

A New Data Set for the Analysis of Migration and Integration in Switzerland

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Content

Introduction

Part I

- Origins of the data base
- Legal and organisational aspects

Part II

- Preparation data sets
- Validation procedure
- Final content

Part III

- Application

Conclusions

Introduction

- Increase and diversification of migration patterns, importance of robust analyses (research, public, policy makers)
- **Need of longitudinal data** to fully understand migration and its determinants.
- **Development of record linkage after WWII** for the welfare state and the taxation system, introduction large files on individual citizens
- **New statistical methods and rise of information technology** contributed to the development of scientific research, the use of administrative registers and adoption of longitudinal approaches
- **Nordic countries**, for example Norway has access to the Central Population Register since 1964 (education, labor force, etc.)
- Switzerland?

Part I

- Origins of the data base
- Legal and organisational aspects

Origins of the data base

Absence of longitudinal data on recent migration flows

Swiss National Cohort, SNSF

- ZAR -2008, VZ 1990/2000, mortality (BEVNAT)
- Probabilistic data matching approach

Contemporary Migration Flows, SNSF

- ZAR 1981-2005, VZ 1990/2000, BEVNAT
- Probabilistic data matching approach

2013, Parliamentary Control of the Administration (PCA):
Evaluation of the residence of foreign nationals under the
Agreement on the Free Movement of Persons

- Linkage of ZEMIS, AVS, AI, AC, ESPA



Origins of the data base

The Germans

PhD: Immigration and Settlement? **German Migration Flows to and from Switzerland** under the Provision of Free Movement of Persons

Method: **Construction of a longitudinal data base** by linking different administrative data sets and surveys from SFSO

- Central Register for Foreign Nationals (ZAR)
- Population and Household Register (STATPOP)
- Structural Survey (RS)

Origins of the data base

The Germans

December 2012	First contact with SFSO
March – April 2013	Negotiations/meetings, contract of data protection
June 2013 – February 2014	Data preparation and deliveries (10x)
February – June 2014	Data linkage



Black Box

Data
delivery
(anonym.)

Data
linkage

Origins of the data base

SNSF project on emigration and nccr – on the move

Economic and social impact of emigration and migratory movements from and to Switzerland

- Philippe Wanner and Ilka Steiner
- SNSF-Project
- October 2014 – December 2015

nccr – on the move

- 2014: Kick-off
- Projects
 - **Demographic** Evolutions
 - Inventory of Individual Statistical Data on Migration (Wanner, Fibbi, Lacroix)
 - Demographics of New Forms of Mobility (Wanner, Vidal Coso, Zufferey, Milivinti)
 - Legal Framework
 - Market Drivers
 - **Labor Market** Effects of “New” Migration to Switzerland (Flückiger, Müller, Ariu, Ngyen)
 - Societal Dynamics
 - The new International **Student** Mobility. Between the South and the North (Piguet, Riaño, Lombard)
 - **Discrimination** as an Obstacle to Social Cohesion (D’Amato, Fibbi, Pecoraro, Zschirnt)

Legal and organizational aspects

Federal Statistics Act (FSA)

- 2013: Partial **revision** regarding data linkages (art 14a).
- January 15th 2014: **The new decree allows for the linkage of different data sources by the SFSO staff as well as for the involvement of external researchers.**

Art. 14.a.I: In order to fulfil its statistical duties, the Federal Office may link data, provided the data is rendered **anonymous**. In the event that data links involve data considered especially sensitive or that data links generate personal profiles, the linked data must be **deleted on completion** of the statistical analysis. The Federal Council regulates the details.

Legal and organizational aspects

June 2014	First contact SFSO
July – October 2014	Data preparation and deliveries by SFSO (5x)
> October 2014	Data “linkage” and validation

Black Box

**Data
anony-
misation
by SFSO**

Delivery

**Data
“link-
age”**

**Data
vali-
dation**

- Close collaboration with team at SFSO
- Data preparation on site

Part II

- Preparation data sets
 - Demographic base
 - Creation of the key file
 - Preparation of files
 - Anonymization by SFSO
 - Data “linkage”
- Validation procedure
 - Source of errors
- Final content

Preparation data sets

Demographic base

2010: Reorganisation of the demographic data collection system

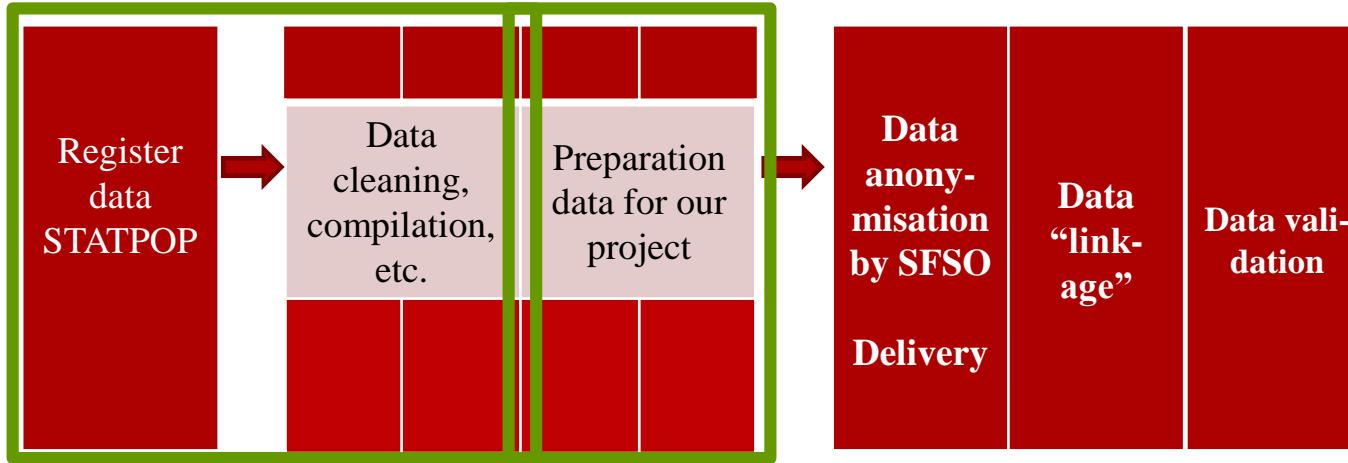
Data sets

- ZAR: foreigners 1997-2010
 - AUPER: asylum seekers and refugees 1997-2010
 - STATPOP: total resident population, $\geq 2010/2011$
- } ZEMIS ≥ 2008

ZAR Stock 31.12.2000	ZAR Flows 2001	ZAR Stock 31.12.2001	ZAR Flows 2010	ZAR Stock 31.12.2010	Key ZAR ID und AHV	STATPOP Stock 31.12.2010	STATPOP Flows 2011	STATPOP Stock 31.12.2011
1	1=emigration	.	.	.	Key ZAR ID und AHV	.	.	.
2	.	2	.	2		2	.	2
3	.	3	3=emigration
4	4=death	.	.	.		5	.	5
5	.	5	6=emigration	5		.	.	.
	6=immigration	6	6=immigration	.		7	7=emigration	.
	7=birth	7	.	7		8	8=death	.
			10=immig	9		9	.	9
				10		10	.	10
ZAR ID-Nummer					AHV-Nr.			

