Appendix to "The Labor Market Effects of Opening the Border: New Evidence from Switzerland" *

Andreas Beerli (ETH Zurich) Giovanni Peri (UC Davis)

A Appendix Tables

Table A1: Distribution of Cross-Border Workers and Resident Immigrants across Language Regions in 2010

	Language region				Immigrant group
	German-speaking	French-speaking	Italian-speaking	Romansh-speaking	share
Resident Immigrants					
Germany	0.954	0.034	0.006	0.007	0.367
Portugal	0.391	0.566	0.026	0.017	0.130
France	0.210	0.782	0.008	0.000	0.106
Italy	0.399	0.216	0.379	0.005	0.078
Ex-Jugoslavia	0.799	0.163	0.036	0.003	0.053
Austria	0.936	0.054	0.010	0.000	0.027
Cross-Border Workers					
France	0.246	0.753	0.001	0.000	0.494
Italy	0.083	0.018	0.891	0.008	0.237
Germany	0.983	0.012	0.004	0.000	0.209
Austria	0.973	0.008	0.002	0.017	0.030
United Kingdom	0.339	0.633	0.028	0.000	0.007

Notes: The origin country shares of the four neighbouring countries were calculated using the national Census in 2000 and 2010 to 2012 in the case of resident immigrants and using data on cross-border workers from the Federal Statistical Office in 1998 and 2010 (the official name for this dataset is "Grenzgängerstatistik"). Note that an 'origin country' is the nationality of a worker in the cross-border worker data whereas it is the country of birth in the Census data. Furthermore, in the Census new resident immigrants are defined as individuals having not lived in Switzerland 5 years ago as in Beerli & Indergand (2014).

*Andreas Beerli: KOF Swiss Economic Institute, ETH Zurich, Leonhardstrasse 21, 8092 Zurich, Switzerland, beerli@kof.ethz.ch; Giovanni Peri: Department of Economics, UC Davis, One Shields Avenue, Davis Ca 95616, USA, gperi@ucdavis.edu.

Table A2: Pre-Trend Analysis of the Evolution of the Share of New Immigrants on Total Employment

Dependent variable: Share of new immigrants on total employment

Area level	Municipality			Commuting zone		
	(1)	(2)	(3)	(4)	(5)	(6)
$BR_m \cdot I(year = 1994)$	-0.00766	-0.00683	-0.00463	-0.00344	-0.00797	-0.00645
	[0.00886]	[0.00819]	[0.00664]	[0.00780]	[0.00782]	[0.00594]
$BR_m \cdot I(year = 1996)$	0.00751	0.00432	0.00539	0.00753	0.00394	0.00500
	[0.00496]	[0.00629]	[0.00712]	[0.00546]	[0.00584]	[0.00586]
$BR_m \cdot I(year = 2000)$	0.00909	0.00654	0.00987	0.0103	0.00816	0.0112
	[0.00427]**	[0.00452]	[0.00522]*	[0.00331]***	[0.00323]**	[0.00368]***
$BR_m \cdot I(year = 2002)$	0.00949	0.00939	0.0129	0.0109	0.00858	0.0116
	[0.00620]	[0.00611]	[0.00644]*	[0.00548]*	[0.00528]	[0.00548]**
$BR_m \cdot I(year = 2004)$	0.0159	0.0149	0.0190	0.0180	0.0155	0.0190
	[0.00813]*	[0.00896]	[0.00866]**	[0.00733]**	[0.00812]*	[0.00774]**
$BR_m \cdot I(year = 2006)$	0.0234	0.0225	0.0264	0.0248	0.0227	0.0261
	[0.00998]**	[0.0111]*	[0.0105]**	[0.00959]**	[0.0107]**	[0.0102]**
$BR_m \cdot I(year = 2008)$	0.0316	0.0281	0.0331	0.0337	0.0293	0.0336
	[0.0110]***	[0.0125]**	[0.0119]***	[0.0108]***	[0.0121]**	[0.0115]***
$BR_m \cdot I(year = 2010)$	0.0361	0.0353	0.0387	0.0395	0.0378	0.0408
	[0.0137]**	[0.0151]**	[0.0137]***	[0.0133]***	[0.0146]**	[0.0133]***
BR_m	0.0711			0.0719		
	[0.0282]**			[0.0275]**		
Year fixed effects	√	√	√	√	√	√
Area fixed effects		√	√		√	√
Bartik			√			√
Observations	12,801	12,801	12,795	948	948	945
R-squared	0.118	0.851	0.852	0.164	0.944	0.946

