

Geovisualization of electoral patterns

Elections in a Spatial Context

Case study of Albanian Parliamentary Elections 1991-2005

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Introduction

- This work represents the outcome of the applicative part of study „Elections in a Spatial Context- Case study of Albanian Parliamentary Elections, 1991-2005“
- Information on spatial and temporal distribution of electoral patterns in country and municipality level is presented here by choropleth maps.

- It consists of two parts:

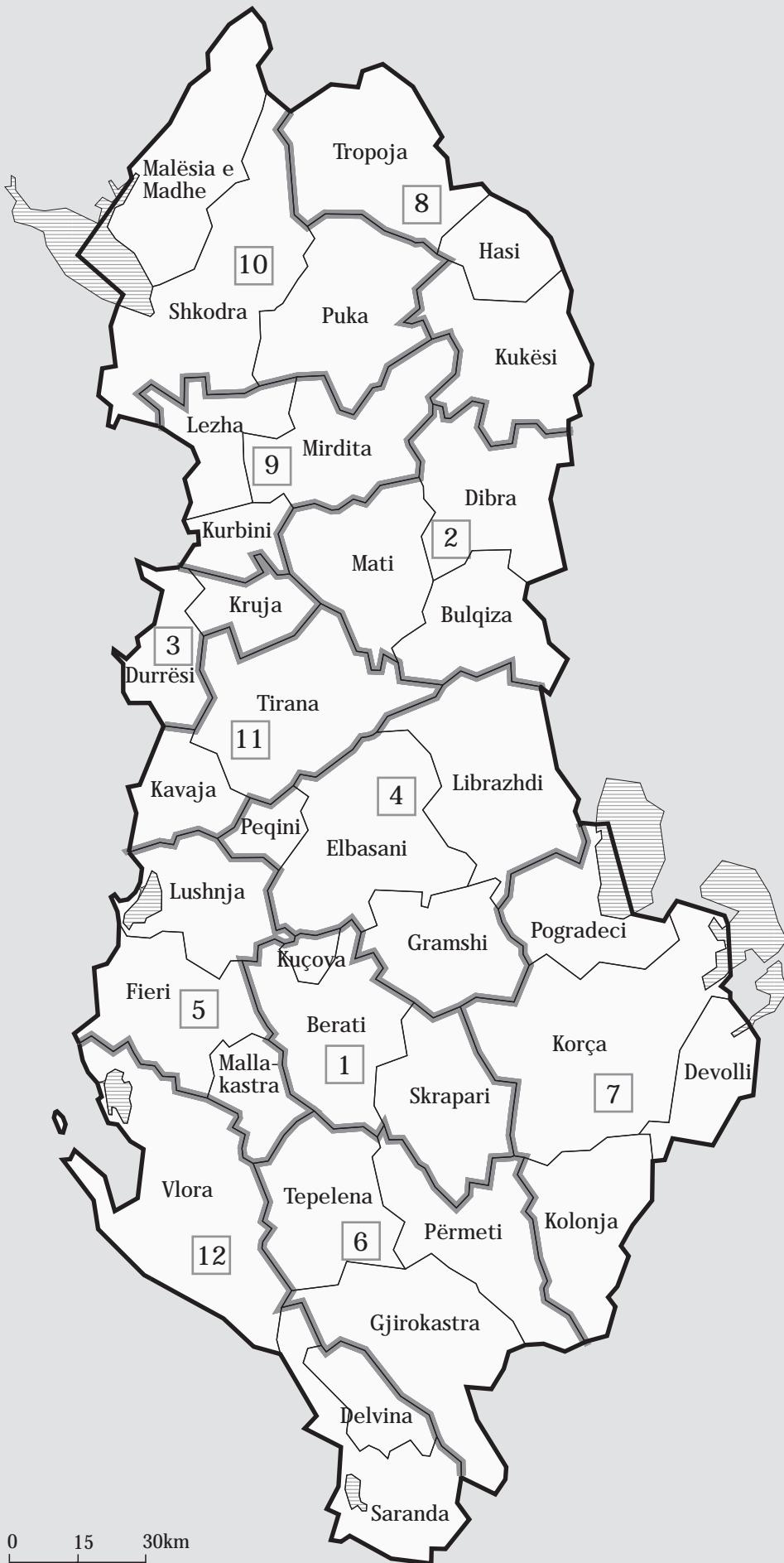
Part A - Geography of components includes 34 choropleth maps that illustrate spatial and temporal distribution of electoral patterns components: A-1 Voting behaviour and A-2 Electoral context profile.

Part B - Geography of relations includes 18 choropleth maps that illustrate spatial and temporal distribution of electoral patterns relations: B-1 Voting behaviour in the framework of electoral context profile and B-2 Voters allocation in constituencies.

- These maps are created with a desktop GIS package and exported into a graphic environment for the layout arrangements.
- In country level 31 maps are of scale 1:1 350 000 and 11 maps of scale 1: 2 700 000
In municipality level 10 maps are of scale 1: 50 000 and 1 reference map of scale 1: 100 000.
- The map legend describes the correspondence between values and colours and indicates the number of cases with each class.
- The presently administrative division of Albania (prefectures and districts) is presented by reference map 1. A second reference map illustrates the spatial extent of three geographical regions. Both reference maps (scale 1: 1 350 000) aim to facilitate for readers the understanding on spatial allocation of voting behaviour in the framework of administrative and regional divisions.

In municipality level, one reference map (scale 1:100 000) illustrates the present administrative divisions of Tirana Municipality.

Administrative division 2005





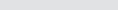
Prefectures

- 1 Berati
- 2 Dibra
- 3 Durrësi
- 4 Elbasani
- 5 Fieri
- 6 Gjirokastra
- 7 Korça
- 8 Kukësi
- 9 Lezha
- 10 Shkodra
- 11 Tirana
- 12 Vlora

Districts

Delvina

Boundaries

-  State
-  Prefecture
-  District

0 15 30km

Source of data

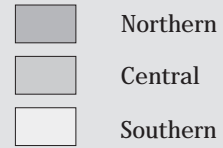
Albania Census Atlas, 2001

Demographic Atlas of Albania, 2003

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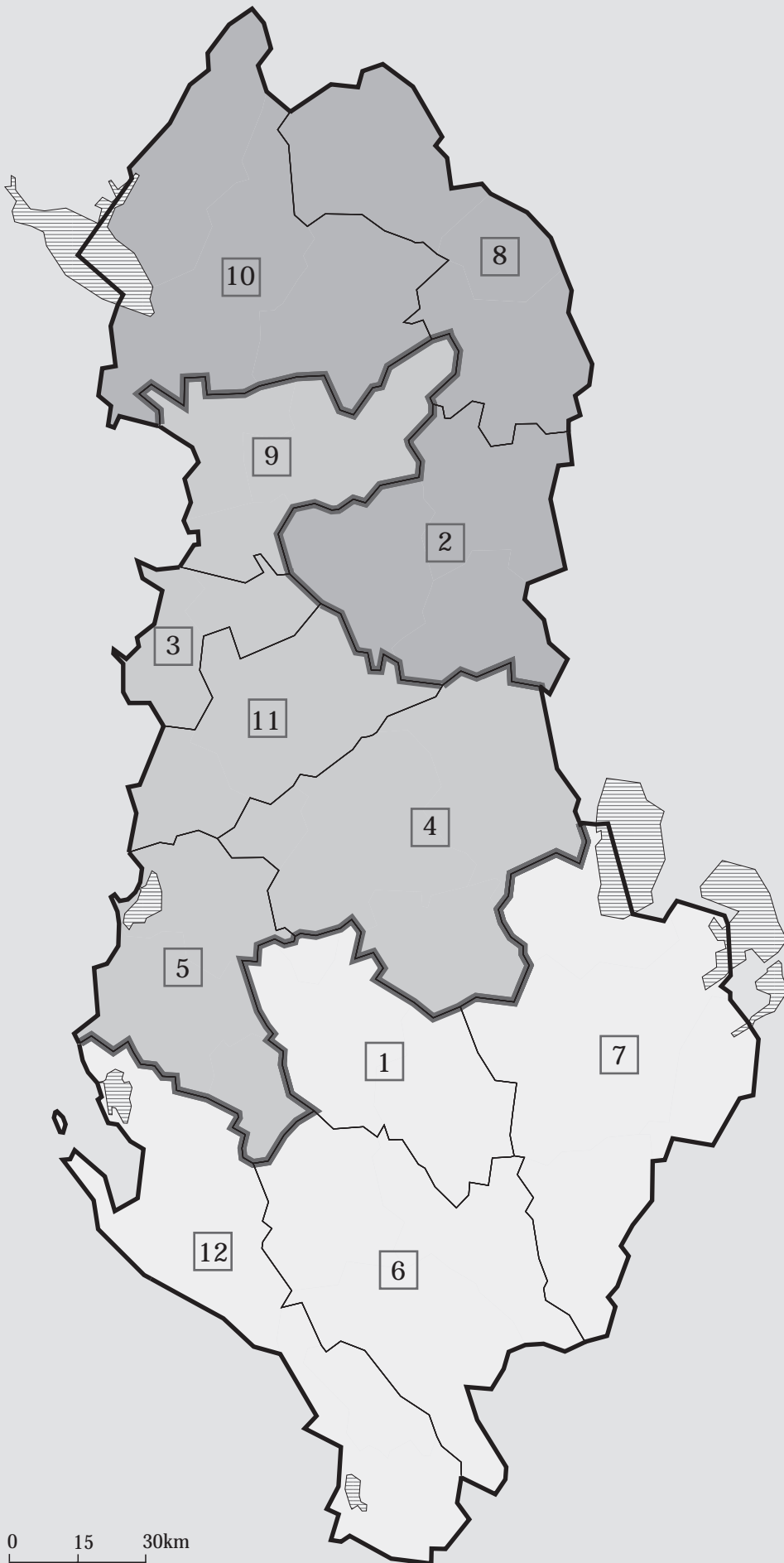
Geographical regions

Geographical regions

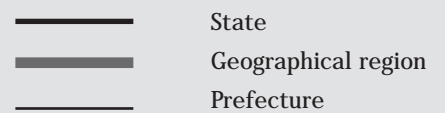


Prefectures

- 1 Berati
- 2 Dibra
- 3 Durrësi
- 4 Elbasani
- 5 Fieri
- 6 Gjirokastra
- 7 Korça
- 8 Kukësi
- 9 Lezha
- 10 Shkodra
- 11 Tirana
- 12 Vlora



Boundaries



Source of data

Albania Census Atlas, 2001

Demographic Atlas of Albania, 2003

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Contents of Topics

A Geography of Components

Country level

- Spatial distribution of vote, parliamentary elections 1991-2005
- Spatial distribution of turnout, parliamentary elections 1991-2005
- Profile of electoral context, parliamentary elections 1997-2005

Municipality level

- Spatial distribution of vote, parliamentary elections 1991-2005
- Spatial distribution of turnout, parliamentary elections 1991-2005
- Profile of electoral context, parliamentary elections 2001

B Geography of Relations

Country level

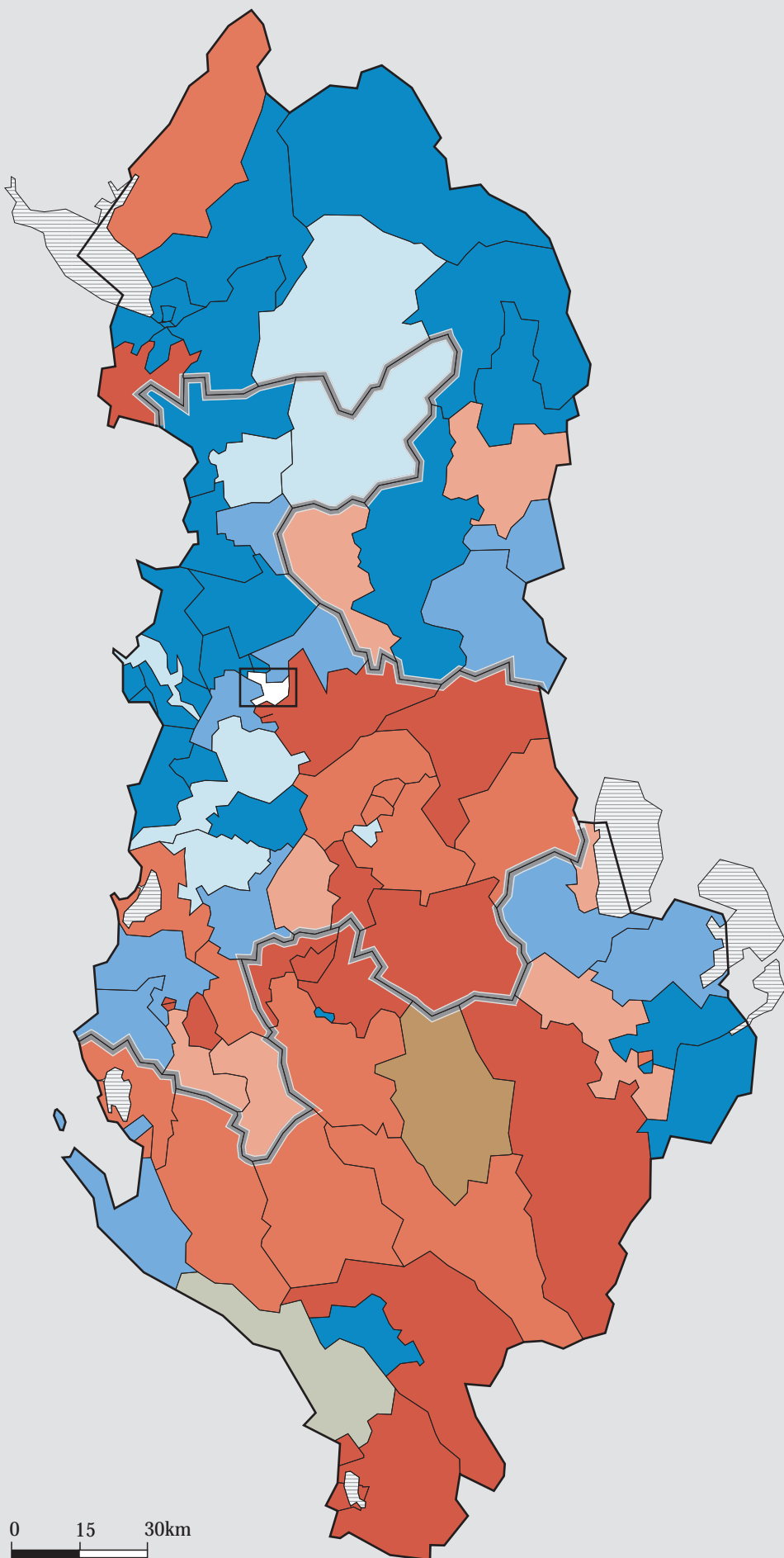
- Spatial distribution of vote in the framework of electoral context, parliamentary elections 1997-2005
- Spatial distribution of turnout in the framework of electoral context, parliamentary elections 1997-2005
- Spatial allocation of voters, parliamentary elections 1991-2005

Municipality level

- Spatial distribution of vote in the framework of electoral context, parliamentary elections 2001
- Spatial distribution of turnout in the framework of electoral context, parliamentary elections 2001
- Spatial allocation of voters, parliamentary elections 2001

Geography of Components

Spatial distribution of vote for party candidates Parliamentary Election 2005



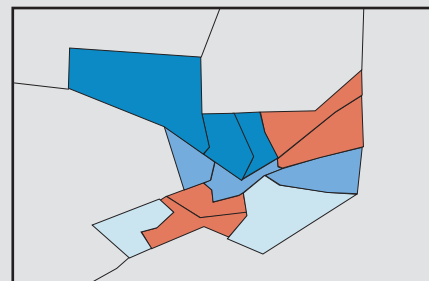
Winning party candidates

	PD	PS	LSI	IC
High	Dark Blue	Dark Red	Dark Brown	Dark Green
Medium	Medium Blue	Medium Red	Medium Brown	Medium Green
Low	Light Blue	Light Red	Light Brown	Light Green

Vote margins in %

High	>10
Medium	>5 - <10
Low	<5

Tirana Municipality



Boundaries

Thick black line	State
Thin black line	Constituency
Grey line	Geographical region

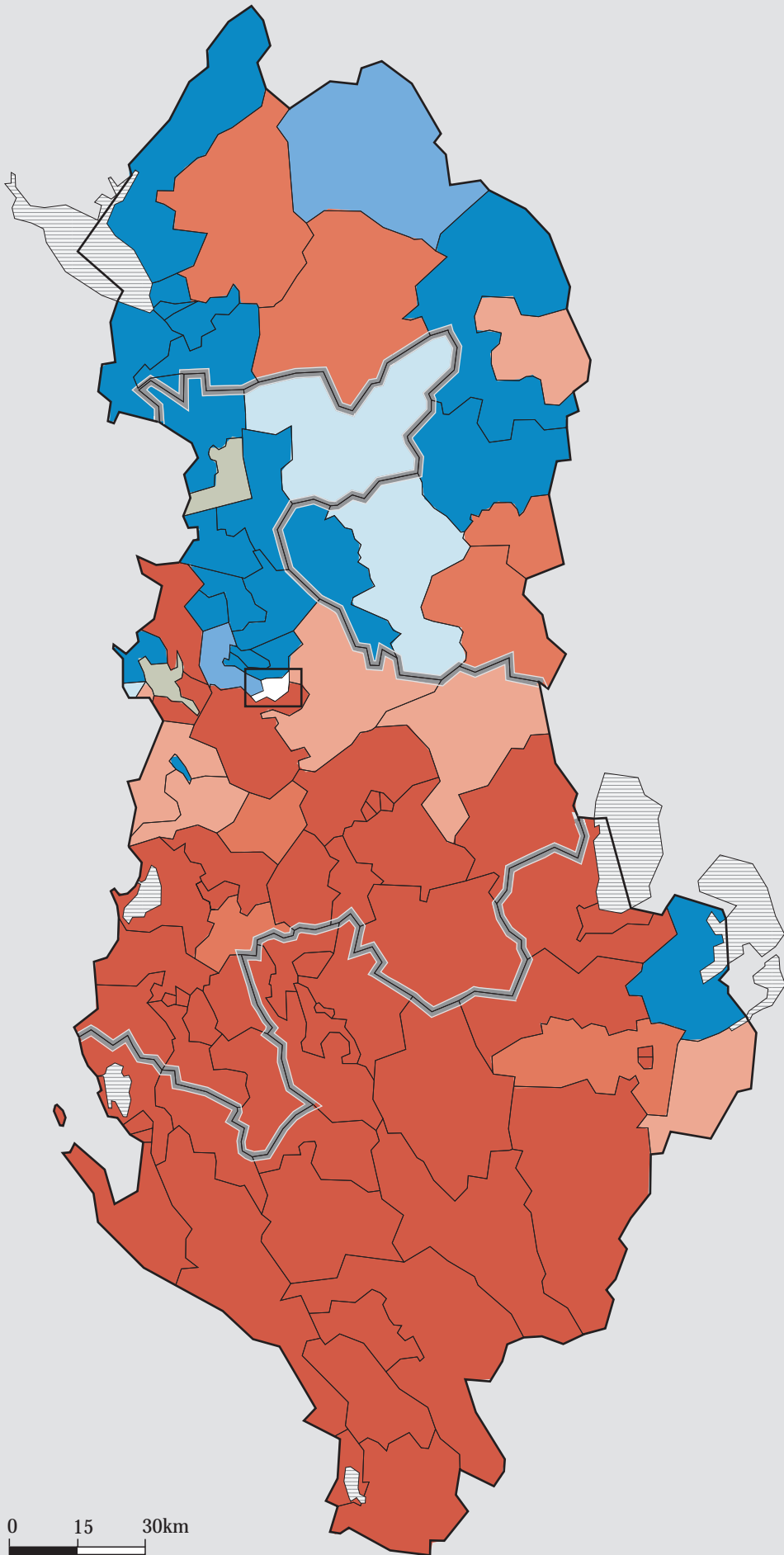
Source of data

Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of vote for party candidates Parliamentary Election 2001



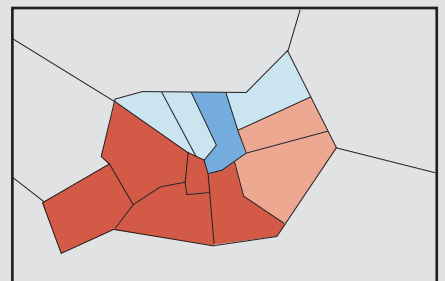
Winning party candidates

	PD	PS	IC
High	Dark Blue	Dark Red	Dark Green
Medium	Light Blue	Light Red	Light Green
Low	Very Light Blue	Very Light Red	Very Light Green

Vote margins in %

High	>10
Medium	>5 - <10
Low	<5

Tirana Municipality



Boundaries

— (thick line)	State
— (medium line)	Constituency
— (thin line)	Geographical region

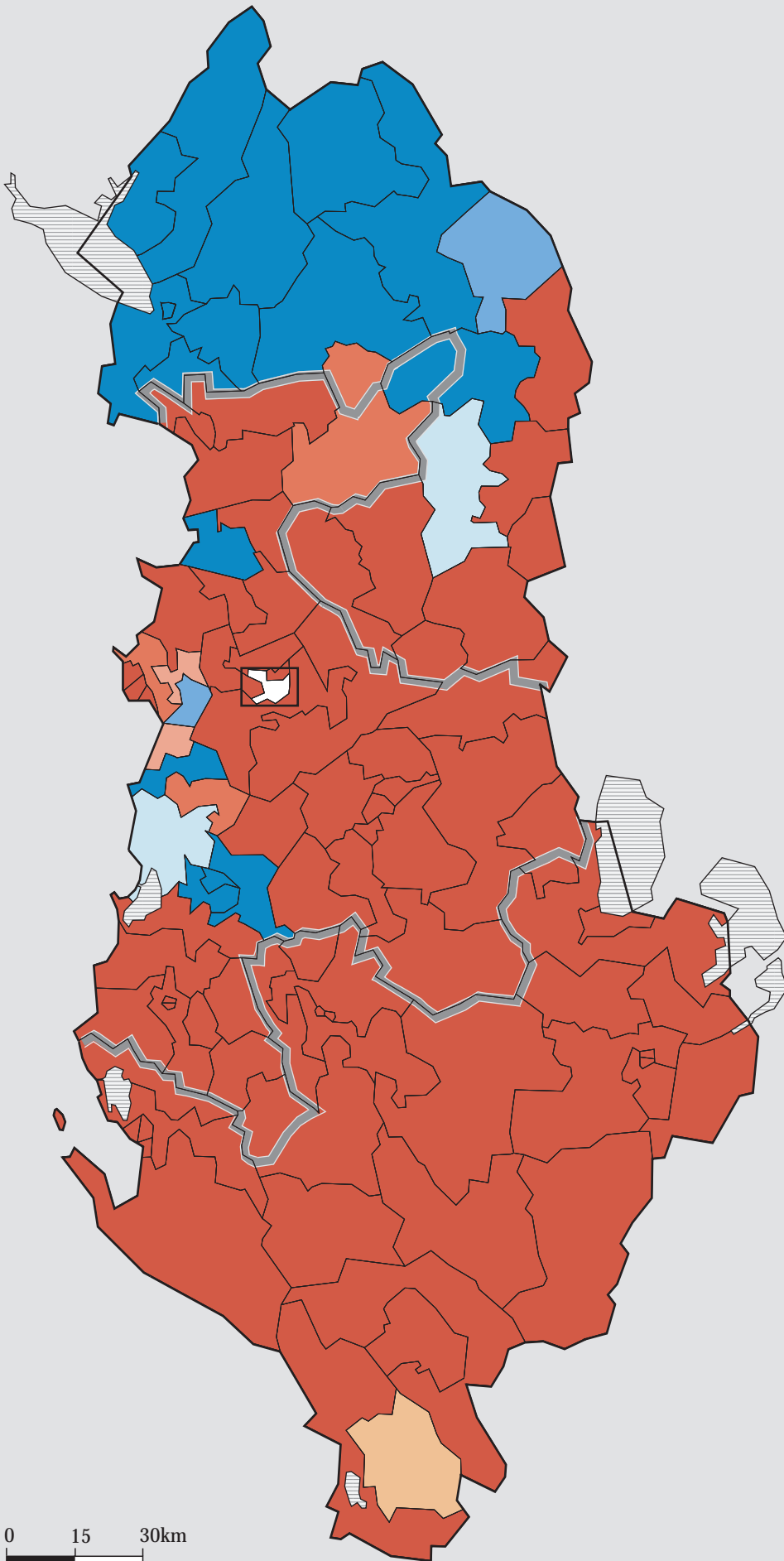
Source of data

Albanian Central Election Committee, 2001 elections

Demographic Atlas of Albania, 2003

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Spatial distribution of vote for party candidates Parliamentary Election 1997