Preparation data sets

Creation of the key file



STATPOP is a compilation of several data sources (prioritisation process)

- Population register
- ZEMIS (AUPER / ZAR)
- BEVNAT
- Diplomates register

Individual	Source	AHV	ZEMIS	ZAR	Age	Gender	Nationality
1	Pop reg.	X			X	X	X
1	ZEMIS		X	X	X	X	

Preparation data sets

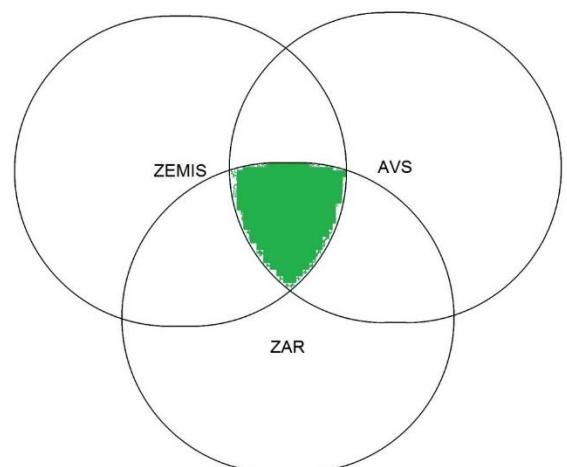
Creation of the key file

ZAR (for.)					ZEMIS					AUPER					AHV				
10	11	12	13	REF	10	11	12	13	REF	10	11	12	13	REF	10	11	12	13	REF
123				123	678				678					756...89					756...89
				258	258				649	649									756...20
						649													756...20
							901		901					333		333			756...55
																			756...55
				910	910				752	752	752			399		399			756...44
																			756...44
																			756...44

Change in one of the four numbers: 0,5%

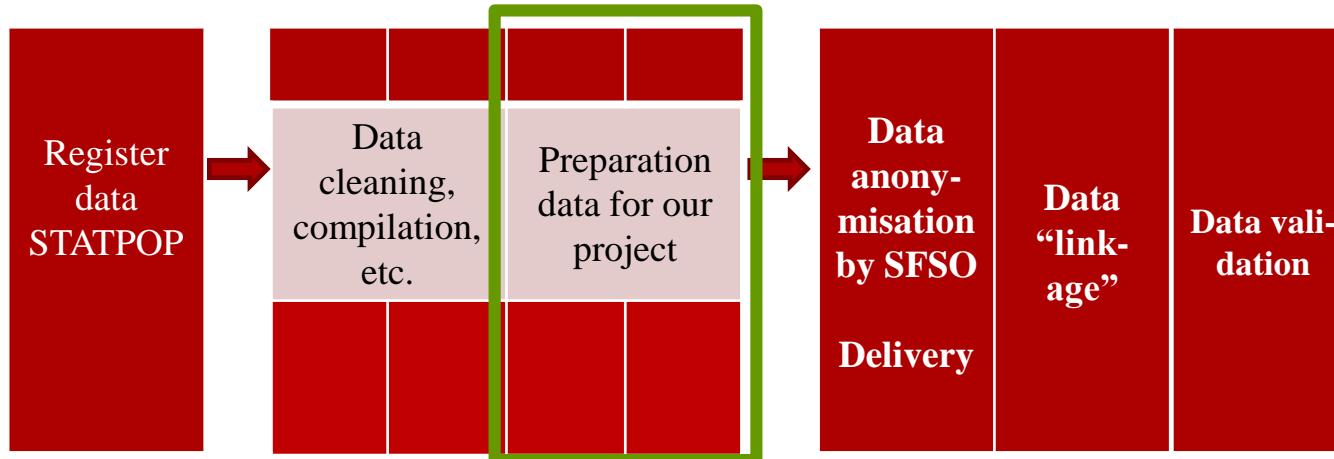
- 11,321 foreigners changed AHV numbers
- 837 foreigners received two different ZEMIS IDs

For Swiss-citizens not traceable (in the framework of this project)



Preparation data sets

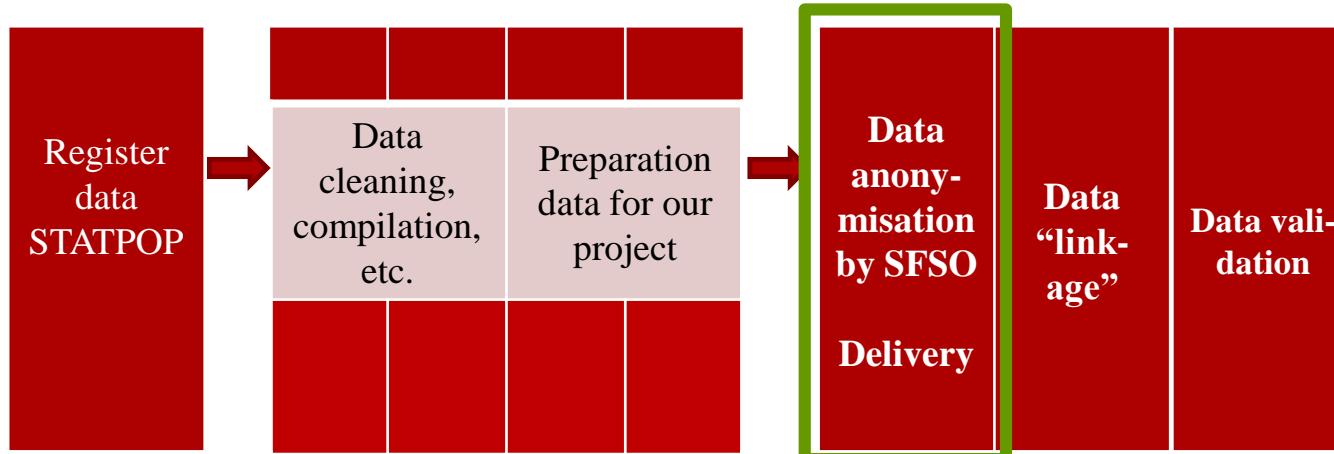
Preparation of files



- Merge all files with key-variable

Preparation data sets

Anonymization by SFSO



- Random PINs, alphanumeric, 46 positions
+PW9tcH+CxSQYn7rA/Tpi2NOYe7VF1KLGzu0StWehKs=
- Algorithm deposited at SFSO for the NCCR
- Project/researcher specific PINs