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. BR_m is one for municipalities (commuting zones) in the border region. $I(year = t)$ is a dummy for the year t. Regressions are weighted using the total workforce of cells.

Table A3: Effect of New Immigrants on Wage Levels of Earlier Immigrants, 2SLS Estimates by Education Group

Area level	Municipality				Commuting zone			
Instrument(s)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Dependent variable: Average log hourly wage of highly educated								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.0848	-0.318	-0.430	-0.152	-0.177	-0.404	-0.262	-0.0453
	[0.578]	[0.693]	[0.647]	[0.591]	[0.587]	[0.684]	[0.691]	[0.498]
F-stats	9.877	8.307	5.650	8.148	7.082	7.239	4.601	7.233
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.572	-0.785	-0.968	-0.373	-0.616	-0.845	-1.002	-0.260
	[0.867]	[0.979]	[1.009]	[0.833]	[0.925]	[1.032]	[1.186]	[0.858]
F-stats	11.57	11.04	9.224	10.87	10.41	10.57	9.438	10.56
Observations	6,827	6,826	6,786	6,618	903	902	902	901
A. Dependent variable: Average log hourly wage of middle educated								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.157	0.0509	-0.195	-0.181	-0.00677	0.149	-0.0384	-0.0195
	[0.370]	[0.272]	[0.318]	[0.310]	[0.291]	[0.209]	[0.307]	[0.276]
F-stats	6.397	6.556	5.586	6.534	4.389	4.597	3.187	4.597
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.168	0.0848	-0.207	-0.240	-0.00585	0.220	-0.189	-0.0267
	[0.457]	[0.375]	[0.405]	[0.393]	[0.352]	[0.303]	[0.419]	[0.386]
F-stats	11.22	13.02	11.19	12.99	8.603	9.229	6.128	9.229
Observations	10,665	10,662	10,547	10,485	945	943	943	943
C. Dependent variable: Average log hourly wage of low educated								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.134	-0.134	-0.119	-0.140	-0.0709	-0.0771	-0.0467	-0.180
	[0.497]	[0.502]	[0.387]	[0.321]	[0.469]	[0.470]	[0.412]	[0.280]
F-stats	3.874	4.327	3.905	4.267	3.517	4.240	4.326	4.240
$BR_m \cdot I(2000 \leq year \leq 2010)$	0.0408	0.0317	-0.0374	-0.0482	0.125	0.0993	0.0204	-0.156
	[0.523]	[0.532]	[0.372]	[0.312]	[0.529]	[0.525]	[0.375]	[0.323]
F-stats	7.742	8.403	7.380	8.240	6.572	7.525	6.500	7.525
Observations	11,034	11,029	10,922	10,892	947	944	944	944
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the average log hourly wage in a location and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. In row 1 in each panel the share of new immigrants is instrumented with two separate dummies for the Phase 1 and Phase 2 of the reform, $BR_m \cdot I(2000 \leq year < 2004)$ and $BR_m \cdot I(2004 \leq year \leq 2010)$. In row 2, the new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is given below the standard errors of each regression. Regressions are weighted using the group specific workforce of cells.