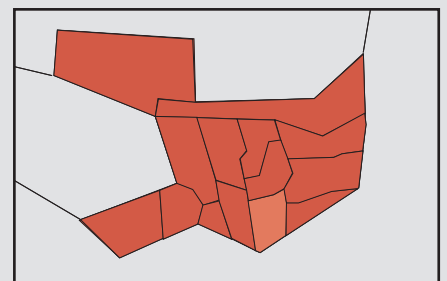
Winning party candidates

	PD	PS	PBDNJ
High	Dark Blue	Dark Red	Dark Orange
Medium	Light Blue	Light Red	Light Orange
Low	Very Light Blue	Very Light Red	Very Light Orange

Vote margins in %

High	>10
Medium	>5 - <10
Low	<5

Tirana Municipality



Boundaries

Thin black line	State
Medium black line	Constituency
Thick grey line	Geographical region

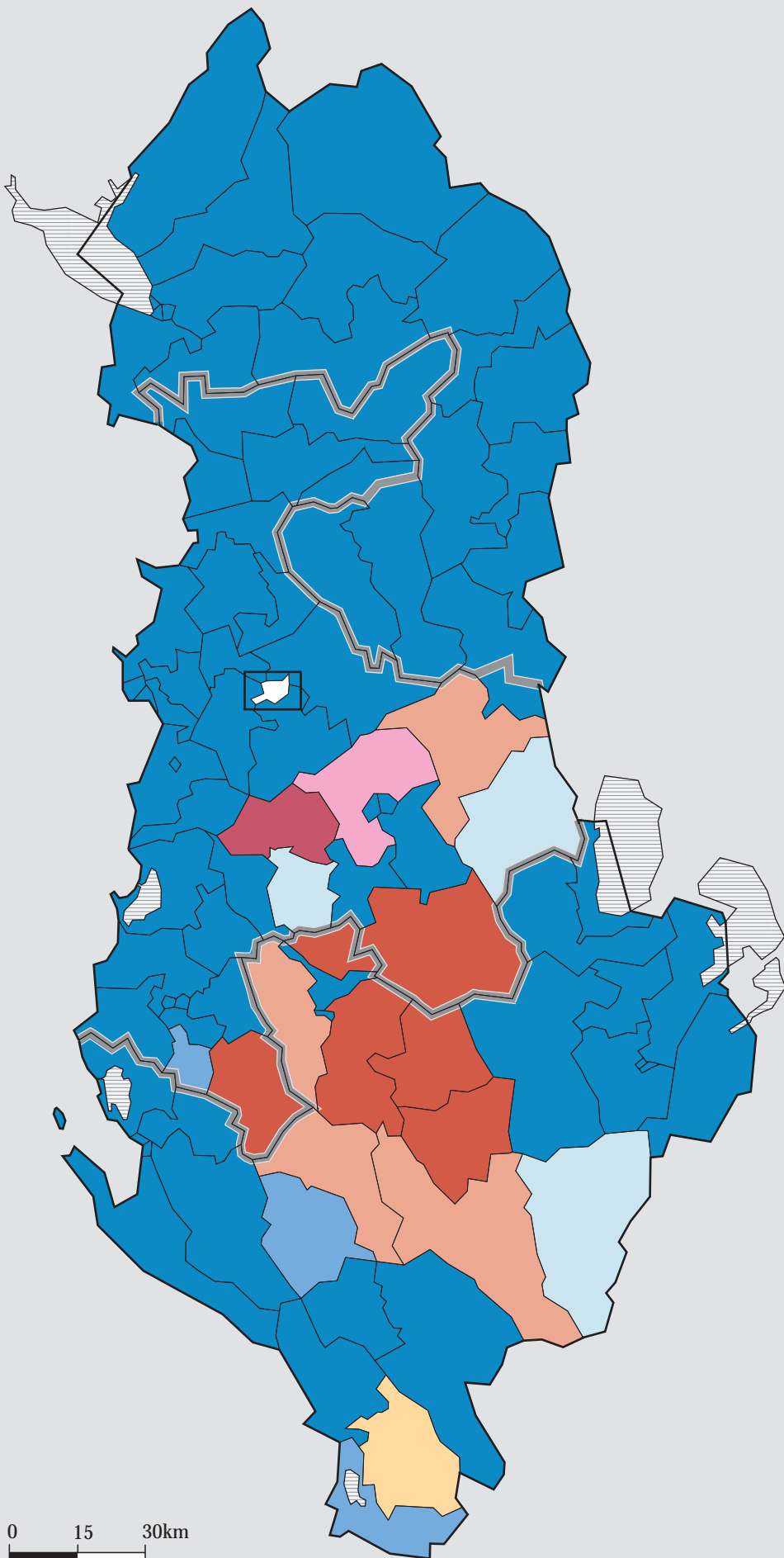
Source of data

Archive of Parliament of Albania, 1997

Demographic Atlas of Albania, 2003

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Spatial distribution of vote for party candidates Parliamentary Election 1992



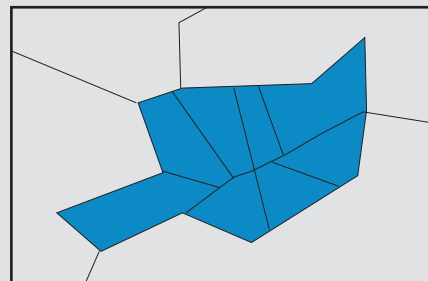
Winning party candidates

	PD	PS	PR	PSD	PBDNJ
High	Dark Blue	Red	Pink	Dark Red	Yellow
Medium	Light Blue	Orange	Light Pink	Light Red	Light Yellow
Low	Very Light Blue	Light Orange	Very Light Pink	Very Light Red	Very Light Yellow

Vote margins in %

High	>10
Medium	>5 - <10
Low	<5

Tirana Municipality



Boundaries

	State
	Constituency
	Geographical region

Source of data

Archive of Parliament of Albania, 1992

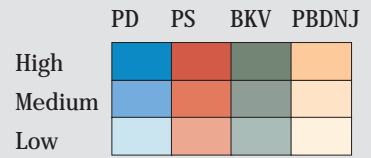
Demographic Atlas of Albania, 2003

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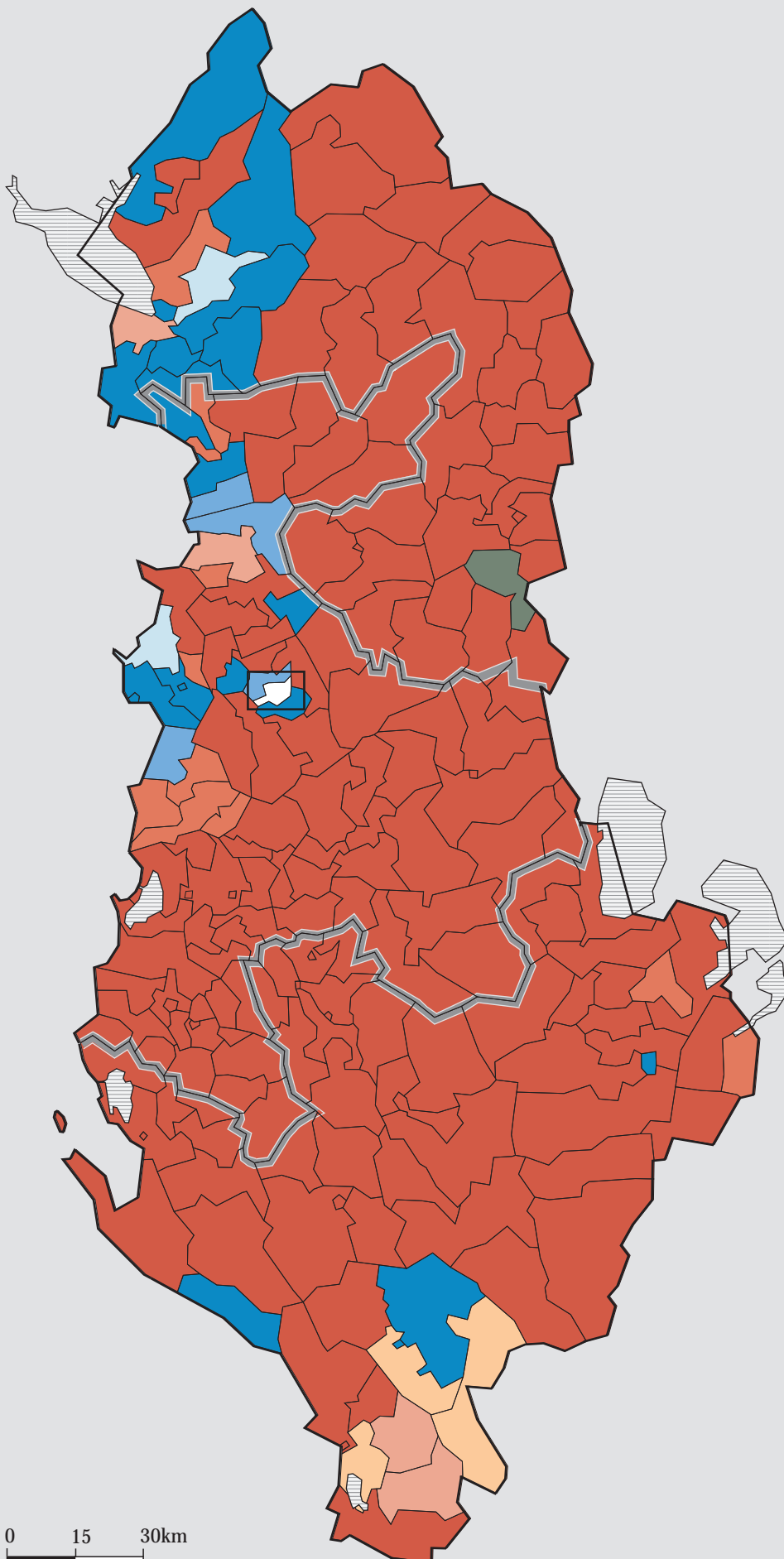
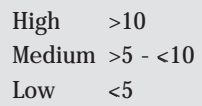
Spatial distribution of vote for party candidates

Parliamentary Election 1991

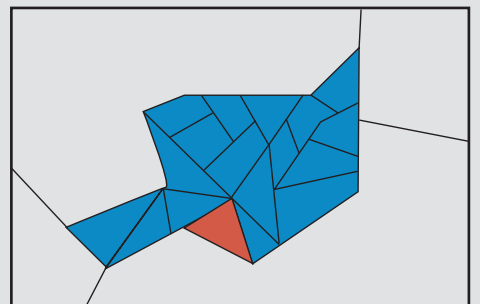
Winning party candidates



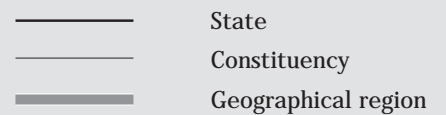
Vote margins in %



Tirana Municipality



Boundaries



Source of data

Archive of Parliament of Albania, 1991

Demographic Atlas of Albania, 2003

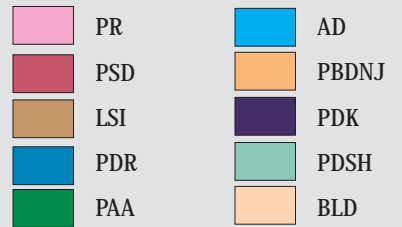
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Spatial distribution of vote for parties

Parliamentary Election 2005

Parties with >10% of total votes per constituency

With seats on parliament/proportional



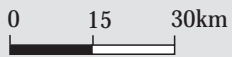
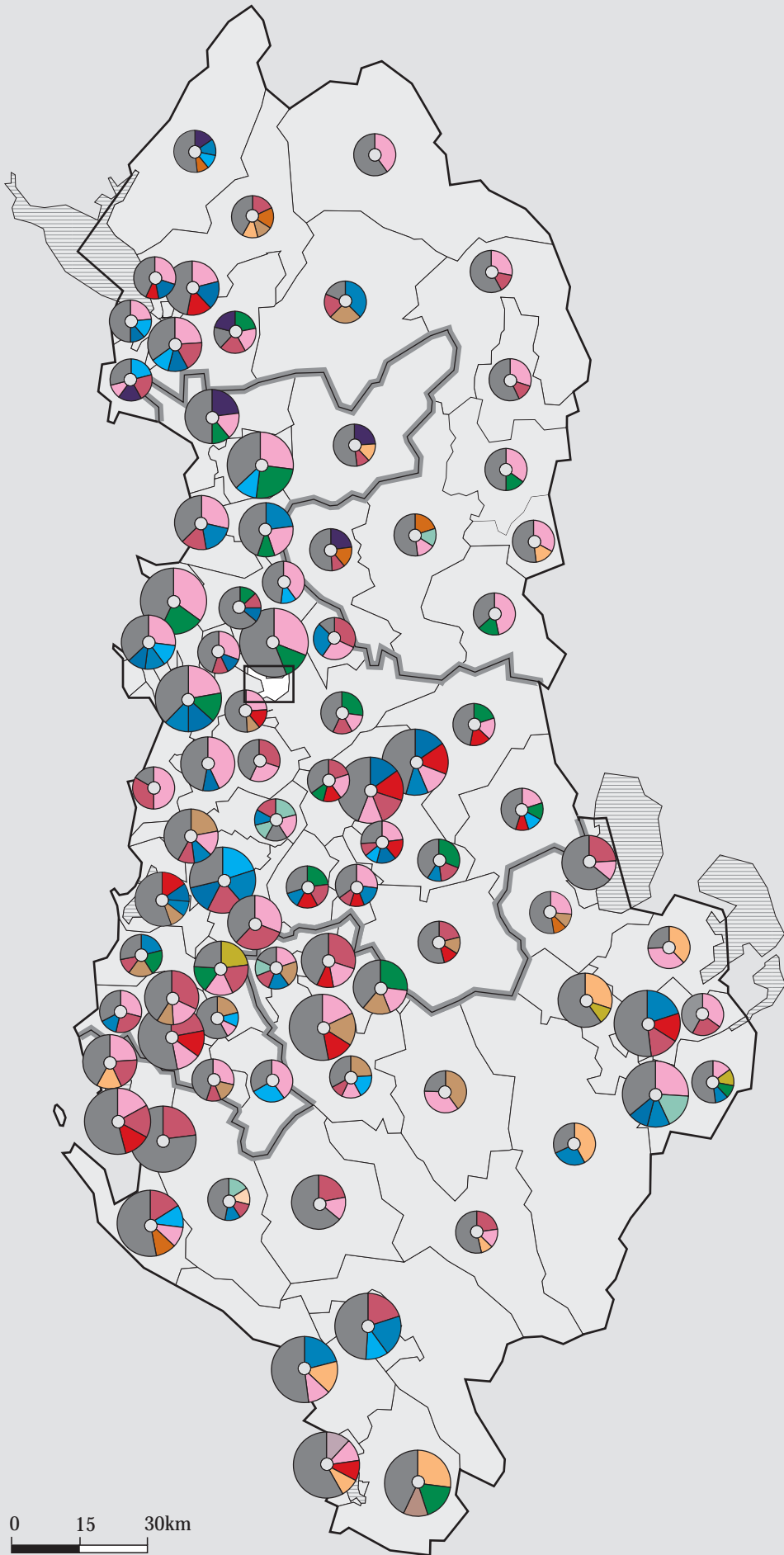
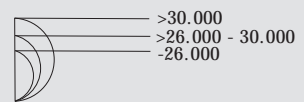
Without seats on parliament/proportional



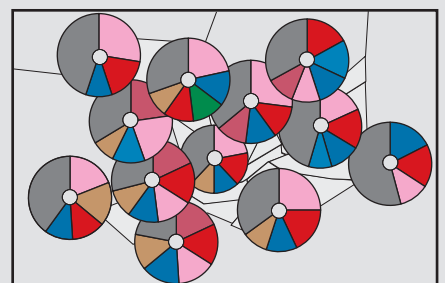
Parties with <10% of total votes per constituency



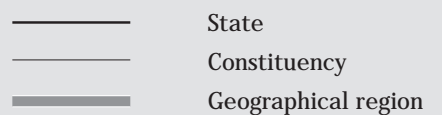
Number of voters



Tirana Municipality



Boundaries



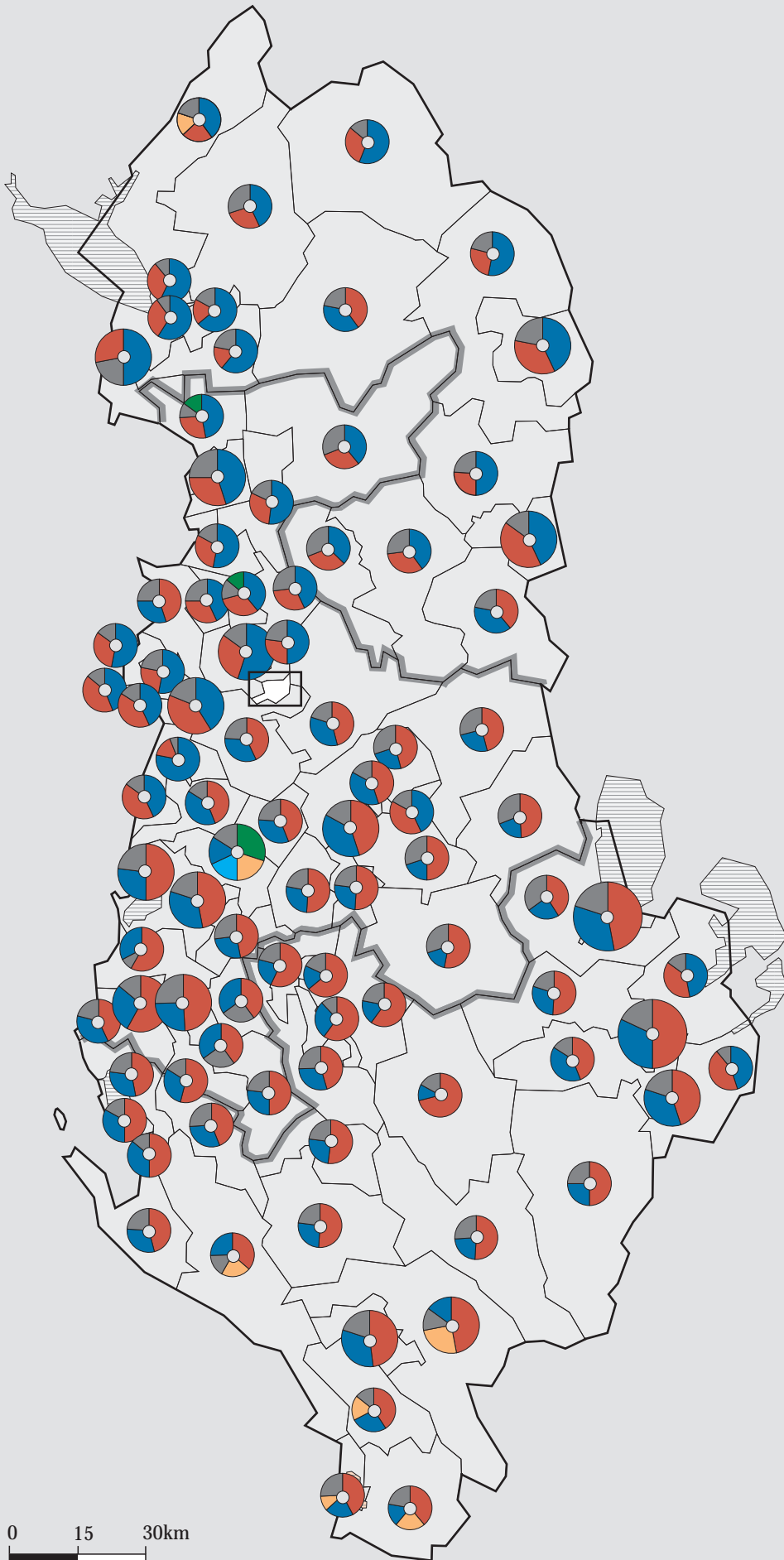
Source of data

Albanian Central Election Committee

Demographic Atlas of Albania, 2003

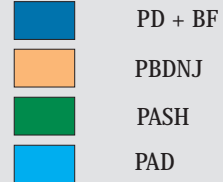
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Spatial distribution of vote for parties Parliamentary Election 2001

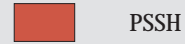


Parties with >10% of total votes per constituency

With seats on parliament/proportional

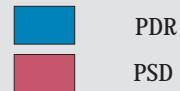


Without seats on parliament/proportional



Parties with <10% of total votes per constituency

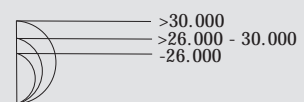
With seats on parliament/proportional



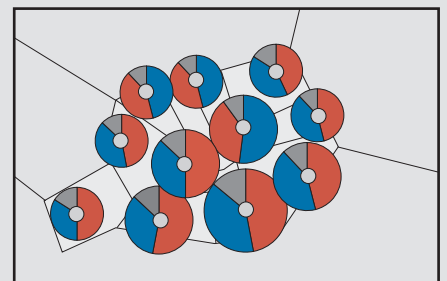
Parties with <10% of total votes per constituency



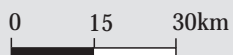
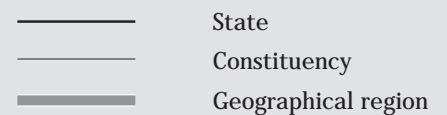
Number of voters



Tirana Municipality



Boundaries



Source of data

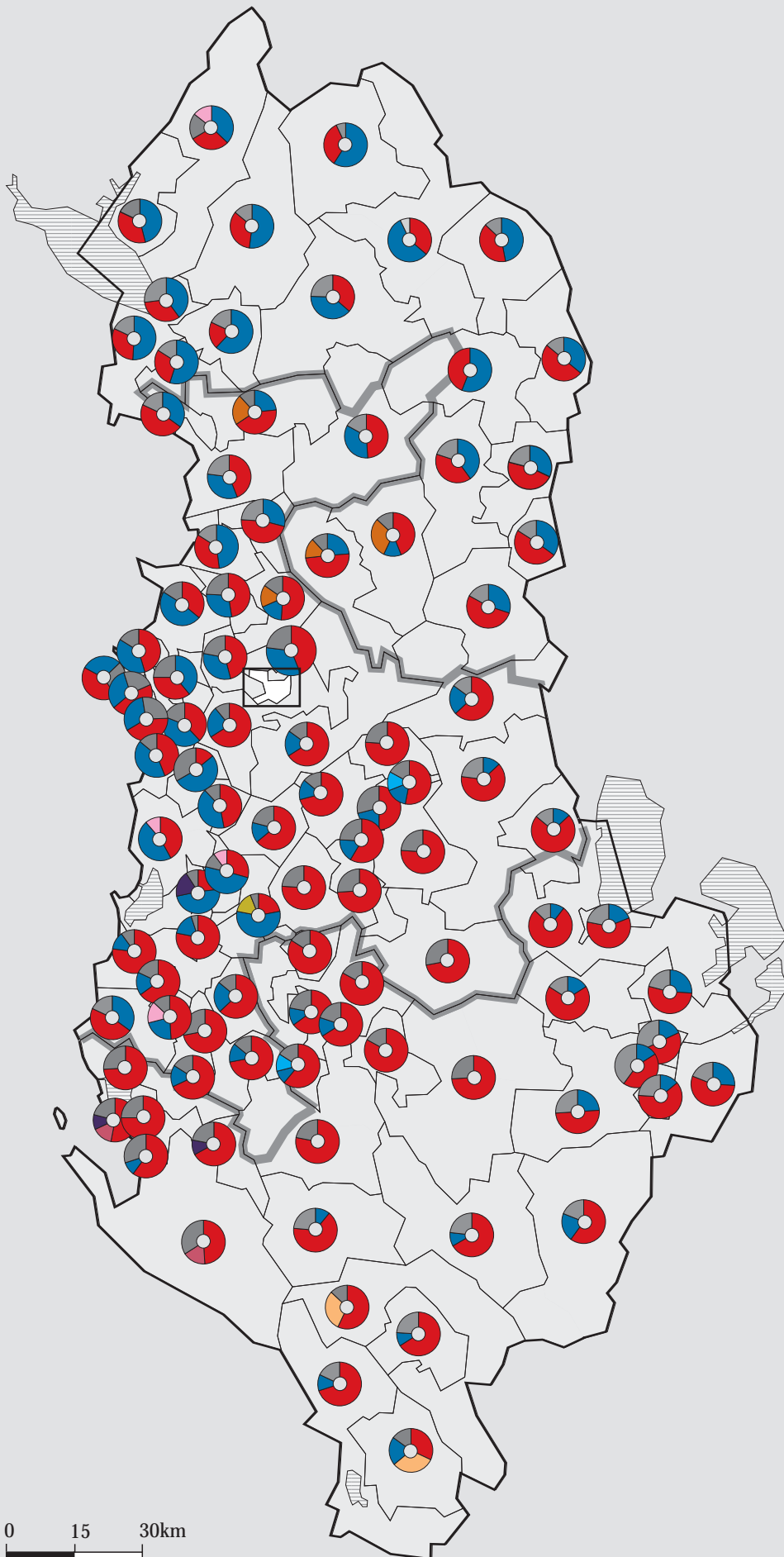
Albanian Central Election Committee

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Spatial distribution of vote for parties