Preparation data sets

Data “linkage”



Validation procedure

Sources of errors

- Duplicate records
- Erroneous linkages (two persons the same AHV number)
- Incoherence between information

Table: Married singles (fictive example)

movement	date	permit	municipality	gender	civil status	birthday	source
marriage	05.04.2004	7	2831	1	M	16.09.1974	ZAR flows
emigration	12.09.2004	7	2831	1	C	16.09.1974	ZAR flows
immigration	30.11.2004	7	2831	1	C	16.09.1974	ZAR flows
	31.12.2004	7	2831	1	C	16.09.1974	ZAR stocks

- Multiple international movements

date	mouvement	Permis	date	mouvement	permis
Juin 04	Immigration internationale	L1	Déc 06	Chgmt. statut (sortie)	
Août 04	Chgmt. statut (sortie)		Déc 06	Chgmt. statut (entrée)	L1
Août 04	Chgmt. statut (entrée)	L2	Déc 06	Chgmt. statut (sortie)	
Oct 04	Emigration commune		Déc 06	Chgmt. statut (entrée)	L5
Oct 04	Immigration commune		Déc 06	Etat	L1
Déc 04	Etat		Fév 07	Emigration commune	
Jan 05	Emigration canton		Fév 07	Immigration commune	
Jan 05	Immigration canton		Avril 07	Emigration internationale	
Fév 05	Chgmt. statut (sortie)		Avril 07	Correction d'entrée	L1
Fév 05	Chgmt. statut (entrée)	L1	Avril 07	Chgmt. statut (sortie)	
Avril 05	Emigration internationale		Avril 07	Chgmt. statut (entrée)	L5
Mai 05	Correction d'entrée		Mai 07	Chgmt. statut (sortie)	
Mai 05	Chgmt. statut (sortie)		Mai 07	Chgmt. statut (entrée)	L1
Mai 05	Chgmt. statut (entrée)	L5	Sep 07	Emigration internationale	
Déc 05	Emigration internationale		Oct 07	Correction d'entrée	
Déc 05	Immigration internationale	L2	Oct 07	Chgmt. statut (sortie)	
Déc 05	Etat		Oct 07	Chgmt. statut (entrée)	L5
Juin 06	Chgmt. statut (sortie)		Déc 07	Etat	
Juin 06	Chgmt. statut (entrée)	L1	Fév 08	Chgmt. statut (sortie)	
Sep 06	Chgmt. statut (sortie)		Fév 08	Chgmt. statut (entrée)	B
Sep 06	Chgmt. statut (entrée)	L2	Nov 08	Emigration commune	
Sep 06	Emigration internationale		Nov 08	Immigration commune	
Sep 06	Correction d'entrée	L1	Déc 08	Etat	
			Déc 09	Etat	
			Juillet 10	Emigration commune	
			Juillet 10	Immigration commune	
			Août 10	Décès	

Validation procedure

Sources of errors

- Duplicate records
- Erroneous linkages (two persons the same AHV number)
- Incoherence between information from different sources

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	31.12.2004	7	2831	1	C	16.09.1974	ZAR stocks

- Multiple international movements
- Duplicate events (birth and immigration)
- Complete and incomplete trajectories

