Switzerland with special focus on the wage differences among the region of Ticino and the other Swiss regions. We decompose the regional wage differentials in two components applying a method proposed by Blinder (1973) and Oaxaca (1973). The first component captures the wage differential due to differences in the characteristics of workers, and the second explains the differentials due to different returns on these characteristics. The results show that with respect to the region of Zurich half of the differential is due to each component, whereas the negative wage difference between Ticino and the other regions is mainly due to a different remuneration of given characteristics.

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## **1 Introduction**

This article analyses important observed average wage differentials among Swiss regions. This is a matter of great interest especially for the region of Ticino, the southern region of Switzerland - the region with the lowest wages in Switzerland.

Neoclassical theory predicts that, especially on a small spatial scale like the Swiss one, interregional wages tend to converge.<sup>1</sup> Possible explanations for the persistence of interregional wage differentials include immobility of workers and differences in industry structure. While the former would lead to different compensation for identical work, the latter would provoke a different labor demand and hence different wages for different work. It is therefore promising to decompose average wage differential in two components: a first one related to the composition of the workforce employed in different regions, and a second one related to the regional segmentation of the labor market that remunerates identical characteristics of individuals differently. The purpose of this paper is to measure these two components.

Two streams of literature have to be considered in this context. The first one follows the hedonic wage theory of Rosen (1986), which states that the wage differentials between two occupations are given by the compensation due to different job characteristics, which themselves depend on different human capital requirements or on different working conditions. The second stream of literature follows Blinder (1973) and Oaxaca (1973) who developed a method to decompose wage differences by gender or ethnicity into different characteristics among individuals and different remuneration of the same characteristics.

Applications of the Blinder-Oaxaca method to decompose regional wage differentials have been developed previously (Garcia and Molina,

2002). Due to the shortage of available data to apply this kind of analysis, the only reference in Switzerland is Rochira and Rosas (2005).

In the following, we present the model of wage decomposition, describe the data used and the sample characteristics. We then present and discuss the empirical findings and draw conclusions.

## **2 The wage decomposition**

The main purpose of this paper is to decompose the wage differentials observed between the Ticino and the other Swiss regions into two components: one due to the individual characteristics and one due to the remuneration of these characteristics. This has been done following the method developed by Blinder (1973) and Oaxaca (1973) and applied by Garcia and Molina (2002) and Rochira and Rosas (2005) to regional wage differentials.

We estimate a wage equation for each Swiss region  $j$  as proposed by Mincer (1974):

$$\ln w_{ij} = X_{ij}'\beta_j + \varepsilon_{ij} \quad (1)$$

where  $\ln w_{ij}$  is the monthly standardized wage for the individual  $i$  of the region  $j$ ,  $X_{ij}$  is a vector which includes human capital, job characteristics and firm characteristics,  $\beta_j$  is the vector of parameters to be estimated and  $\varepsilon_{ij}$  is the error term with the usual properties.

We then use the coefficients estimated for each Swiss region  $j$  and apply the Blinder - Oaxaca method to decompose the wage differential resulting from the comparison among the region  $t$  and the region  $r$

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<sup>1</sup> Note that this holds for wages in real terms. As we will be applying our estimates to nominal wages due to lack of regionalized purchasing power indices, our differentials will include possible differences in purchasing power.

$$\overline{\ln w_t} - \overline{\ln w_r} = \underbrace{\beta_t(\bar{X}_t - \bar{X}_r)}_{\text{endowments}} + \underbrace{(\hat{\beta}_t - \hat{\beta}_r)\bar{X}_r}_{\text{remunerations}} \quad (2)$$

where the left-hand-term indicates the differences between the wages of region  $t$  and region  $r$  as explained by two components: the first term of the right-hand-side reflects the part of the wage difference due to the workers characteristics called “*endowment component*”, while the second term of the right-hand-side shows the wage difference due to the different remuneration of these characteristics called “*remuneration component*”.

### **3 Data and descriptive statistics**

The empirical analysis is based on data from the Swiss Wage Structure Survey<sup>2</sup> 2002 (or SWSS) that provides cross section data. The survey has been implemented by the Swiss Federal Statistical Office (SFSO) among a representative sample of 45’000 firms reporting salaries, job characteristics and individual attributes of 1.1 million individual workers in Switzerland. From the SWSS have been selected the individual observations who include all the variables used in the wage equations. The result is a representative sample of 808’279 available individual observations of occupied workers.

