

DISPLACED BY GLOBALIZATION: CHANCE OR THREAT?

A CASE STUDY*

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Abstract: The vision of globalization-displaced workers as permanent unemployed workers is prevalent in media and public. But is this perception of displaced workers as losers of globalization in general true? According to trade theory this must not be the case. After all, globalization leads not only to job destruction, but as well to job creation and thus to new and maybe even better paid job opportunities for displaced labor. Based on an empirical analysis of Swiss firm and individual data this paper shows (i) that while many workers displaced by globalization find new and sometimes even better paid jobs, notably old and unskilled workers withhold a high risk to be harmed after being displaced by globalization. While these groups at risk are the same as in other industrialized countries, this paper shows (ii) that the adjustment costs of globalization-displaced workers in Switzerland are interestingly considerably lower than in other European countries and the US.

JEL classification: F14; F16; J63

Keywords: Globalization; Displaced Workers; Switzerland

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1. Introduction

Globalization--defined as increasing international division of labor through trade with goods and services--leads on industry and firm level to structural adjustment and thus to job creation and destruction. Assessing this structural change, media and public focus strongly on job destruction, thereby presenting displaced workers as losers of globalization. The regular uproar following job cuts caused by globalization in the North shows that this fear is deeply anchored in the public mind.

Given this perspective, the critics toward restructuring firms and the public affinity to protect non-paying jobs by industrial policy seem to be legitimate. But is the perception of displaced workers as losers of globalization in general true? According to trade theory this must not be the case. After all, globalization leads also to job creation and thus to new and maybe even better paid job opportunities for displaced workers. Yet, the question of whether this theoretical expectation manifests itself in practice is however an empirical question.

In case of Switzerland the adjustment costs of displaced workers have--regardless its trigger and relevancy for economic policy--not yet been assessed. Nevertheless, previous empirical work from Sheldon (1999) on formerly unemployed workers in Switzerland suggests that the adjustment costs of globalization displaced labor in Switzerland could be significantly lower than in other countries. Not only, are the adjustment costs of formerly unemployed Swiss workers --as will be showed in section 2--clearly lower than the ones from displaced workers in other OECD countries. In addition, according to Salant (1977) the adjustment costs of formerly unemployed workers are even expected to be higher compared to displaced workers in general as their endowment with unfavorable sociodemographic characteristics is expected to be higher. Gibbons and Katz (1991) affirm this

expectation by showing that the “Lemons Problem” explains why labor market outcome in case of selective layoffs is worse than in case of mass layoffs. This assessment should provide a reason good enough to assess the adjustment costs and opportunities of globalization displaced labour in Switzerland and compare it to other OECD countries.

To do so, this study conducts the first analysis of employment and wage effects of workers who have lost their jobs in Switzerland in the wake of globalization and structural change based on Swiss firm and individual data. The analysis is directed by the following three research questions:

- (1) What happens to the affected workers during the reorganization?
- (2) Do they find new jobs and, if yes, where and at what price?
- (3) Which of the affected workers run a high risk to lose from displacement?

The remainder of the paper is structured as follows. Section 2 reviews briefly the basic ideas of trade theory and the so far conducted empirical research. Section 3 and 4 introduce the methodology and data used to run the empirical analysis. In section 5 the results of the descriptive and econometric analysis are presented. Section 6 concludes.

2. Globalization and Job Displacement: What we know by now

2.1. Theory

International trade theory has developed a broad body of literature which determines the winners and losers of an increasing international division of labor through trade with goods and services. Thereby a variety of conditions that describe real world situations are considered. In a nutshell, standard trade theory considers globalization to be beneficial to overall welfare while being a potential threat for workers endowed with characteristics specific to a non-competitive and thus descending industry: be it through real wage cuts (Jones, 1965), be it--assuming wage rigidity--through unemployment (Davis, 1998). Con-

trariwise, for mobile workers endowed with characteristics well demanded by or specific to the competitive and thus expanding industry, globalization can be beneficial.¹ Newer theories concerning fragmentation (Jones, 2000 such as Egger and Kreickemeier, 2008) and off-shoring (Feenstra, 2004) don't differ much from this assessment, despite that the labor market adjustment caused by trade in intermediates foremost takes place within the industry (i.e. contracting vs. expanding firms). Thus, trade theory suggests that workers harmed by globalization can, but must not be identical to workers displaced by globalization. After all, displaced workers can be endowed with characteristics or skills well demanded by expanding industries or firms.

Of course, the reverse can as well be true. In well developed countries such as Switzerland--holding a comparative advantage in the production of (human-) capital intensive goods and services--trade theory expects low skilled labor to be harmed by globalization. First, low skilled workers have a higher risk being displaced in the wake of globalization than medium and high skilled workers. Their employment share in labor intensive industries (apparel and clothing) or activities (production) is disproportional high (Kletzer, 2001). Second, globalization and technological change lead to an increase in the relative demand of high to low skilled labor (Deardorff 1998) and a shift of low skilled jobs from industry to the service sector worsening the labor market situation of the unskilled (Sheldon, 2008).² Thus after being displaced by globalization, the low skilled worker needs to find a new job under worse conditions. Taken to extremes, the displaced low skilled can

¹ For further details compare Krugman and Obstfeld (2003), chapter 3 and 4.

² Given the relative low capital endowment of the service sector relative to the industry, the labor productivity of low skilled and thus their wages in the service sector tend to be lower than in the industry. In case of Switzerland, the average wage of low skilled in the service sector was in 2007 10% lower compared to the industry sector (own calculation based on BFS, 2008).

accept the new situation and suffer from a relative or even absolute wage cut or - in case of wage rigidity - be faced with structural unemployment (Krugman, 1995).

However regarding labor displacement and potential groups at risk, trade theory alone doesn't tell the whole story. In addition, there's obviously need to draw on labor theory. Taken a labor theory perspective, old workers and workers loosing firm, industry or sector specific human capital are expected to run a high risk being harmed by displacement regardless of the trigger. First, according to the theories of human capital (Becker, 1962) and seniority (Laezar, 1979) older workers hold a higher risk of becoming unemployed once being displaced. The amortization time for the firm reemploying and reinvesting in an older worker is relative to a younger worker short, while the seniority wage of the older worker is relatively high. Thus holding all things equal but age, firms have a tendency to fill its vacancies with younger workers. Second, in order to get reemployed some workers need to change firm, industry or sector thereby running risk to loose accumulated specific human capital, be it through formal education, on-the-job training, information on the business etc. In case the (specific) human capital of a worker is reduced in the wake of displacement, so is his equilibrium wage; a wage cut the worker can except or become unemployed.³ Last but not least, displacement can go in line with a loss of union or efficiency wage rents (Fallick, 1996). Since the latter are rather seldom in industries with high competition their role in the here discussed framework is expected to be of minor relevance.

Thus, based on trade and labor theory we expect that workers displaced by globalization run especially high risk to loose (win) in case of the sociodemographic characteristics

³ For further details on human capital theory compare Becker (1962).

of low skills and high age, whereas the loss of specific human capital or previous wage rents are additional risks.

2.2. Empirical Evidence

The employment and wage effects of mass-layoffs are subject to the so called “Displaced Workers Literature”. Already in 1968, Palen and Fahey analyzed in a US case study the re-employment and unemployment quote of workers displaced after a firm closure. First empirical work based on survey data was conducted in the late 1980s. While Addison and Portugal (1989) focused on all displaced US workers, Kruse (1988) concentrated his research on trade-displaced US workers. These two strands pull through the by now many countries embracing empirical work⁴, whereas Ruhm (1991) and Jacobson, LaLonde and Sullivan (1993) are key references in general and Kletzer (2000 and 2001) regarding trade-displaced workers in particular. Given the here relevant research question this research can be broken down to three common observations and one research gap.

