

Preferred citation style

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Firm location decisions in the region of St. Gallen

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Zürich

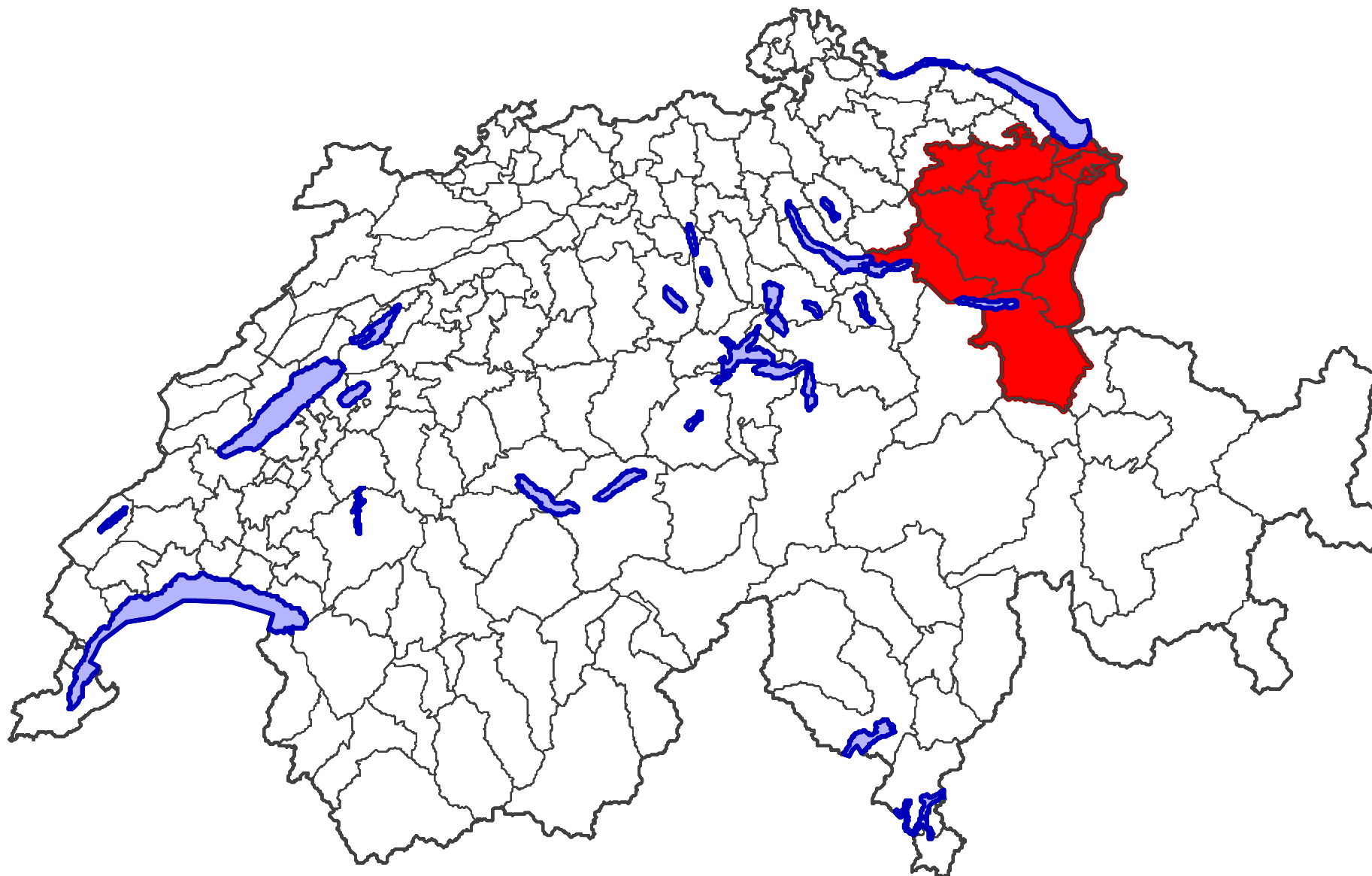
Swiss Transport Research Conference
Ascona, September 2010

 Institut für Verkehrsplanung und Transportsysteme
Institute for Transport Planning and Systems

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Study Area



Data base

Commercial Registers

Cantons of St.Gallen and Appenzell
 1991-2006
 21'000-32'000 companies per year
 variables:
 legal seat, address, etc.