Parliamentary Election 1997



Parties with >10% of total votes in constituency

With seats on parliament/proportional



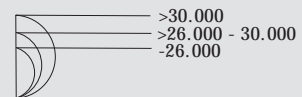
Without seats on parliament/proportional



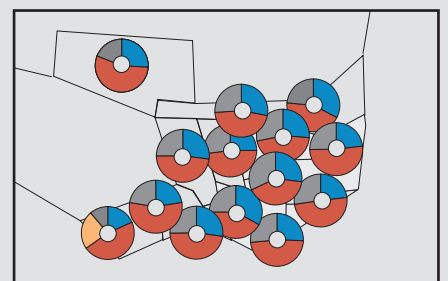
Parties with <10% of total votes in constituency



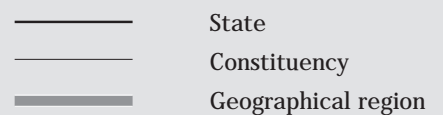
Number of voters



Tirana Municipality



Boundaries



Source of data

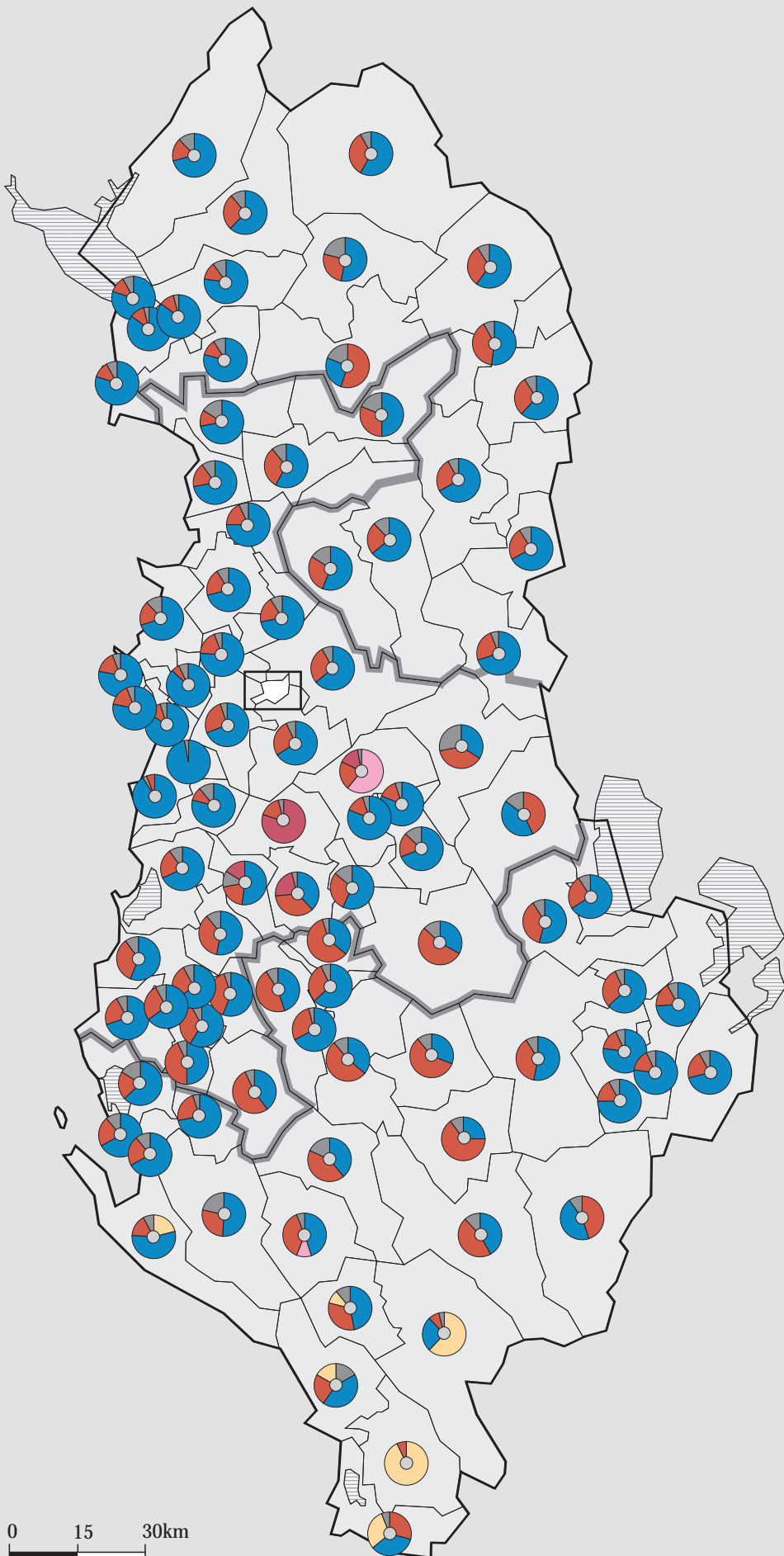
Archive of Parliament of Albania, 1997

Demographic Atlas of Albania, 2003

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Spatial distribution of vote for parties

Parliamentary Election 1992



Parties with >10% of total votes per constituency

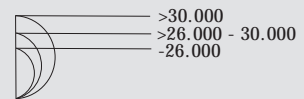
With seats on parliament/proportional



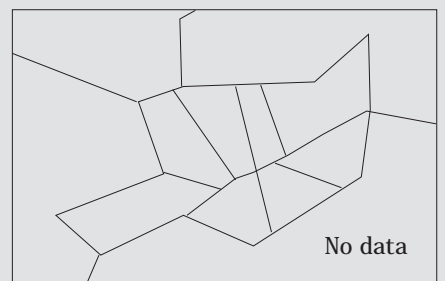
Parties with <10% of total votes per constituency



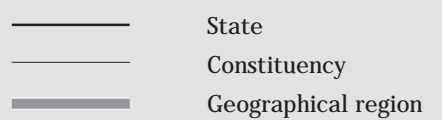
Number of voters



Tirana Municipality



Boundaries



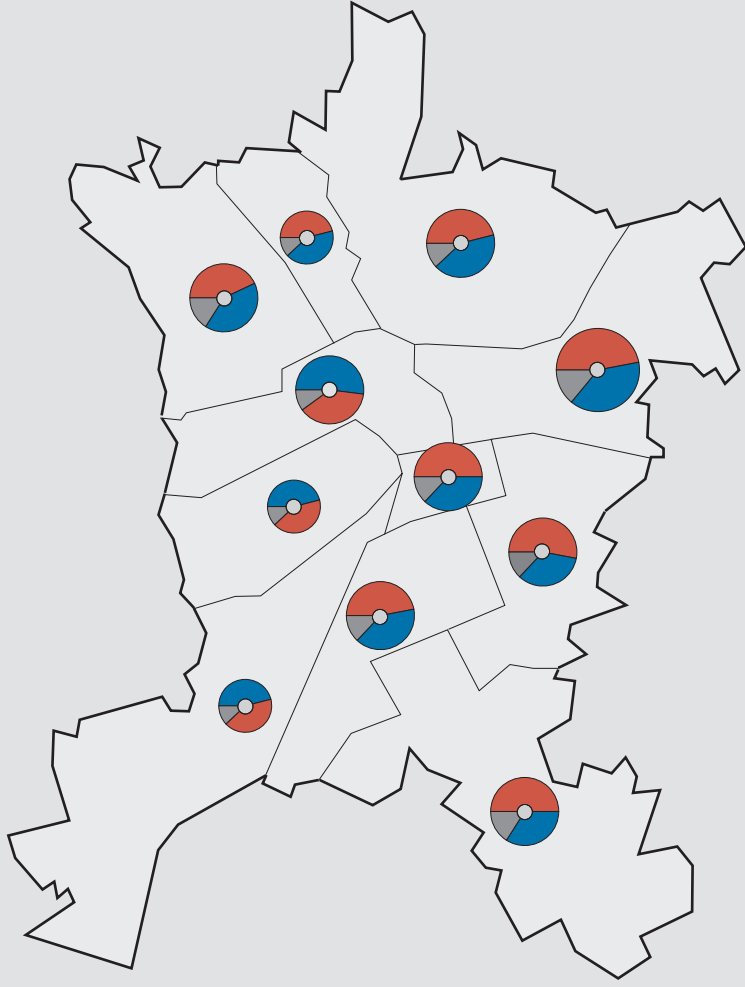
Source of data

Archive of Parliament of Albania, 1992

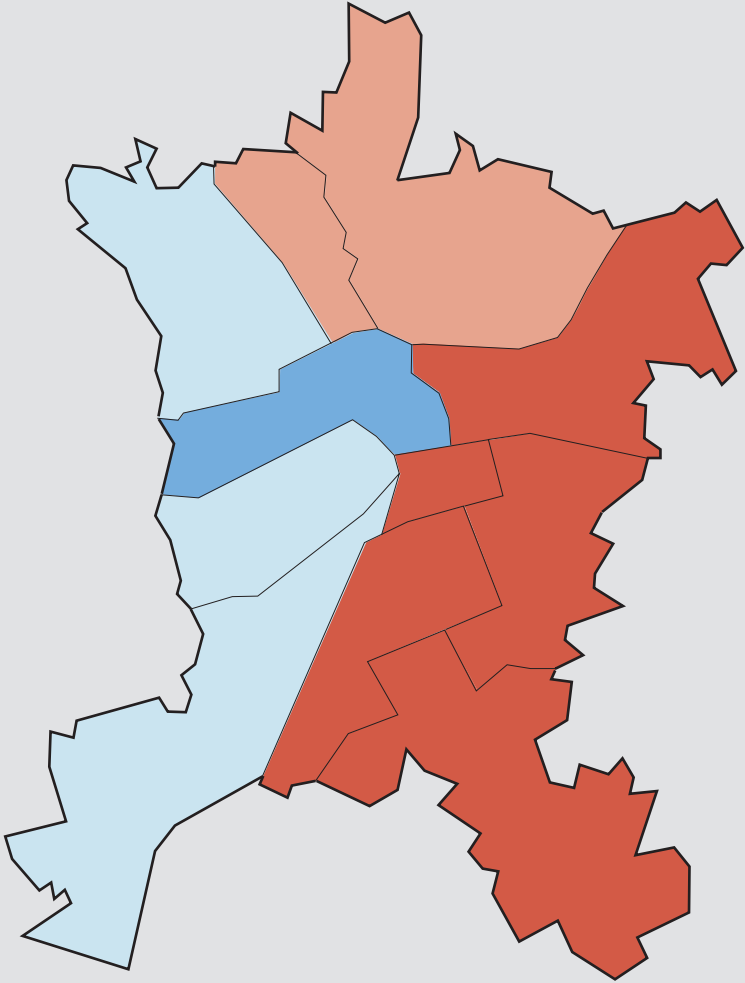
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A-2



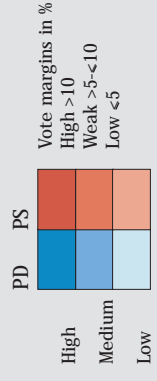
A-1



Vote choice Municipality of Tirana Parliamentary Election 2001

Map A-1

Winning party candidates



Reference map



Map A-2

Parties



Number of voters



Reference map

Codes of administrative and electoral divisions

- 5 Municipality unit
- 42 Constituency

Boundaries

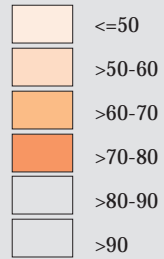
- Municipality (thick black line)
- Municipality unit (thin black line)
- Vote pattern (dashed line)
- Constituency 1:50000 (thin grey line)
- Constituency 1:100 000 (thin red line)

Source of data
 Demographic Atlas of Albania 2003
 Albanian Central Election Committee
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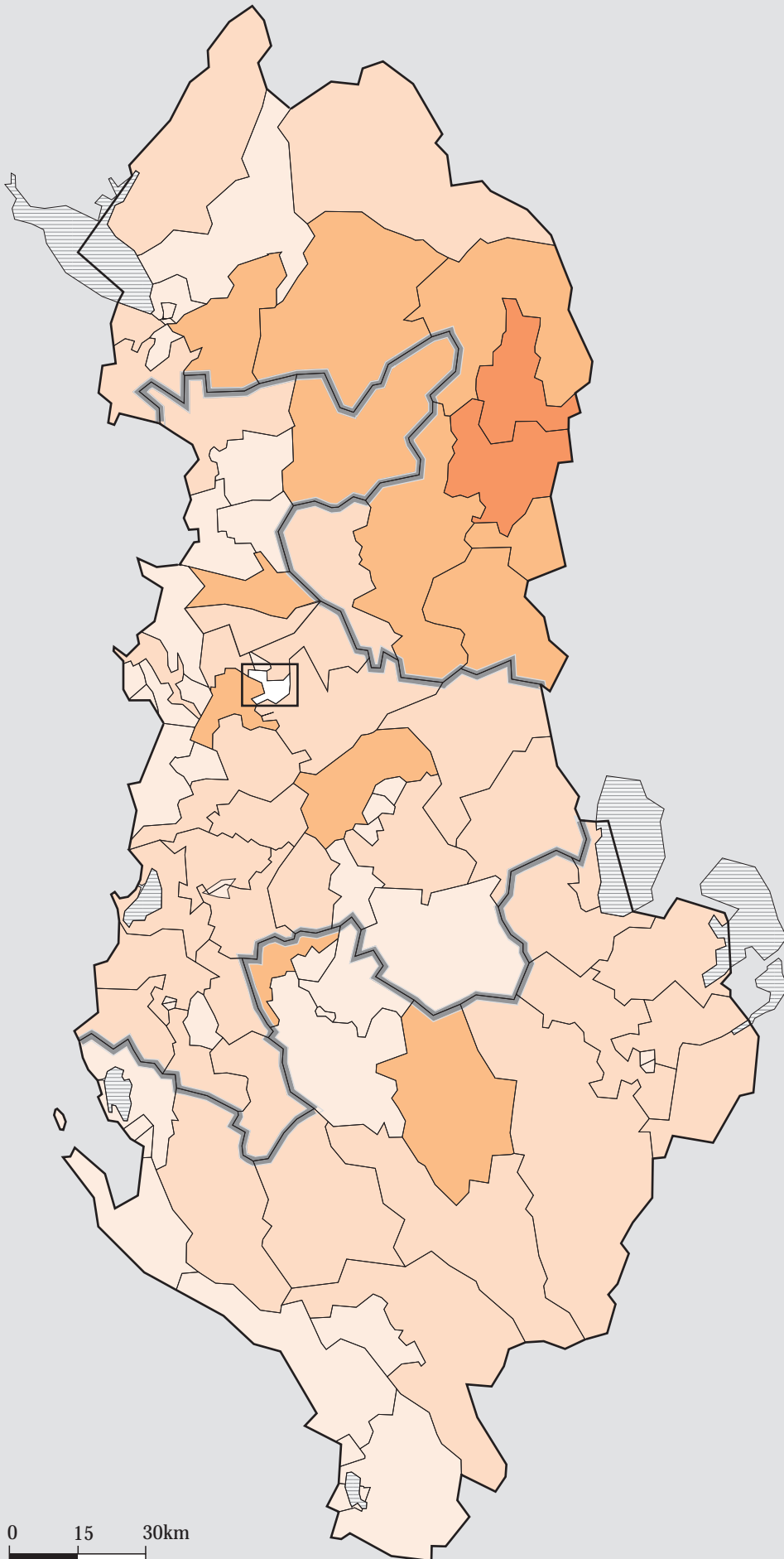
Spatial distribution of turnout

Parliamentary Election 2005

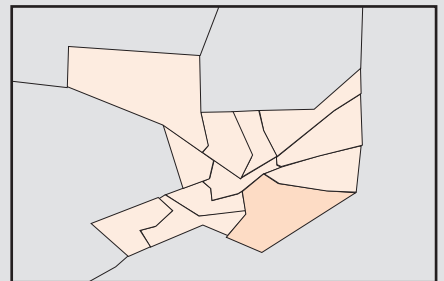
Electoral turnout as %
of total number of country voters



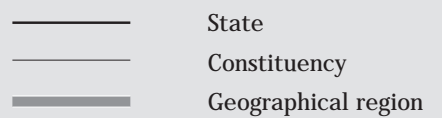
∅ 49%



Tirana Municipality



Boundaries



Source of data

Albanian Central Election Committee

Demographic Atlas of Albania, 2003

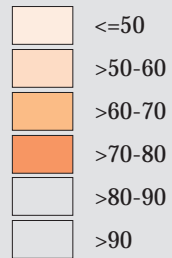
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0 15 30km

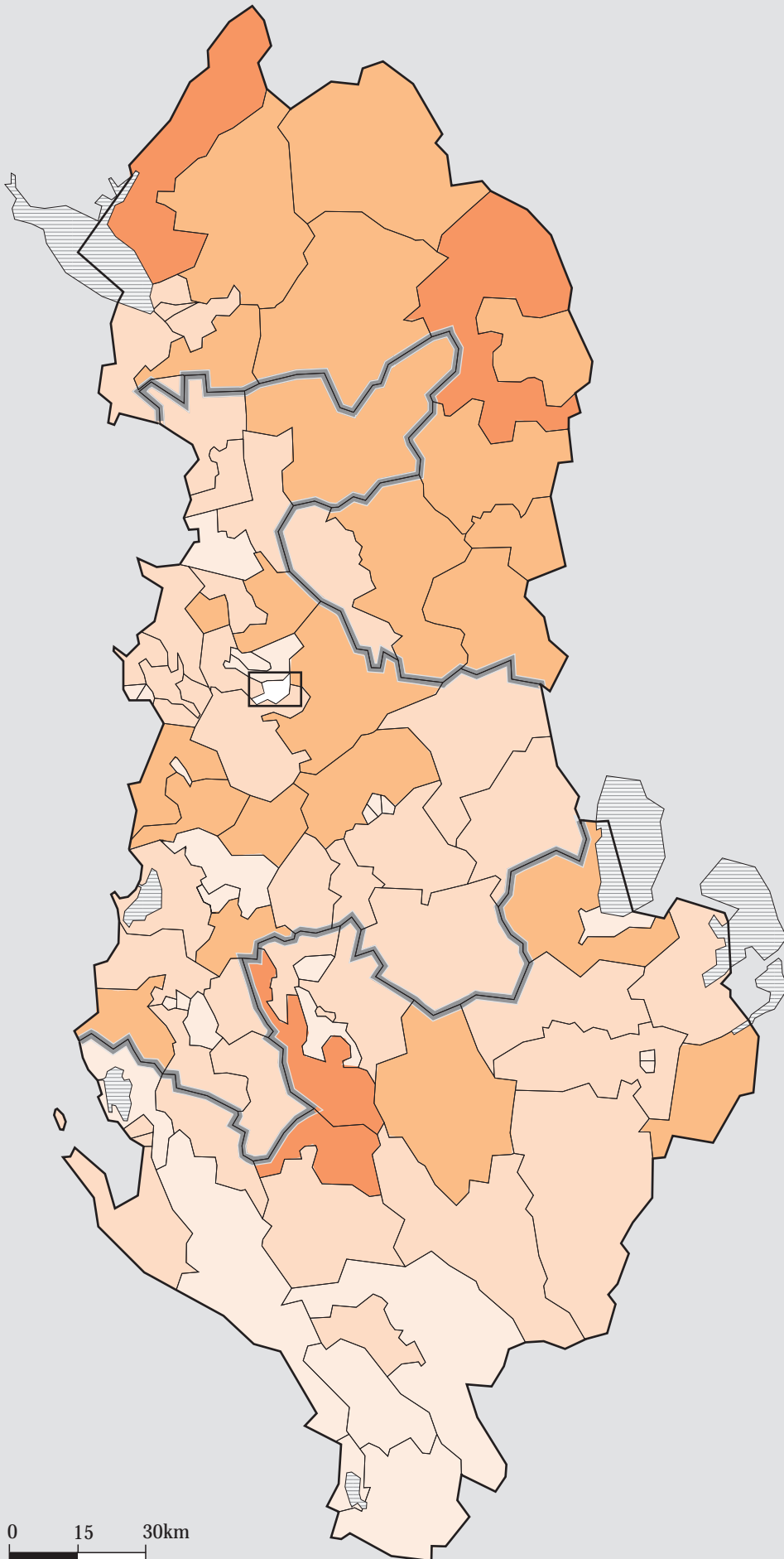
Spatial distribution of turnout

Parliamentary Election 2001

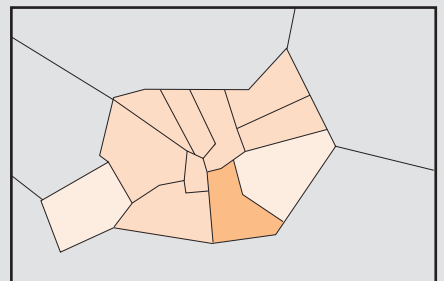
Electoral turnout as % of registered voters in constituency



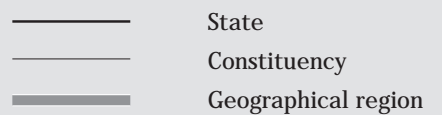
Ø 53%



Tirana Municipality



Boundaries



Source of data

Albanian Central Election Committee

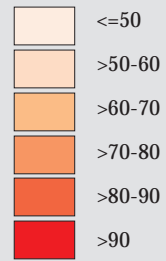
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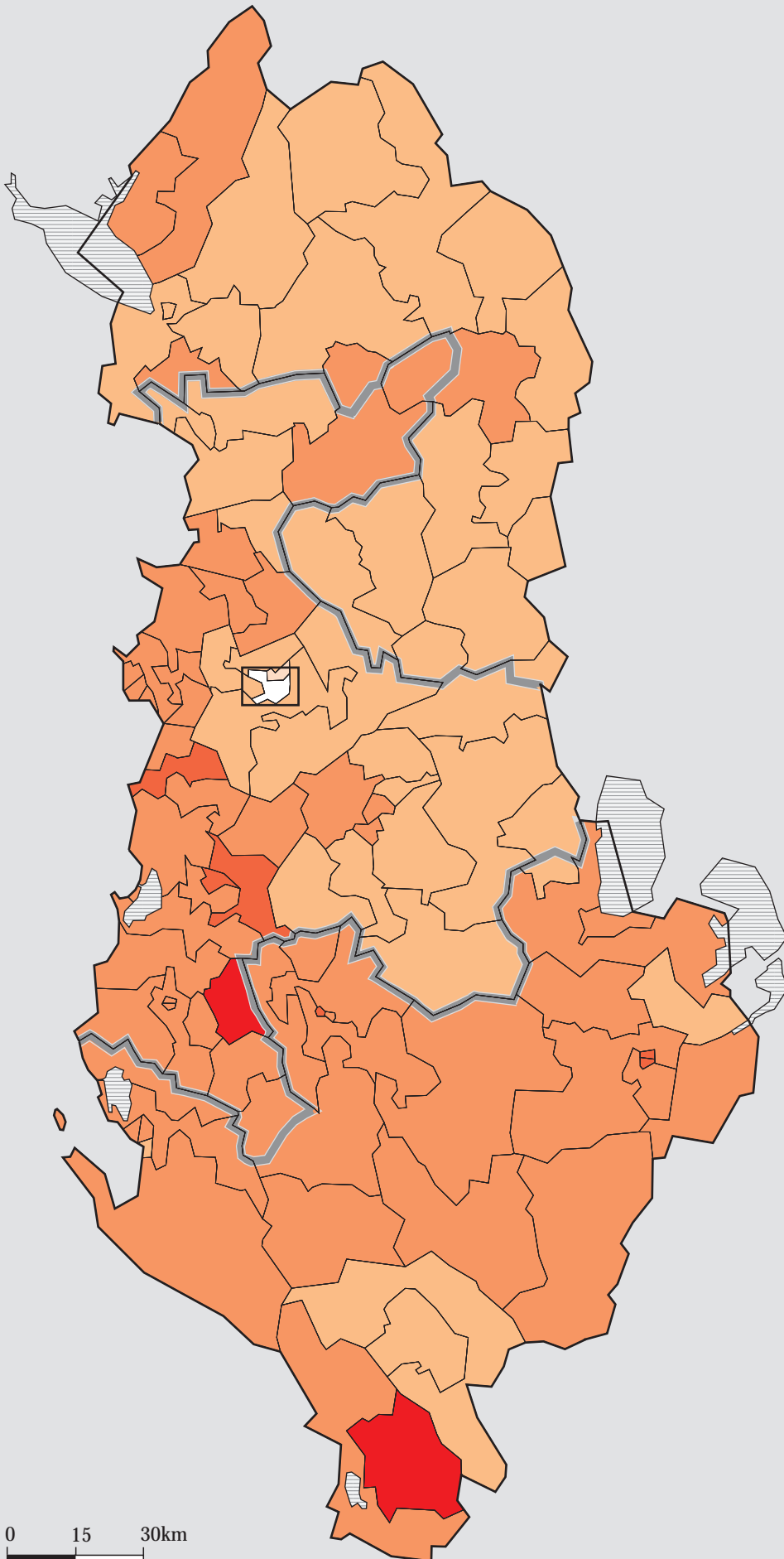
Spatial distribution of turnout