First, the losers of displacement are per definition those who don’t get reemployed or, in case of reemployment, experience permanent wage cuts. Second, in the medium term many displaced workers find a new job with neutral or positive wage effect. According to the OECD (2005) looking at 14 European countries in between 1994 and 2001, two years after displacement 57.3% of the workers are reemployed, 47.1% of them with neutral or positive wage effect.⁵ Accordingly, for some displaced workers job destruction goes in-

⁴ In Kuhn (2002) Australia, Belgium, Denmark, France, Germany, the Netherlands, U.K., USA; in OECD (2005) Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, the Netherlands, Portugal, Spain and U.K.; in Bognanno und Delgado (2005) Japan; in Kaplan et al. (2005) Mexico; in Huttunen et al. (2006) Norway and in Eliason and Storrie (2006) Sweden.

⁵ Note that the trade proxy used by the OECD (2005) and Kletzer (2001) is biased to overestimate the adjustment costs of workers displaced by globalization due to the solely concentration on the import-competing manufacturing sector. As is demonstrated in section 4, globalization also leads to displacement in export-oriented sectors (be it manufacturing or services), sectors in which the qualification profile of workers is higher and thus the adjustment costs due to globalization expected to be lower compared to the import-competing manufacturing sector. Therefore, not only the OECD displacement data referencing to import competing, but as well to all sectors is used for comparison reasons.

deed in line with wage cuts or unemployment. Using for the purpose of consistency the OECD numbers, 52.9% of reemployed workers experience wage cuts, while 42.7% are still or again looking for a job. Following the above definition, approximately 73% of the displaced workers are worse off two years after displacement while approximately 27% are even or better off. Only looking at high-international-competition manufacturing this ratio increases slightly to 77-to-23%, a ratio equivalent to the adjustment costs of trade displaced workers in the US two years after displacement within the time period 1979-1999. Yet, displaced workers in the US--generally known as having a more flexible labor market than continental Europe--experience less unemployment (36.6%), but more wage cuts (64.0%).⁶ Accordingly, as Irwin (2005) suggests, the plight of displacement should not be trivialized. Still, the data shows as well that the general perception of displaced workers as losers of globalization is not necessarily true. Many find a new job, some even to equal or better salary. Last but not least, the third common observation concerns the risk factors. As suggested by theory, the sociodemographic characteristics age and human capital are together with macroeconomic factors such as the business cycle and the general condition of the labor market indeed decisive for the individual adjustment costs/opportunities after displacement.

Yet, as footnote four suggests the research gap consists of the fact that none of these studies include the adjustment costs of Swiss workers displaced by globalization. As mentioned in the introduction, these could be significantly lower compared to other Western economies as the adjustment costs of formerly unemployed workers in Switzerland tend to be considerably lower than the adjustment costs of displaced workers in Europe and the US. According to Sheldon (1999) the share of formerly unemployed workers in Switzer-

⁶ For details compare Kletzer (2001).

land suffering two years after layoff from either unemployment or negative wage cut (declines decline) lies in between rounded 43% (26.1% unemployed, 17.3% income decline) regarding the laid off cohorts in between 1984 and 1987, rounded 45% (30.4%, 14.4%) regarding the laid off cohorts in between 1988-1990 and rounded 54% (39.7%, 14.0%) regarding the laid off cohorts in between 1990-1993, the beginning of the Swiss recession years in the 90s. Thus, for these three time spans the “looser/non-looser” ratio for formerly unemployed in Switzerland amounts to 43-to-57%, 45-to-55% or 54-to-46%, whereas even the highest ratio is considerably lower compared to the 77-to-23% ratio of the trade displaced workers in European and U.S. import competing sectors. In fact, due to the lemons problem outlined in the introduction this difference could even be more pronounced in case of globalization displaced workers in Switzerland. Thus, having hopefully excited some curiosity the next step will be to see if the latter indeed is true.

3. Methodology and Estimation Model

3.1. Case Studies

Following Storrie (1993) the analysis of the adjustment costs of workers displaced by globalization is conducted based on case studies. Case studies have the advantage that the reorganization is depicted holistically, key processes are better understood and the results can be underlined with specific examples. The selection of the case studies was done according to four criteria. First, a key trigger of the reorganization had to be globalization. Second, there must have been a mass-layoff assuring a big enough sample size. Third, to ease data collection only reorganizations in the last four years were considered and fourth, reorganizations in both import-competing and export oriented industries had to be included. Based on this criteria six reorganizations were chosen including the firms Bombardier (railway vehicle manufacturing), Calida (apparel), Ciba and Clariant (both speciality

chemicals), Lego (toys) and Roche (pharma). Section four gives an overview of the data used.

Data collection itself was realized using a standardized questionnaire. The firm data, including all displaced workers, was collected through firm interviews, while the individual respectively the worker data was collected by a written and anonymity assuring poll in the three official country languages German, French and Italian. Unlike the firm data the individual data includes a sub-set of the displaced workers due to a response rate below 100%.⁷ The firm data includes all six above mentioned firms, while the individual data includes due to in some cases more restrictive firm policies only workers displaced by Calida, Bombardier and Lego. Accordingly the resulting observations will be representative for the examined samples of the case studies and not for all displaced workers in Switzerland. Therefore, an additional analysis based on survey data was considered. Unfortunately, such data is currently not available for Switzerland.⁸ Thus, future research based on Swiss survey data--once available--will definitely be a valuable completion of the conducted case study approach. However, be aware that the adjustment costs might be overestimated if the chosen survey sample does not include the share of displaced workers finding a new job in the displacing firm itself.⁹ On important take away of the here conducted case study approach is--as will be showed in section 5--that the share of inplacements of the announced displacements can be sizable.

⁷ The actual response rate lied within 20-31%. Knowing that in one-time written polls without further inquiries the response rate seldom amounts over 20% this is a good rate (Porst, 2001).

⁸ The needed coupling in between the Swiss population survey (SAKE) and the Swiss firm survey (BZ) is due to a missing algorithm currently not possible. Yet, to analyze the adjustment costs of workers loosing their job in restructuring firms (e.g. displacement of 10% in a certain year) active in particular import and export intensive sectors this coupling is premise.

⁹ Assuming rational firms inplaced workers are expected to be endowed with relatively well-demanded attributes. Thus the share of displaced workers finally being outplaced is expected to include more "lemons" than the overall displaced population. The results in section 5 underline this.

3.2. How to Measure What

The empirical strategy followed in this paper in order to answer the outlined research questions in section 1 can be set up in three steps. First, to answer what happens to the affected workers during reorganization the displacement framework and process is analyzed based on cross-sectional comparison of firm data. Table 1 gives an outline of the criteria and data considered. The criteria “time of reorientation” is defined as time span in between Advance Notice and the end of the notice period. The rest of table 1 should be self-explanatory.

Table 1: Criteria to Analyze Displacement Process and Framework

<i>Displacement Framework</i>	
Displacements according to	Advance Notice
	Time for reorientation
	Accompanying measures
Database: Firm sample (Bombardier, Calida, Ciba, Clariant, Lego, Roche)	
<i>Employment Effects During Displacement</i>	
Displaced workers according to	Inplacement
	Retirement
	Early retirement
	Given Notice
	Received notice with/without subsequent solution
Database: Firm sample (Bombardier, Calida, Ciba, Clariant, Lego, Roche)	

Second, to answer if displaced workers find a new job and, if yes, where and at what price, the employment fate of displaced workers is analyzed based on a cross-sectional analysis of worker data. Table 2 gives an outline of the criteria and data considered.