Business Register (BUR)

Swiss Federal Statistic Office FSO
 2003-2006
 29'000-31'000 companies per year
 variables:
 largeness and sectors

Identification number	Legal status
CH-020.3.035.574-2	Limited or Corporation

In	Ca	Bus
1		senozon AG

In	Ca	Share capital (CHF)	Paid in (CHF)
1		100'000.00	100'000.00

In	Ca	Participation capital (CHF)	Paid in (CHF)

In	Ca	
1		Die Gesellschaft bezweckt die Führung eines Dienstle- Verkehrsplanung sowie verwandte Tätigkeitsgebiete von Geodaten, kartographischen Produkten sowie ent- Zweigniederlassungen und Tochtergesellschaften im im In- und Ausland beteiligen sowie alle Geschäfte tät Zusammenhang stehen. Die Gesellschaft kann im In- und verwalten. Sie kann auch Finanzierungen für eige Bürgschaften für Tochtergesellschaften und Dritte ein

In	Ca	
1		Mitteilungen an die Aktionäre erfolgen per Brief, E-Mai
1		Die Übertragbarkeit der Namenaktien ist nach Massg
1		Gemäss Erklärung vom 19.08.2010 wurde auf die eing
1		Weitere Adresse: Schmiedgasse 33, 9102 Herisau.

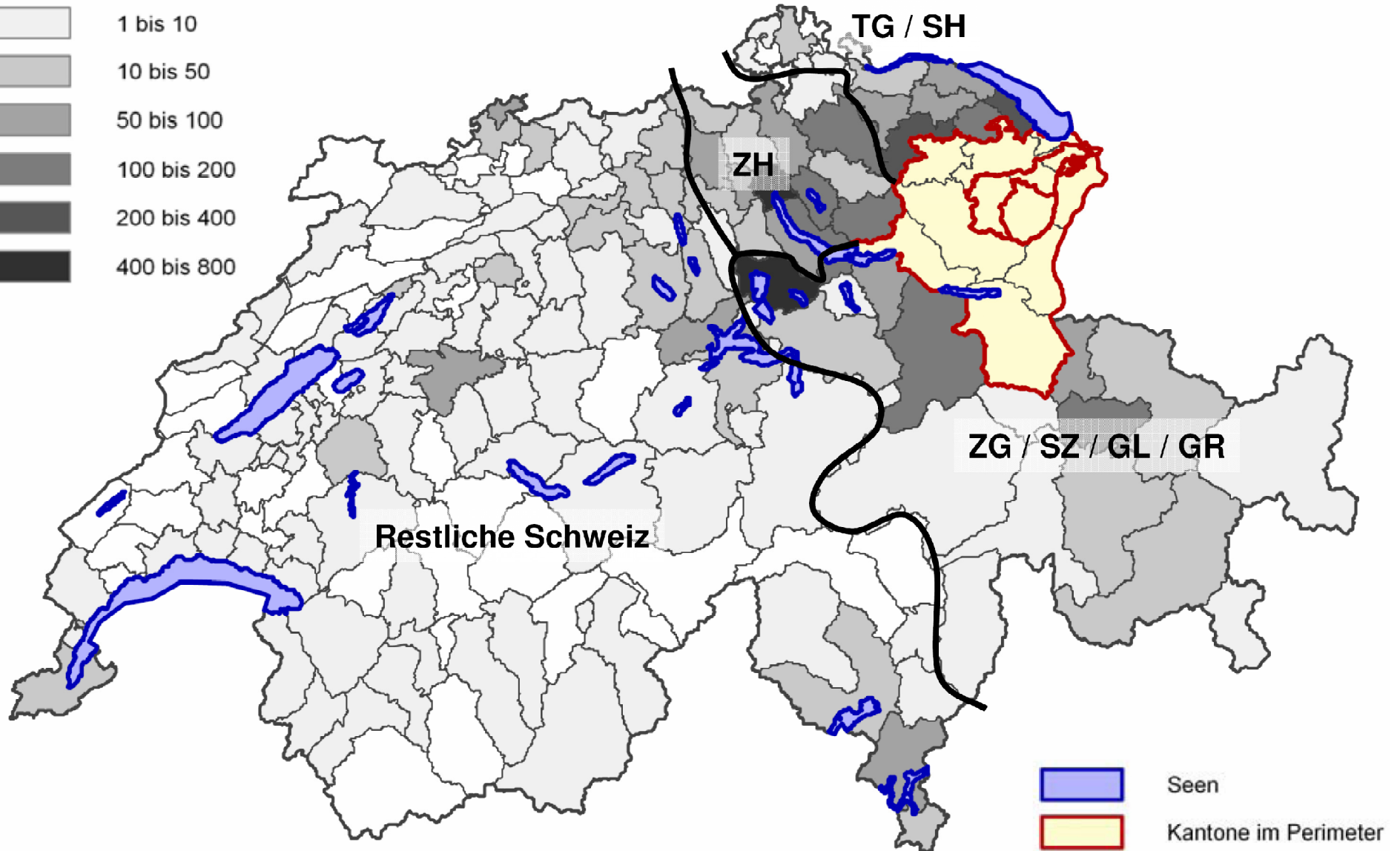
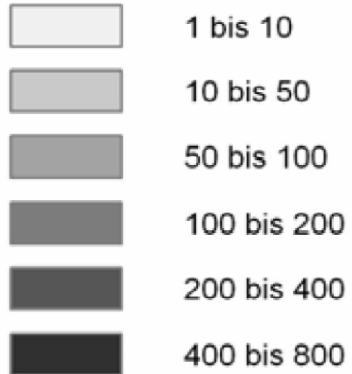
In	Ca	Qu