The SWSS 2002 is the first survey since its creation in 1996 that allows to decompose the entire Swiss sample in seven representative regional sub-samples: Ticino (TI) with 28’402 observations, Lake of Geneve Region (LRG) with 127’931 observations, Espace Mitteland (EM) with 191’424 observations, North-Western Switzerland (NWS) with 119’373 observations, Zurich (ZH) with 174’350 observations, Eastern Switzerland (ES) with 97’883 observations and Central Switzerland (CS) with 68’966. Hence, Ticino is by far the smallest region.

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<sup>2</sup> In german the survey is called “*Schweizerische Lohnstrukturerhebung (LSE)*”

**Table 1: Descriptive statistics**

	Ticino		Lake of Geneva Reg.		Espace Mittelland		North-Western Switz.		Zurich		Eastern Switzerland		Central Switzerland	
	<i>mean</i>	<i>std. dev.</i>	<i>mean</i>	<i>std. dev.</i>	<i>mean</i>	<i>std. dev.</i>	<i>mean</i>	<i>std. dev.</i>	<i>mean</i>	<i>std. dev.</i>	<i>mean</i>	<i>std. dev.</i>	<i>mean</i>	<i>std. dev.</i>
Log of monthly wage	8.473	(0.399)	8.668	(0.433)	8.583	(0.339)	8.681	(0.385)	8.764	(0.418)	8.591	(0.352)	8.640	(0.374)
Education	11.807	(1.967)	12.257	(2.098)	11.929	(1.775)	12.138	(1.880)	12.362	(1.958)	11.837	(1.744)	12.016	(1.751)
Experience	22.577	(11.198)	22.210	(11.193)	22.660	(11.598)	22.866	(11.375)	21.595	(11.526)	22.692	(11.634)	21.767	(11.435)
Tenure	9.062	(8.496)	8.788	(8.666)	9.341	(9.030)	9.579	(9.369)	8.083	(8.339)	9.437	(9.107)	9.040	(8.992)
Female	0.361	(0.480)	0.388	(0.487)	0.356	(0.479)	0.324	(0.468)	0.355	(0.479)	0.300	(0.458)	0.306	(0.461)
Married	0.607	(0.489)	0.594	(0.491)	0.574	(0.495)	0.593	(0.491)	0.539	(0.498)	0.599	(0.490)	0.568	(0.495)
Part time	0.128	(0.334)	0.186	(0.389)	0.188	(0.391)	0.152	(0.359)	0.160	(0.367)	0.137	(0.343)	0.138	(0.345)
Union	0.533	(0.499)	0.414	(0.493)	0.409	(0.492)	0.328	(0.469)	0.283	(0.450)	0.373	(0.483)	0.375	(0.484)
Swiss	0.431	(0.495)	0.593	(0.491)	0.766	(0.424)	0.621	(0.485)	0.745	(0.436)	0.671	(0.470)	0.787	(0.410)
Seasonal	0.022	(0.148)	0.021	(0.143)	0.010	(0.098)	0.005	(0.072)	0.009	(0.093)	0.026	(0.160)	0.013	(0.114)
Annual	0.034	(0.182)	0.055	(0.227)	0.037	(0.189)	0.048	(0.213)	0.050	(0.217)	0.055	(0.228)	0.053	(0.224)
Resident	0.213	(0.409)	0.216	(0.412)	0.147	(0.354)	0.159	(0.366)	0.171	(0.376)	0.182	(0.386)	0.131	(0.338)
Cross-border	0.296	(0.457)	0.101	(0.301)	0.031	(0.174)	0.139	(0.346)	0.013	(0.115)	0.051	(0.220)	0.002	(0.044)
Other permits	0.003	(0.056)	0.013	(0.114)	0.006	(0.078)	0.022	(0.146)	0.009	(0.096)	0.008	(0.088)	0.010	(0.101)
High skills	0.073	(0.259)	0.076	(0.265)	0.068	(0.251)	0.091	(0.288)	0.107	(0.309)	0.076	(0.265)	0.085	(0.278)
Middle high sk.	0.197	(0.398)	0.227	(0.419)	0.261	(0.439)	0.286	(0.452)	0.326	(0.469)	0.287	(0.452)	0.301	(0.459)
Middle low sk.	0.396	(0.489)	0.433	(0.495)	0.419	(0.493)	0.443	(0.497)	0.403	(0.491)	0.419	(0.493)	0.412	(0.492)
Low skills	0.331	(0.471)	0.257	(0.437)	0.247	(0.431)	0.177	(0.382)	0.154	(0.361)	0.214	(0.410)	0.191	(0.393)
Middle low sk.	0.078	(0.268)	0.073	(0.261)	0.065	(0.246)	0.064	(0.245)	0.071	(0.256)	0.070	(0.256)	0.076	(0.266)