Validation procedure

Source of errors

ENTRY RECORD

immigration
birth

entry correction

For.: record end of 1997

CH: record end of 2010

END RECORD

record end of 2013
emigration

death

departure

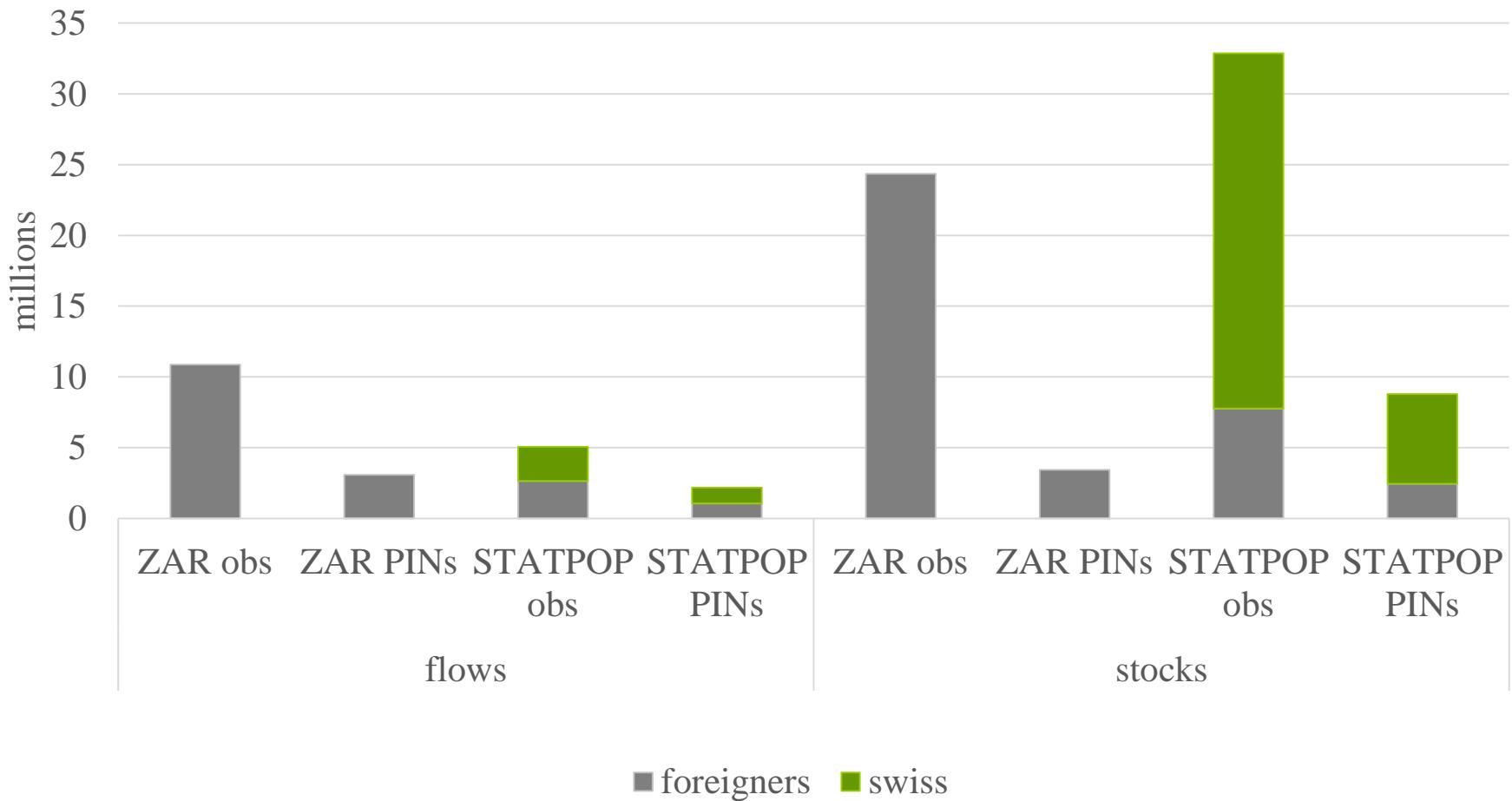
correction

naturalisation

- Single observations
- For foreigners, the link between ZAR 2010 and STATPOP 2010
 - 15'000 in ZAR not in STATPOP
 - 30'000 in STATPOP not in ZAR

Final content

Graph : Number of observations and PINs in the different data sets, by origin (millions)



Final content

	ZAR	STATPOP
stocks	<ul style="list-style-type: none">• Socio-demographic variables• Migration specific variables	
		<ul style="list-style-type: none">• duration of permit• type of household
movements	<ul style="list-style-type: none">• Socio-demographic variables• Migration specific variables• Type of movement• Motif of immigration	

Part III

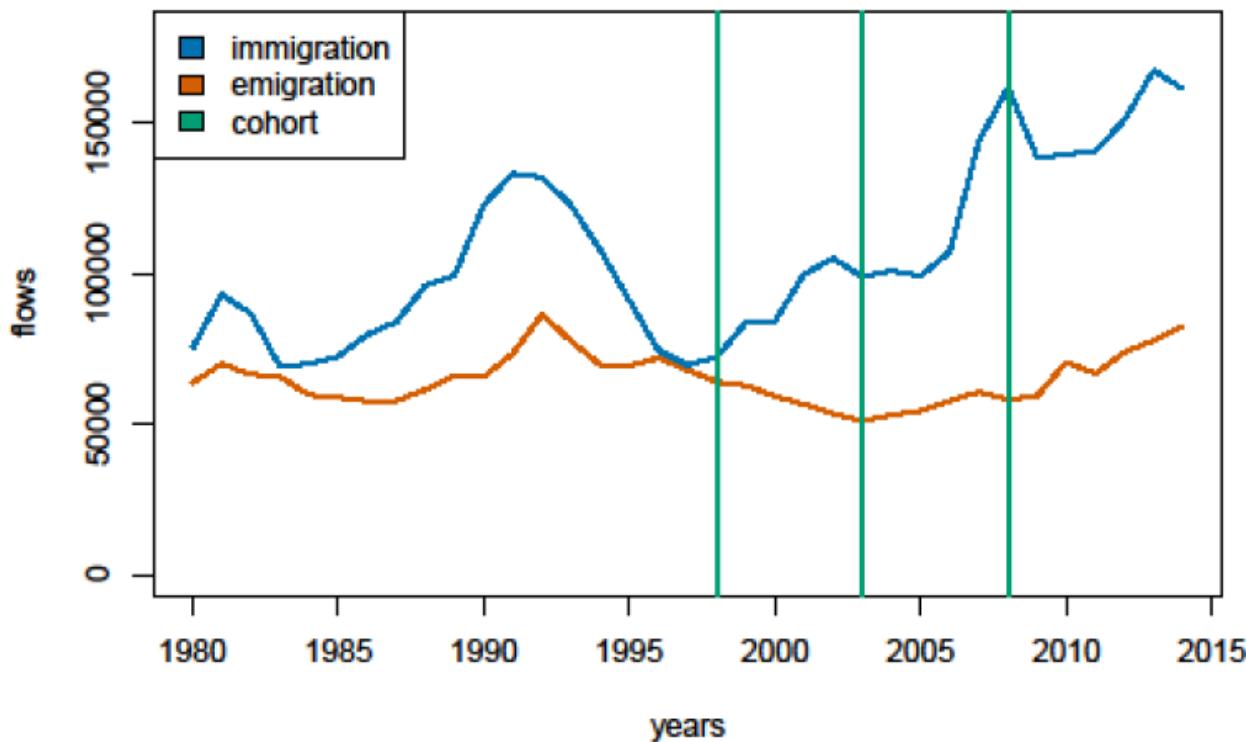
- Application

Complexification of migration pathways

by Jonathan Zufferey

Context

- This research aims at classifying the trajectories of immigrants to/in Switzerland
- Understand the factors associated with the different trajectories
- Close the gap between internal and international migrations



- Following international and internal movements of 3 cohorts (1998/2003/2008), during 60 months

Complexification of migration pathways

by Jonathan Zufferey

Data

	1998	2003	2008	Total
Official statistics	72'202	98'812	161'629	332'643
Immigrants (register)	141'967	184'850	204'151	530'968
First immigrants (register)	107'633	109'328	133'395	350'356
mistake in the trajectory	4'630	3'939	1'826	10'395
correction	3'134	6'368	10'549	20'051
death	198	203	207	608
naturalisation	982	676	1'045	2'703
Population of interest	98'689	98'142	119'768	316'599