In	Ca	Branch offices

Vis	Ref	No journal	Date	SOGC	Date
ZH	1	30529	24.08.2010	167	3

Set of Alternatives (116+4)

Anzahl Migrationen



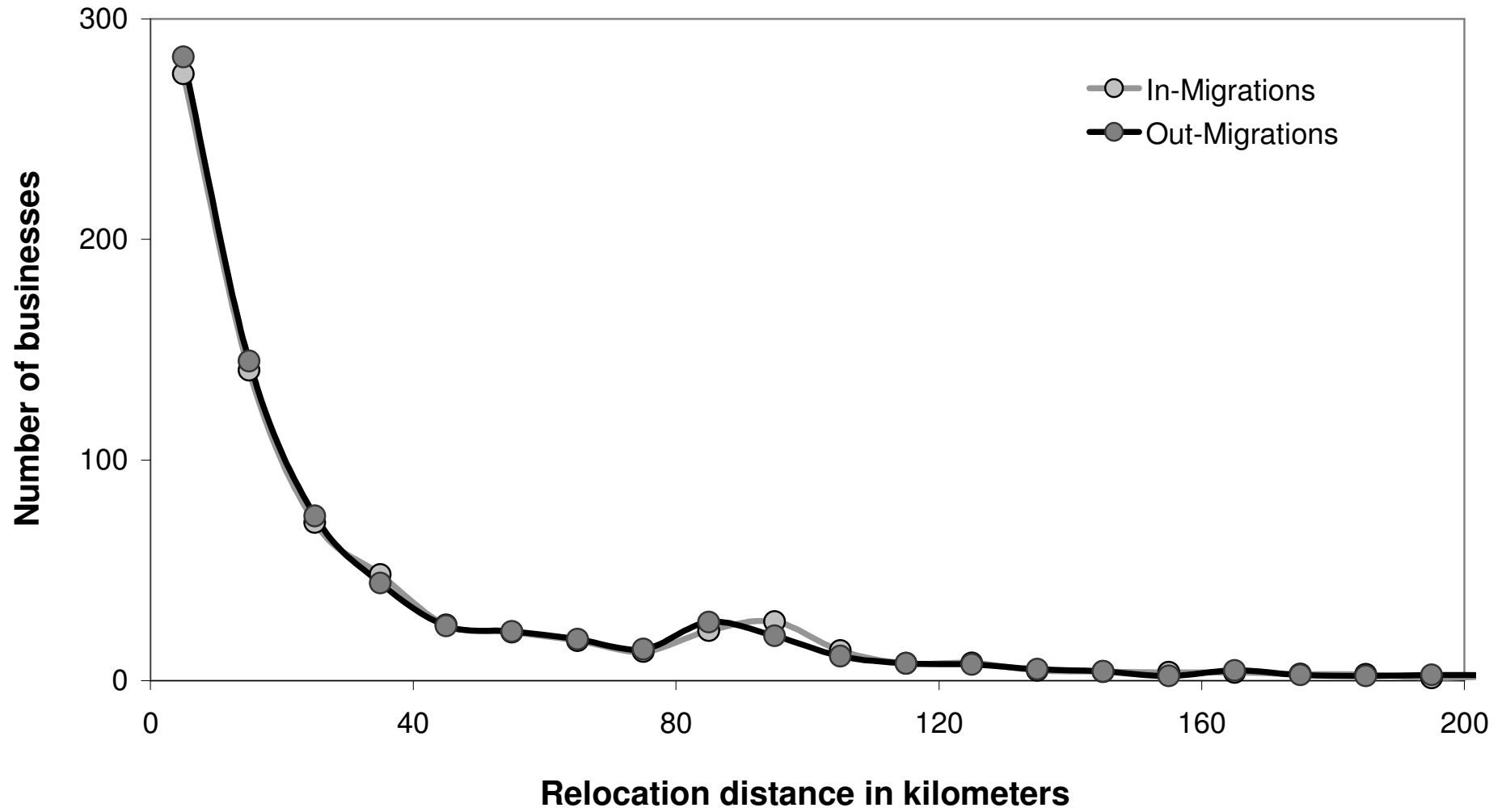
Parts of the utility-functions and nests: overview