Top manager	0.077	(0.266)	0.085	(0.279)	0.073	(0.260)	0.078	(0.269)	0.083	(0.276)	0.077	(0.266)	0.089	(0.285)
Middle manager	0.120	(0.325)	0.116	(0.320)	0.106	(0.308)	0.101	(0.302)	0.138	(0.345)	0.120	(0.325)	0.132	(0.338)
Manager	0.124	(0.329)	0.120	(0.325)	0.092	(0.289)	0.070	(0.256)	0.096	(0.295)	0.075	(0.263)	0.075	(0.264)
No manager	0.599	(0.490)	0.600	(0.490)	0.663	(0.473)	0.675	(0.469)	0.608	(0.488)	0.656	(0.475)	0.624	(0.484)
Firm size 2-4	0.094	(0.291)	0.065	(0.247)	0.055	(0.228)	0.051	(0.220)	0.045	(0.207)	0.060	(0.237)	0.070	(0.255)
Firm size 5-9	0.169	(0.374)	0.128	(0.334)	0.125	(0.330)	0.100	(0.300)	0.101	(0.301)	0.120	(0.325)	0.128	(0.334)
Firm size 10-99	0.304	(0.460)	0.289	(0.453)	0.289	(0.453)	0.259	(0.438)	0.231	(0.421)	0.326	(0.469)	0.322	(0.467)
Firm size 100-199	0.111	(0.315)	0.112	(0.316)	0.106	(0.307)	0.116	(0.320)	0.096	(0.295)	0.107	(0.309)	0.114	(0.318)
Firm size 200-499	0.091	(0.287)	0.113	(0.317)	0.115	(0.319)	0.149	(0.356)	0.124	(0.329)	0.122	(0.327)	0.112	(0.315)
Firm size 500 +	0.082	(0.274)	0.178	(0.383)	0.201	(0.401)	0.208	(0.406)	0.302	(0.459)	0.146	(0.353)	0.125	(0.331)
Agriculture	0.006	(0.077)	0.007	(0.083)	0.007	(0.085)	0.006	(0.076)	0.008	(0.087)	0.008	(0.087)	0.007	(0.086)
Mining & quarrying	0.004	(0.063)	0.002	(0.039)	0.002	(0.045)	0.002	(0.042)	0.001	(0.038)	0.004	(0.061)	0.003	(0.050)
Manufacturing	0.275	(0.446)	0.182	(0.386)	0.345	(0.475)	0.357	(0.479)	0.187	(0.390)	0.424	(0.494)	0.340	(0.474)
Electricity, gas & water	0.008	(0.087)	0.011	(0.104)	0.005	(0.070)	0.010	(0.100)	0.001	(0.023)	0.006	(0.074)	0.007	(0.083)
Construction	0.136	(0.342)	0.090	(0.286)	0.091	(0.288)	0.105	(0.307)	0.086	(0.280)	0.123	(0.328)	0.129	(0.335)
Sale & repair	0.186	(0.389)	0.192	(0.394)	0.227	(0.419)	0.171	(0.376)	0.203	(0.402)	0.142	(0.349)	0.193	(0.394)
Hotels & restaurants	0.086	(0.281)	0.074	(0.261)	0.049	(0.215)	0.051	(0.219)	0.044	(0.205)	0.055	(0.227)	0.057	(0.233)
Transport & communication	0.030	(0.170)	0.045	(0.208)	0.040	(0.197)	0.063	(0.244)	0.053	(0.223)	0.046	(0.210)	0.039	(0.195)
Banking, insurance	0.063	(0.242)	0.081	(0.273)	0.020	(0.139)	0.033	(0.179)	0.172	(0.377)	0.022	(0.148)	0.035	(0.185)
Computer, R & D	0.093	(0.290)	0.136	(0.342)	0.077	(0.267)	0.107	(0.309)	0.152	(0.359)	0.071	(0.256)	0.099	(0.299)
Educational sector	0.014	(0.117)	0.021	(0.144)	0.011	(0.104)	0.009	(0.094)	0.012	(0.108)	0.013	(0.114)	0.011	(0.103)
Health & social work	0.080	(0.271)	0.119	(0.323)	0.096	(0.294)	0.065	(0.247)	0.049	(0.215)	0.067	(0.250)	0.056	(0.230)
Other services	0.021	(0.143)	0.042	(0.200)	0.030	(0.171)	0.021	(0.142)	0.034	(0.181)	0.020	(0.139)	0.023	(0.149)
Observations	28402		127931		191424		119373		174350		97883		68966	

Table 1 shows the mean and standard deviations of the variables for the regional sub-samples. Thus, one has nominal monthly standardized logarithm of wages in Swiss Francs, human capital characteristics, gender, marital status, share of part time workers, unionization, work permits for foreign workers, skill types, hierarchical levels, firm size and sectors.