Parliamentary Election 1997

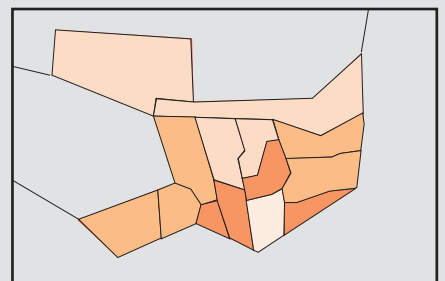
Electoral turnout as % of registered voters in constituency



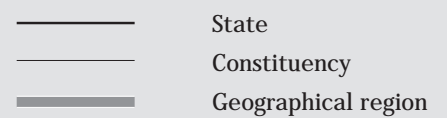
∅ 73%



Tirana Municipality



Boundaries



Source of data

Archive of Parliament of Albania, 1997

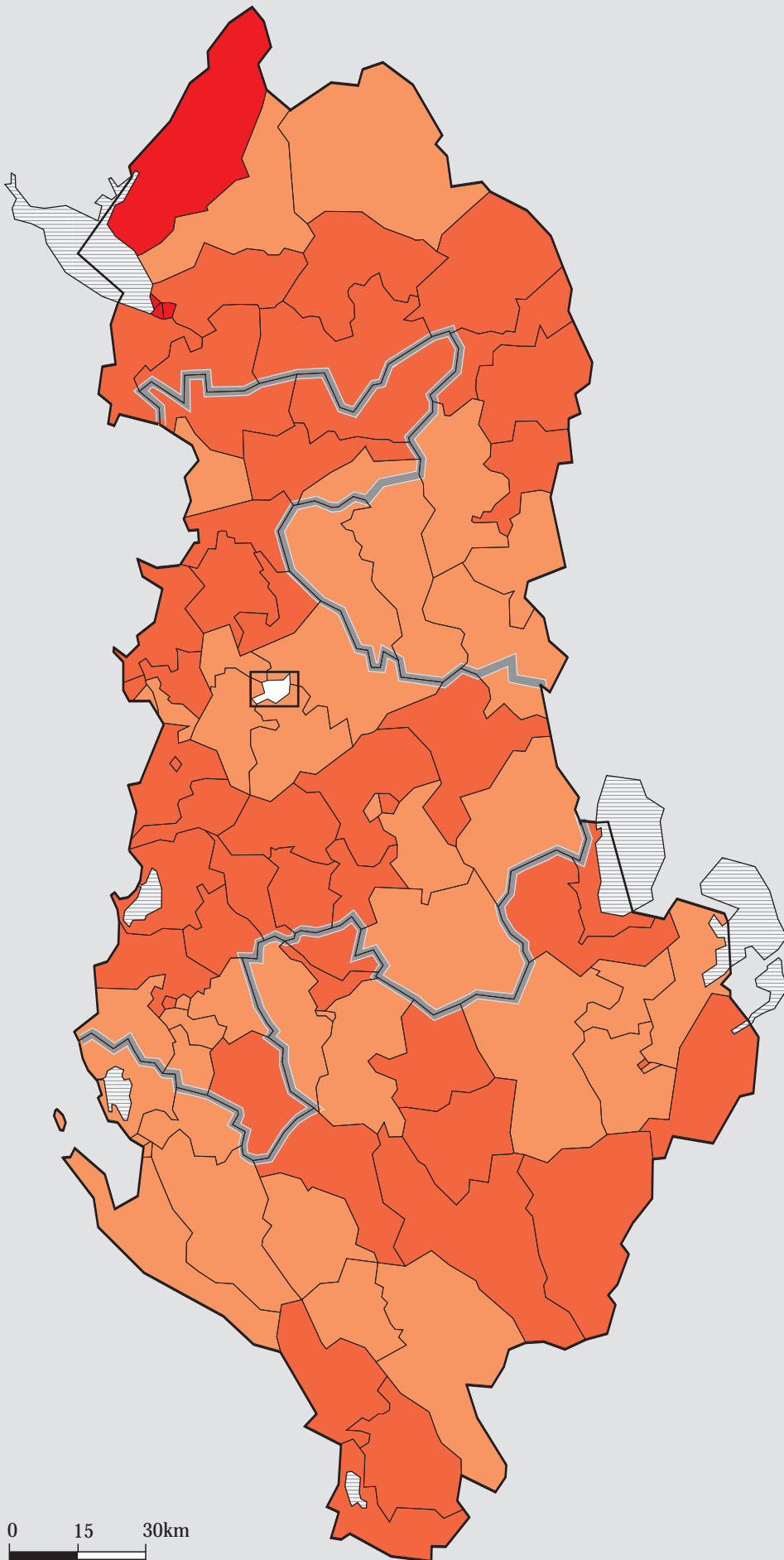
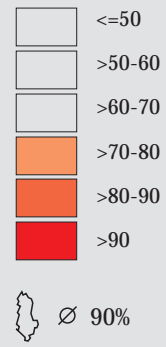
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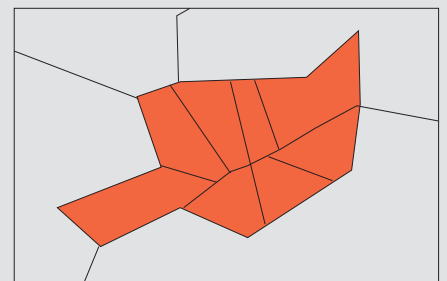
Spatial distribution of turnout

Parliamentary Election 1992

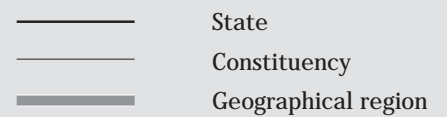
Electoral turnout as % of registered voters in constituency



Tirana Municipality



Boundaries



Source of data

Archive of Parliament of Albania, 1992

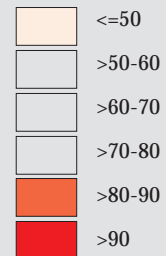
Demographic Atlas of Albania, 2003

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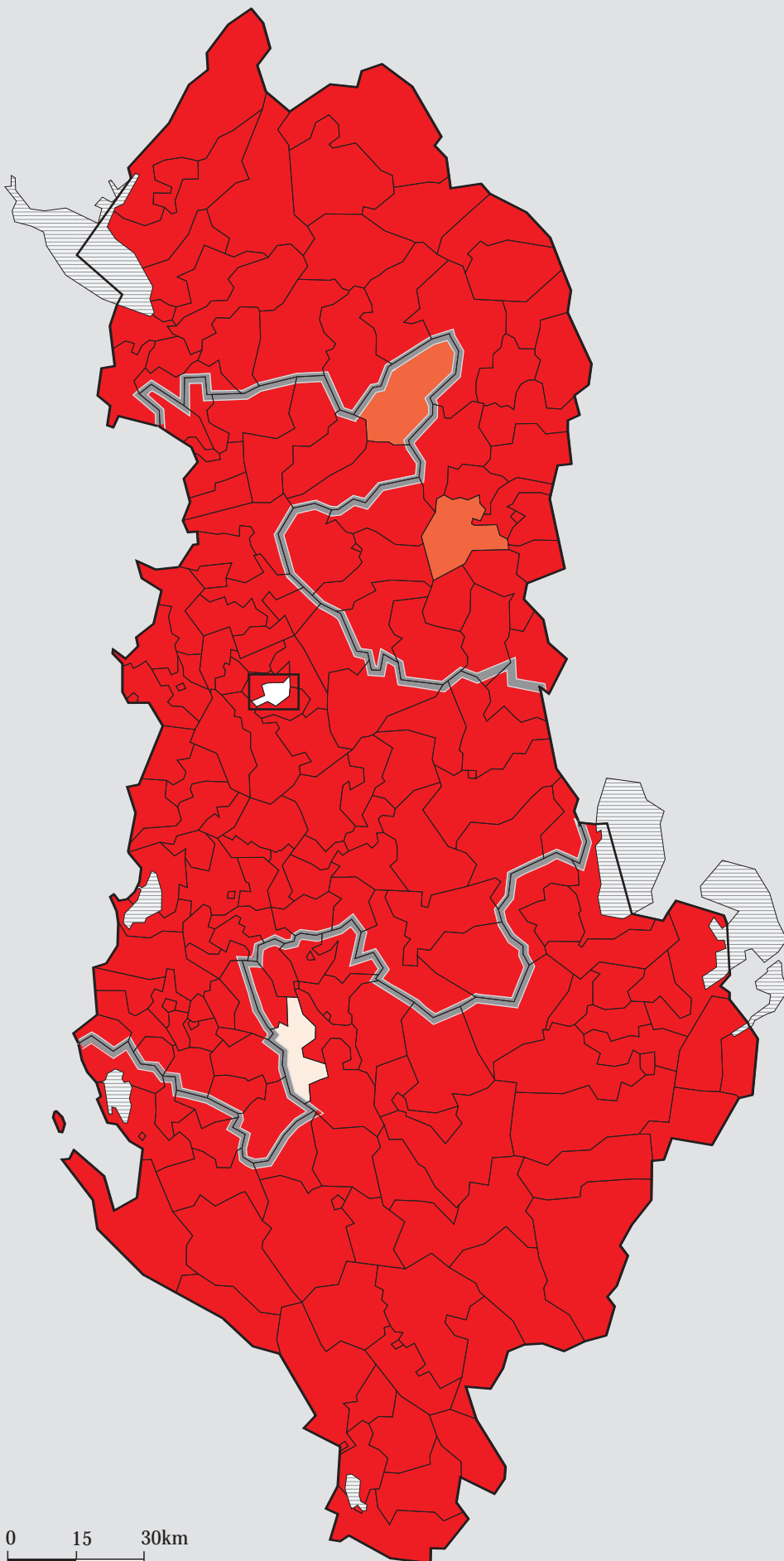
Spatial distribution of turnout

Parliamentary Election 1991

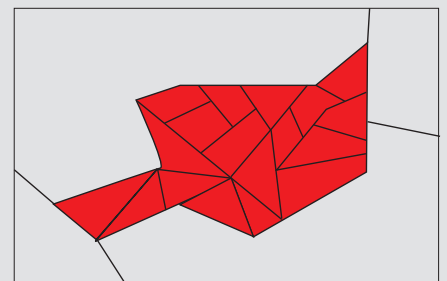
Electoral turnout as % of total number of country voters



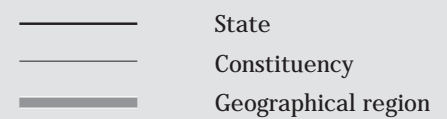
∅ 98%



Tirana Municipality



Boundaries



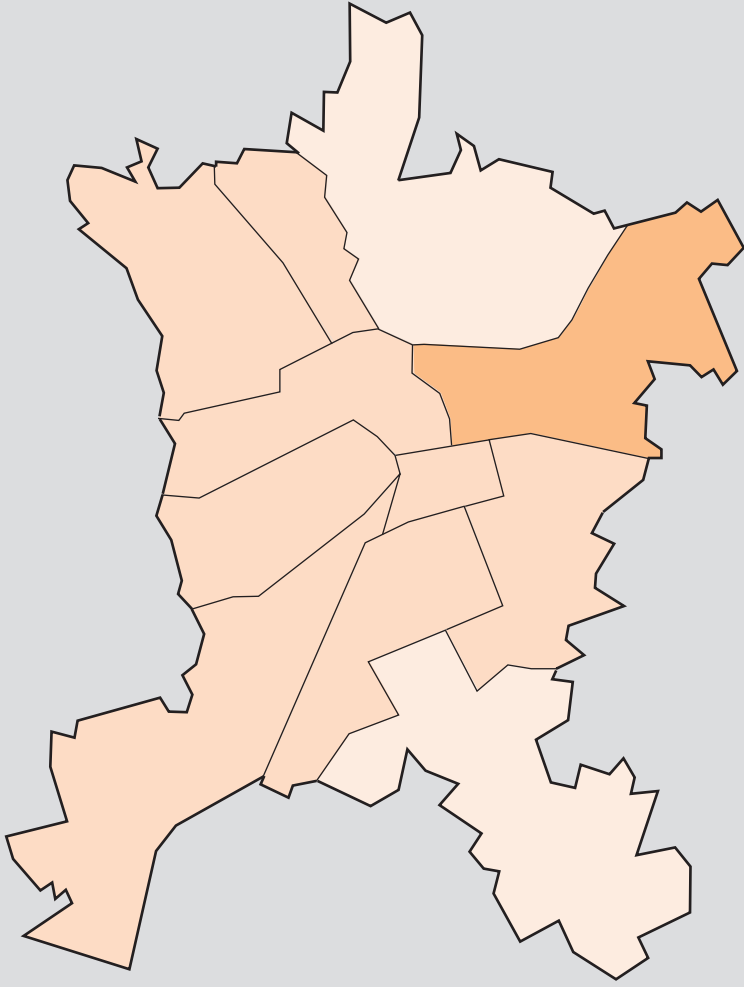
Source of data

Archive of Parliament of Albania, 1991

Demographic Atlas of Albania, 2003

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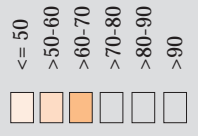
A-3



Turnout
Municipality of Tirana
Parliamentary Election 2001

Map A-3

Electoral turnout as %
of total number of country voters



Reference map



Reference map
Codes of
administrative and
electoral divisions

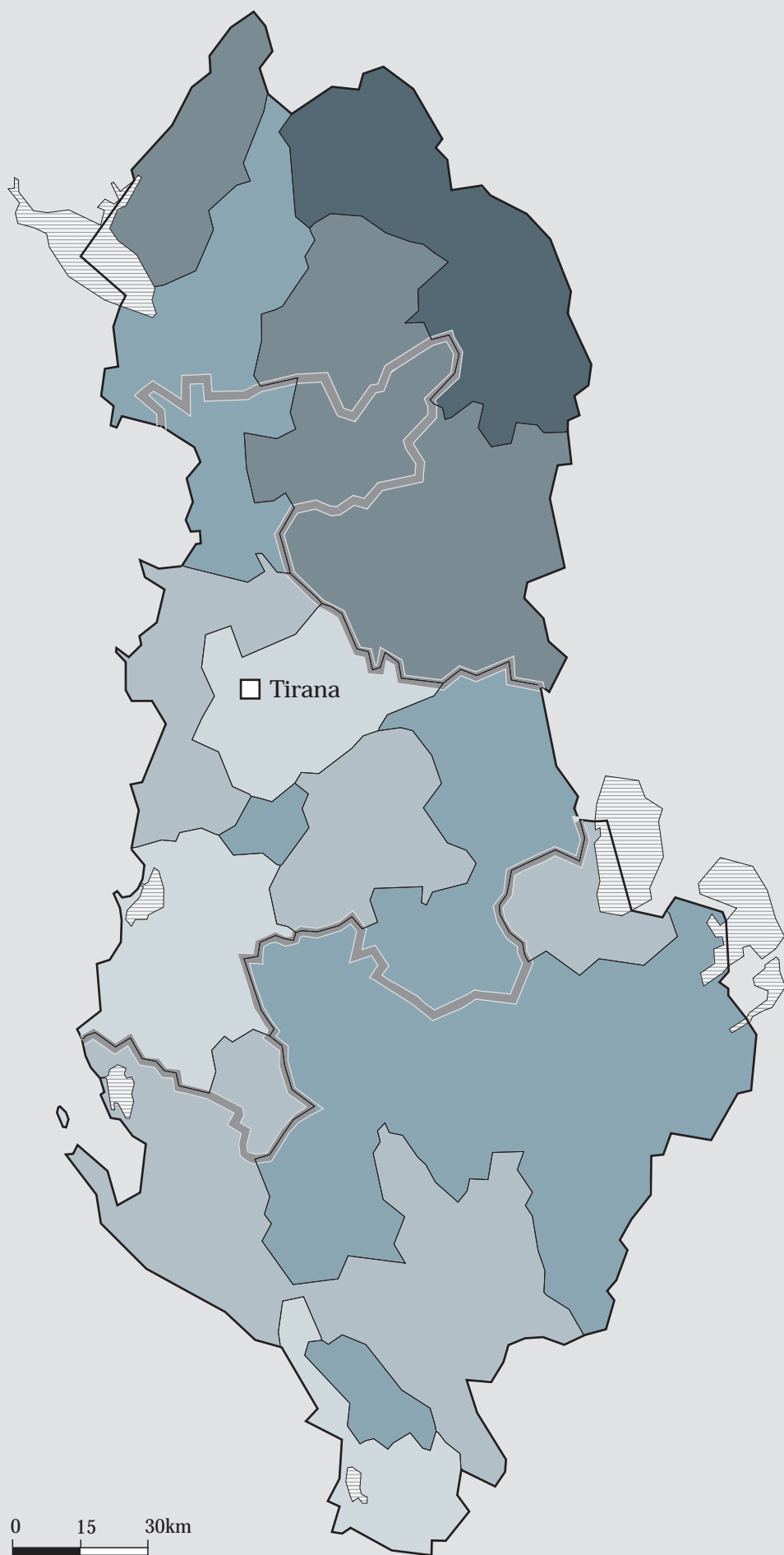
- 5 Municipality unit
- 42 Constituency

Boundaries


- Municipality
- Constituency 1:50 000
- Constituency 1:100 000


Source of data
Demographic Atlas of Albania 2003
Albanian Central Election Committee
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Profile of electoral context
Independent variables/Group I
Parliamentary Election 2005





Zones of electoral context

	Zone 1
Unemployment rate	low
Years of schooling	very high
Families on social assistance	low
Internal migration	gain very high/ loss very low

	Zone 2
Unemployment rate	medium
Years of schooling	high
Families on social assistance	medium
Internal migration	gain high/medium loss low/medium

	Zone 3
Unemployment rate	medium/high
Years of schooling	medium/high
Families on social assistance	medium/high
Internal migration	gain medium/low loss medium/high

	Zone 4
Unemployment rate	high
Years of schooling	medium
Families on social assistance	high
Internal migration	loss high

	Zone 5
Unemployment rate	very high
Years of schooling	low
Families on social assistance	very high
Internal migration	loss very high

Boundaries

-  State
-  Context zone
-  Geographical region

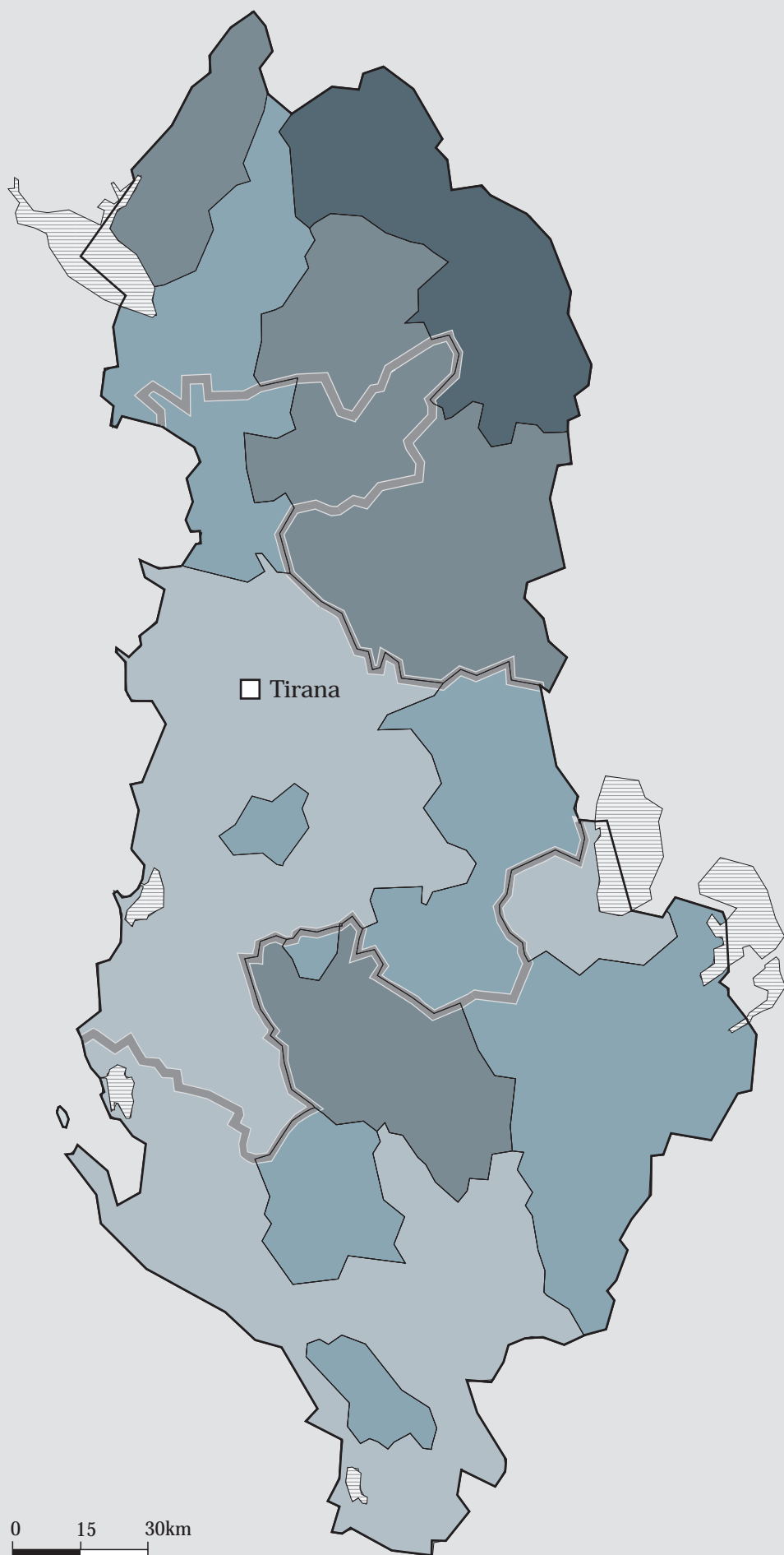
Source of data

INSTAT: Indicators by prefectures 2004-2005, Tirana 2006

Demographic Atlas of Albania, 2003

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Profile of electoral context
Independent variables/Group I
Parliamentary Election 2001



Zones of electoral context

	Zone 1
Unemployment rate	low
Years of schooling	very high
Families on social assistance	low
Internal migration	gain very high/ loss very low
	Zone 2
Unemployment rate	medium
Years of schooling	high
Families on social assistance	medium
Internal migration	gain high/medium loss low/medium
	Zone 3
Unemployment rate	medium/high
Years of schooling	medium/high
Families on social assistance	medium/high
Internal migration	gain medium/low loss medium/high
	Zone 4
Unemployment rate	high
Years of schooling	medium
Families on social assistance	high
Internal migration	loss high
	Zone 5
Unemployment rate	very high
Years of schooling	low
Families on social assistance	very high
Internal migration	loss very high