Table 2: Criteria to Analyze Employment and Wage Effects after Displacement

<i>Employment Effects after Displacement</i>	
Job seeker according to	Reemployment
	Employment
	Sector and industry of employment
	Wage effect (-, neutral, +)
	Unemployment (implicit loss of income)
Database: Worker sample	

The criteria reemployment and employment differ in the sense that a worker reemployed after displacement must not be employed at the time of the poll (e.g. repeated unemployment). The industry of employment is defined on the Swiss two-digit industrial classifica-

tion. The wage effect results from the ratio new to old wage. Thus, in distinction to Jacobson, LaLonde and Sullivan (1993) the wage effect on the employed is not mixed with the income effect of the unemployed displaced workers. There's a good reason for this approach. First, by mixing the two effects it cannot be distinguished if a worker earns less for his work or for being unemployed. Second unlike wages, unemployment payments are determined by political and not by market forces. The resulting income cuts due to unemployment are thus not only politically "accepted" but as well ex-ante known (Switzerland 20-30% of the last wage).

Third, to answer which of the displaced workers run a high risk to lose from displacement in the wake of globalization an econometric analysis based on pooled worker data is conducted in order to identify the risk factors concerning unemployment and wage cuts. Section 4 describes the estimation method in detail.

3.3. Econometric Model

As done in previous research (compare section 2) those displaced workers who at the time of the survey either experience a wage cut or unemployment are considered to belong to the losers of globalization. Thus the question of interest is which factors are linked with a higher probability respectively risk to be either affected by unemployment or a negative wage cut. Given the binominal character of the depended variable Unemployment [$y_i \in (1 = \text{unemployed}, 0 = \text{other})$] and the ordinal character of the dependant variable Wage Effect [$y_i \in (1 = \text{negativ}, 2 = \text{neutral}, 3 = \text{positiv})$] the risk to become unemployed is analyzed within on a logit model while the risk of a experiencing a wage cut is analyzed within an ordered logit model.¹⁰ Both models can be given in a latent-variable interpretation. This in-

¹⁰ To test the monotony assumption of the ordered logit model the wage effect was as well analyzed within a multinomial logit model. The resulting estimates showed however, that the here available sample is too small for the latter model to result in statistically secured data.

terpretation distinguishes in between the observed binary or ordinal outcome, y_i , and an underlying continuous unobservable (or latent) variable, y_i^* .¹¹

Based hereupon the “Unemployment Estimation” (logit model) reads as follows:

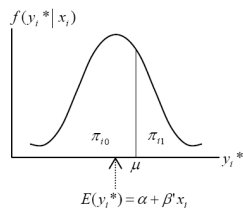
$$y_i^* = \alpha + \beta' x_i + \varepsilon_i, \tag{3.3.-1}$$

$$y_i = \begin{cases} 1, & \text{wenn } y_i^* > \mu, \\ 0, & \text{wenn } y_i^* \leq \mu, \end{cases}$$

whereas:

- y_i^* = unemployment probability/potential of person i ,
- y = 1 (unemployed), 0 (other),
- α = constant,
- β = column vector of parameters to be estimated, measuring the influence of variables in x ,
- x = column vector of all in t (before displacement) und $t-1$ (after displacement) captured, potential influencing factors of a workers employment fate,
- μ = a not closer defined threshold which's exceedance leads to unemployment,
- i = individual/observation unit ($i = 1, 2, \dots, n$), whereas n stands for the sample size,
- ε = error term.

Thus, it is only observed whether the latent variable is exceeded and i becomes unemployed or not. The identification of the latent variable requires that we fix its scale by placing a restriction on the variance of the error term ε_i . By setting $\sigma = \pi^2/\sqrt{3}$ and respectively $\frac{\varepsilon_i}{\sigma} \sim L(0, \pi^2/3)$ the following logit model (3.3.-2) can formally and graphically be derived from (3.3.-1).

$$\left. \begin{aligned} \pi_{i1} &= P(y_i^* > \mu) = \Lambda\left(\frac{\alpha - \mu + \beta' x_i}{\sigma}\right) = \frac{1}{1 + e^{-\left(\frac{\alpha - \mu + \beta' x_i}{\sigma}\right)}}, \\ \pi_{i0} &= P(y_i^* \leq \mu) = 1 - \pi_{i1}, \end{aligned} \right\} \tag{3.3.-2}$$


whereas:

- π = probability that a in t displaced worker is unemployed [$y=1$] or not [$y=0$] in $t-1$,
- Λ = standard logit distribution function.
- f = standard logit density function.

¹¹ The following derivation of the two models is based on Cameron and Trivedi (2009) and Winkelmann and Boes (2006).

The parameters of the logit model are estimated using maximum-likelihood.¹² The corresponding likelihood function is:

$$L = \prod_{i=1}^n \pi_i^{y_i} (1 - \pi_i)^{1-y_i}. \quad (3.3-3)$$

The “Wage Effect Estimation” (ordered logit model) reads - following the same procedure - as follows.

$$y_i^* = \alpha + \beta' x_i + \varepsilon_i, \quad (3.3-4)$$

$$y_{i1} = \begin{cases} 1, & \text{if } y_i^* \leq \gamma_1 \\ 0, & \text{other} \end{cases}$$

$$y_{i2} = \begin{cases} 1, & \text{if } \gamma_1 \leq y_i^* < \gamma_2 \\ 0, & \text{other} \end{cases}$$

$$y_{i3} = \begin{cases} 1, & \text{if } y_i^* > \gamma_2 \\ 0, & \text{other} \end{cases}$$

whereas different to (3.3-1)

- y= 1 (negative wage effect), 2 (neutral wage effect), 3 (positive wage effect),
- x= column vector of all in t (before displacement) and t-1 (after displacement) captured, potential wage influencing factors,
- y= a not closer defined threshold, the exceedance γ_1 goes in line with a change from a negative to a neutral wage effect whereas the exceedance of γ_2 goes in line with a change from a neutral to a positive wage effect.

By setting $\sigma = \pi^2/\sqrt{3}$ respectively $\frac{\varepsilon_i}{\sigma} \sim L(0, \pi^2/3)$ the following ordered logit model (3.3.-5)

can formally and graphically be derived from (3.3.-4).

$$\left. \begin{aligned} \pi_{i1} &= P(y_i^* \leq \gamma_1) = \Lambda\left(\frac{\gamma_1 - \alpha - \beta' x_i}{\sigma}\right) = \frac{1}{1 + e^{-\left(\frac{\gamma_1 - \alpha - \beta' x_i}{\sigma}\right)}}, \\ \pi_{i2} &= P(\gamma_1 \leq y_i^* < \gamma_2) = \Lambda\left(\frac{\gamma_2 - \alpha - \beta' x_i}{\sigma}\right) - \pi_{i1} = \frac{1}{1 + e^{-\left(\frac{\gamma_2 - \alpha - \beta' x_i}{\sigma}\right)}} - \pi_{i1}, \\ \pi_{i3} &= P(y_i^* > \gamma_2) = 1 - \pi_{i1} - \pi_{i2}, \end{aligned} \right\} \begin{array}{l} f(y_i^* | x_i) \\ \pi_{i1} \quad \pi_{i2} \quad \pi_{i3} \\ \gamma_1 \quad \gamma_2 \\ E(y_i^*) = \alpha + \beta' x_i \end{array} \quad (3.3.-5)$$

whereas different to (3.3.-2):

- π = probability that a in t displaced worker experiences a negative [y=1], a neutral [y=2] or positive [y=3] wage effect in t-1.

The maximum likelihood function for the estimation of the parameters reads as follows:

$$L = \prod_{i=1}^I \prod_{j=1}^3 (\pi_{ij})^{y_{ij}}. \quad (3.3.-6)$$

¹² The structure parameters α and β are unidentifiable. Estimated are the intercept $(\alpha - \mu / \sigma)$ and the coefficient (β / σ) .

These two estimation models are starting point for the econometric analysis in section 5. In order to get a big enough sample to estimate ML, the worker samples of Bombardier, Calida and Lego are --of course controlling for the different framework of the case studies-- pooled. Observations with missing values are foreclosed. Their estimation by multiple imputation is not pursued due to their small number and the case study character.

4. The Data: Mass-Layoffs, Triggers and Displaced Workers

As already mentioned in section 3, the data used consists out of six case studies with several thousands observations in the firm sample and several hundred observations in the worker sample. Table 3 gives an overview of the case studies.