- Almost 10% of inapplicable trajectories

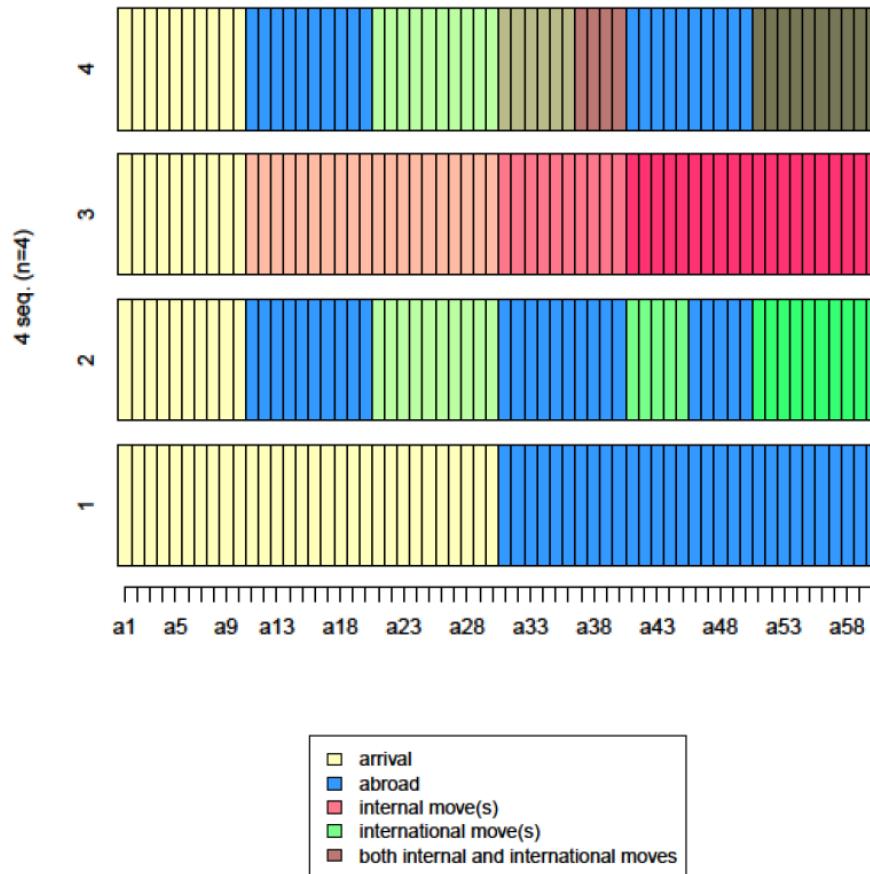
Methods

- Sequence and Cluster Analysis

Complexification of migration pathways

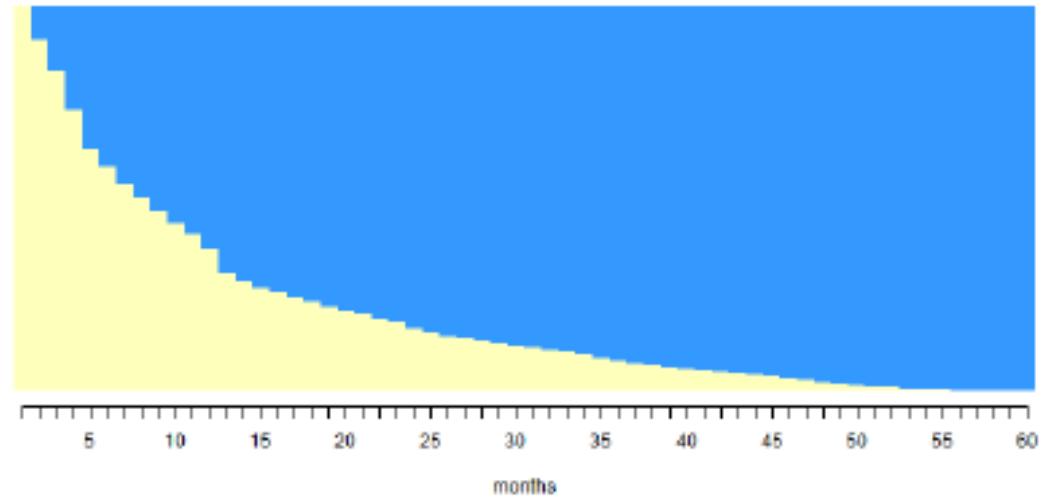
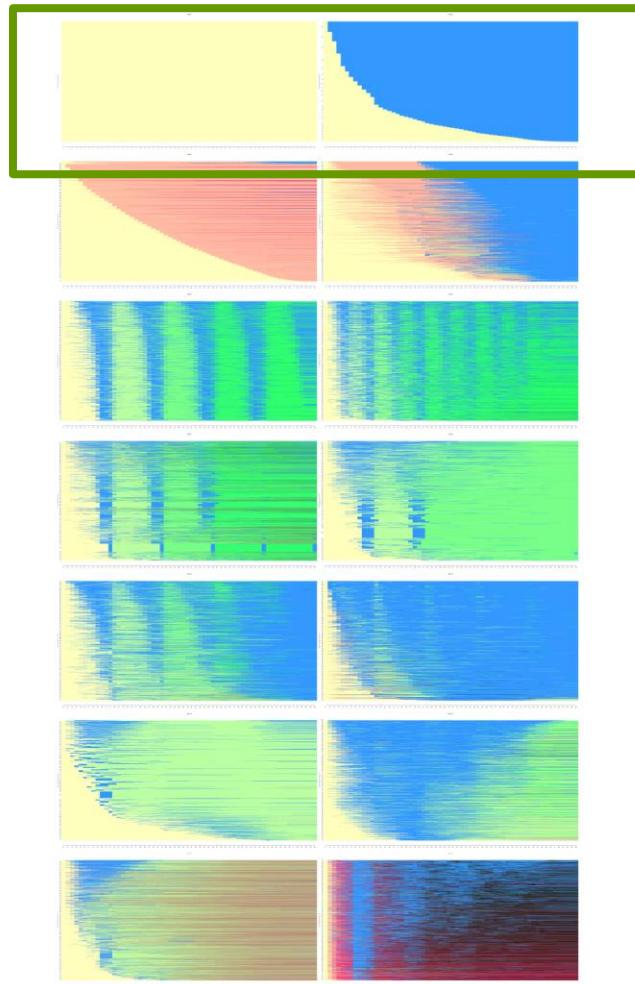
by Jonathan Zufferey