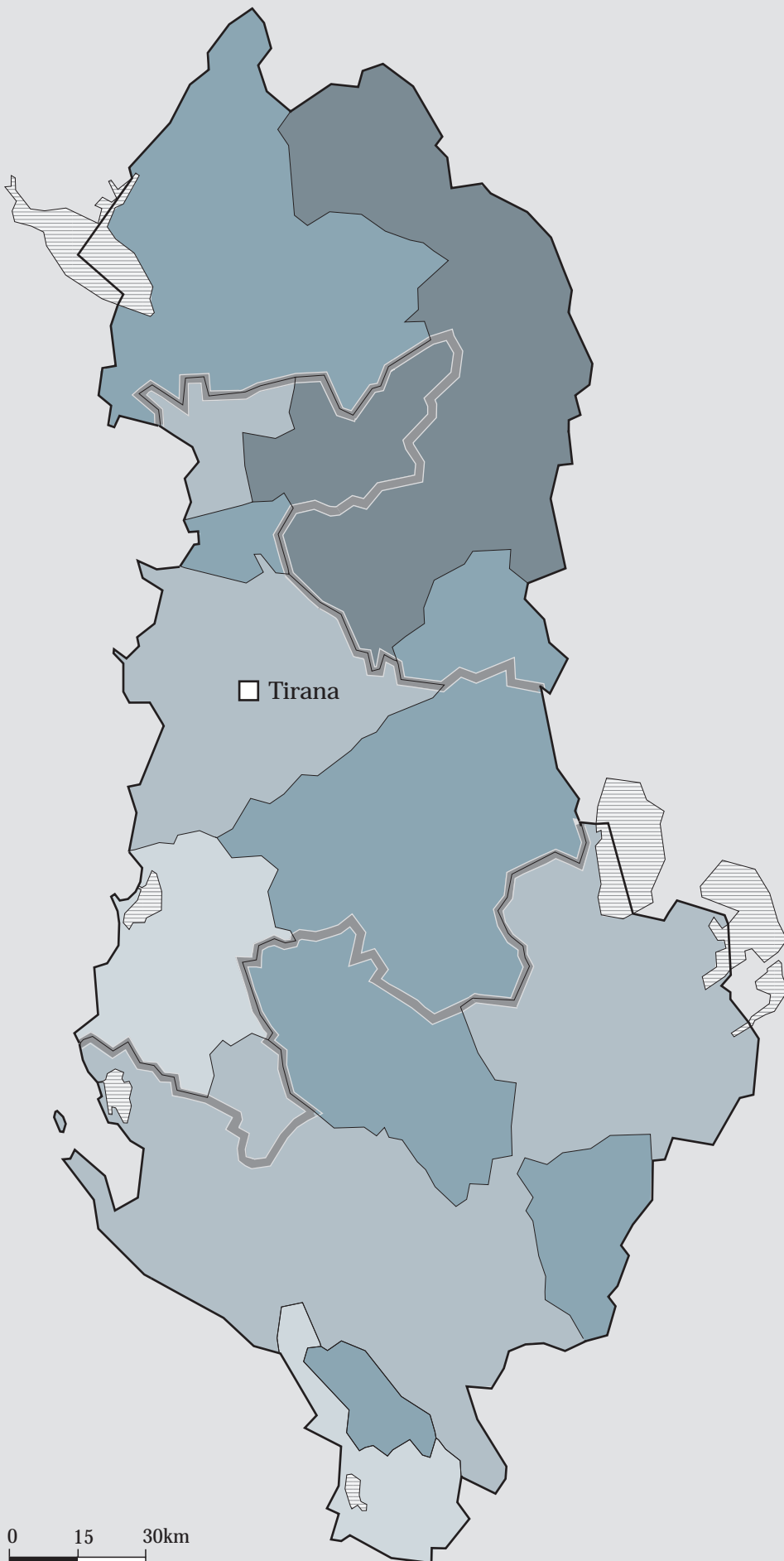
Boundaries

	State
	Context zone
	Geographical region

Source of data

INSTAT: Indicators by prefectures 2001-2002, Tirana 2002
Demographic Atlas of Albania, 2003
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Profile of electoral context
Independent variables/Group I
Parliamentary Election 1997



Zones of electoral context

	Zone 1
Unemployment rate	low
Years of schooling	very high
Families on social assistance	low
Internal migration	gain very high/ loss very low

	Zone 2
Unemployment rate	medium
Years of schooling	high
Families on social assistance	medium
Internal migration	gain high/medium loss low/medium

	Zone 3
Unemployment rate	medium/high
Years of schooling	medium/high
Families on social assistance	medium/high
Internal migration	gain medium/low loss medium/high

	Zone 4
Unemployment rate	high
Years of schooling	medium
Families on social assistance	high
Internal migration	loss high

	Zone 5
Unemployment rate	very high
Years of schooling	low
Families on social assistance	very high
Internal migration	loss very high

Boundaries

	State
	Context zone
	Geographical region

Source of data

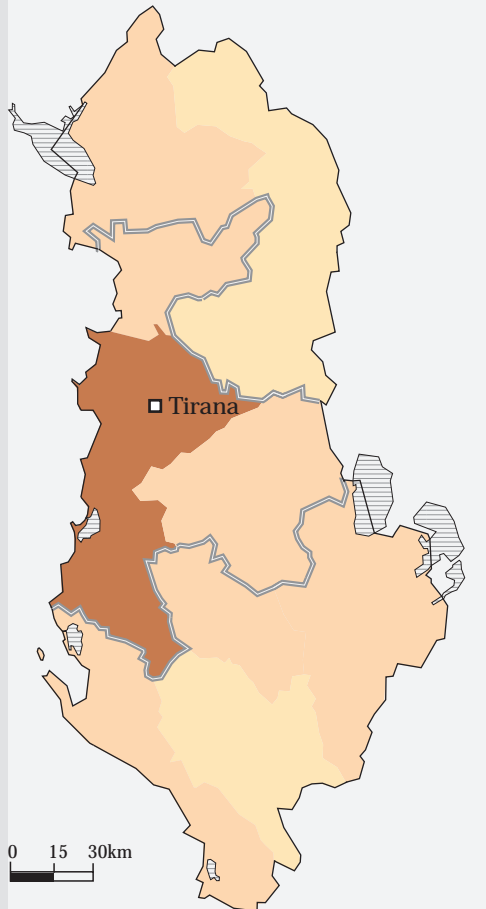
INSTAT: Indicators by prefectures 1996-2000, Tirana 2001

Demographic Atlas of Albania, 2003

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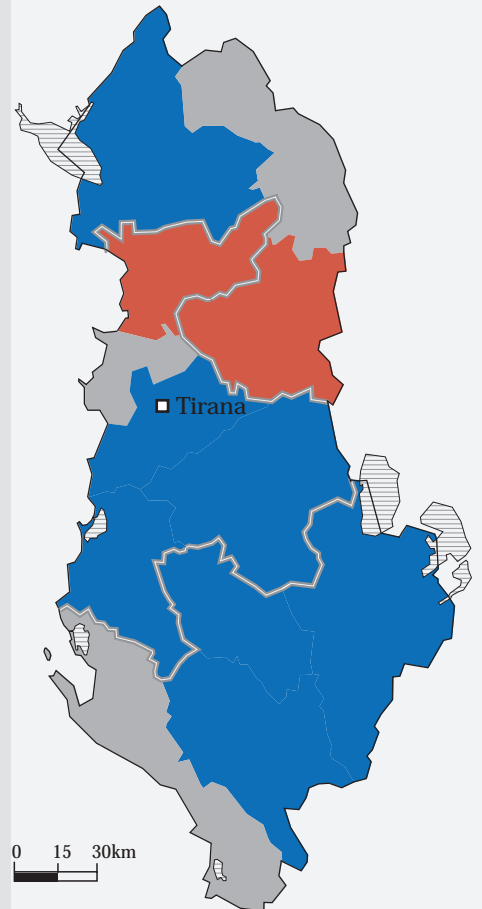
Map 1

Spatial distribution of population density



Map 2

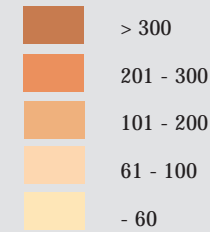
Spatial distribution of gender



Profile of electoral context
Independent variables/Group II
Parliamentary Election 2005

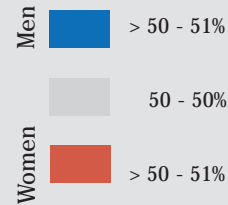
Map 1

Population density , persons/km2



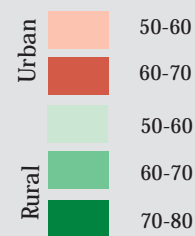
Map 2

Gender distribution in %



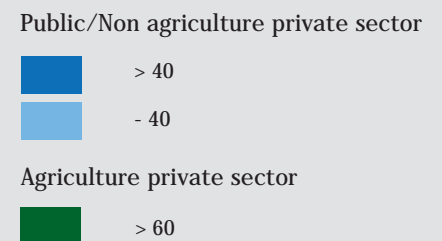
Map 3

Urban/Rural population in %

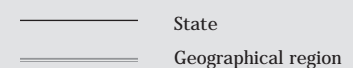


Map 4

Employment by economic activities in %



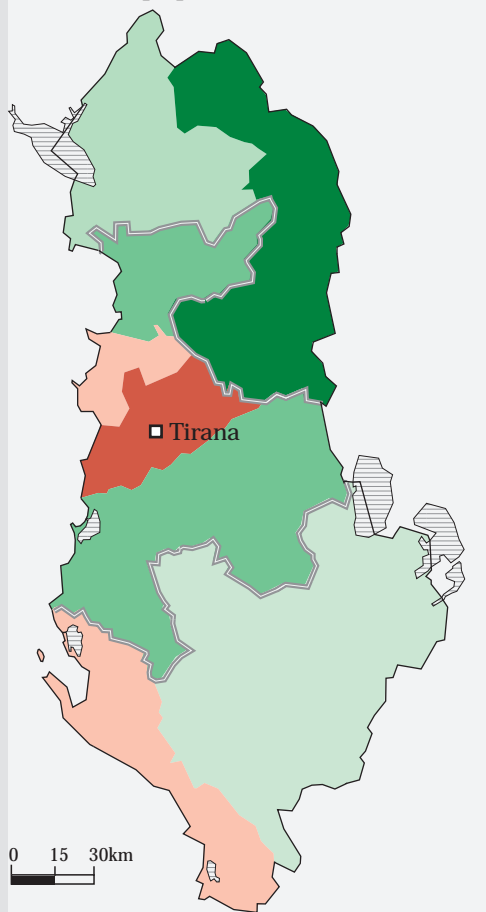
Boundaries



Source of data
INSTAT: Indicators by prefectures 2004-2005
Demographic Atlas of Albania, 2003
© 2007, E.Begu and H.Asche, University of Potsdam

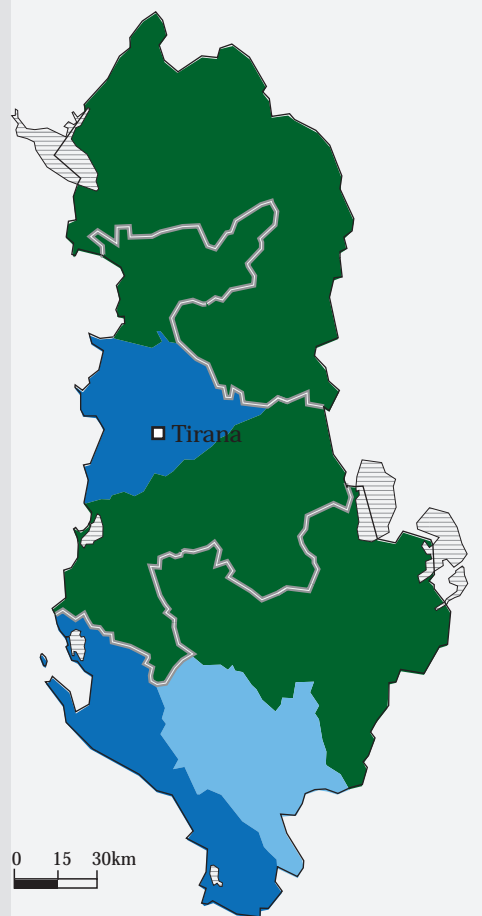
Map 3

Spatial distribution of urban and rural population

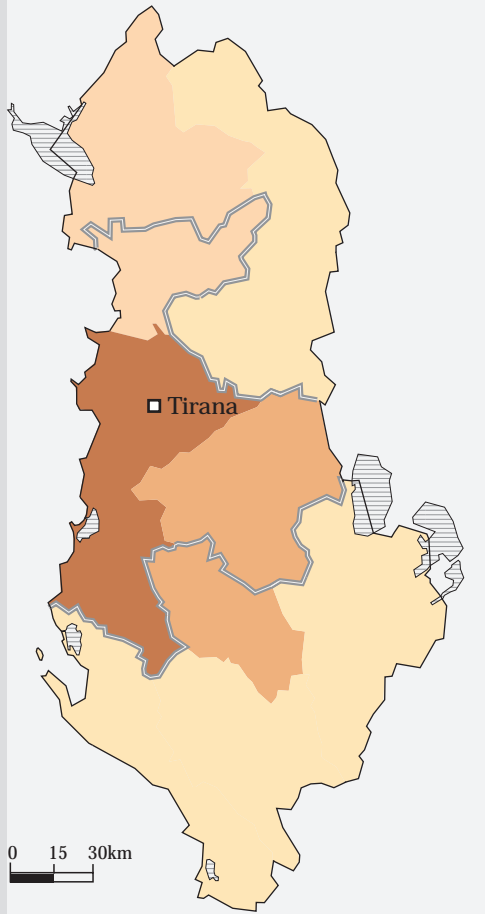


Map 4

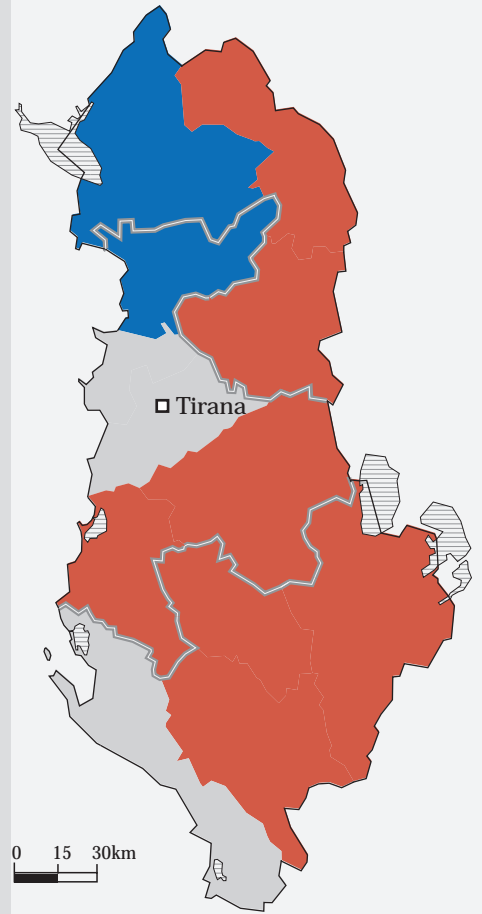
Spatial distribution of employment by economic activities



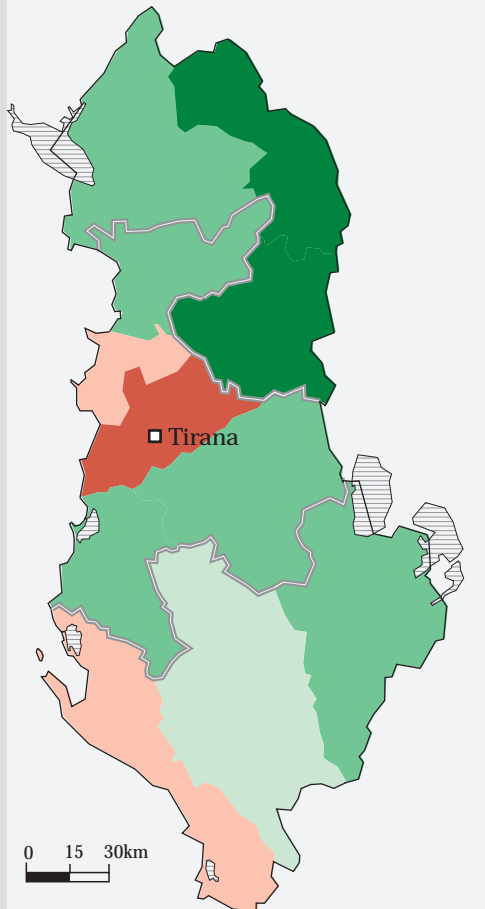
Map 1
Spatial distribution of population density



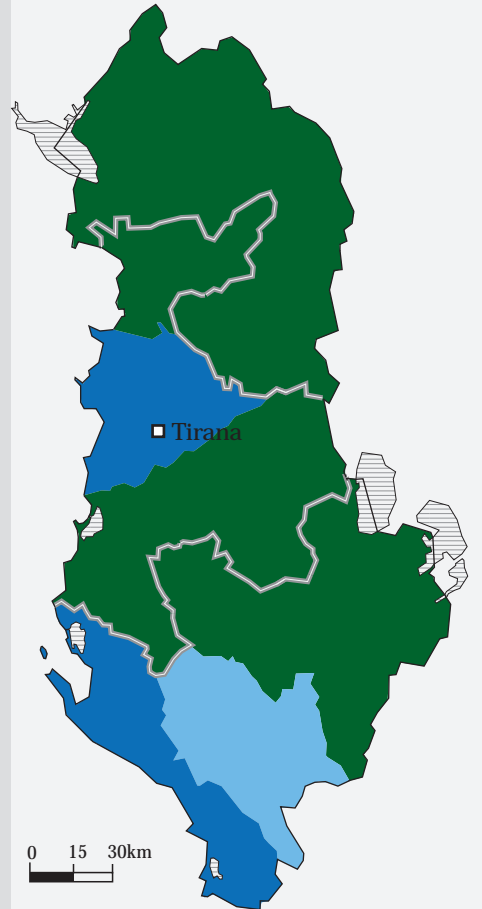
Map 2
Spatial distribution of gender



Map 3
Spatial distribution of urban and rural population



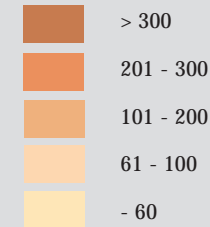
Map 4
Spatial distribution of employment by economic activities



Profile of electoral context
Independent variables/Group II
Parliamentary Election 2001

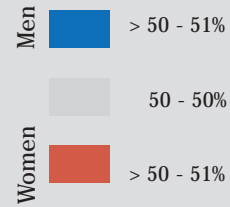
Map 1

Population density , persons/km2



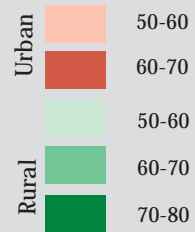
Map 2

Gender distribution in %



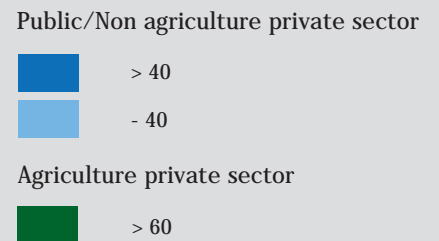
Map 3

Urban/Rural population in %

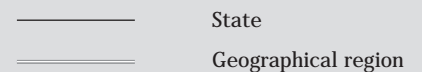


Map 4

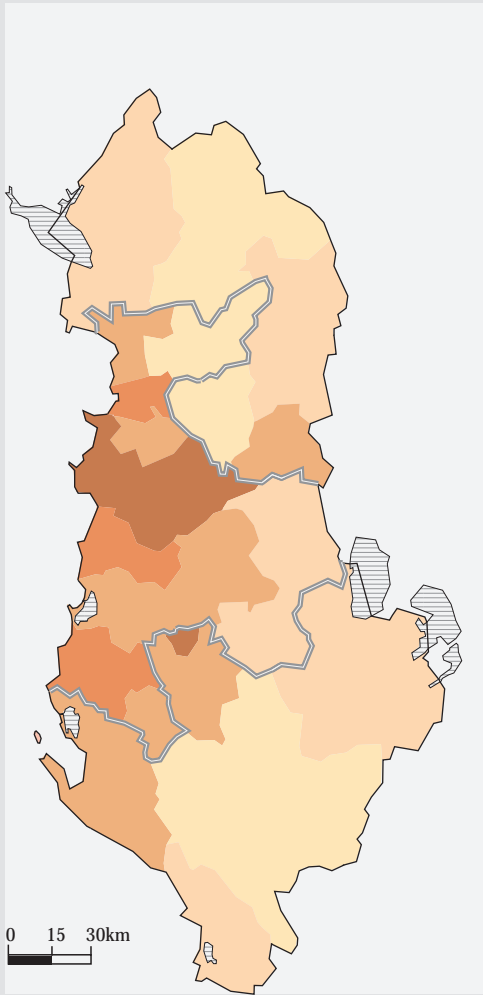
Employment by economic activities in %



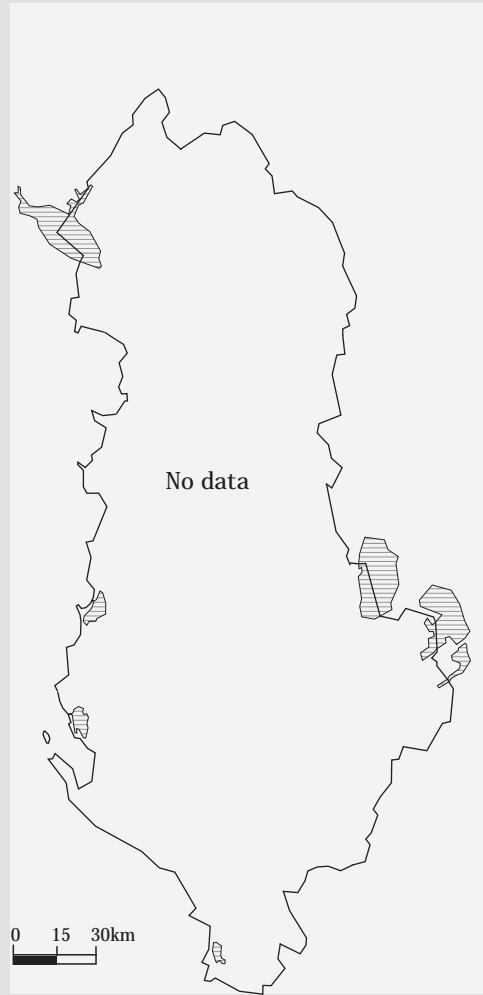
Boundaries



Map 1



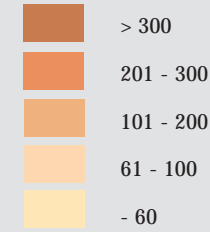
Map 2



Profile of electoral context
Independent variables/Group II
Parliamentary Election 1997