The region of Zurich shows the highest wage, followed by North-Western Switzerland, Lake of Geneva Region, Central Switzerland, Eastern Switzerland, Espace Mitteland and the region of Ticino.

Considering the human capital components, it is important to note that the regions show similar levels of years of education, years of experience and years of tenure. The only remarkable difference is the low average level of years of tenure in the region of Zurich, probably due to higher incentive for of worker's turnover as compared to the other Swiss regions.

The gender distribution reveals a higher share of females in the Lake of Geneva Region (38% of total employees) and in the region of Ticino (36%) while the figures are, respectively 35% for Espace Mitteland and Zurich, 32% for North-Western Switzerland and 30% for Central Switzerland and Eastern Switzerland, respectively.

In all regions, married workers are a majority with shares of around 60% of total employees. In contrast part time workers are proportionally less than full time workers in all regions. The region of Ticino shows the lowest share of part time workers (13%), while the highest shares are observed in the Lake of Geneva Region and in Espace Mitteland (19%).

The share of unionized workers is above 50% only in the region of Ticino (53%). On the other hand, the region of Zurich shows the lowest rate (28%).

Only in the region of Ticino, Swiss workers represent a minority (43% of total employees). The highest share of Swiss workers in total employment is observed in Central Switzerland, followed by Espace

Mitteland, Zurich, Eastern Switzerland, North-Western Switzerland and the Lake of Geneva Region.

Foreign workers, they are subdivided in five categories of working permits available in Switzerland since the year 2002. Resident workers represent the most important category of foreign workers in all the regions except for the region of Ticino where the highest share is observed in cross-border commuters (29% of total employment).

The composition of workers by skill levels shows relevant differences in the distribution of middle to high skilled workers and in the distribution of low skilled workers. In the region of Ticino the middle to high skilled workers have a share of 20% in total employment, while in the region of Zurich the respective share is 33%. On the other hand, low skilled workers represent 33% of employment in Ticino and 15% in region of Zurich.

Important differences can also be observed in the share of workers employed by firms with more than 500 employees (very big firms). The region of Ticino shows the lowest share (8%), while the region of Zurich has the highest one (30%).

Finally, the regions show some differences with respect to the structure of their economy. The manufacturing sector accounts for 42% of the labor force in Eastern Switzerland where Banking and Finance occupies 2% only. On the opposite extreme, the figures for the same two sectors are 19% manufacturing and 17 % banking in Zurich, and 15% and 8%, respectively in Geneva. Ticino is on the Swiss average in manufacturing (27%) but close to Geneva in banking.

#### ***4 Empirical Results***

Table 2 shows the results of the wage estimations for each Swiss region using equation (1). The constant term is similar in all regions. Ticino shows the highest constant, followed by the Espace Mitteland, the

North-Western Switzerland, Zurich, the Eastern Switzerland, Central Switzerland and finally the Lake of Geneva Region.

Considering the human capital variables, the return to education is significant in all regions, and is higher in the region of Lake of Geneva and in the Central Switzerland, followed by Zurich, Eastern Switzerland and Espace Mitteland. In the region of Ticino investment in education shows the lowest return. The coefficients of years of experience are significant in all the regions in both the linear and the quadratic terms and with the expected signs. The region of Zurich shows the highest rate of return on experience, and the region of Ticino again the lowest one. Similar coefficients among regions are observed in years of tenure, and only the linear term is significantly different from zero, except in the region of the Lake of Geneva where the quadratic term is significant at the 5% level and has the expected sign. Overall, the Ticino region shows significantly lower returns on investment in human capital.

Relative to the gender, females are sensibly discriminated in all the Swiss regions, and in Ticino the discrimination is the most intense. Married workers earn more than non married employees in Central Switzerland and in the Lake of Geneva region where no significant differences are observed. The advantage of married workers is more important in the Espace Mitteland as well as in the region of Ticino and North-Western Switzerland. Differences are observed in the wage premium of part time workers among the regions. The coefficients of the part time workers are not significantly different from zero in the region of Espace Mitteland and in the region of Central Switzerland. Positive wage premiums are observed in the region of Ticino, in the Lake of Geneva Region and in the region of Eastern Switzerland. Part time workers are penalized with respect to full time workers in the region of Zurich and in the region of North-Western Switzerland.