FIGURE 2: Example of the mobility trajectory of four fictive individuals



Complexification of migration pathways

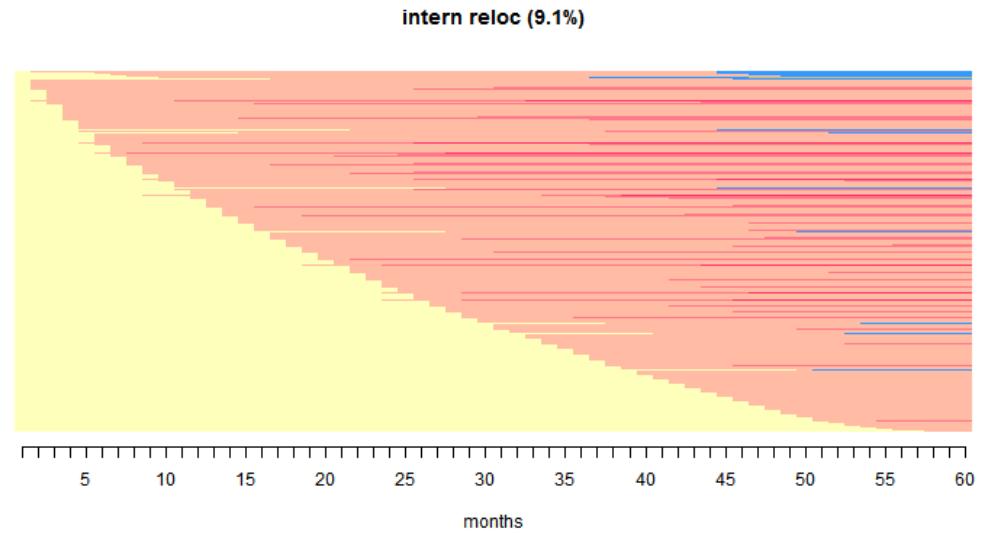
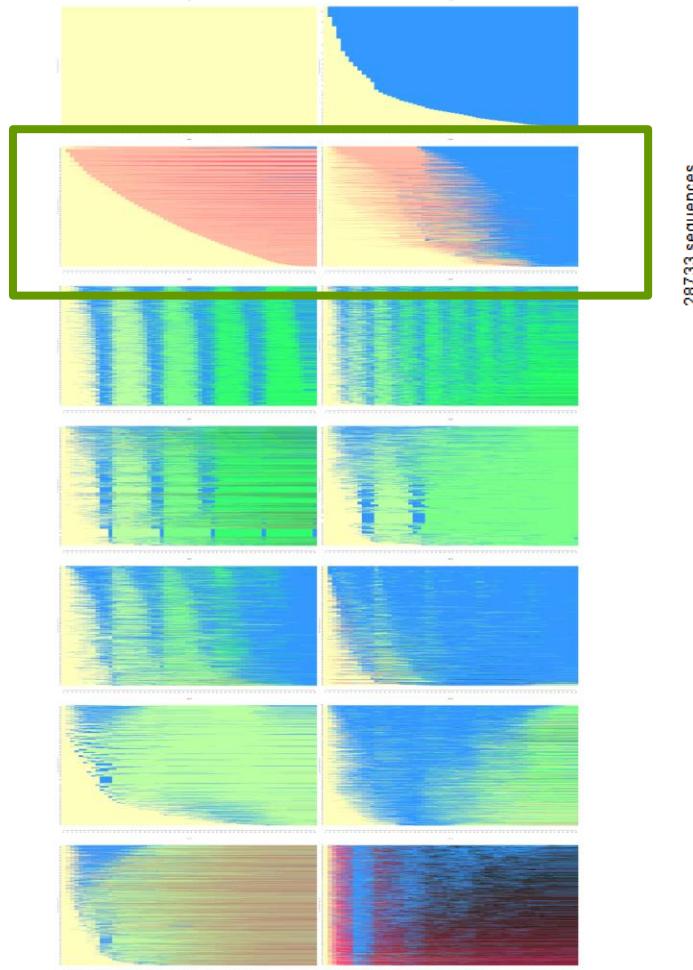
by Jonathan Zufferey



- arrival
- abroad
- internal move(s)
- international move(s)
- both internal and international moves

Complexification of migration pathways

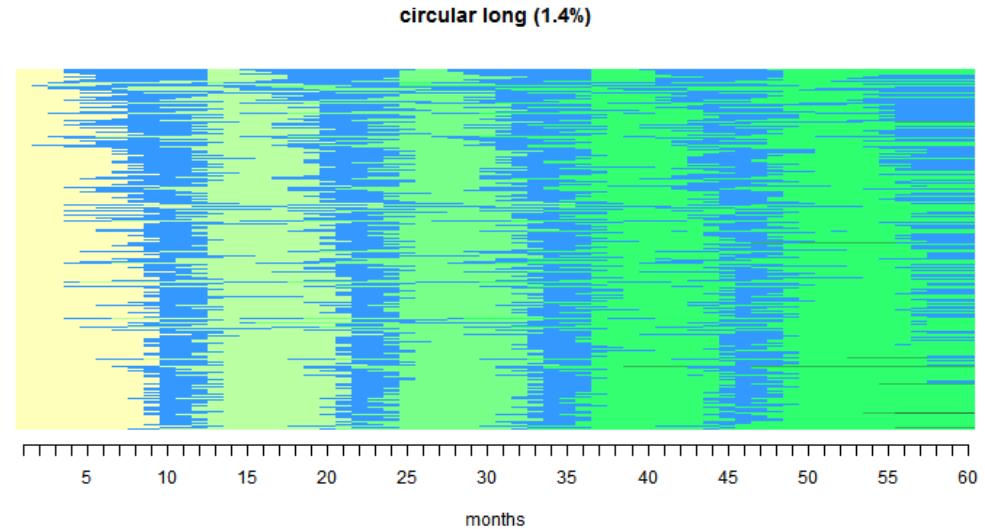
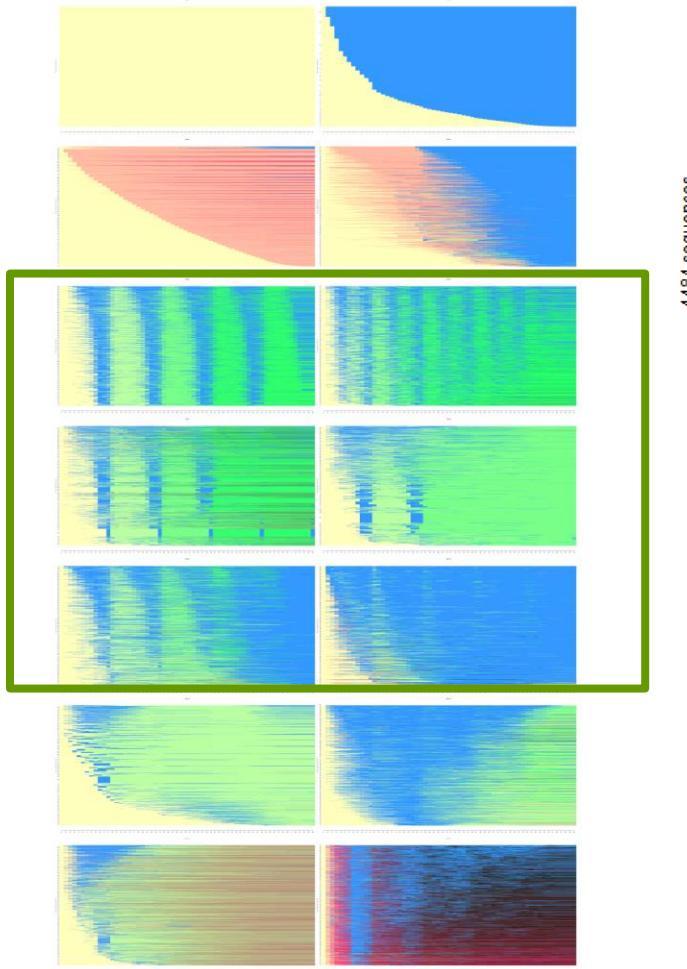
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- arrival
- abroad
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Complexification of migration pathways