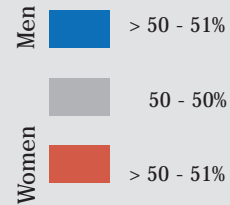
Map 1

Population density , persons/km2



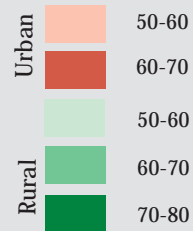
Map 2

Gender distribution in %

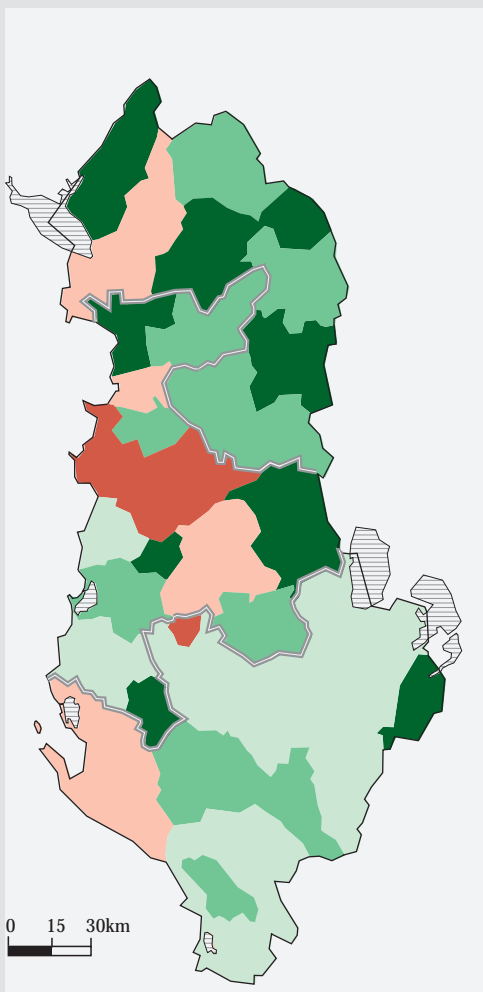


Map 3

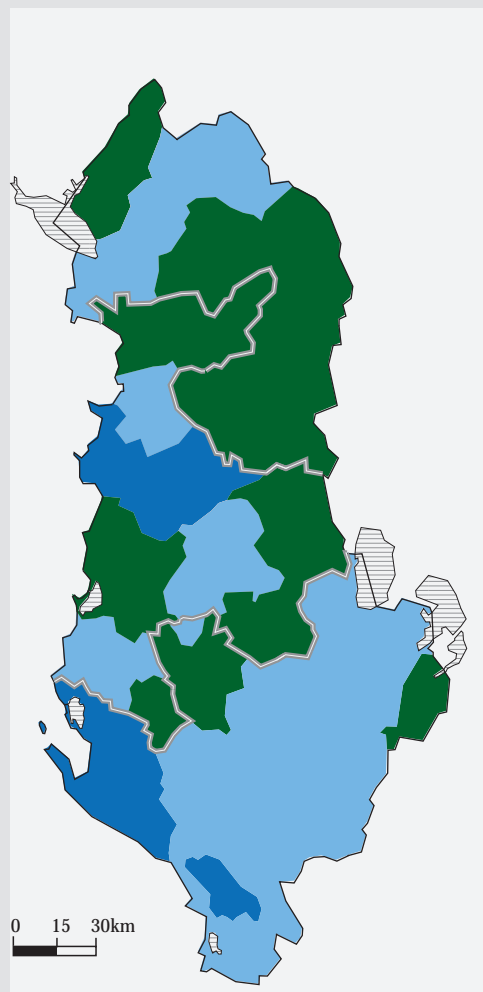
Urban/Rural population in %



Map 3



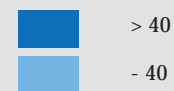
Map 4



Map 4

Employment by economic activities in %

Public/Non agriculture private sector



Agriculture private sector



Boundaries



Source of data

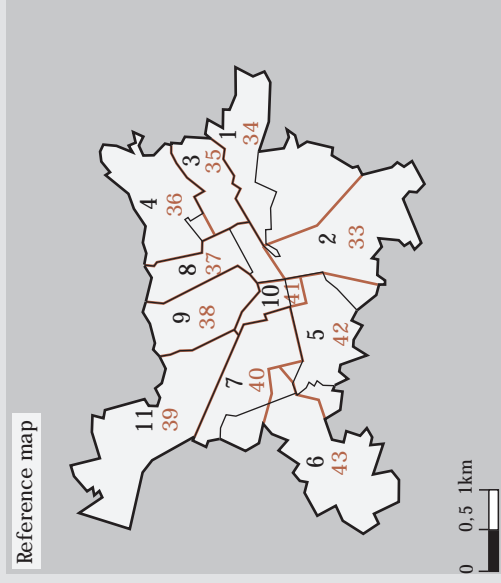
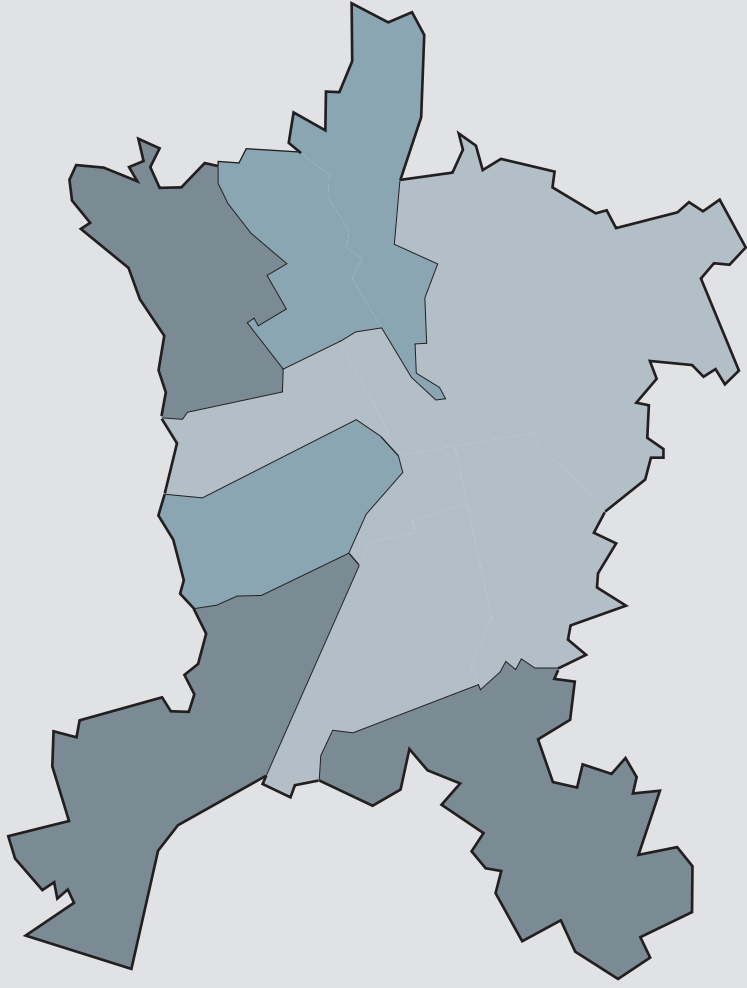
INSTAT: Statistical yearbook 1988

Demographic Atlas of Albania, 2003

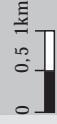
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Zones of electoral context

Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Unemployment rate low	Unemployment rate medium	Unemployment rate medium-high	Unemployment rate high	Unemployment rate very high
Years of schooling very high	Years of schooling high	Years of schooling high-medium	Years of schooling medium-low	Years of schooling low
Monetary poverty indicator low	Monetary poverty indicator low- medium	Monetary poverty indicator medium-high	Monetary poverty indicator high	Monetary poverty indicator very hig
Monthly consumption indicator very high	Monthly consumption indicator high	Monthly consumption indicator high-medium	Monthly consumption indicator medium-low	Monthly consumption indicator low
Internal migration gain very high loss very low	Internal migration gain high loss low	Internal migration gain medium loss medium	Internal migration gain low loss high	Internal migration loss very high



Reference map



Profile of electoral context

Municipality of Tirana
Parliamentary Election 2001

Map 1-2

Zones of electoral context

Spatial correlation of independent variables

Reference map

Codes of administrative and electoral divisions

- 5 Municipality unit
- 42 Constituency

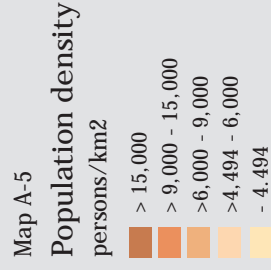
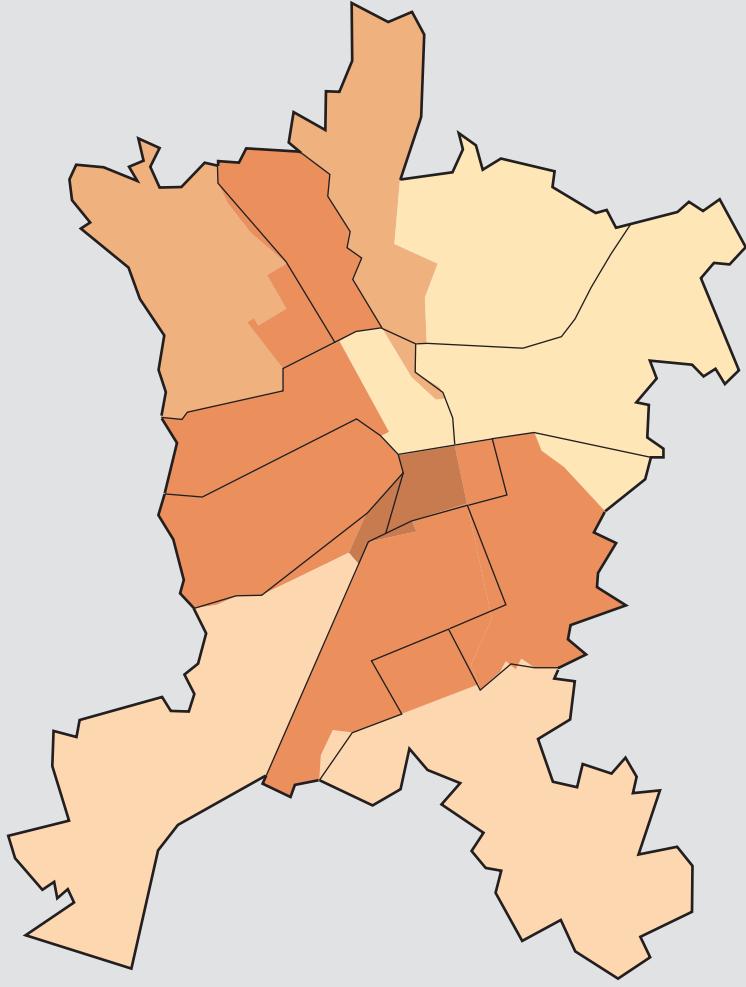
Boundaries

- Municipality
- Municipality unit
- Context zone
- Constituency 1:100 000

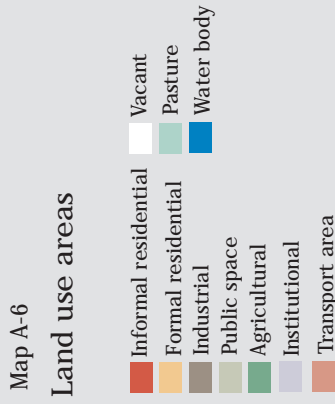
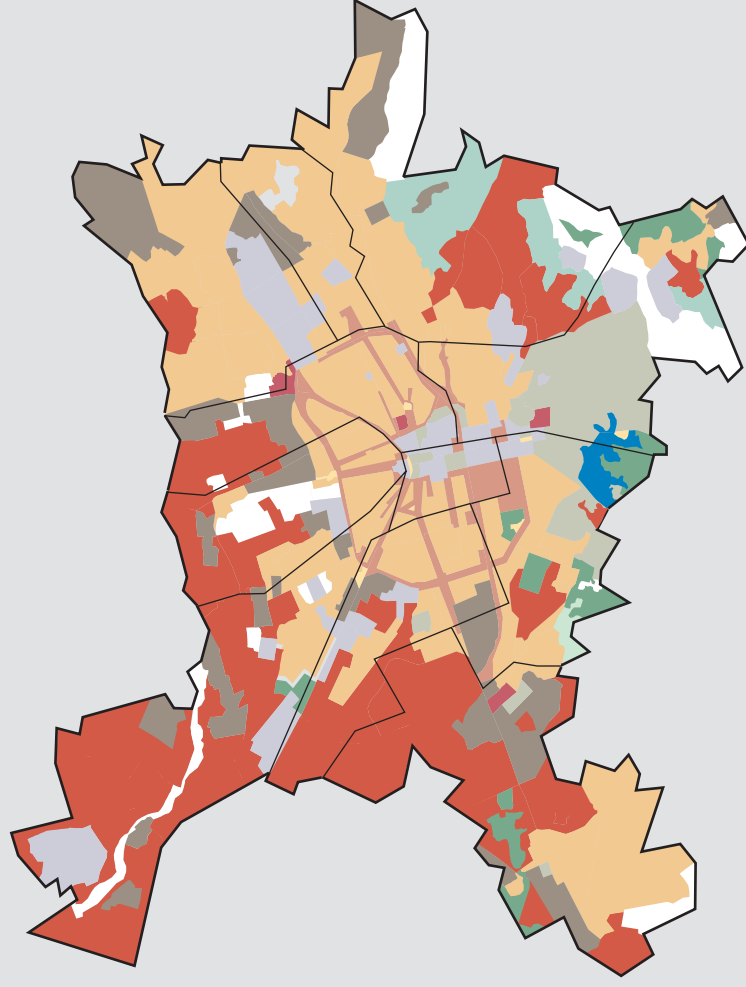
Source of data

INSTAT: Maps of poverty and inequality in Albania, 2004
 INSTAT: Registration of population and dwellings, 2001
 Tirana Municipality: Statistical Bulletin, 2001
 Demographic Atlas of Albania 2003
 Albanian Central Election Committee
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A-5

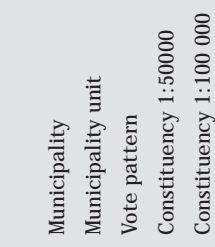
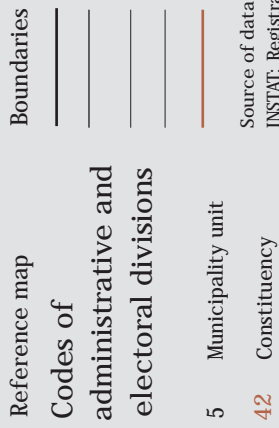
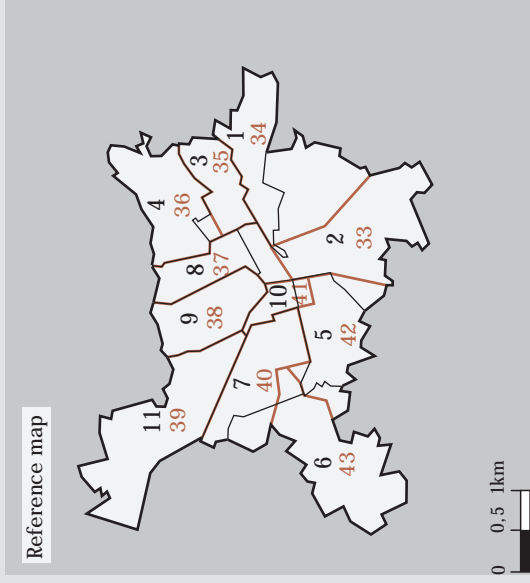


A-6



Profile of electoral context - population density and land use features

**Municipality of Tirana
Parliamentary Election 2001**

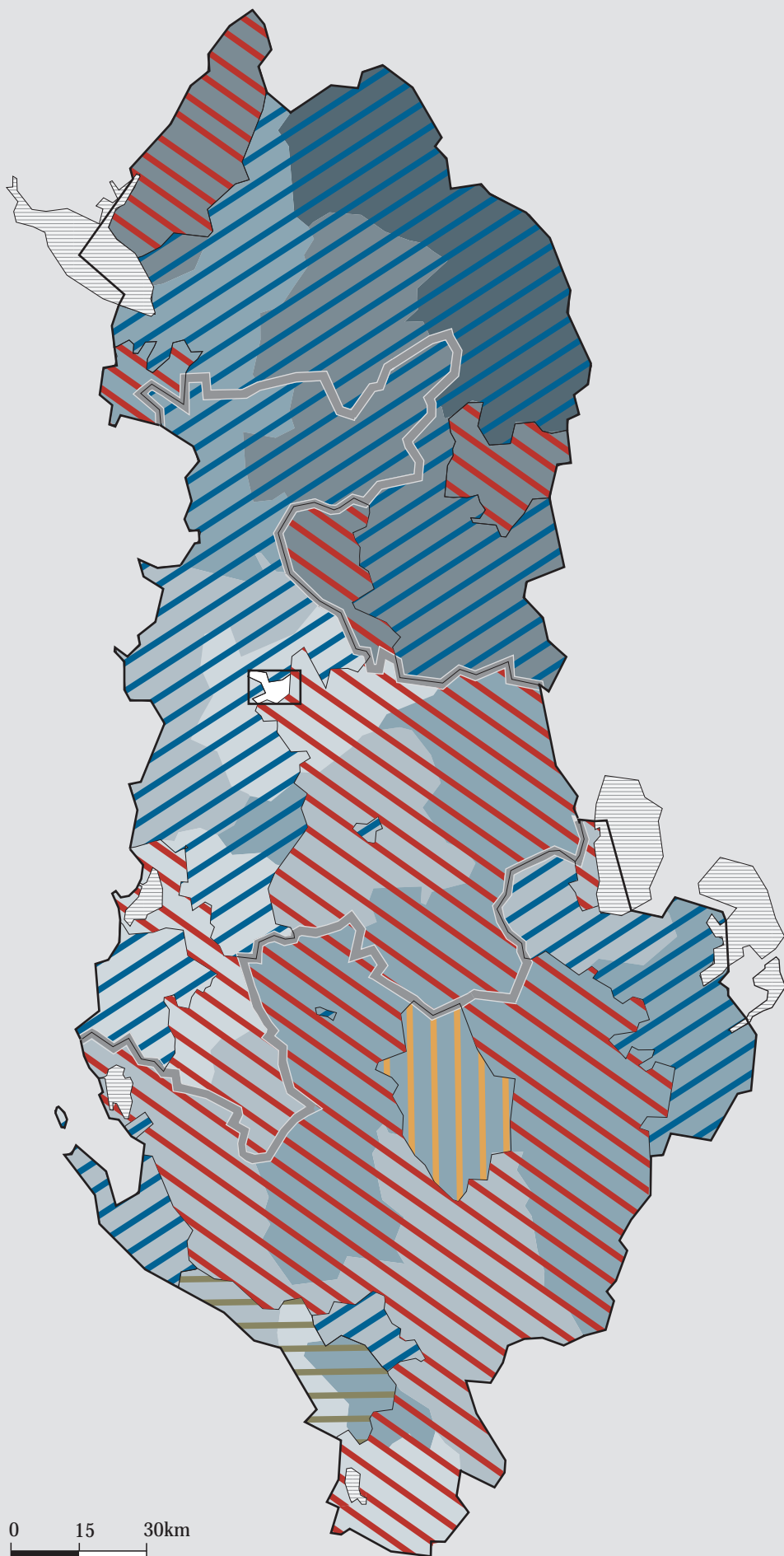


Source of data
 INSTAT: Registration of population and dwellings, 2001
 Demographic Atlas of Albania 2003
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Geography of Relations

Spatial distribution of vote within context framework

Parliamentary Election 2005



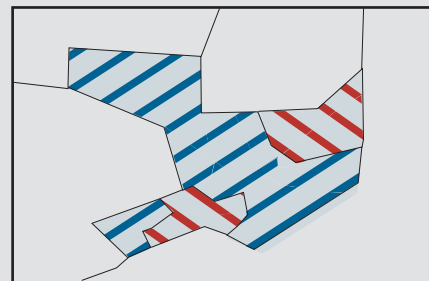
Zones of electoral context



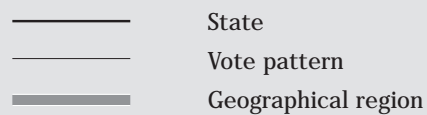
Parties candidates



Tirana Municipality



Boundaries



Source of data

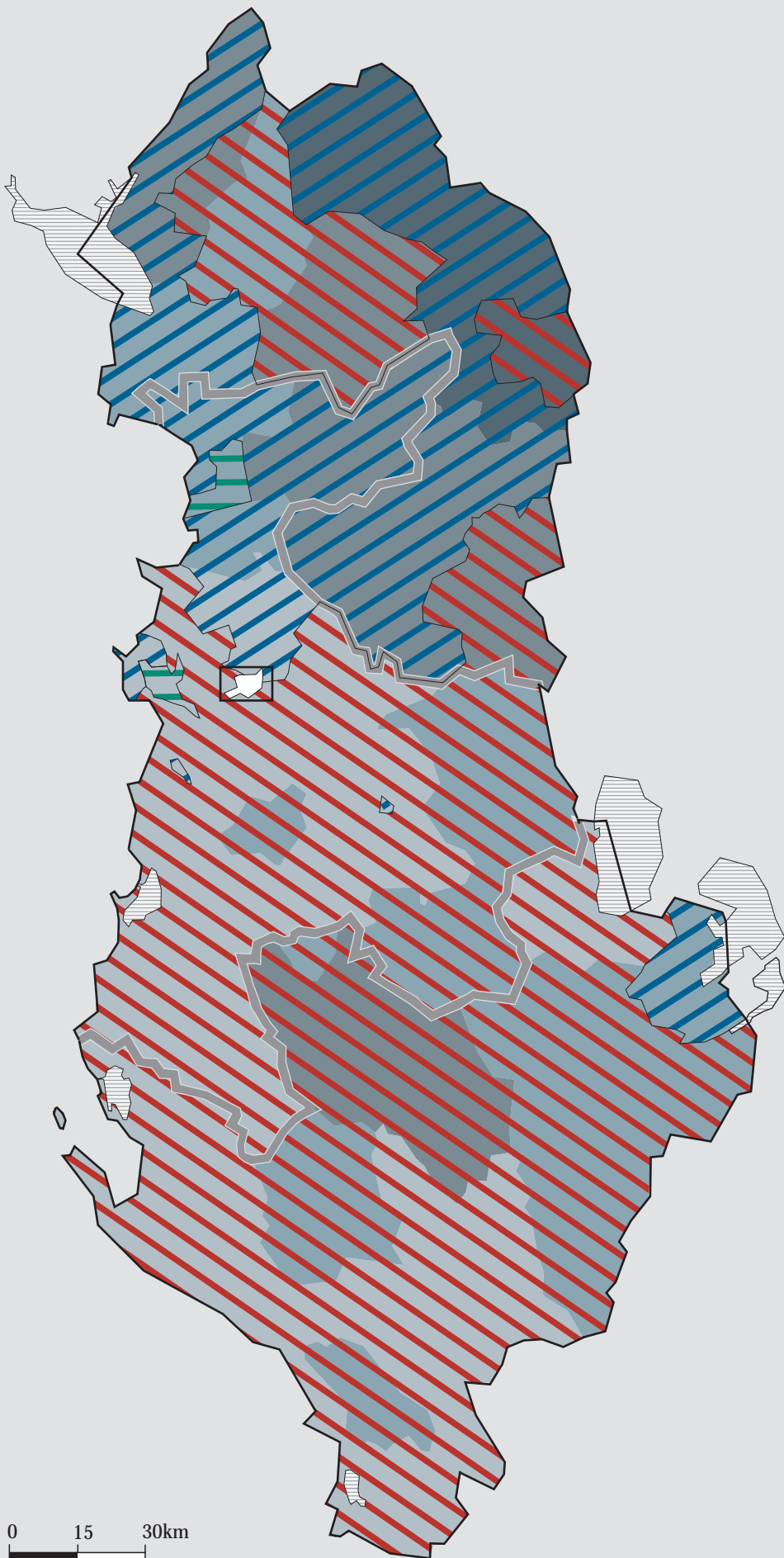
Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of vote within context framework

Parliamentary Election 2001



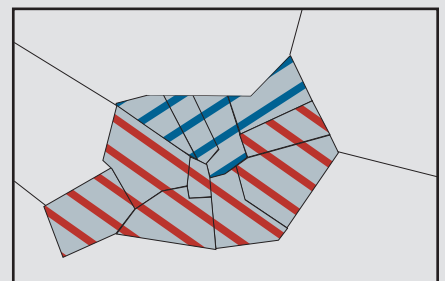
Zones of electoral context



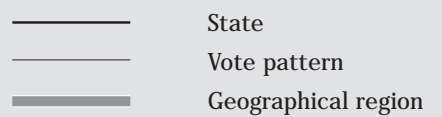
Parties candidates



Tirana Municipality



Boundaries



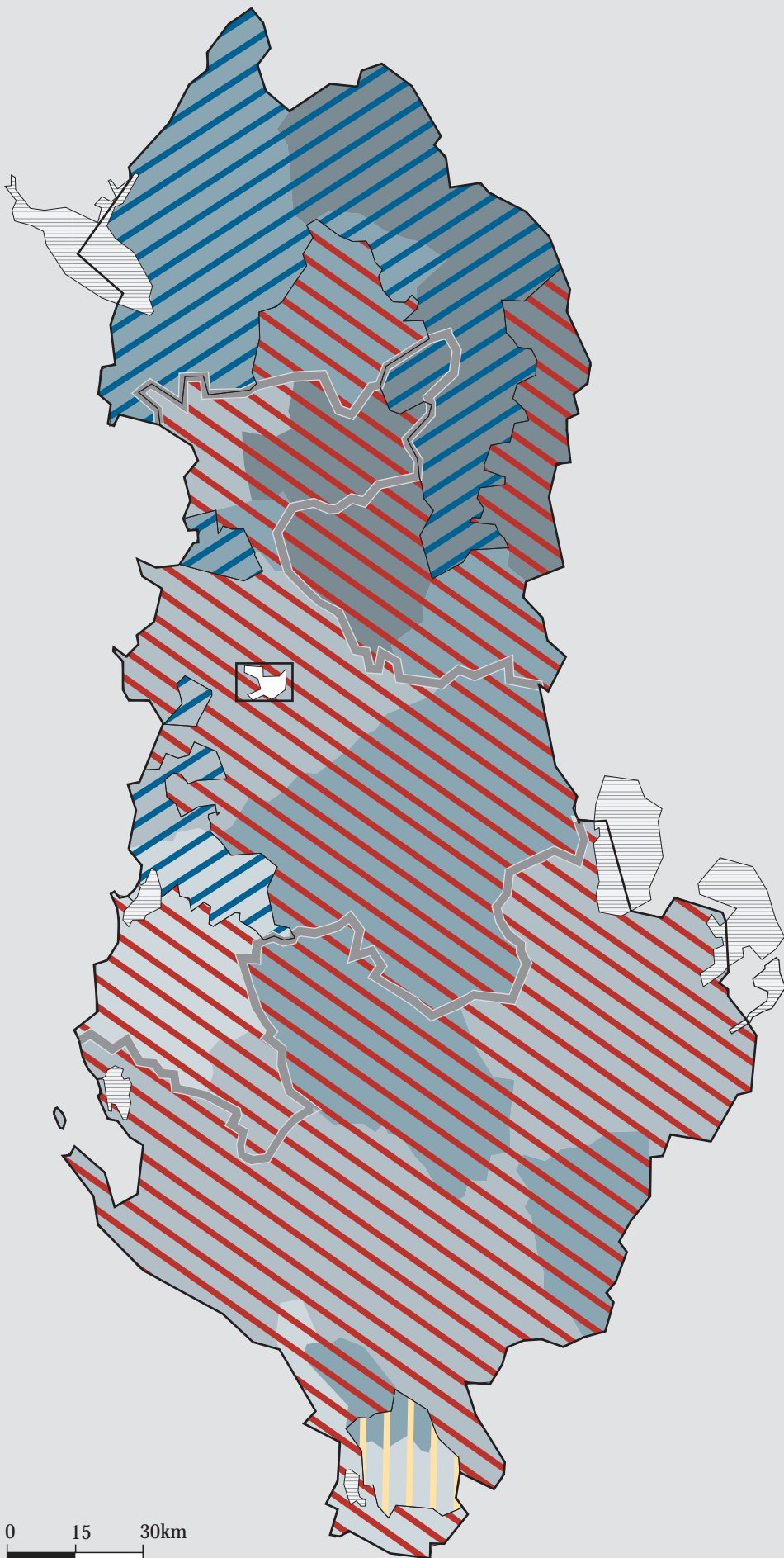
Source of data

Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of vote within context framework Parliamentary Election 1997