	part of the utility-function for alternative				
	1	2	3	...	120
Parts of the utility-functions					
advantage of not migrating	Constant	-	-		-
distance to previous site	-	Distance	Distance		Distance
site related factors	Set of factors	Set of factors	Set of factors		Set of factors
Nests					
nest of the previous site	Nest A	-	-		-
nest of other communities	-	Nest B*	Nest B*		Nest B*
Selection Bias**					
block of the previous site	Sel. Bias	-	-		-

* fixed

** New estimator of Bierlaire *et al.* (2008)

Distances involved



Modelling geographical aspects

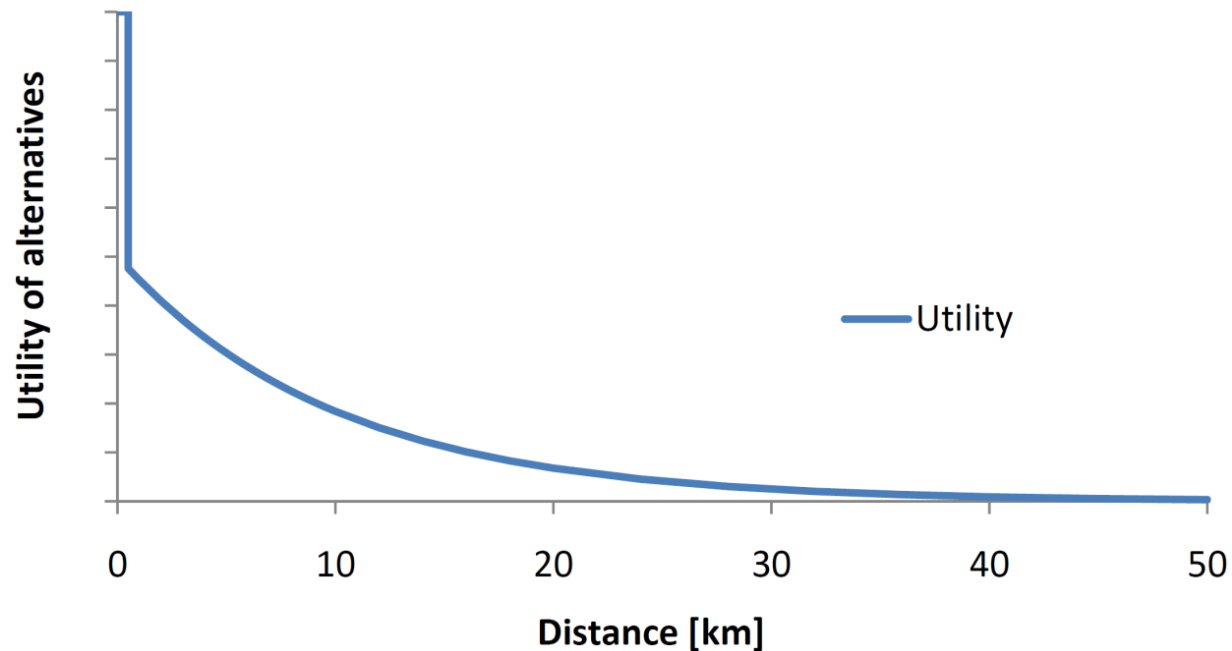
Non-movers: Constant (previous site)