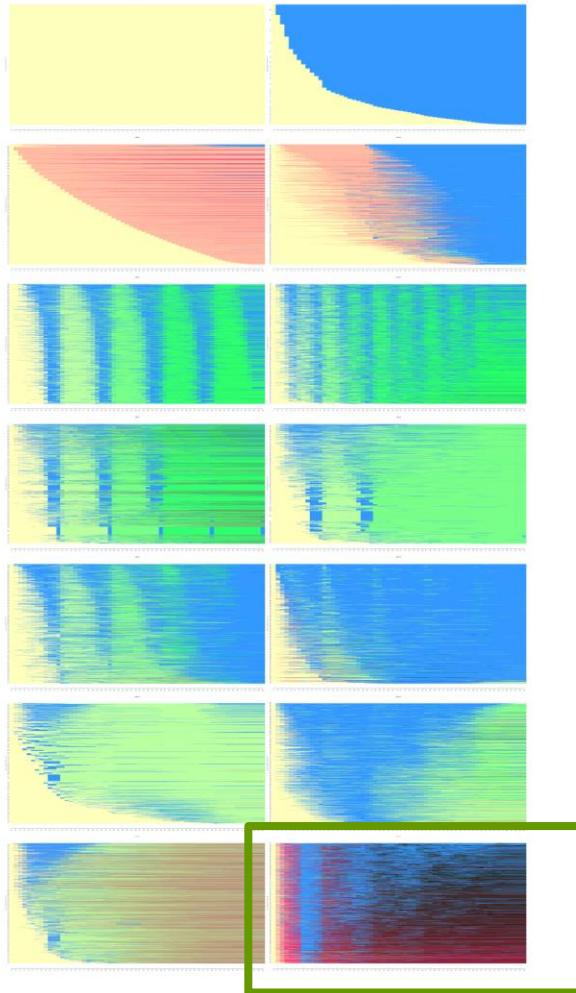
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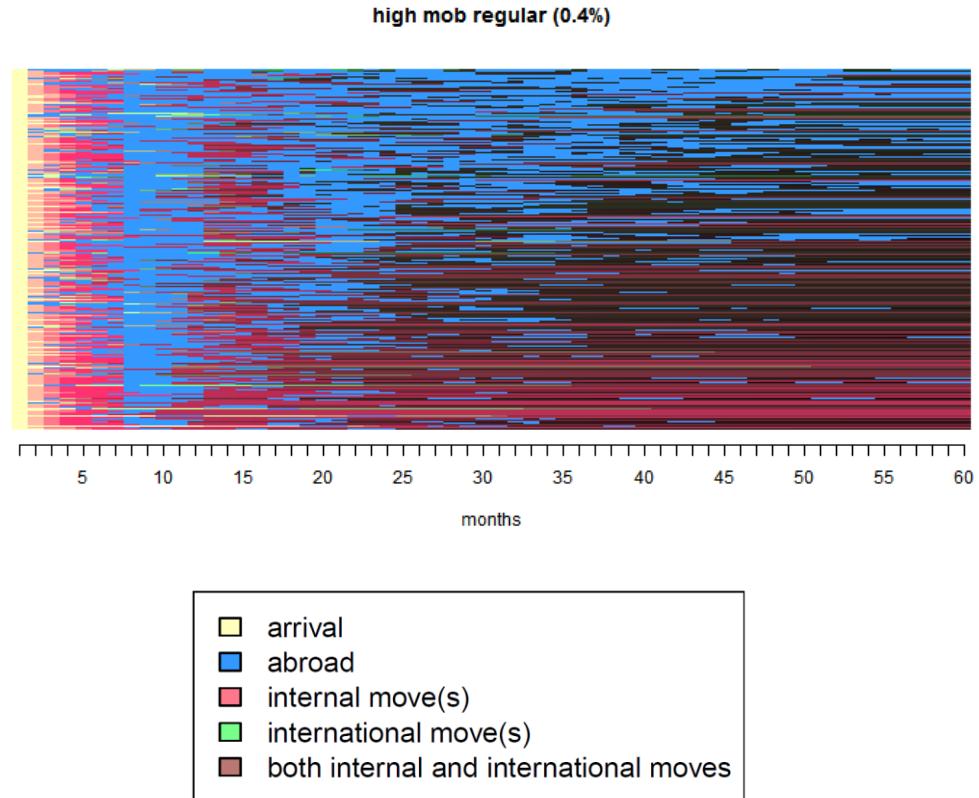
- [Yellow square] arrival
- [Blue square] abroad
- [Red square] internal move(s)
- [Green square] international move(s)
- [Brown square] both internal and international moves