**Table 2: Estimated coefficients**

	(1) <i>Ticino</i>	(2) <i>LGR</i>	(3) <i>EM</i>	(4) <i>NWS</i>	(5) <i>ZH</i>	(6) <i>ES</i>	(7) <i>CS</i>
Constant	7.576 (342.83)**	7.422 (655.32)**	7.569 (720.36)**	7.558 (603.28)**	7.557 (733.14)**	7.554 (533.85)**	7.543 (464.75)**
Education	0.044 (27.92)**	0.059 (74.37)**	0.048 (58.70)**	0.047 (43.85)**	0.053 (72.41)**	0.050 (44.41)**	0.058 (45.49)**
Experience	0.017 (20.21)**	0.020 (40.38)**	0.018 (51.46)**	0.022 (48.19)**	0.026 (64.98)**	0.019 (39.65)**	0.023 (40.55)**
(Exp <sup>2</sup> )/100	-0.028 (16.08)**	-0.031 (27.98)**	-0.030 (41.14)**	-0.036 (37.22)**	-0.042 (51.11)**	-0.030 (31.36)**	-0.036 (30.32)**
Tenure	0.002 (2.66)**	0.004 (10.40)**	0.003 (9.05)**	0.003 (6.69)**	0.002 (4.67)**	0.003 (6.88)**	0.001 (2.07)*
(Tenure <sup>2</sup> )/100	0.003 (0.97)	-0.003 (2.08)*	-0.002 (1.93)	0.001 (0.53)	0.002 (1.84)	-0.001 (0.70)	0.002 (1.02)
Female	-0.181 (34.04)**	-0.119 (43.20)**	-0.137 (53.82)**	-0.128 (39.89)**	-0.131 (51.02)**	-0.169 (47.49)**	-0.143 (35.20)**
Married	0.019 (3.83)**	0.008 (3.09)**	0.021 (9.62)**	0.017 (6.42)**	0.010 (4.21)**	0.012 (3.77)**	0.006 (1.80)
Part time	0.028 (4.58)**	0.012 (4.02)**	-0.004 (1.28)	-0.012 (3.09)**	-0.033 (10.47)**	0.013 (2.84)**	0.002 (0.36)
Union	-0.015 (2.93)**	-0.044 (17.13)**	-0.009 (4.55)**	-0.041 (15.14)**	-0.036 (13.07)**	-0.001 (0.32)	-0.039 (11.89)**
Seasonal	-0.046 (2.93)**	-0.034 (2.59)**	-0.069 (7.90)**	-0.105 (8.27)**	-0.037 (3.65)**	-0.072 (7.25)**	-0.028 (1.57)
Annual	0.011 (0.88)	0.043 (6.73)**	-0.023 (4.46)**	-0.014 (2.39)*	0.002 (0.39)	-0.037 (6.41)**	0.026 (3.65)**
Resident	-0.028 (4.40)**	0.004 (1.37)	-0.012 (4.48)**	-0.027 (6.55)**	-0.042 (13.56)**	-0.024 (7.17)**	-0.005 (1.17)
Cross-border	-0.085 (15.59)**	0.027 (7.72)**	-0.057 (16.09)**	-0.017 (5.62)**	-0.040 (5.97)**	-0.029 (4.64)**	-0.045 (1.85)
Other permits	0.034 (1.08)	0.000 (0.04)	-0.059 (5.21)**	-0.136 (10.26)**	-0.062 (6.60)**	-0.077 (5.29)**	-0.067 (3.81)**
Skills	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hierarchical evels	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm size	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28402	127931	191424	119373	174350	97883	68966
R-squared	0.62	0.63	0.59	0.62	0.61	0.61	0.59

Dependent variable log monthly wage; Robust t-statistics in parentheses; \* significant at 5%; \*\* significant at 1%. TI = Ticino; LGR = Lake of Geneva Region; EM = Espace Mittelland; NWS = North-Western Switzerland; ES = Eastern Switzerland; CS = Central Switzerland.

Unionized workers earn less than non unionized employees in all regions except for the region of Eastern Switzerland.

Regarding work permits, workers with a seasonal permit earn less compared to Swiss workers in all regions except for Central Switzerland where the relative coefficient is not significantly different from zero. The negative premium of seasonal workers is particularly relevant in North-Western Switzerland, where they earn 10.5% less than an equivalent Swiss worker.

The resulting wage differentials between Swiss workers and foreign workers with an annual permit are different for the regions. Annual workers earn more than Swiss workers in the Lake of Geneva Region and the Central Switzerland while no significant differences are found for the regions of Zurich and Ticino. On the other hand, annual workers earn less than equivalent Swiss employees in Eastern Switzerland, Espace Mitteland and North-Western Switzerland.

In general, resident workers earn slightly less than Swiss workers except for the Lake of Geneva Region and in the Central Switzerland where no significant differences are observed.