Table A4: Effect of New Immigrants on Hours Worked of Earlier Immigrants, 2SLS Estimates by Education Group

Area level	Municipality			Commuting zone		
Instrument(s)	(1)	(2)	(3)	(4)	(5)	(6)
A. Dependent variable: Log total hours worked by highly educated						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	6.142	6.170	1.328	3.762	3.852	-0.853
	[3.903]	[3.939]	[2.853]	[3.221]	[3.235]	[2.532]
F-stats	9.692	9.440	6.275	7.048	7.315	5.092
$BR_m \cdot I(2000 \leq year \leq 2010)$	4.825	4.850	0.756	2.312	2.402	-2.311
	[3.607]	[3.674]	[2.755]	[3.001]	[3.060]	[2.381]
F-stats	11.46	11.72	10.10	10.37	10.84	10.61
Observations	6,868	6,867	6,826	905	904	904
R-squared	0.944	0.944	0.967	0.963	0.963	0.982
B. Dependent variable: Log total hours worked by middle educated						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-1.802	-2.515	-1.439	-4.144	-4.567	-2.742
	[1.942]	[1.813]	[1.783]	[2.452]	[2.321]*	[2.250]
F-stats	6.398	6.880	5.884	4.389	4.791	3.557
$BR_m \cdot I(2000 \leq year \leq 2010)$	-1.674	-2.539	-1.849	-5.008	-5.518	-4.624
	[1.775]	[1.682]	[1.677]	[2.482]*	[2.354]**	[2.112]**
F-stats	11.22	13.23	11.49	8.603	9.489	6.798
Observations	10,666	10,663	10,548	945	943	943
R-squared	0.946	0.944	0.956	0.960	0.959	0.969
C. Dependent variable: Log total hours worked by low educated						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.328	-0.379	-0.419	-2.463	-2.468	-2.262
	[2.160]	[2.298]	[2.024]	[2.420]	[2.536]	[2.197]
F-stats	3.874	4.346	3.915	3.517	4.217	4.316
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.00588	-0.0591	0.148	-3.949	-4.028	-3.378
	[1.985]	[2.165]	[2.285]	[2.900]	[3.181]	[2.272]
F-stats	7.742	8.482	7.451	6.572	7.524	6.533
Observations	11,034	11,029	10,922	947	944	944
R-squared	0.907	0.907	0.931	0.934	0.933	0.956
Year/Area fixed effects	√	√	√	√	√	√
Bartik		√	√		√	√
Demo. controls			√			√

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of log total hours by education group in a location and year on the share of new immigrants, ($IM_{m,t}/TOTEMP_{m,t}$), on the total workforce. In row 1 in each panel the share of new immigrants is instrumented with two separate dummies for the Phase 1 and Phase 2 of the reform, $BR_m \cdot I(2000 \leq year < 2004)$ and $BR_m \cdot I(2004 \leq year \leq 2010)$. In row 2, the new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is given below the standard errors of each regression. Regressions are weighted using the group specific workforce of cells.

Table A5: Effect of New Immigrants on the Distribution of Earlier Immigrants Across Management Levels Within Education Groups, 2SLS Estimates