Complexification of migration pathways

by Jonathan Zufferey

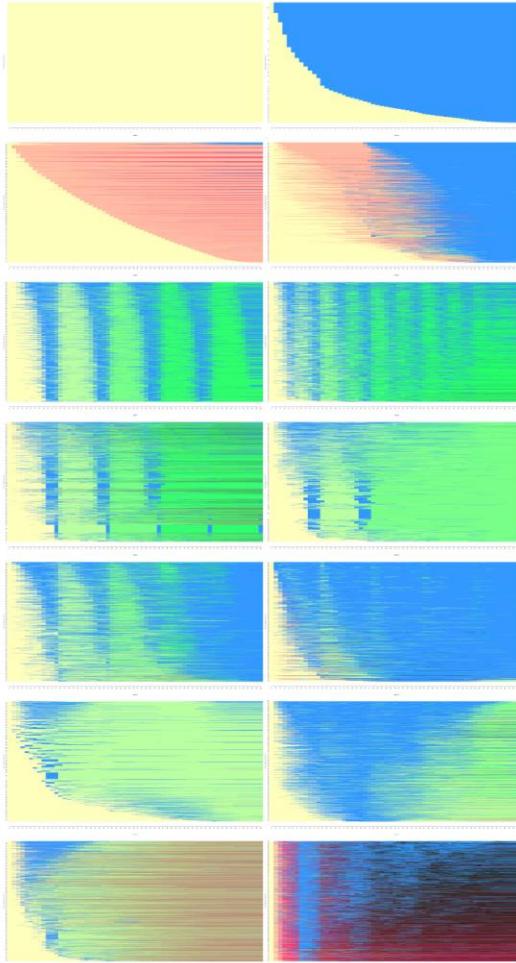


1139 sequences



Complexification of migration pathways

by Jonathan Zufferey



Paradox:

- The number of immigrants increases but the share of those who (definitely) settle increases as well
- The highest mobility refers to a model of the past (seasonal workers)

Heterogeneity in migration practices : many different ways to migrate

Conclusions

- Organizational aspects
- Extensions
 - according to the need of researchers and policy makers
 - different domains, not only migration research

Conclusions

Extensions and future development

Structural survey, ≥ 2010 , sample

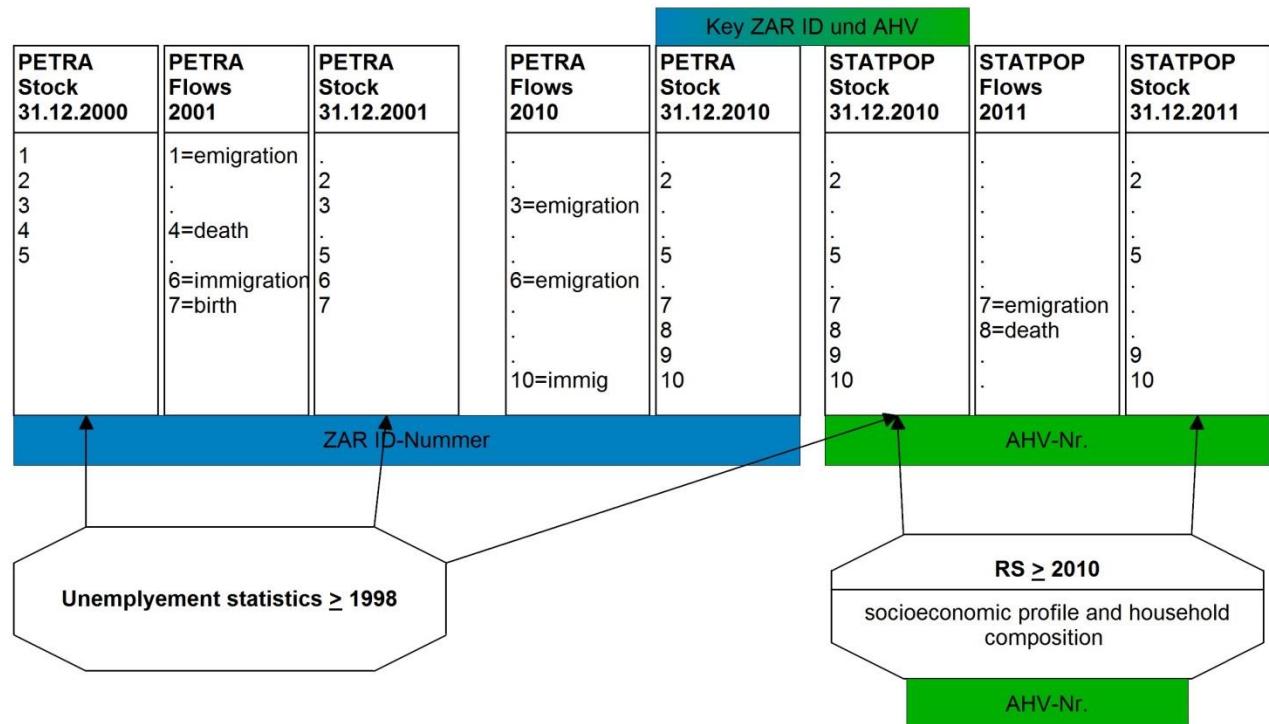
Unemployment statistics (PLASTA, SECO-based), ≥ 1998

Contributions and pensions (AI, AVS, etc.), ≥ 1998

Yearly extensions ≥ 2014

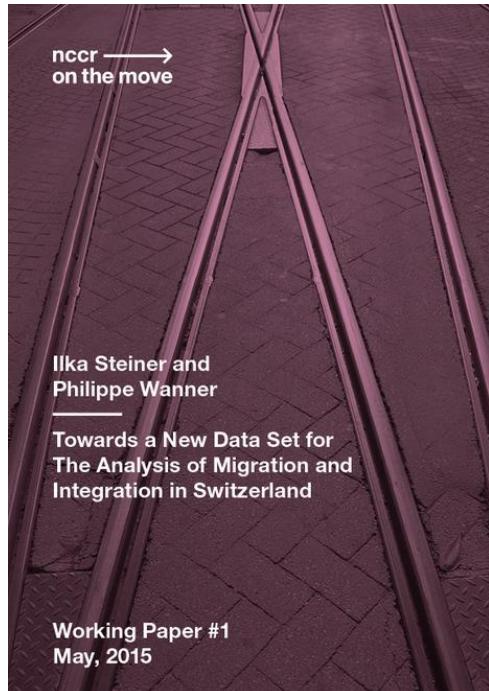
BEVNAT

Census



Conclusions

- Organizational aspects
- Extensions
 - according to the need of researchers and policy makers
 - different domains, not only migration research
- “Deletion on completion”
- First step in the direction of longitudinal data at SFSO



Steiner, Ilka and Philippe Wanner (2015). Towards a New Data Set for The Analysis of Migration and Integration in Switzerland. *nccr – on the move, Working Paper 1*.

Thank you

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