Table 3: Data Overview

<i>Stylized Facts of Case Studies</i>			
Firm	Bombardier	Calida	Ciba
Industry	Railway vehicle manufacturing	Apparel	Specialty chemicals
Trade balance of industry	Net importing industry	Net importing industry	Net exporting industry
Kind of reorganization	Shutdown production site	Shutdown cuts division	Automation textile colors division
Trigger	GATS, international competition	Competition low wage countries	East migration textile industry
Time Frame of reorganization	03/2004-06/2005	02/2005-09/2006	10/2004-12/2006
Time Frame of job cut	10/2004-06/2005	02/2005-09/2006	01/2005-12/2006
Time frame of firm poll (FP)	03/2007-04/2007	10/2007	09/2007
Time frame of worker poll (WP)	05/2007-06/2007	11/2007	-
Displaced labor (firm sample)	387	93	320
Poll sample displaced workers	120 (rate of return 31%)	19 (rate of return 20%)	-
Firm	Clariant	Lego	Roche
Industry	Specialty chemicals	Toys	Pharma
Trade balance of industry	Net exporting industry	Net importing industry	Net exporting industry
Kind of reorganization	Restructuring textile colors division	Outsourcing production site	Restructuring Division Pharma
Trigger	East migration textile industry	Competition low wage countries	International competition
Time Frame of reorganization	10/2002-12/2005	08/2005-06/2006	05/2001-06/2004
Time Frame of job cut	1/2003-12/2005	11/2005-06/2006	06/2001-06/2004
Time frame of firm poll (FP)	06/2007	04/2007	02/2008
Time frame of worker poll (WP)	-	06/2007-07/2007	-
Displaced labor (firm sample)	299	342	991
Poll sample displaced workers	-	106 (rate of return 31%)	-

As depicted in table 3 the case studies embrace different kinds of reorganizations while the trigger has throughout a close link to globalization. In order to stay competitive with respect to the increasing competition from Asian producers respectively in Asia producing competitors, the toy manufacturer Lego outsourced the whole production (incl. capital stock) to the Czech Republic, the apparel producer Calida decided to close its cuts division and the speciality chemical manufacturer Ciba and Clariant automatized their textile colors production. In case of Bombardier and Roche the link to globalization might, at least on

first sight, be somewhat less obvious. The railway vehicle manufacturer Bombardier closed one of two production sites in Switzerland in the wake of the introduction of GATS, liberalizing domestic buying markets thereby leading to overcapacities and sharper competition. Last but not least, Roche fostered its specialization strategy strongly in order to stay on top in the highly competitive global innovation market thereby completely refocusing its pharma business. A more in depth description of the case studies (e.g. historical outline, firm statements) goes beyond the scope of this paper, but can be found in Wyss (2009, p. 7-15).¹³

Thus, in the wake of globalization Bombardier displaced 387, Calida 93, Ciba 320, Clariant 299, Lego 342 and Roche 991 workers. All of these workers are included in the firm sample. As noted in section 3, individual data could not be collected for all case studies due to different internal policies. In case of Bombardier (S=120), Calida (S=19) and Lego (S=106) individual data is available for a random sample of 20-30% of the displaced workers. This data only includes workers having looked for a new job after being displaced. Workers freely withdrawing from the labor market--be it due to pregnancy, working partner, fulltime advanced training or (voluntary early) retirement--were removed from the sample as there is nothing known regarding their potential future chances or difficulties on the labor market. In addition, observations with missing values were removed from the worker sample. Their calculation through multiple estimation is passed as their number is relatively small resulting into a large enough remaining sample and the case study character of this paper.¹⁴ For the econometric analysis the sample of the unemployment estima-

¹³ This study is written in German. On demand, the author can send an outline in English to interested readers.

¹⁴ From total 244 observations 27 were removed from the worker data due to a freely withdraw from the labor market resulting in remaining 217 observations. From these observations maximal 3 were removed in the descriptive analysis whereas in the econometric analysis depending on the research question 21 (unemployment) up to 33 (wage effect) observations had to be removed due to missing values caused by non response in the poll.

tion amounts to 196 observations, while the sample of the wage effect estimation counts 153 observations.

5. Displaced by Globalization: Analysis of Labor Market Effects

Section 5 is structured in a descriptive and econometric analysis, whereas the research question one and two are due to their univariate nature part of the former, the research question three is due to its multivariate nature part of the latter. Both sections are focused on the main results of the analysis. A more in depth analysis can be found in Wyss (2009).

5.1. What Happens During and After Displacement

In a first step, the fate of the displaced workers during the reorganization is of interest. How is the displacement conducted? Which employment effects are yet observed during displacement? According to the depicted criteria in table 1 (p. 10) the cross-sectional descriptive analysis of the firm data can be summarized in three key observations.

First after being informed of the upcoming displacement, affected worker don't lose their job immediately. They have a longer time span for a professional reorientation at their disposal. Table 4 shows that while all firms used an advanced notice, some did so rather at short notice (e.g. Calida). Yet, in the end--amongst others due to an extension of the notice period as social-compensation measure--displacement began in all case studies with a delay of min. 4 to max. 9 months wearing on for min. 1 to max. just under 4 years.

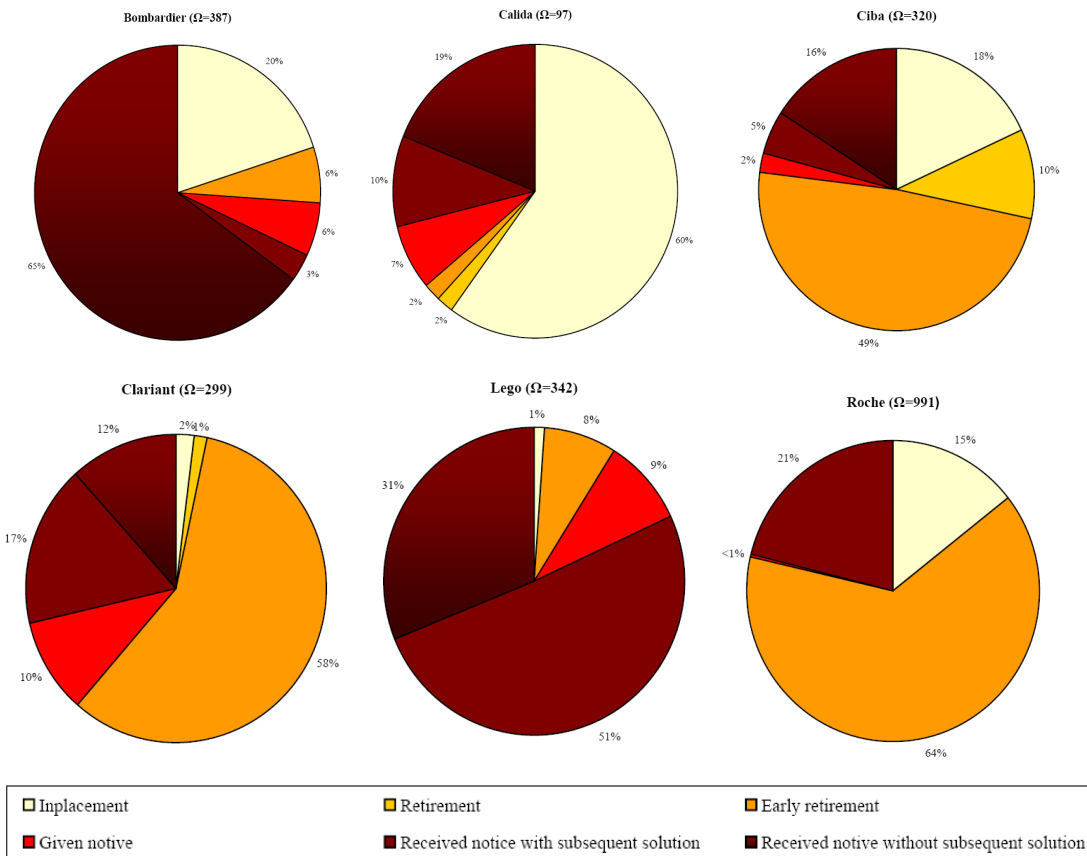
Second, the here observed firms took numerous measures (e.g. compensation of potential wage cuts and mobility costs, initial aid)--many of them going beyond their legal duties (e.g. inplacement thanks due early retirement of non affected workers)--to cushion the social costs caused by globalization. Table 4 gives a brief overview. Thus, the critic of displacing firms conducting social free-riding doesn't appear to be justifiable in the here observed case studies.