Except for the Lake of Geneva Region where they earn more than Swiss employees, cross-border commuters earn less than Swiss workers, and in Ticino the discrimination is most emphasized.

Skill levels are significant at 99% level in all the regions and show the expected signs, the higher the skill level the higher the wage premium. The same applies for the manager categories.

**Table 1: Decomposition of the regional wage differentials**

	Lake of Geneva Region			Espace Mittelland			North-Western Switzerland			Zurich			Eastern Switzerland			Central Switzerland		
	$\hat{\beta}_l(\bar{x}_l - \bar{x}_R)$	$\bar{x}_R(\hat{\beta}_l - \hat{\beta}_R)$	Total	$\hat{\beta}_l(\bar{x}_l - \bar{x}_R)$	$\bar{x}_R(\hat{\beta}_l - \hat{\beta}_R)$	Total	$\hat{\beta}_l(\bar{x}_l - \bar{x}_R)$	$\bar{x}_R(\hat{\beta}_l - \hat{\beta}_R)$	Total	$\hat{\beta}_l(\bar{x}_l - \bar{x}_R)$	$\bar{x}_R(\hat{\beta}_l - \hat{\beta}_R)$	Total	$\hat{\beta}_l(\bar{x}_l - \bar{x}_R)$	$\bar{x}_R(\hat{\beta}_l - \hat{\beta}_R)$	Total	$\hat{\beta}_l(\bar{x}_l - \bar{x}_R)$	$\bar{x}_R(\hat{\beta}_l - \hat{\beta}_R)$	Total
Total	36.87	63.13	100.00	30.57	69.43	100.00	32.15	67.85	100.00	46.39	53.61	100.00	34.12	65.88	100.00	36.25	63.75	100.00
Constant	0.00	-76.08	-76.08	0.00	-5.96	-5.96	0.00	-8.28	-8.28	0.00	-6.23	-6.23	0.00	-17.28	-17.28	0.00	-18.19	-18.19
Education	9.82	88.64	98.46	4.58	33.03	37.61	6.63	12.52	19.15	7.87	35.90	43.78	1.06	49.64	50.70	5.15	93.75	98.89
Experience	-3.16	31.95	28.79	1.23	18.98	20.21	2.29	50.93	53.22	-5.49	57.92	52.42	1.59	22.32	23.91	-7.86	68.17	60.31
(Exp^2)/100	2.24	-8.87	-6.64	-0.88	-9.41	-10.29	-1.64	-20.31	-21.96	3.83	-22.08	-18.25	-1.14	-10.80	-11.94	5.51	-23.26	-17.76
Tenure	-0.30	9.46	9.16	0.51	8.37	8.88	0.51	2.54	3.05	-0.69	-0.82	-1.51	0.65	5.72	6.37	-0.03	-5.48	-5.50
(Tenure^2)/100	-0.06	-2.06	-2.12	0.11	-3.49	-3.37	0.11	-0.80	-0.69	-0.14	-0.08	-0.22	0.14	-2.45	-2.30	-0.01	-0.45	-0.45
Female	-2.38	11.89	9.51	0.81	13.29	14.11	3.04	7.72	10.75	0.33	5.75	6.08	8.80	2.78	11.58	5.59	6.47	12.06
Married	-0.11	-3.26	-3.37	-0.52	0.94	0.42	-0.11	-0.38	-0.50	-0.41	-1.50	-1.91	-0.11	-3.25	-3.36	-0.40	-4.00	-4.40
Part time	0.78	-1.41	-0.63	1.40	-5.00	-3.60	0.30	-2.70	-2.40	0.28	-3.10	-2.82	0.18	-1.59	-1.41	0.15	-1.98	-1.83
Union	0.87	-5.96	-5.09	1.56	2.07	3.63	1.38	-3.81	-2.43	1.19	-1.88	-0.69	1.89	4.12	6.00	1.30	-4.96	-3.66
Seasonal	0.03	0.12	0.15	0.48	-0.19	0.29	0.35	-0.14	0.21	0.20	0.02	0.22	-0.15	-0.55	-0.70	0.23	0.13	0.35
Annual	0.11	0.85	0.96	0.03	-1.08	-1.05	0.07	-0.55	-0.48	0.05	-0.14	-0.09	0.18	-2.11	-1.93	0.12	0.42	0.54
Resident	-0.05	3.45	3.40	1.56	2.06	3.62	0.68	0.10	0.78	0.38	-0.74	-0.36	0.68	0.65	1.34	1.28	1.70	2.97
Cross-border	8.13	5.56	13.69	18.92	0.72	19.64	6.01	4.22	10.23	7.65	0.19	7.84	16.39	2.24	18.64	13.82	0.04	13.86
Other permits	0.17	-0.22	-0.05	0.09	-0.49	-0.40	0.29	-1.67	-1.38	0.07	-0.29	-0.22	0.13	-0.69	-0.56	0.14	-0.58	-0.45