Area level	Municipality				Commuting zone			
Dependent Variable (Group Share in 1998)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Highly educated				
Share in high manag.	0.114	0.113	-0.144	0.273	0.0214	0.0111	-0.752	0.461
(0.189)	[0.790]	[0.787]	[0.852]	[0.894]	[0.928]	[0.929]	[1.176]	[1.096]
Share in middle manag.	0.413	0.410	0.465	0.277	0.335	0.319	0.989	0.0915
(0.215)	[0.731]	[0.740]	[0.791]	[0.834]	[0.809]	[0.833]	[1.046]	[0.870]
Share in low manag.	0.270	0.273	0.437	0.293	0.581	0.589	1.094	0.410
(0.281)	[0.935]	[0.938]	[0.957]	[0.910]	[0.808]	[0.822]	[1.032]	[0.831]
Share in no manag.	-0.797	-0.796	-0.757	-0.843	-0.938	-0.919	-1.331	-0.963
(0.315)	[0.710]	[0.714]	[0.717]	[0.673]	[0.574]	[0.582]	[0.703]*	[0.545]*
Observations	6,837	6,836	6,795	6,561	905	904	904	904
R-squared	0.434	0.434	0.437	0.429	0.375	0.377	0.376	0.371
F-stats	11.42	11.68	10.04	12.00	10.37	10.84	10.61	10.84
				B. Middle educated				
Share in high manag.	-0.0658	-0.0444	-0.0491	-0.0872	-0.178	-0.157	-0.240	-0.180
(0.018)	[0.192]	[0.185]	[0.204]	[0.195]	[0.234]	[0.228]	[0.328]	[0.260]
Share in middle manag.	0.167	0.105	0.0856	0.236	0.192	0.157	0.226	0.275
(0.04)	[0.303]	[0.257]	[0.282]	[0.359]	[0.348]	[0.310]	[0.362]	[0.408]
Share in low manag.	0.134	0.274	0.305	0.456	0.0797	0.288	0.275	0.685
(0.228)	[0.502]	[0.447]	[0.457]	[0.380]	[0.426]	[0.402]	[0.485]	[0.400]*
Share in no manag.	-0.235	-0.334	-0.342	-0.605	-0.0935	-0.288	-0.261	-0.780
(0.714)	[0.677]	[0.587]	[0.615]	[0.680]	[0.612]	[0.562]	[0.712]	[0.656]
Observations	10,574	10,571	10,459	10,303	944	942	942	942
R-squared	0.394	0.392	0.398	0.361	0.513	0.513	0.527	0.419
F-stats	11.12	13.11	11.39	12.94	8.593	9.479	6.782	9.479
				C. Low educated				
Share in high manag.	-0.0853	-0.0917	-0.113	-0.0851	-0.0797	-0.0847	-0.110	-0.0819
(0.003)	[0.0584]	[0.0634]	[0.0734]	[0.0719]	[0.0678]	[0.0662]	[0.0817]	[0.0679]
Share in middle manag.	-0.00839	-0.0119	-0.0236	-0.0300	0.0205	0.0182	0.0121	-0.0271
(0.003)	[0.0631]	[0.0636]	[0.0702]	[0.0669]	[0.0697]	[0.0682]	[0.0817]	[0.0792]
Share in low manag.	0.856	0.894	0.859	0.801	0.989	1.024	1.298	1.043
(0.076)	[0.575]	[0.597]	[0.601]	[0.610]	[0.649]	[0.683]	[0.866]	[0.765]
Share in no manag.	-0.762	-0.790	-0.723	-0.686	-0.930	-0.957	-1.200	-0.934
(0.918)	[0.597]	[0.622]	[0.630]	[0.634]	[0.699]	[0.738]	[0.918]	[0.820]
Observations	10,934	10,929	10,829	10,730	947	944	944	944
R-squared	0.269	0.263	0.287	0.291	0.255	0.254	0.186	0.221
F-stats	7.592	8.283	7.369	8.138	6.572	7.524	6.533	7.524
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the share of workers in a management level on the total workforce of an education group in an area and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. The new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is the same for each management level among an education group. Regressions are weighted using the group specific workforce of cells.

Table A6: Effect of New Immigrants on the Distribution of Earlier Immigrants Across Job Tasks Within Education Groups, 2SLS Estimates