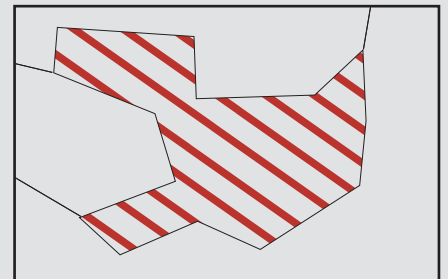
Zones of electoral context



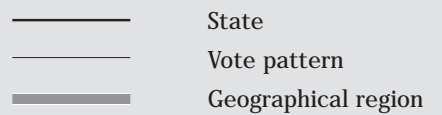
Parties candidates



Tirana Municipality



Boundaries



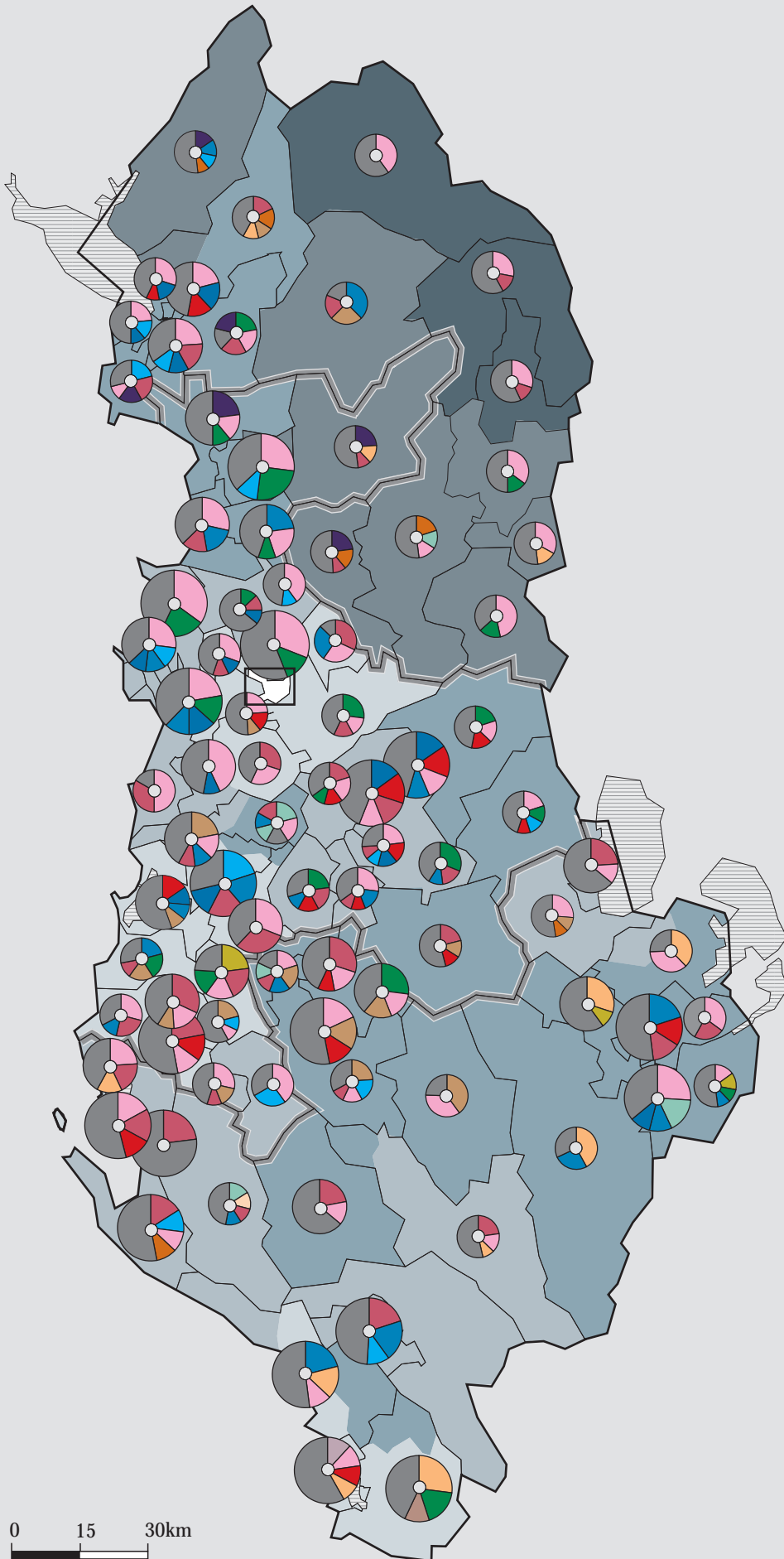
Source of data

Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of vote within context framework Parliamentary Election 2005



Zones of electoral context

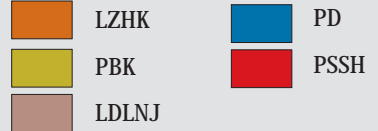


Parties with >10% of total votes per constituency

With seats on parliament/proportional



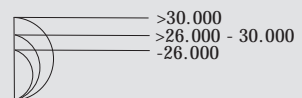
Without seats on parliament/proportional



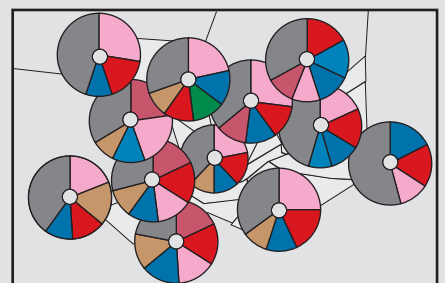
Parties with <10% of total votes per constituency



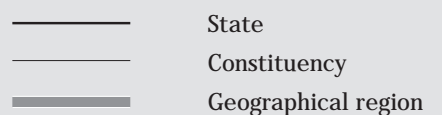
Number of voters



Tirana Municipality



Boundaries



Source of data

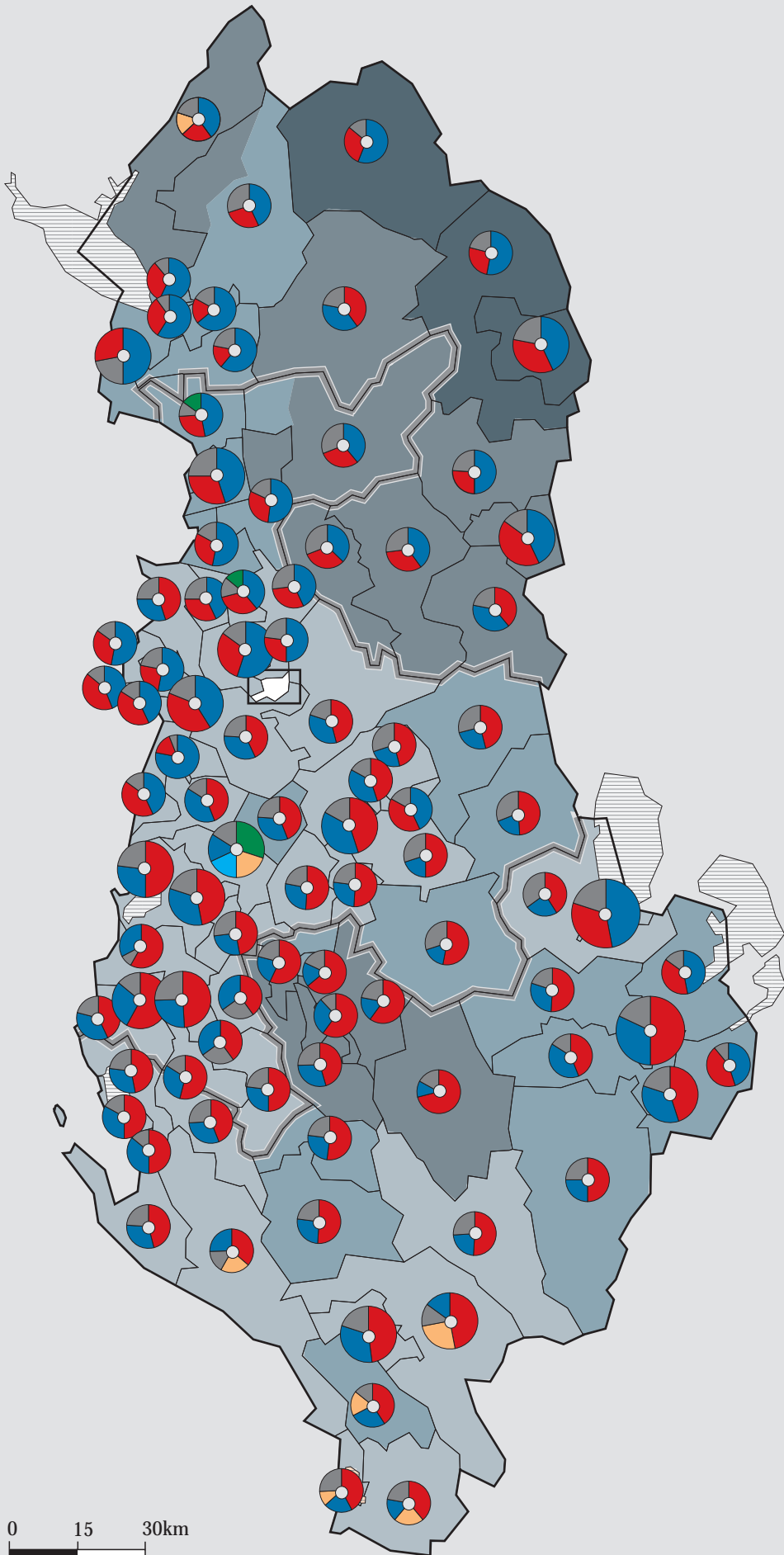
Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of vote within context framework

Parliamentary Election 2001

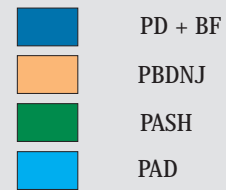


Zones of electoral context



Parties with >10% of total votes per constituency

With seats on parliament/proportional

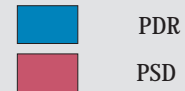


Without seats on parliament/proportional



Parties with <10% of total votes per constituency

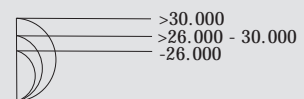
With seats on parliament/proportional



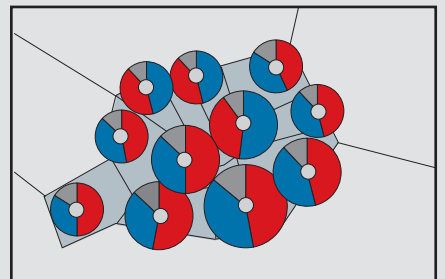
Without seats on parliament/proportional



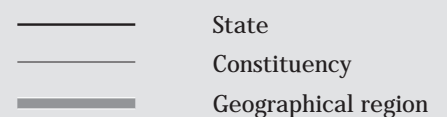
Number of voters



Tirana Municipality



Boundaries



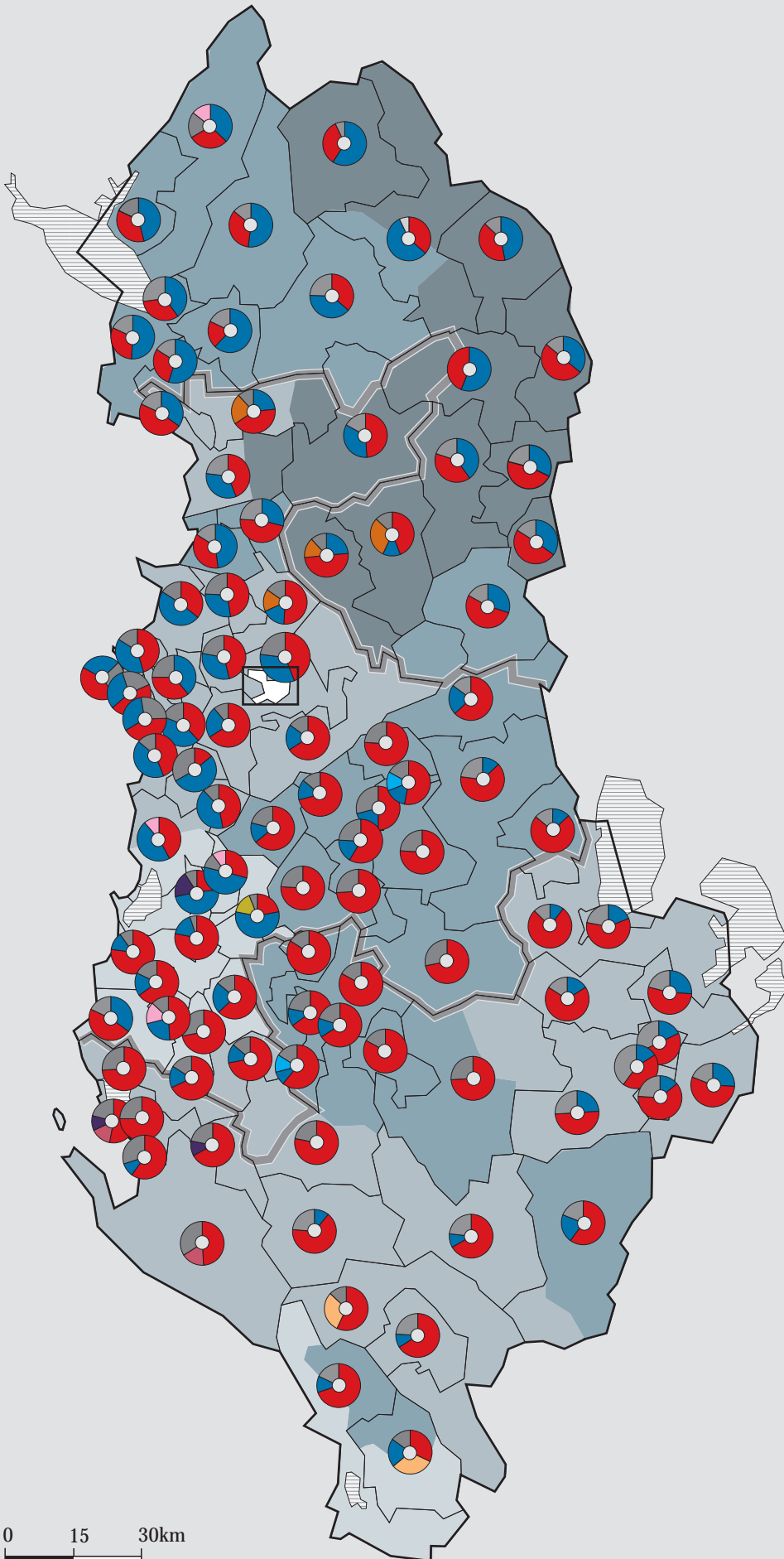
Source of data

Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of vote within context framework
Parliamentary Election 1997



Zones of electoral context

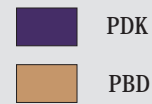


Parties with >10% of total votes in constituency

With seats on parliament/proportional



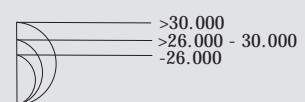
Without seats on parliament/proportional



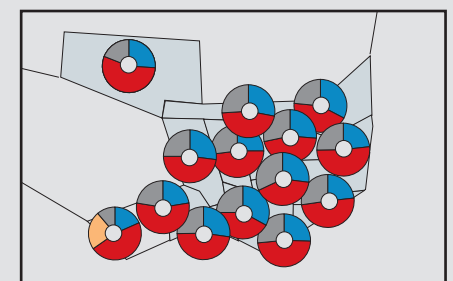
Parties with <10% of total votes in constituency



Number of voters



Tirana Municipality



Boundaries

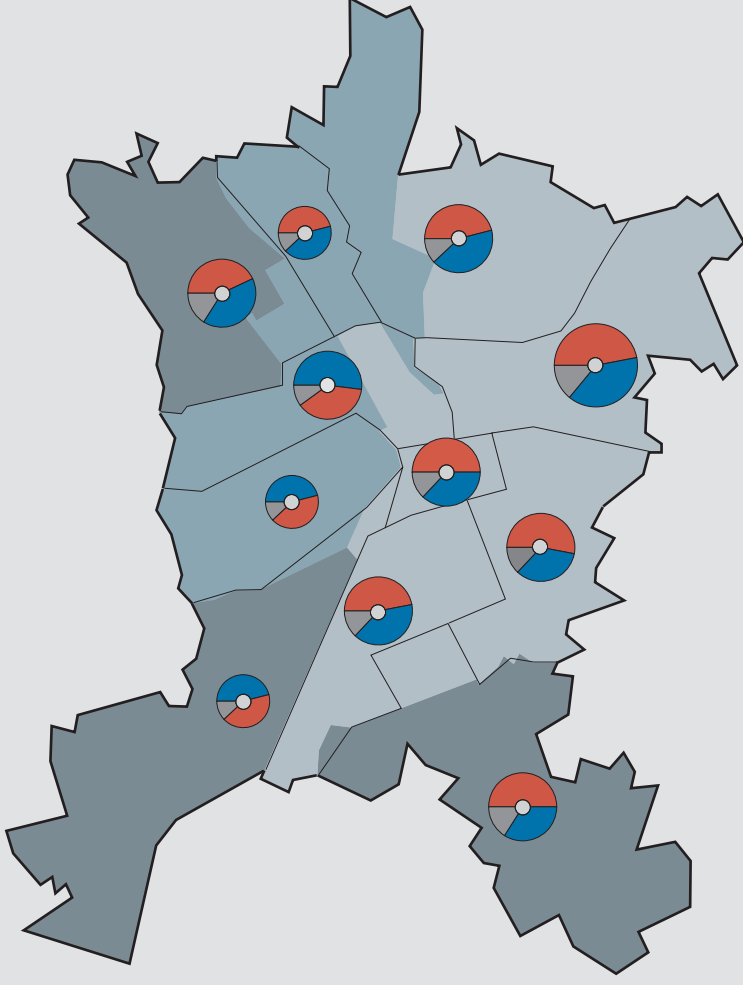
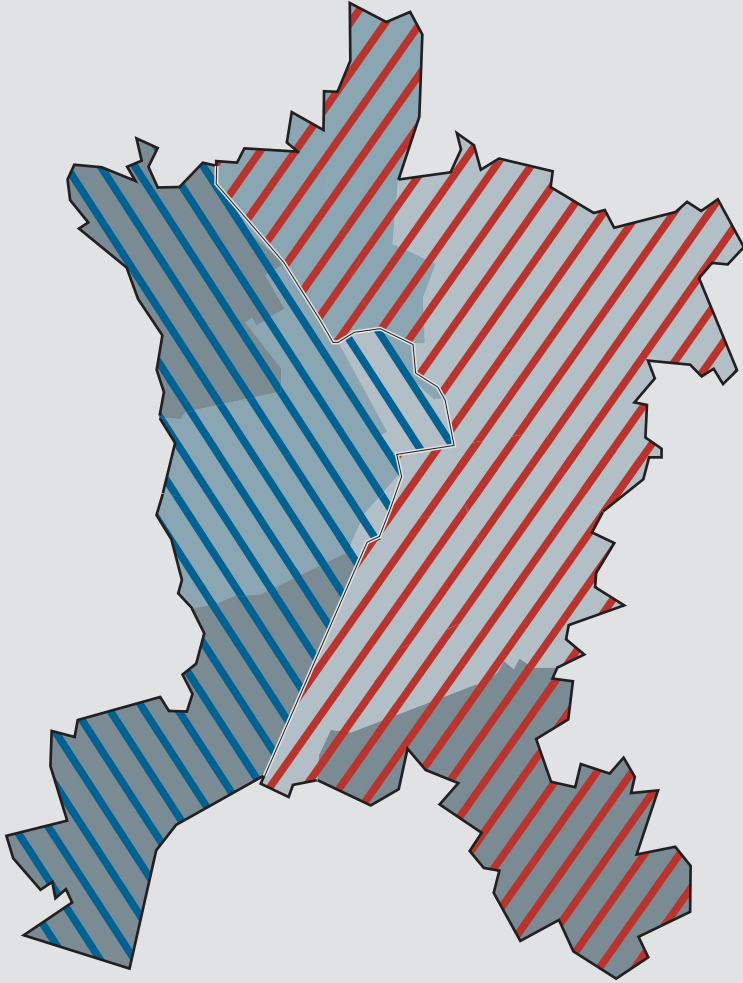


Source of data

Archive of Parliament of Albania, 1997

Demographic Atlas of Albania, 2003

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Spatial distribution of vote within context framework
Municipality of Tirana
Parliamentary Election 2001

Map B-1
Winning party candidates

PD

PS

Map B-2
Parties

PD

PS

Parties with <10% of votes

Number of voters

>30.000

>26.000 - 30.000

<26.000

Reference map



Zones of electoral context

Zone 2

Zone 3

Zone 4

Boundaries

Municipality

Municipality unit

Vote pattern

Constituency 1:50000

Constituency 1:100 000

Reference map

Codes of administrative and electoral divisions

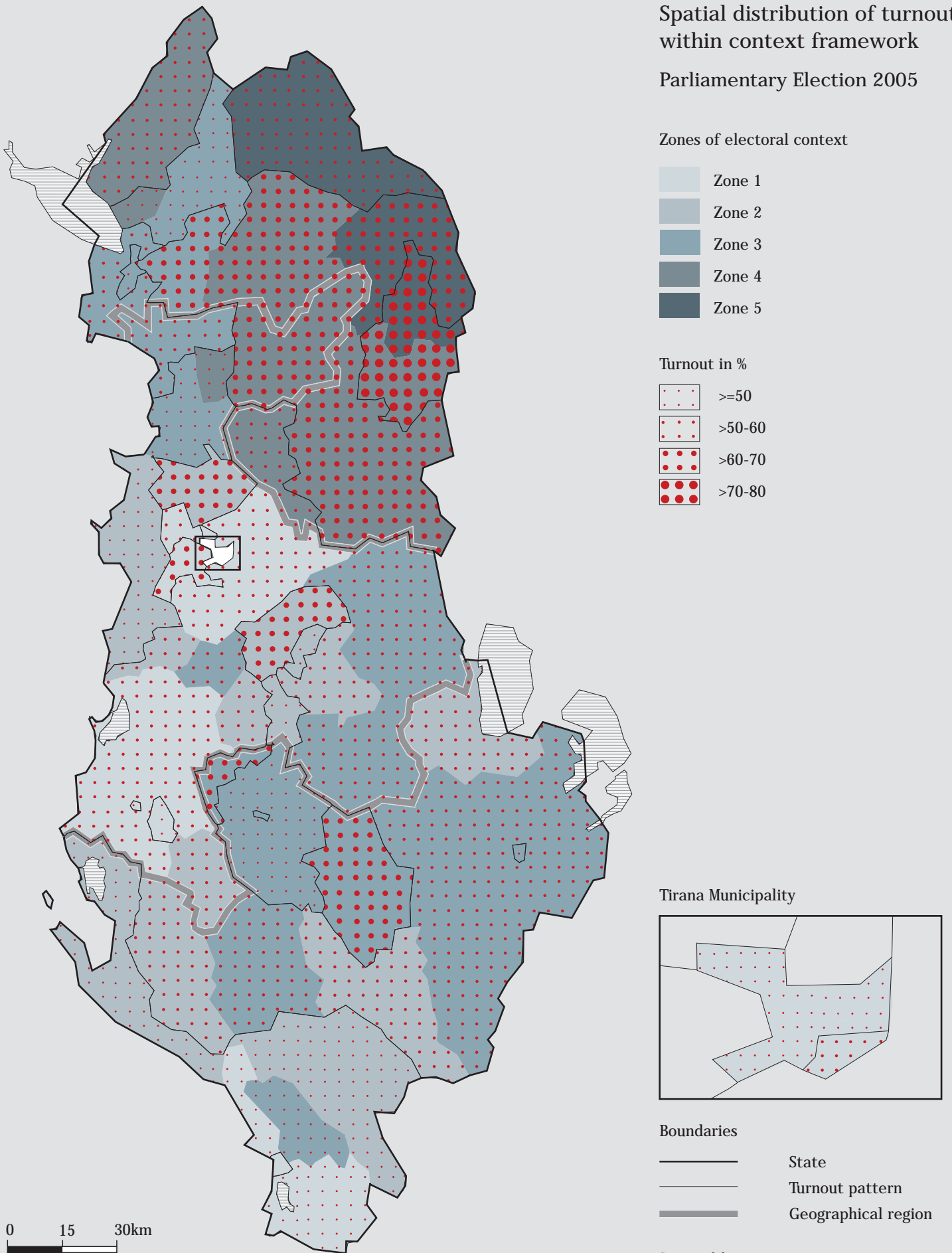
5 Municipality unit

42 Constituency

Source of data
Demographic Atlas of Albania 2003
Albanian Central Election Committee
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Spatial distribution of turnout within context framework