High skills	0.58	1.22	1.80	-1.36	-1.54	-2.90	2.66	2.01	4.66	3.48	2.59	6.07	0.79	0.64	1.43	2.15	-0.15	2.00
Middle high sk.	2.56	-1.23	1.33	9.51	-2.02	7.48	7.10	7.45	14.55	7.26	3.45	10.71	12.52	-0.31	12.21	10.19	0.22	10.41
Middle low sk.	1.67	0.22	1.89	1.78	-0.68	1.10	1.97	5.21	7.18	0.20	0.88	1.09	1.64	-3.03	-1.39	0.83	-0.47	0.36
Top manager	-0.57	0.90	0.34	-2.80	-1.81	-4.61	-1.59	-0.13	-1.72	-0.59	0.06	-0.52	-1.52	-3.41	-4.92	-0.22	-1.22	-1.44
Middle manager	0.75	1.64	2.39	-0.62	-1.00	-1.62	0.12	-0.66	-0.54	0.36	0.18	0.54	-0.03	-1.88	-1.91	1.24	-1.64	-0.39
Manager	-0.19	1.80	1.61	-1.00	0.07	-0.92	-0.70	-1.47	-2.17	0.46	-0.01	0.46	-0.03	-1.80	-1.82	0.52	-3.16	-2.64
Low manager	-0.07	-0.09	-0.16	-1.07	0.12	-0.94	-0.97	-0.68	-1.64	-0.35	-0.84	-1.19	-1.54	-0.95	-2.49	-1.08	-1.09	-2.17
Firm size 5-9	1.07	-0.63	0.43	1.97	0.01	1.99	1.65	0.68	2.33	1.15	0.01	1.16	2.04	-0.70	1.34	1.20	-2.44	-1.24
Firm size 10-99	-0.19	-2.81	-3.00	-0.34	-4.39	-4.73	-0.53	-1.47	-2.01	-0.62	-0.79	-1.41	0.46	-4.29	-3.83	0.26	-8.93	-8.67
Firm size 100-199	0.03	2.75	2.78	-0.26	1.98	1.71	0.11	1.06	1.17	-0.26	0.24	-0.01	-0.18	-0.17	-0.35	0.08	-0.65	-0.58
Firm size 200-499	1.41	0.11	1.52	2.60	-1.56	1.04	3.38	-1.46	1.93	1.36	-2.30	-0.95	3.11	-3.52	-0.41	1.50	-4.33	-2.84
Firm size 500 +	3.34	5.76	9.11	7.09	10.57	17.66	4.00	6.00	10.00	4.95	-2.60	2.35	3.57	8.88	12.44	1.68	3.46	5.14
Agriculture	-0.02	-0.10	-0.12	-0.05	-0.30	-0.35	0.00	-0.12	-0.11	-0.02	-0.17	-0.19	-0.06	-0.10	-0.16	-0.04	-0.26	-0.30
Mining & quarrying	-0.17	-0.03	-0.20	-0.23	-0.05	-0.28	-0.14	0.01	-0.13	-0.11	-0.03	-0.14	-0.03	-0.06	-0.09	-0.11	-0.11	-0.22
Manufacturing	0.97	7.42	8.38	-1.25	28.11	26.86	-0.78	20.12	19.34	0.59	4.85	5.45	-2.48	35.73	33.25	-0.76	1.40	0.63
Electricity,gas & water	0.27	-0.02	0.25	-0.37	0.27	-0.10	0.18	0.20	0.38	-0.36	-0.01	-0.37	-0.26	0.28	0.02	-0.05	-0.44	-0.49
Construction	-1.96	-0.42	-2.38	-3.29	-2.01	-5.30	-1.20	-1.65	-2.86	-1.40	-1.55	-2.95	-0.89	-1.79	-2.68	-0.32	-6.98	-7.30
Hotels & restaurants	0.56	-0.99	-0.43	2.84	-0.79	2.04	1.44	0.46	1.90	1.22	-0.47	0.75	2.25	0.21	2.45	1.43	-2.73	-1.30
Transport & communication	0.32	-0.84	-0.53	0.37	0.24	0.61	0.63	-1.75	-1.12	0.30	0.67	0.97	0.54	-2.12	-1.58	0.22	-3.34	-3.11
Banking, insurance	3.28	-1.32	1.96	-13.01	-2.15	-15.16	-4.76	-2.42	-7.18	12.50	-9.05	3.44	-11.38	-1.97	-13.35	-5.45	-3.72	-9.17
Computer, R & D	3.45	0.48	3.93	-2.09	-1.15	-3.24	1.08	0.44	1.52	3.11	-2.31	0.79	-2.81	-0.58	-3.39	0.60	-4.49	-3.89
Educational sector	0.23	-0.65	-0.42	-0.17	0.46	0.29	-0.14	0.21	0.07	-0.04	-0.07	-0.12	-0.04	1.57	1.53	-0.11	0.10	-0.01
Health & social work	3.60	-4.89	-1.29	2.53	-8.30	-5.77	-1.25	-3.75	-5.00	-1.86	-1.88	-3.74	-1.87	-3.70	-5.57	-2.46	-5.82	-8.28
Other services	-0.13	0.81	0.67	-0.10	1.50	1.40	0.00	0.18	0.18	-0.06	-0.19	-0.25	0.01	0.18	0.20	-0.01	-1.24	-1.25