Table 4: Displacement Framework

Firm	Advance Notice	Time of Reorientation (Min-Max)	Joint Accompanying Measures	Indiv. Accompanying Measures
Bombardier	7 months	8-18 months	Amongst others: In- and outplacement, initial aid/compensation, psychological care retraining, notice extension, early retirement	Amongst others: Compensation wage cut, inplacement due to early retirement, job protection for older workers, compensation for mobility costs
Calida	1 day	4-23 months		
Ciba	3 months	9-36 months		
Clariant	3 months	9-45 months		
Lego	3 months	4-14 months		
Roche	1 month	7-46 months		

Third, displacement should not be equated with given notice and given notice not with unemployment. Graph 1 shows that for 20-80% of displaced workers does not go in line with received notice, but with inplacement (1-60%), (firm financed early) retirement (4-64%) or given notice (2-10%). In the reverse conclusion, displacement indeed went in line with given notice for approximately 20-80% of displaced workers. Yet, at the end of the notice period by the majority over 2/3 (below 1/3) of displaced workers had--according to the firm data--a (no) follow-up solution.

Graph 1: Employment Effects during Displacement



5.2. Adjustment Costs of Globalization Displaced Workers

Regarding unemployment, this firm estimate seems compared to the in section 2 described adjustment costs observable in the US and other European countries “promising”. But let’s not rush and first have a look at the employment and wage effects after displacement based on the worker data of Bombardier, Calida and Lego. Following the depicted criteria in table 2 (p. 10) the cross-sectional descriptive analysis of the workers data can--again--be summarized in three key observations.

First, the vision of globalization-displaced workers as losers of globalization does not necessarily reflect reality. For around half of displaced labor displacement is no threat. Table 5 shows that 1-2 years after displacement approximately in between 70% and 92% of job-seeking displaced labor have found a new job, whereof approximately 60-80% with positive or neutral wage effect.

Table 5: Employment and Wage Effects after Displacement

<i>Firm</i>	<i>Time since Reorganization</i>	<i>Reemployment Quote</i>	<i>Employment Quote</i>
Bombardier	23-24 months	84%	83%
Calida	14 months	72%	72%
Lego	12-13 months	93%	92%
<i>Firm</i>	<i>Industry of Employment</i>	<i>Wage Effect</i>	<i>Unemployment Quote</i>
Bombardier	33% same sector and industry 31% same sector, different industry 36% switch from industry to services	27% positive 33% neutral 40% negative	17%
Calida	85% same sector and industry 7% same sector, different industry 8% switch from industry to services	8% positive 61% neutral 31% negative	28%
Lego	18% same sector and industry 52% same sector, different industry 30% switch from industry to services	48% positive 19% neutral 33% negative	8%

The comparison of the reemployment with the employment quote shows that the share of reemployed workers that has lost its job again at the time of the poll is with 1%-Point in case of Lego an Bombardier small. While a majority of approximately 60-90% of workers found their new job in the initial industry, roughly 10-40% changed sector in order to get reemployed leading to some tertiarization.

Second, these numbers show as well that for a not to trivialize number of displaced workers adjustment costs can be substantial. In the here analyzed reorganizations, 1-2 years after displacement yet approximately 30-40% of workers were confronted with a negative wage effect while roughly 10-30% of displaced workers were affected by long-term unemployment. Note that despite of the extensive social-compensation measures depicted in table 4 an average of 45% of all displaced workers declared not having been supported by their firms during the displacement period. This observation could be due to a breach of confidence or in the words of human resource theory a breach of the inner social contract.

Third, converting these numbers to the loser-non-loser (L-n-L) ratio--introduced in section 2 with regard to the empirical results of Kletzer (2001), OECD (2005) and Sheldon (1999)--the following rounded L-n-L ratios result for the here analyzed case studies: 50-to-50% in case of Bombardier and Calida and 38-to-62% in case of Lego. Now, compared to the L-n-L ratios in Europe (OECD, 2005) and the US (Kletzer, 2001) of approximately 80-to-20% in import competing sectors, the corresponding "Swiss" ratio in these three net importing industries are--as already anticipated in the introduction--considerably lower. The reason for these lower adjustment costs can be multiple and need to be analyzed in a study of its own. Maybe the Swiss openness leading to new job possibilities in other firms and industries combined with its flexible labor market and strong social net could explain some of the difference in adjustment costs.

Now, compared to the L-n-L ratio of the formerly unemployed in Switzerland the picture is not so clear. The expected Gibbons-Katz effect--that displaced workers should perform better than formerly unemployed due to an expected smaller share of lemons--cannot be observed clearly. In the case of Lego the L-n-L ratio of 38-to-62% is somewhat smaller

while in the case of Bombardier and Lego the L-n-L ratio of 50-50% is compared to the corresponding ratios of formerly unemployed workers in between 1984-1993 at least not definite higher.¹⁵ On one hand, the close results in between displaced and formerly unemployed workers in Switzerland underline the plausibility of the results of the here analyzed case studies. On the other hand, theory would have expected globalization displaced workers to perform somewhat better as formerly unemployed workers due to the lemons effect proposed by Salant (1977) and observed by Gibbons and Katz (1991). Yet, the somewhat missing Gibbons-Katz effect can to some extent be explained. First, in case of Bombardier and Calida the share of inplacements was with 20% respectively 60% relatively high compared to the 1% share in case of Lego. Assuming that firms have a tendency to keep the “good” workers, the finally outplaced workers are in case of Bombardier and Calida expected to include more lemons compared to Lego. Assuming that potential employers were aware of this situation, finding a new job for former Bombardier and Calida workers might have been more difficult compared to former Lego workers. Second, due to the fact that Bombardier, Calida and Lego represent displaced workers from rather labor-intensive activities (production) the case study selection of this study might overdraw the adjustment costs of globalization displaced workers. As the Roche case study depicts, the latter can as well include workers displaced from more skill intensive activities. Last but not least, the fact that the case study results are unlike the results from Sheldon (including all unemployed workers in Switzerland) based only on a sample of globalization-displaced workers might lead to some overestimation of the loser share due to the existence of confidence intervals.

¹⁵ L-n-L ratio of formerly unemployed after 1 year: 42-to-58% (1984-90), 49-to-51% (1990-93): after 2 years: 43-to-54% (1984-87), 42-to-58% (1987-1990), 54-to-46% (1990-1993).

Last but not least the comparison in between the L-n-L ratio in between globalization displaced and formerly unemployed workers results in one further interesting observation. By definition, similar L-n-L ratios must not be caused by similar effect. As showed in section 2, they are the sum of the share of workers experience negative wage effects or unemployment. The comparison of these single effects in between displaced and formerly unemployed workers in Switzerland shows that in relative terms the former loose more frequent due to a negative wage effect while the latter loose more frequent due to (repeated) unemployment. While after 1-2 years the share of globalization displaced workers experiencing a negative wage effect is located in between rounded 20-35% the corresponding range for formerly unemployed workers amounts to 10-20%. Looking at the other side of the medal, the corresponding unemployment share in case of globalization displaced workers is located in between rounded 10-30% while amounting to 25-40% in case of formerly unemployed workers. Thus, compared to formerly unemployed workers globalization displaced workers seem--at least in the here analyzed case studies--to be more often harmed by wage cuts than by unemployment in case of Switzerland.

