

Manuela Lenk Statistics Austria Register based census

> Vienna 18 September 2013

## **The AMS-Cluster Project**

## Results from the update of 2013



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We provide information



- To find groups of districts with similar structural properties that influence the performance of the different regional bureaus (RBs) of the Austrian Public Employment Service (AMS)
- Evaluate performance of various RBs with respect to structural factors that can't be influenced by the RBs

#### Framework of the AMS-Cluster Project



- > Leader of the Project: Austrian Public Employment Service
- Contractor: Statistics Austria
- Data: Provided by Statistics Austria and The Austrian Public Employment Service
- First results: 2009
- Regular updates of the AMS-Cluster Project with new data :
  - 2011: Same methodical approach (Regression and Cluster Analysis), 2 predefined clusters and one more variable
  - > 2013: Same methodical approach as 2011



- Regression-analysis for the Unemployment Rate (UR) in the districts to select the variables for the cluster-analysis
- Cluster-analysis I (Ward-method to detect the number of clusters)
- Cluster-analysis II (k-means-method for the assignment to the clusters)
- Interpretation of the clusters

## Variables tested in the regression-analysis



- Demographic variables
  - Share of different age groups, Population of the districts, Share of different groups of foreigners, Regional education level, Level of urbanization
- Various measures on the distribution and development of income
- Gender related topics
  - Unemployment rate of women, Number of day-care centers for children, Gender wage gap, Birth rate, Rate of public employment
- Labor market variables
  - Share of seasonal workers, Amplitude of the unemployment rate, Ratio of part-time employed
- Variables on Commuting
  - > The share of people commuting to another country, the share of people commuting to the district, the share of people commuting out from the district
- Other variables
  - Municipal tax per capita, Number of institutions of higher education, Share of employed in services

#### Regression analysis



- Aim is to find the important variables and the corresponding weights for the cluster-analysis
- Stepwise regression
- > Dependent variable: *Unemployment Rate (UR)*
- > Independent variables: All other variables
- > Standardization to make the values comparable
- T-values of the regression coefficients as weights for the cluster analysis



Stepwise Regression Dependent Variable: Unemployment Rate		
Variable	t-value	Pr >  t
Share EU-15	-2.17	0.0333
Part-Time	-4.40	<0.0001
Active	-6.25	<0.0001
Gender Gap	-1.63	0.1077
Income Q2	-5.89	<0.0001
Amplitude UR	3.00	0.0039
R <sup>2</sup>	0.798	
n	73	



- Default Variable: Share of population between 15 and 64 in relation to all Austrians in this age group. Included on request of the Austrian Public Employment Service (Share of Labor Force)
- Share of Labor Force born outside of Austria, but in a EU-15 country, in each district (Share EU-15)



- Relative amplitude of the unemployment rate within a month in per cent. Reference value is the highest rate of unemployment in each period (*Amplitude-UR*)
- Rate of part-time employed in relation to full-time employed. The number of full-time employed is chosen as reference value (*Part-Time*)
- Rate of active people in relation to all people in working age for the corresponding district (*Active*)



- Difference between male and female income in percent. Male income = 100 per cent (*Gender Gap*)
- Median of the yearly income of full-time employed in the district (*Income Q2*)

#### **Cluster analysis**



- Variables with significant influence on the unemployment rate are chosen for the cluster analysis
- Two clusters were predefined by thy Austrian Public Employment Service
  - City Cluster
  - Tourism Cluster
- The number of the clusters were determined according to the Ward-method
  - Six clusters predefined for the next step
- The assignment to the clusters was carried out according to the k-means-method

#### **Results** I



Cluster 1: High income

- Highest income (Income Q2)
- Lowest rate of part-time employed (Part-Time)
- > Amplitude-UR and Active are relatively high

Cluster 2: Small population

- > Lowest share labor force (*Share of Labor Force*)
- Lowest gender wage gap (Gender Gap)
- Lowest share of non-Austrian EU-15 citizens (*Share EU-15*)
  Cluster 3: Low income
- > Low income (*Income Q2*)
- Lowest share of active persons (Active)

#### **Results II**



Cluster 4: Large population

- Large Population (Share of Labor Force)
- High gender wage gap (Gender Gap)
- Large Share of non-Austrian EU-15 citizens (Share EU-15)

Cluster 5: High rate of active persons in rural area

- Highest rate of active persons (Active)
- Lowest seasonal change of the unemployment rate (Amplitude UR)
- Small population in working age (Share of Labor Force)
- Low share of non-Austrians EU-15 citizens (Share EU-15)

#### **Results III**



Cluster 6: Innsbruck (only one RB)

- Large population (Share of Labor Force)
- Highest seasonal fluctuations (Amplitude UR)
- Low gender wage gap (Gender Gap)
- > Low income (*Income Q2*)
- > Low share of active persons (*Active*)
- > Highest rate of part-time employed (*Part-Time*)
- > Highest rate of non-Austrian EU-15 citizens (Share EU-15)

Cluster 7: City area (predefined)

Cluster 8: Tourism area (predefined)



							Share of
	Share EU-	Part-		Gender	IncomeQ	Amplitude	Labor
Cluster	15	Time	Active	Gap	2	-UR	Force
1	1.60	29.89	71.73	27.54	26239.91	62.52	0.97
2	1.02	30.06	71.72	23.51	22894.76	42.65	0.42
3	1.48	32.09	68.17	27.97	21638.84	51.61	0.66
4	2.89	32.79	70.48	30.17	22794.50	62.28	1.39
5	1.22	33.29	74.66	29.46	22564.95	41.07	0.68
6	5.87	42.62	69.41	27.95	21690.95	70.98	3.47

Lowest	Rather	Rather	Highest
value	low value	high	value
		value	

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#### **Allocation of the Clusters**





Source: Computed by Statistics Austria with data from Statistic Austria and the Austrian Public Employment Service (AMS). Results from the 2013-update.

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