Table 3 shows the results of the decomposition of the wage differentials by regions, as a percentage of the total wage differential, and taking the region of Ticino as reference.

For every region, the first column indicates the percentage of the wage differential explained by the difference in the workers characteristics. The second column shows the wage differential due to the different remuneration of the characteristics or differential due to the market. Finally, the third column shows the total wage differential.<sup>3</sup>

Since the region of Ticino has been taken as the reference region, and since it has the lowest wage among the Swiss regions, the total differential is always a negative value that has been normalized to one hundred. Then positive signs of the values in Table 3 must be interpreted as a contribution to the wage differential in disfavor of Ticino, whilst the negative sign indicates a contribution in favor of Ticino.

When analyzing the table, note that a percentage indicates how the wage differential explained by the model is assigned to the differences in characteristics (endowments) and remunerations.

The first row of the table indicates how the total wage differential is decomposed between endowment and remuneration. Thus, it can be seen that in all regions the most important contribution to the wage differential is attributable to the remuneration component. In general the proportion of the wage differential explained by the remuneration term is around 60%. The only exception regards the region of Zurich. Here the decomposition is more balanced, the proportion of the remuneration component explains 54% of total wage differential.

More in detail, the second row shows the effect of the intercept, that shows a negative sign in all the regions. This is particularly negative and

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<sup>3</sup> Using nominal wages, part or all estimated differences might be due to differences in the cost of living. However, it is reasonable to assume, first, that this will be comprised in the remuneration term, and not in the endowments, and, second, it should not interfere with the interpretation of single characteristics on the wage differentials.

high for the Lake of Geneva Region, it works in favor of Ticino and attenuate the total differential by the 76%. This implies that the other variables has to explain the 176% of the total differential between Ticino and the Lake of Geneva Region.

Education and experience explain an important part of the total negative differentials, and most of it is due to the differences in the remunerations. In contrast, due to remuneration, tenure slightly attenuates the wage gap between Ticino and the other Swiss regions.

With respect to the gender, Ticino is the regional labor market discriminating female workers most and this increases the regional wage gap.

Considering working permits, the relative high concentration of cross-border commuters in Ticino increases the wage differentials with respect to the other Swiss regions.

The relative lower share of middle to high skill workers in Ticino explains an important part of the existing wage differential.

Firms with more than 500 employees contribute to a higher wage gap between Ticino and the other regions, due both to the relative low share of very big firms in Ticino (endowments) and to the fact that the wage premium of workers employed in large firms as compared to small ones is lower than in the other Swiss regions.

Finally, considering the sectors, is important to note that manufacturing sector explains a part of the wage differential due principally to the remuneration component. Instead, the banking and insurance sector attenuates the wage differentials in favor of Ticino. This is not a surprise as the region of Ticino is the third financial place in Switzerland after Zurich and Geneva.

## **5 Conclusion**

In this paper, the wage differentials among different Swiss regions have been decomposed in a differential due to individual endowments and one due to a different remuneration of the characteristics (market).

The region of Ticino has been taken as reference in the regional wage decomposition.

A first result is that the differences are due to a higher proportion to the difference in the remuneration of the characteristics, and that only the region of Zurich shows a more balanced decomposition.

The variables which exert more influence in explaining the wage gap between the region of Ticino and the other Swiss regions are years of education, years of experience, the gender, cross-border commuters, middle high skill levels, firms with more than 500 employees and the manufacturing sector. On the other side, the variables which exert a more influence in attenuating the wage gap are years of tenure and the banking and insurance sector.

With respect to the human capital variables, i.e. years of education, years of experience and years of tenure, the distribution of this characteristics between the regions are similar, but differ in their remunerations.

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