5.3. Globalization and Displacement: The Risk Groups

After having descriptively analyzed the adjustment costs of globalization-displaced workers, the group of workers with a potentially high probability to be harmed either by wage cuts or unemployment needs to be identified. This is done by running the microeconomic model described in section 3.3 (p.11-13). Concrete the probability of a negative, neutral or positive wage effect is estimated based on the ordered logit model described in (3.3.-5) and the maximum likelihood function depicted in (3.3.-6) while the unemployment probability is estimated based on the logit model described in (3.3.-2) and the maximum likelihood function depicted in (3.3.-3).

The description of the unemployment and wage effect sample by mean, standard deviation, minimum and maximum specification of the estimated variables can both be found in appendixes 1-2. Most of the explanatory variables entering the estimations are based on the theoretical outline in section 2: age enters directly, skills through the proxy formal education (UNCTAD: SEC I, SEC II and TER) and occupational group (laborer, clerk, university graduate), specific human capital indirectly through the variables seniority and employment level and the loss of firm, industry or sector rents through the variables change of firm, industry or sector.¹⁶ In addition to these theoretically motivated variables the variables job search duration and employment duration enter the estimation(s). The motivation here is an empirical one as previous research shows that a relative long job search is positively related to higher adjustment costs while a longer wage cuts are negatively related to longer employment duration. Last but not least, the estimation includes various variables controlling for some discrimination (gender, marital status, nationality) and for the different framework of the three analyzed case studies (firm dummy, labor market condition during displacement and time period since displacement). The labor market condition during displacement is modeled using the adjusted cantonal unemployment quote (e.g. in case of Calida the one from the canton Lucerne). This approach allows controlling for the fact that an unemployment quote of X% in a structural weak canton can be indicator for a good labor market situation while in a structural strong canton the same quote can indicate a bad labor market situation. Of course, the adjustment costs are expected to be positively correlated with a bad labor market situation. The sample descriptions show further that all but two explanatory variables are categorical variables as the

¹⁶ Firms invest more in full-time workers. Accordingly we expect them to have a higher endowment with specific human capital than part-time workers. Note as well that due to perfect prediction the category seniority is defined broader in the unemployment estimation.

questions within the poll were formulated as easy as possible to assure a higher rate of return. Accordingly, these categorical variables were recoded in dummy variables (1=true, 0=not true), whereas the mean of a dummy variable describes in each case the share of workers with the dummy characteristic 1. Note that due to perfect collinearity only a subset of $n-1$ dummy variables belonging to the same variable will be estimated. The left out dummy variable serves as reference. Finally, the three control variables need to be estimated in separate estimations due to multicollinearity.

Appendixes 3-4 show the results of the unemployment and wage effect estimation. In order to improve the interpretation of the non-linear models the probability of unemployment such as of the different wage effects was as well estimated for the average person in each sample.¹⁷ This allows comparing the unemployment probability of a low skilled worker not only to the corresponding probability of a high skilled (reference category), but as well to the average worker in the sample.¹⁸ This comparison is eased to the depicted MM-statistic in the estimation outputs. The MM-statistic, known as well as the Segregation Index from Duncan and Duncan (1955)¹⁹, expresses the difference of the $p(y)$ -distribution in between each character and the average person in percentage points. The expected probability $E[p(y)]$ is calculated based on logit (3.3.-2) and ordered logit equations (3.3.-5) in section 3.3.

¹⁷ Thus, all variables are estimated in deviation from their mean.

¹⁸ Note that in non-linear models the probability distribution of the average person is not equal to the corresponding distribution of the mean in the sample ($f[E(x)] \neq E[f(x)]$). This explains the difference in the expected unemployment probability of the average worker in appendix 4 and the mean of the depending variable unemployed in appendix II.

¹⁹ However, not Duncan and Duncan but Schutz (1951) has developed the MM-statistic in order to measure income distribution. The MM-statistic is calculated as sum of the absolute difference in between the probability distribution of each variable compared to the one of the average person divided by 2. Be aware that the MM-statistic of the variables can not be compared one to one as the categories are not measured in the same unit (e.g. age in years vs, education in graduation degree).

The estimation output show that globalization and structural change are foremost a threat for old, low skilled worker. Unlike in case of the (lower) adjustment costs, the workers at risk losing from displacement in the wake of globalization are the same as in other OECD countries. While older displaced workers run a high risk becoming unemployed, displaced workers with a low formal education run a high risk of both a negative wage effect and unemployment.²⁰ Appendix 3 shows that the probability of a low skilled worker to experience a negative wage effect amounts to 82.2%, while the corresponding risk for a (medium) high skilled worker amounts to (31.3%) 13.4%. This statistically significant risk is roughly 50%-points higher compared to an average displaced worker (MM-statistic) and roughly six times higher compared to high skilled displaced workers. With the roughly seven-fold risk of becoming unemployed compared to high skilled workers, low skilled workers can in line with theory indeed be expected to belong to the important losers of displacement by globalization. Compatible hereto, all displacing firms gave to protocol that after displacement they shifted their labor demand towards higher skilled labor. However, with respect to unemployment the key risk group are older displaced workers. As expected by theory (short amortization time in combination with seniority wages) the probability of above 55-years old to become unemployed after being displaced by globalization amounts to 22.6%. As the MM-statistic shows, compared to the average displaced worker this is a statistically significant 21%-points higher unemployment risk. As comparison, from the workers in the age group of 46-55 years (below 25-45) “only” 2.6% (0.5%) are expected to become unemployed. In a nutshell, the older and lower skilled the higher the risk becoming unemployed, the lower the skills the higher the risk of experiencing wage cuts.

²⁰ Note, the statistically insignificant effect of the skill proxy occupational group is due to its far less precise definition of skills compared to formal education not surprising (bigger measurement errors).

Besides age and skills, a high seniority, a long job search, a change of industry and a bad labor market situation increase in line with theory and previous research the adjustment costs of displacement. There is as well some evidence for discrimination. Let's start from the top of the estimation outputs and move down. High seniority (high endowment with specific human capital²¹) has a statistically significant correlation both with a negative wage effect and unemployment. A displaced worker with a seniority of over 10 years has an expected probability for a negative wage cut of 44.5%, roughly the two-fold probability of workers with shorter seniority. With regard to unemployment, seniority is not such a problematic characteristic. The expected probability of displaced workers with high seniority is with 2.3% roughly 1%-point higher compared to workers with lower seniority. By contrast, with an expected unemployment probability of 14.1% a long job search (above 9 months) statistically significant increases the adjustment costs clearly.²² As expected earlier, as well the change of industry can result into the negative wage effect. The estimation outputs show some evidence for some discrimination. Foreigners with Swiss residency run a 1.2%-point statistically significant higher risk than the average person to become unemployed, while border crossers seem to be more affected by a wage cuts. However, once the estimation is controlled for the fact that border crossers might suffer wage cuts due to re-employment in Germany or France, both countries with lower wage levels than Switzerland, this correlation is not any longer statistically significant. Furthermore, in case of the higher unemployment probability of foreigners not only discrimination, but as well language problems could be decisive. Last but not least, let's have a look at the case study

²¹ A further not yet mentioned explanation could be a relative low employability due to the long absence on the market of job seekers.