Movers: Advantage of nearness

$$\propto \times e^{(-\lambda \times d_{i \rightarrow j})}$$

with α and λ as estimated parameters

distance $d_{i \rightarrow j}$ between actual site i and alternative j [km]



Variables tested apart distance: step 1

Factors of production

degree of land use in building zones

rate of unemployment and population with graduate degree

Business environment

large or intermediate city

employees within the same sector (agglomeration effects)

diversity in sectors (urbanisation effects)

Governmental environment

tax burden for different legal forms

highway connection / rail connection / accessibility

duration of the process for building licence

cantonal business development

Variables tested apart distance: step 2

Landprice

Residuals of landprice (non explained part by the other variables)

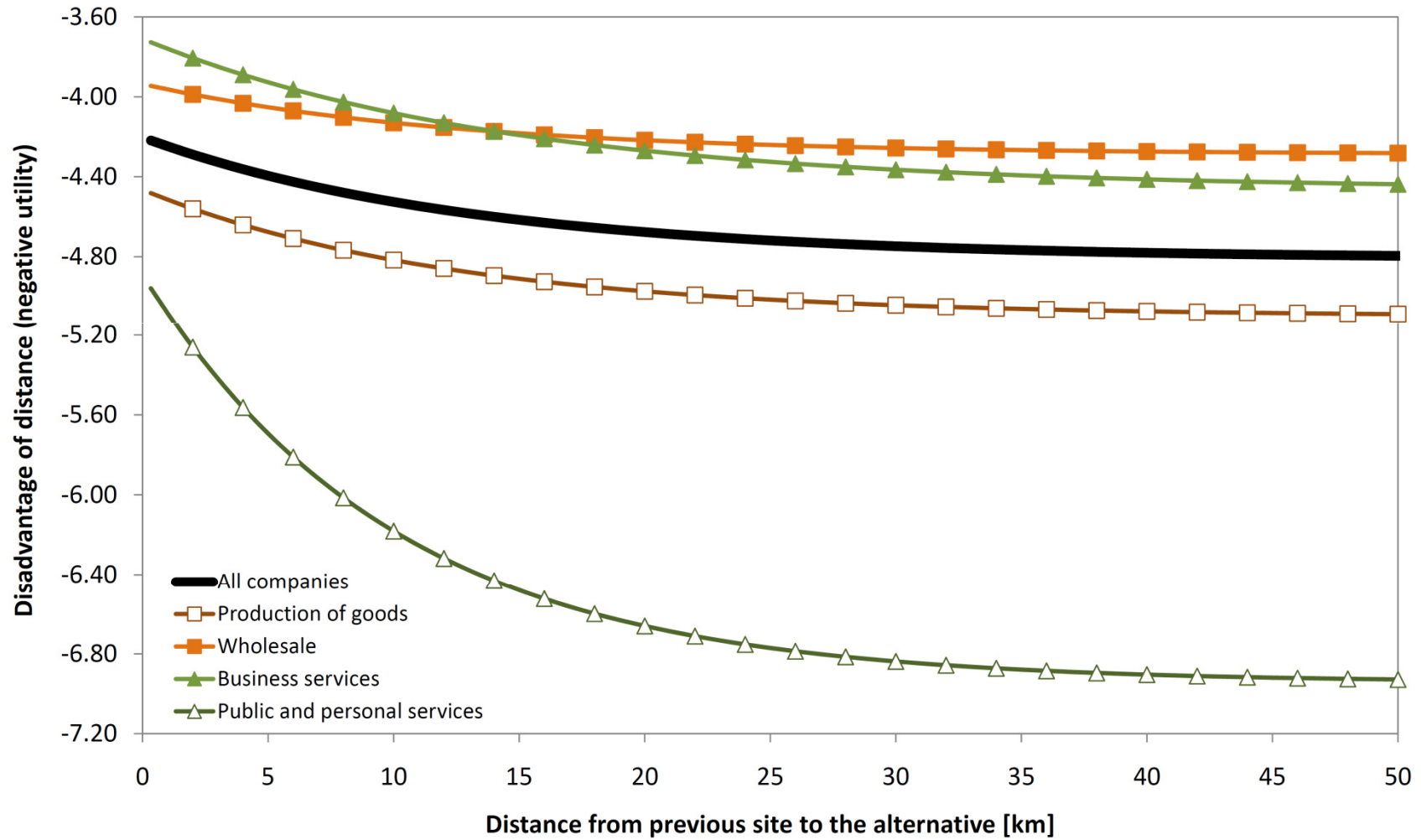
Results: general information

Model including all observed companies

Number of observations	10'700
movers	7'200
non-movers (representing 386'000)	3'500
Null log-likelihood	-51'400
Final log-likelihood	-31'200
Adj. Rho-square	0.392