Area level	Municipality				Commuting zone			
Dependent variable (Group Share in 1998)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Highly educated				
Share in complex tasks	-0.483	-0.498	-0.641	-0.344	-0.563	-0.616	-1.040	-0.384
(0.225)	[0.629]	[0.599]	[0.669]	[0.604]	[0.601]	[0.584]	[0.744]	[0.689]
Share in intermed. tasks	-0.0787	-0.0628	0.0604	-0.0291	-0.173	-0.121	0.226	-0.0792
(0.747)	[0.881]	[0.841]	[0.893]	[0.780]	[0.782]	[0.763]	[0.878]	[0.879]
Share in simple tasks	0.562	0.561	0.580	0.374	0.736	0.738	0.815	0.463
(0.029)	[0.560]	[0.560]	[0.614]	[0.398]	[0.511]	[0.519]	[0.644]	[0.425]
Observations	6,864	6,863	6,822	6,586	903	902	902	902
R-squared	0.361	0.361	0.359	0.343	0.197	0.197	0.194	0.121
F-stats	11.46	11.73	10.11	11.92	10.37	10.85	10.61	10.85
				B. Middle educated				
Share in complex tasks	0.144	0.159	0.160	0.109	0.112	0.124	0.148	0.0987
(0.016)	[0.194]	[0.180]	[0.191]	[0.163]	[0.184]	[0.177]	[0.230]	[0.172]
Share in intermed. tasks	-1.479	-1.454	-1.481	-0.793	-1.636	-1.632	-2.055	-1.011
(0.847)	[0.925]	[0.839]*	[0.846]*	[0.602]	[1.025]	[0.969]	[1.153]*	[0.686]
Share in simple tasks	1.335	1.294	1.321	0.683	1.524	1.508	1.908	0.912
(0.137)	[0.946]	[0.852]	[0.844]	[0.636]	[1.028]	[0.964]	[1.129]	[0.699]
Observations	10,657	10,654	10,539	10,381	945	943	943	943
R-squared	0.140	0.151	0.160	0.245	0.095	0.101	0.021	0.169
F-stats	11.22	13.26	11.50	13.15	8.603	9.489	6.798	9.489
				C. Low educated				
Share in complex tasks	0.0567	0.0517	0.0529	0.0339	0.0577	0.0542	0.0361	0.0352
(0.001)	[0.0687]	[0.0620]	[0.0726]	[0.0750]	[0.0889]	[0.0829]	[0.0946]	[0.0865]
Share in intermed. tasks	0.391	0.414	0.424	0.520	0.561	0.588	0.906	0.625
(0.265)	[0.663]	[0.648]	[0.631]	[0.626]	[0.928]	[0.898]	[0.972]	[0.870]
Share in simple tasks	-0.448	-0.465	-0.476	-0.553	-0.619	-0.643	-0.942	-0.660
(0.734)	[0.632]	[0.628]	[0.617]	[0.614]	[0.878]	[0.857]	[0.944]	[0.838]
Observations	11,025	11,020	10,913	10,814	947	944	944	944
R-squared	0.374	0.373	0.408	0.355	0.302	0.303	0.338	0.267
F-stats	7.689	8.417	7.358	8.231	6.572	7.524	6.533	7.524
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the share of workers in a task group on the total workforce of an education group in an area and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. The new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is the same for each task group among an education group. Regressions are weighted using the group specific workforce of cells.

B Data Appendix

B.1 Construction of Adjusted Average Log Hourly Wages

To construct an adjusted wage outcome measures cleaned from the effect of individual, demographic characteristics, we follow a procedure suggested by Peri & Sparber (2009). We regress the log hourly wages of individual workers on a full set of age dummies (46 dummies), dummies for the education level (2 dummies), marital status, gender and tenure and tenure squared.

$$\begin{aligned} y_{i,n,t} &= \alpha_{n,t} + \sum_{a=18}^{64} \beta_{a,n,t} \left(AGE_{i,n,t} = a\right) + \gamma_{n,t} EDU^{M}_{i,n,t} + \delta_{n,t} EDU^{H}_{i,n,t} \\ &\quad + \phi_{n,t} TEN_{i,n,t} + \psi_{n,t} TEN^{2}_{i,n,t} + \eta_{n,t} MAR_{i,n,t} + \rho_{n,t} GEN_{i,n,t} + \epsilon_{i,n,t} \end{aligned}$$

where $y_{i,n,t}$ is the log hourly wage of individual i with nationality $n \in \{\text{natives, earlier immigrants}\}$ in wave t. We do this regressions separately for natives and earlier immigrant in each year.[1] Then, we subtract an individuals predicted wage from its actual outcome. This residual represents an individual's wage cleaned form demographic effects. Finally, we collapse the data on the level or municipalities or commuting zones to get the average of the adjusted log hourly wage using each individuals survey weight.

[1] In the wage regressions we exclude wages above the 99th percentile.