²² The based on previous research unexpected negative correlation in between wage and a job search above 3 months is statistically insignificant and could amongst other be caused by an endogeneity problem (unclear cause-effect relation). It could be possible that some of the workers know already very early that--in order to get reemployed--they need to accept a wage cut. Not accepting this situation in the beginning they extend their search. Taking this perspective, the negative wage effect would be cause for the long job search and not vice-versa.

control variables. While none of them is statistically secured correlated with the wage effect, the contrary is true in case of the unemployment probability. The estimation output shows that workers displaced by Bombardier (expected unemployment probability 2.3%) run compared to workers displaced by Lego (expected unemployment probability 0.2%) a statistically significant higher risk of becoming unemployed. As already noted in section 5.2 this could be due to the higher lemon (inplacement) share in case of Bombardier compared to Lego. The calculation of the average marginal effect of the only metric variables “unemployment level” and “time since end of displacement period” according to Bartus (2005) show that especially that the former matters by far more than the latter regarding adjustment costs. While a 1% increase of the time passed since the displacement period leads to a 0.23% higher unemployment probability, a 1% increase of the adjusted cantonal unemployment quote leads to a 4.32% higher risk of becoming unemployed. This strong influence of the labor market condition on the adjustment costs is not further surprising. However, given the current economic crisis with the constantly increasing unemployment, it is neither not comforting.

6. Concluding Remarks

In the opening of this paper three research questions were stated: What happens to the affected workers during the reorganization, do they find new jobs and, if yes, at what price and who are the potential losers from displacement by globalization. Based on the findings of this paper these questions can be answered as follows:

First, after being informed of the upcoming displacement workers don't lose their job immediately, but have at least several months up to several years time for their professional reorientation. In addition, displacement should not be equated with given notice and

given notice not with unemployment. Already during the displacement period many workers find a new job within or outside the displacing firm.

Second, the vision of globalization-displaced workers as losers of globalization does not necessarily reflect reality. While the plight of displacement should by no means be trivialized, this study shows that many displaced workers find a new job to equal or better salary. However, as expected due to previous research displacement by globalization is for some workers as well closely linked with high adjustment costs, be it in form of wage cuts be it in form of long-term unemployment. Interestingly, this study shows that in case of Switzerland the share of globalization losers seems to be considerably lower than in other European countries and the US.

Last but not least, the empirical findings indicate--in line with previous research for other countries--that displaced old and low skilled workers are especially at risk being harmed by displacement in the wake of globalization. While the over 55-year-olds have a significant higher risk staying unemployed than the average worker, low skilled have a significant higher risk for both earning losses and permanent unemployment compared to high skilled.

Based on these results, policies that directly support the labor market reintegration of displaced old and low skilled workers seem most promising in minimizing the labor adjustment costs of globalization. The contrary seems to be true for policies that try to delay structural change since they prevent the potential winners among trade-displaced workers to take advantage of the job opportunities globalization offers them.

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Appendix I

Sample Wage Effect				
(S = 153)				
Variables	Mean	Standard Deviation	Min	Max
Wage effect in t				
negative	0.373	0.485	0	1
neutral	0.275	0.448	0	1
positive	0.353	0.479	0	1
Age in t				
below 25-45 years	0.562	0.498	0	1
46-55 years	0.366	0.483	0	1
56-65 years	0.072	0.259	0	1
Formal Education in t				
low skilled	0.098	0.298	0	1
medium skilled	0.641	0.481	0	1
high skilled	0.261	0.441	0	1
Occupational Group in t-1				
Low skilled	0.163	0.371	0	1
medium skilled	0.529	0.501	0	1
high skilled	0.307	0.463	0	1
Seniority in t-1				
below 3 years	0.105	0.307	0	1
3-5 years	0.105	0.307	0	1
6-10 years	0.203	0.403	0	1
above 10 years	0.588	0.494	0	1
Employment Level in t-1				
full-time	0.922	0.270	0	1
Job Search Duration with Respect to Reemployment				
below 1 month	0.542	0.500	0	1
1-3 months	0.144	0.352	0	1
4-9 months	0.176	0.382	0	1
above 9 months	0.137	0.345	0	1
Employment Duration				
below 6 months	0.307	0.463	0	1
6-12 months	0.144	0.352	0	1
13-18 months	0.235	0.426	0	1
above 18 months	0.314	0.466	0	1
Change of Firm				
yes	0.876	0.331	0	1
Change of Sector				
yes	0.739	0.441	0	1
Change of Industry				
yes	0.333	0.473	0	1
Married in t				
yes	0.641	0.481	0	1
Gender				
male	0.797	0.403	0	1
Nationality in t				
Swiss	0.608	0.490	0	1
foreigner with Swiss residence	0.176	0.382	0	1
border crosser	0.216	0.413	0	1
Firm Dummy				
Bombardier	0.516	0.501	0	1
Calida	0.026	0.160	0	1
Lego	0.458	0.500	0	1
Unemployment Level during Displacement Period				
adjusted cantonal unemployment quote	0.721	0.396	0.3	1.1
Time since End of Displacement Period				
months in between end of job cut and poll	17.732	5.470	12	23

Legend

*

t-1
t

Moment of displacement
Moment of poll

Appendix II

Sample Unemployment (S = 196)				
Variables	Mean	Standard Deviation	Min	Max
Unemployed in t				
yes	0.143	0.351	0	1
Age in t				
below 25-45 years	0.500	0.501	0	1
46-55 years	0.362	0.482	0	1
56-65 years	0.138	0.346	0	1
Formal Education in t				
low skilled	0.143	0.351	0	1
medium skilled	0.638	0.482	0	1
high skilled	0.219	0.415	0	1
Occupational Group in t-1				
Low skilled	0.179	0.384	0	1
medium skilled	0.546	0.499	0	1
high skilled	0.276	0.448	0	1
Seniority in t-1				
below 3-5 years	0.199	0.400	0	1
6-10 years	0.184	0.388	0	1
above 10 years	0.617	0.487	0	1
Employment Level in t-1				
full-time	0.913	0.282	0	1
Job Search Duration				
below 1 month	0.474	0.501	0	1
1-3 months	0.133	0.340	0	1
4-9 months	0.153	0.361	0	1
above 9 months	0.240	0.428	0	1
Married in t				
yes	0.673	0.470	0	1
Gender				
male	0.796	0.404	0	1
Nationality in t				
Swiss	0.587	0.494	0	1
foreigner with Swiss residence	0.204	0.404	0	1
border crosser	0.209	0.408	0	1
Firm Dummy				
Bombardier	0.520	0.501	0	1
Calida	0.051	0.221	0	1
Lego	0.429	0.496	0	1
Unemployment Level during Displacement Period				
adjusted cantonal unemployment quote	0.732	0.390	0.3	1.1
Time since End of Displacement Period				
months in between end of job cut and poll	17.827	5.420	12	23