Results: disadvantage of distance

0 = Utility of previous site



Results: Ranking of estimated parameters

all	Parameter	Manu- fact.	Whole- sale	Bus. service	Pers. service
1*	Alternative is a city	3*	2*	2*	1*
2*	Cantonal business development	2*	3*	3*	2*
3*	Tax burden for joint stock comp.	4*	4*	4*	4
4	Previous site is in a city	1*	1	1*	8
5*	Municipality with a rail connection	6*	5*	8*	3*
6*	Index of diversity in sectors	5*	9*	5*	11
7*	Population with graduate degree	8*	14*	5*	14
8*	highway connection	10*	6*	9*	6
9*	Tax burden for partnerships	7*	8*	7*	10
10*	Accessibility to employees	9*	10*	10*	5*
...
18	Land price for commerce	17	18	18	16

* Significant according to t-test

Results: Simulation of relocation choice

District	Real	Sim.	diff	diff
SG: District of St.Gallen	1919	1743	-176	-9%
SG: District of Rorschach	868	878	+10	+1%
SG: District of Rheintal	1263	1283	+20	+2%
SG: District of Werdenberg	592	577	-15	-3%
SG: District of Sarganserland	380	409	+29	+8%
SG: District of See-Gaster	619	608	-11	-2%
SG: District of Toggenburg	520	511	-9	-2%
SG: District of Wil	1014	1002	-12	-1%
AI: Appenzell Innerrhoden	324	338	+14	+4%
AR: Western part (Hinterland)	320	351	+31	+10%
AR: Middle part (Mittelland)	291	344	+53	+18%
AR: Eastern part (Vorderland)	211	276	+65	+31%

Conclusions

Discrete choice model proves effects of

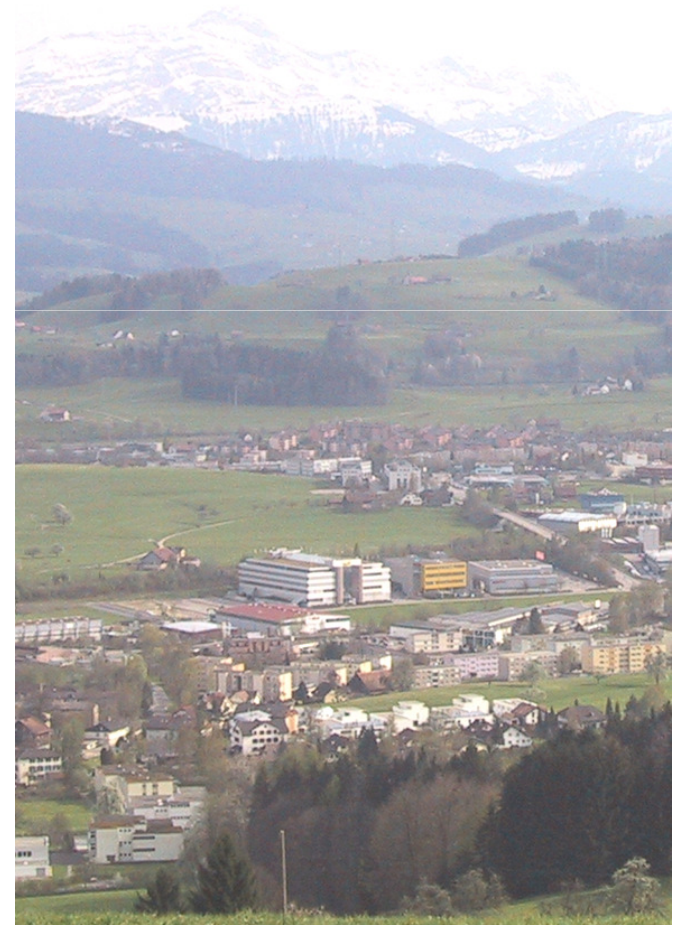
- distance
- business friendliness
- taxes on capital and benefit

unexpected results

- small effect of employees within the same sector
- strong effect of road conditions



Thank you for your attention



Literature

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