Legend

*

t-1

Moment of displacement

t

Moment of poll

Appendix III

Wage Effect							
[Ordered Logit Model: y (1=negative, 2=neutral, 3=positive)]							
Explanatory Variables	(1)	(2)	(3)	E [p(y)]			MM
Average Person				y=1	y=2	y=3	
				0.301	0.411	0.288	0.000
Age in t							
below 25-45 years	0.834 [2.037]	0.897 [1.153]	0.91 [1.165]	0.268	0.410	0.322	3.487
46-55 years	0.685 [0.740]	0.721 [0.792]	0.73 [0.802]	0.298	0.411	0.291	0.328
above 55 years'				0.457	0.371	0.171	15.588
Formal Education in t							
low skilled	-3.394*** [-2.840]	-3.387*** [-2.829]	-3.374*** [-2.825]	0.822	0.142	0.036	52.018
medium skilled	-1.083* [-1.908]	-1.111** [-1.981]	-1.110** [-1.982]	0.313	0.410	0.276	1.204
high skilled'				0.134	0.336	0.530	24.221
Occupational Group in t-1							
low skilled	0.377 [0.418]	0.442 [0.494]	0.468 [0.526]	0.241	0.405	0.354	6.647
medium skilled	0.018 [0.034]	0.043 [0.083]	0.05 [0.097]	0.313	0.411	0.277	1.130
high skilled'				0.317	0.410	0.273	1.518
Seniority in t-1							
below 3 years	1.511** [2.403]	1.521** [2.420]	1.519** [2.418]	0.150	0.353	0.496	20.878
3-5 years	2.101*** [2.804]	2.105*** [2.846]	2.103*** [2.860]	0.089	0.271	0.640	35.243
6-10 years	1.188** [1.991]	1.161** [1.981]	1.155** [1.975]	0.196	0.387	0.416	12.882
above 10 years'				0.445	0.377	0.179	14.326
Employment Level in t-1							
full-time	-0.479 [-0.564]	-0.482 [-0.567]	-0.477 [-0.561]	0.309	0.411	0.280	0.797
part-time'				0.217	0.397	0.386	9.805
Job Search Duration with Respect to Reemployment							
below 1 month'				0.333	0.408	0.258	3.203
1-3 months	1.246** [2.054]	1.224** [2.028]	1.213** [2.012]	0.126	0.327	0.548	26.000
4-9 months	-0.008 [-0.016]	-0.01 [-0.019]	-0.017 [-0.032]	0.335	0.408	0.257	3.381
above 9 months	-0.217 [-0.309]	-0.218 [-0.312]	-0.227 [-0.328]	0.383	0.398	0.219	8.187
Employment Duration							
below 6 months	-0.737 [-1.218]	-0.69 [-1.154]	-0.668 [-1.126]	0.391	0.396	0.213	8.994
6-12 months	-0.197 [-0.261]	-0.195 [-0.253]	-0.184 [-0.239]	0.272	0.410	0.317	2.974
13-18 months	-0.354 [-0.541]	-0.306 [-0.473]	-0.281 [-0.440]	0.305	0.411	0.284	0.337
above 18 months'				0.235	0.403	0.361	7.386
Change of Firm							
yes	0.383 [0.433]	0.426 [0.483]	0.441 [0.500]	0.291	0.411	0.297	0.992
no'				0.376	0.400	0.224	7.491
Change of Sector							
yes	-1.296* [-1.851]	-1.296* [-1.866]	-1.291* [-1.866]	0.377	0.400	0.223	7.571
no'				0.142	0.345	0.513	22.493
Change of Industry							
yes	-0.284 [-0.571]	-0.274 [-0.553]	-0.274 [-0.554]	0.343	0.407	0.250	4.129
no'				0.282	0.411	0.307	1.978
Married in t							
yes	-0.259 [-0.652]	-0.288 [-0.736]	-0.297 [-0.759]	0.321	0.410	0.269	1.996
no'				0.268	0.410	0.323	3.515
Gender							
male	0.557 [0.897]	0.633 [1.039]	0.649 [1.060]	0.278	0.411	0.311	2.367
female'				0.402	0.392	0.206	10.074
Nationality in t							
foreigner with Swiss residence	0.085 [0.143]	0.085 [0.143]	0.082 [0.138]	0.244	0.406	0.351	6.295
border crosser	-1.022* [-1.688]	-1.016* [-1.665]	-1.032* [-1.697]	0.494	0.355	0.151	19.257
Swiss'				0.260	0.409	0.331	4.385
Firm Dummy							
Calida	-0.092 [-0.097]			0.415	0.388	0.197	11.413
Lego	0.896 [1.603]			0.209	0.394	0.397	10.925
Bombardier'				0.393	0.395	0.212	9.197
Unemployment Level during Displacement Period							
		-1.075 [-1.561]					
Time since End of Displacement Period							
			-0.074 [-1.527]				
Threshold							
Cut1	-0.841*** [-3.727]	-0.841*** [-3.741]	-0.841*** [-3.746]				
Cut2	0.907*** [4.499]	0.903*** [4.477]	0.901*** [4.474]				
Goodness of Fit							
Observations	153	153	153				
chi2	64.31	64.19	64.31				
df_m	25	24	24				
chi2 critical value ($\alpha < 0.01$)	34.38	33.20	33.20				
p>chi2	0.000	0.000	0.000				

Legend

'	Reference category
E [p(y)]	Expected probability of each character group to experience a negative (y=1), neutral (y=2) or positive (y=3) wage effect, calculated based on (1)
MM	Segregation index of Duncan and Duncan. Expresses difference of p(y)-distribution in between each character and the average person in percentage points; calculated based on (1)
[]	Robust t-values
Asterix	*** p<0.01, ** p<0.05, * p<0.1

Appendix IV

Unemployment						
[Logit Model y (1=unemployed, 0=otherwise)]						
Explanatory Variables	(1)	(2)	(3)	E [p(y)]		MM
				y=1	y=0	
Average Person				0.015	0.985	0.000
Age in t						
below 25-45 years	-4.116*** [-3.170]	-4.098*** [-3.099]	-4.096*** [-3.058]	0.005	0.995	1.070
46-55 years	-2.387*** [-2.797]	-2.453*** [-2.737]	-2.504*** [-2.785]	0.026	0.974	1.065
above 55 years'				0.226	0.774	21.017
Formal Education in t						
low skilled	2.022* [1.696]	2.138* [1.785]	2.124* [1.734]	0.026	0.974	1.061
medium skilled	1.880** [2.152]	2.009** [2.279]	2.034** [2.276]	0.023	0.977	0.724
high skilled'				0.004	0.996	1.190
Occupational Group in t-1						
low skilled	1.963 [1.465]	1.815 [1.431]	1.694 [1.383]	0.064	0.936	4.898
medium skilled	0.193 [0.253]	0.114 [0.147]	0.124 [0.160]	0.012	0.988	0.345
high skilled'				0.010	0.990	0.554
Seniority in t-1						
below 3-5 years	-0.996* [-1.741]	-1.067* [-1.791]	-1.102* [-1.808]	0.009	0.991	0.682
6-10 years	-1.128 [-0.859]	-1.117 [-0.848]	-1.121 [-0.846]	0.008	0.992	0.788
above 10 years'				0.023	0.977	0.753
Employment Level in t-1						
full-time	-1.009 [-1.370]	-1.293 [-1.642]	-1.397* [-1.713]	0.014	0.986	0.127
part-time'				0.038	0.962	2.246
Job Search Duration						
below 1 month'				0.003	0.997	1.241
1-3 months	3.192* [1.843]	3.317* [1.843]	3.322* [1.842]	0.069	0.931	5.329
4-9 months	1.715 [0.947]	1.8 [0.949]	1.788 [0.945]	0.017	0.983	0.114
above 9 months	3.989** [2.537]	4.110** [2.471]	4.147** [2.477]	0.141	0.859	12.527
Married in t						
yes	0.102 [0.175]	0.161 [0.281]	0.176 [0.309]	0.016	0.984	0.051
no'				0.014	0.986	0.101
Gender						
male	-0.079 [-0.119]	0.024 [0.038]	0.068 [0.105]	0.015	0.985	0.024
female'				0.016	0.984	0.098
Nationality in t						
foreigner with Swiss residence	1.242* [1.944]	1.399** [2.149]	1.442** [2.172]	0.028	0.972	1.248
border crosser	-0.451 [-0.494]	-0.451 [-0.486]	-0.407 [-0.431]	0.005	0.995	1.018
Swiss'				0.008	0.992	0.721
Firm Dummy						
Calida	-0.573 [-0.676]			0.013	0.987	0.216
Lego	-2.385** [-2.181]			0.002	0.998	1.324
Bombardier'				0.023	0.977	0.786
Unemployment Level during Displacement Period		2.897** [2.234]				
Time since End of Displacement Period			0.190** [2.187]			
Constant	-4.156*** [-4.120]	-4.173*** [-3.979]	-4.144*** [-3.935]			
Goodness of Fit						
observations	196	196	196			
chi2	42.78	42.39	42.37			
df_m	18	17	17			
chi2 critical value ($\alpha < 0.01$)	34.81	33.41	33.41			
p>chi2	0.001	0.001	0.001			

Legend

'
E [p(y)]
MM
[]
Asterix

Reference category

Expected probability for each character group to become unemployed (y=1) or not (y=0); calculated based on (1)
Segregation index of Duncan and Duncan. Expresses difference of p(y)-distribution in between each character and the average person in percentage points; calculated based on (1)
Robust t-values
*** p<0.01, ** p<0.05, * p<0.1