Parliamentary Election 2005



Source of data

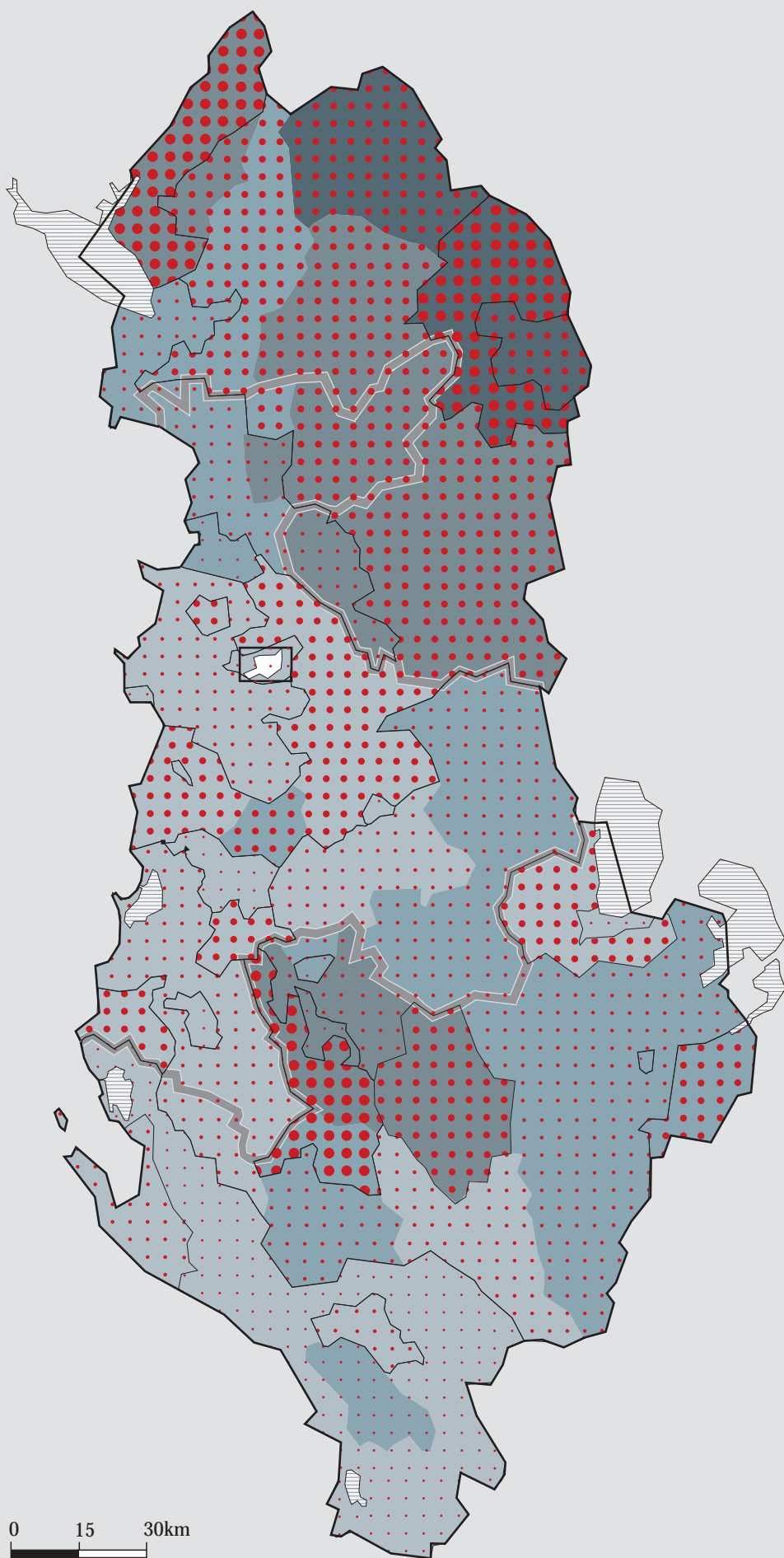
Albanian Central Election Committee

Demographic Atlas of Albania, 2003

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Spatial distribution of turnout within context framework

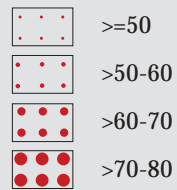
Parliamentary Election 2001



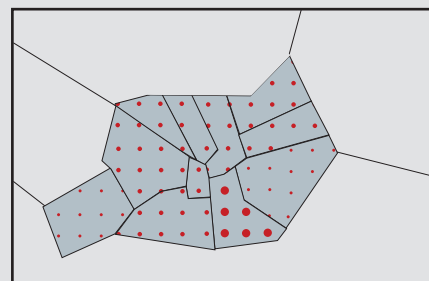
Zones of electoral context



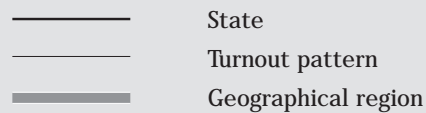
Turnout in %



Tirana Municipality



Boundaries



Source of data

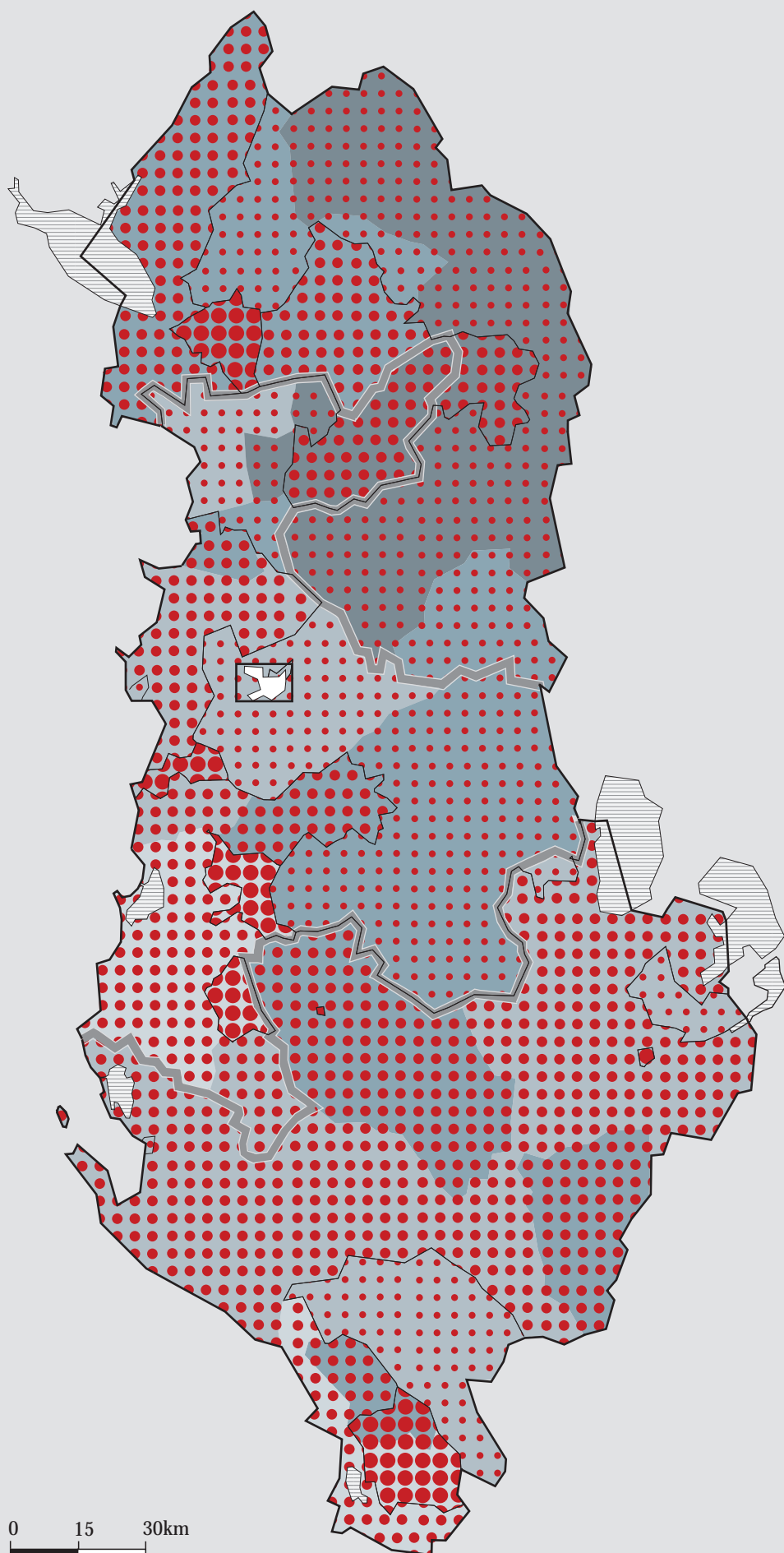
Albanian Central Election Committee

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Spatial distribution of turnout within context framework

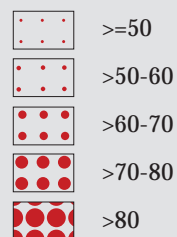
Parliamentary Election 1997



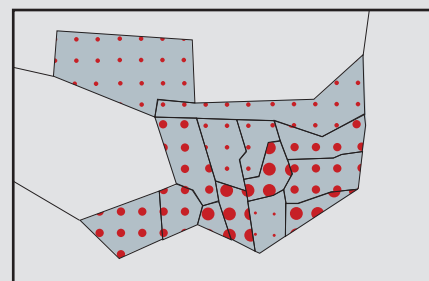
Zones of electoral context



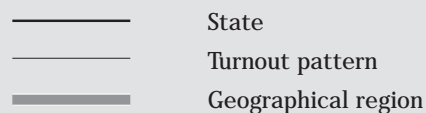
Electoral turnout as % of registered voters in constituency



Tirana Municipality



Boundaries



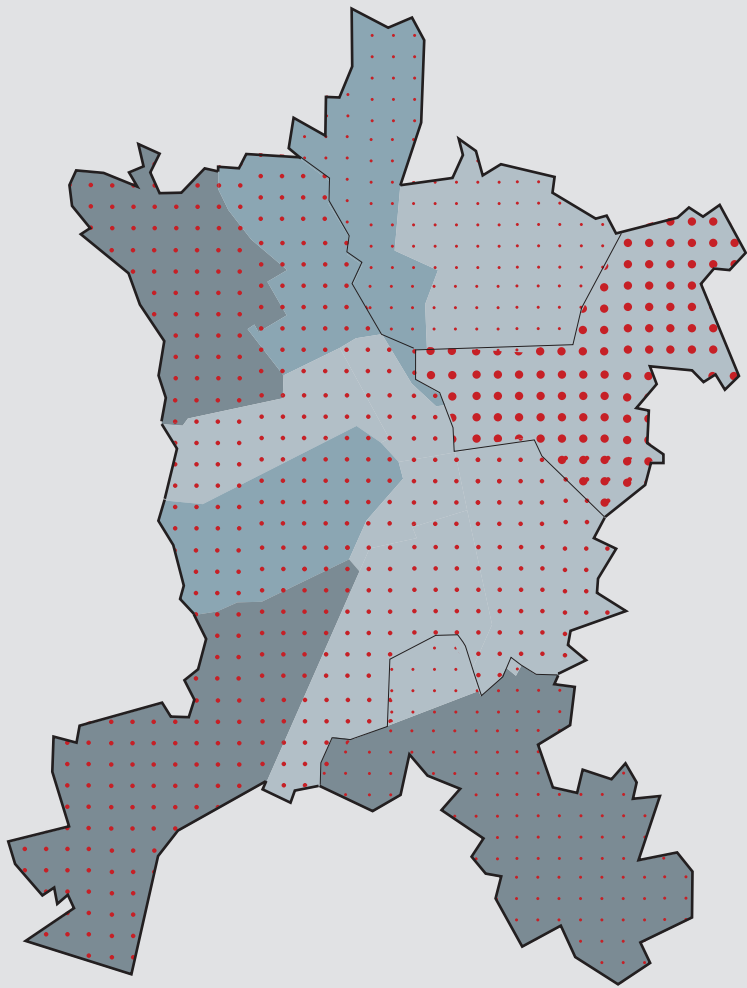
Source of data

Albanian Central Election Committee

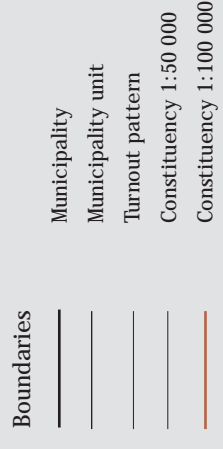
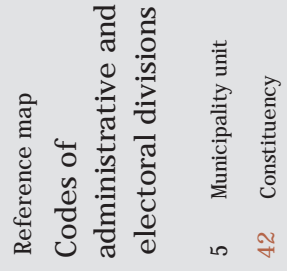
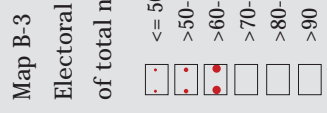
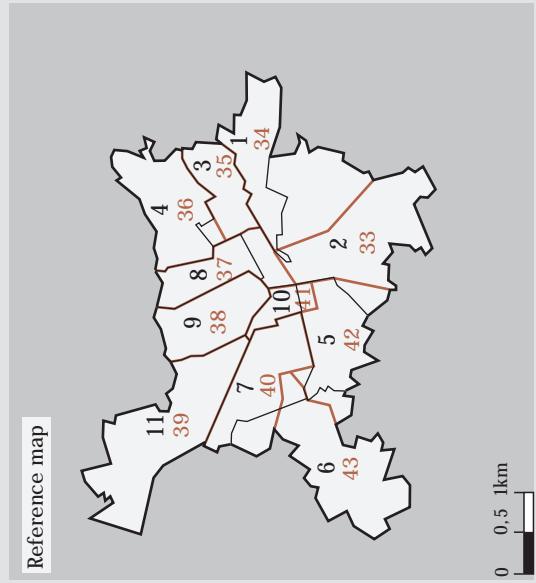
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B-3



Spatial distribution of turnout within context framework
Municipality of Tirana
Parliamentary Election 2001

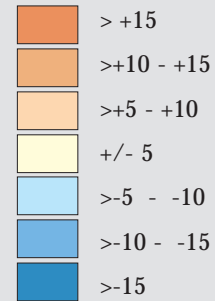


Source of data
Demographic Atlas of Albania 2003
Albanian Central Election Committee
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Voters allocation

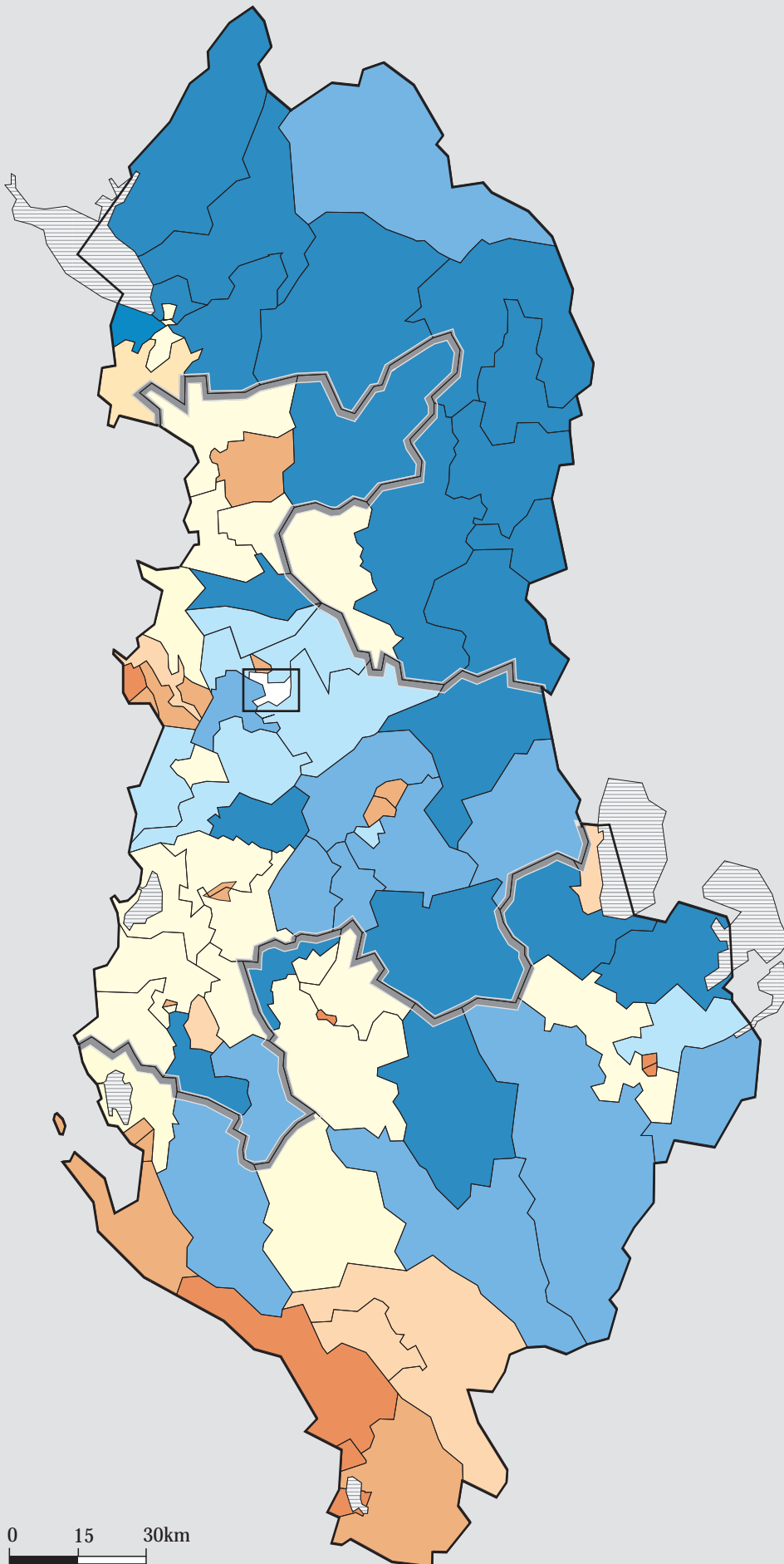
Parliamentary Election 2005

Deviation in voters allocation as % towards tolerated deviation

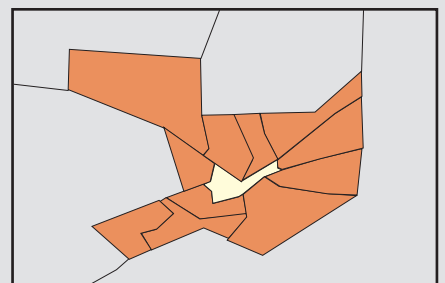


Average number of voters per constituency is 28.507

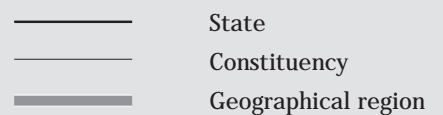
Tolerated deviation from the average number is +/-5%



Tirana Municipality



Boundaries



Source of data

Albanian Central Election Committee

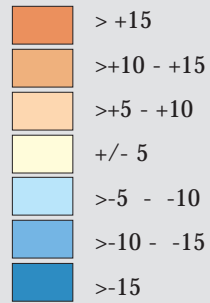
Demographic Atlas of Albania, 2003

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Voters allocation

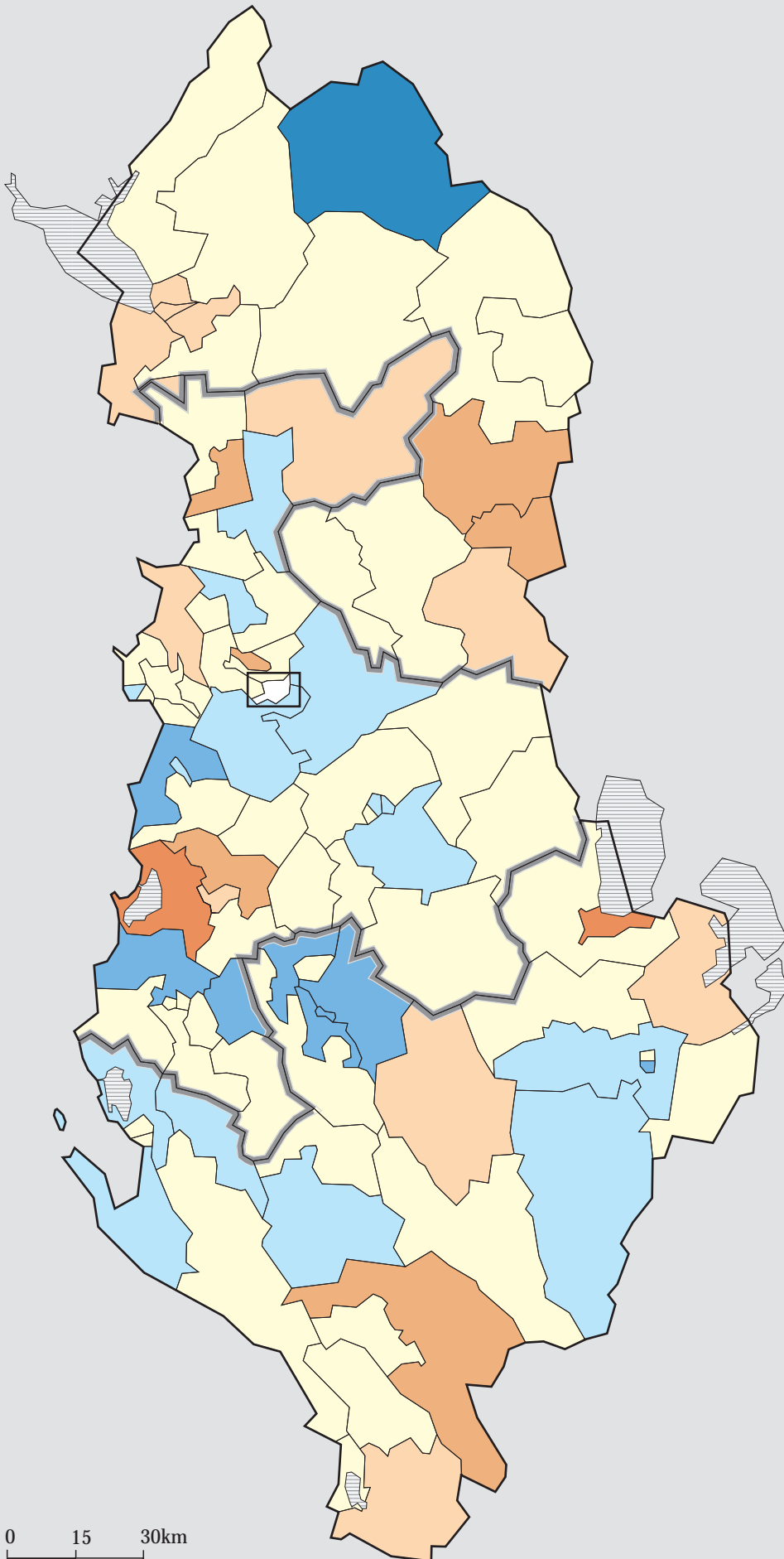
Parliamentary Election 2001

Deviation in voters allocation as % towards tolerated deviation

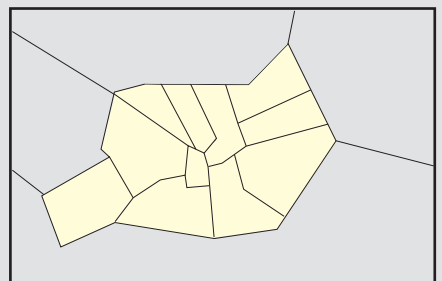


Average number of voters per constituency is 23.290

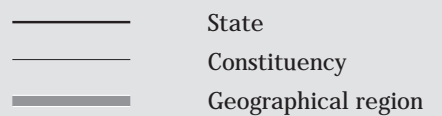
Tolerated deviation from the average number is +/-5%



Tirana Municipality



Boundaries



Source of data

Albanian Central Election Committee

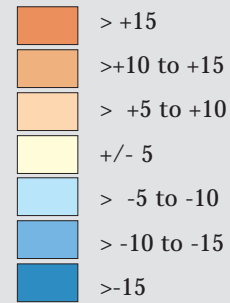
Demographic Atlas of Albania, 2003

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Voters allocation

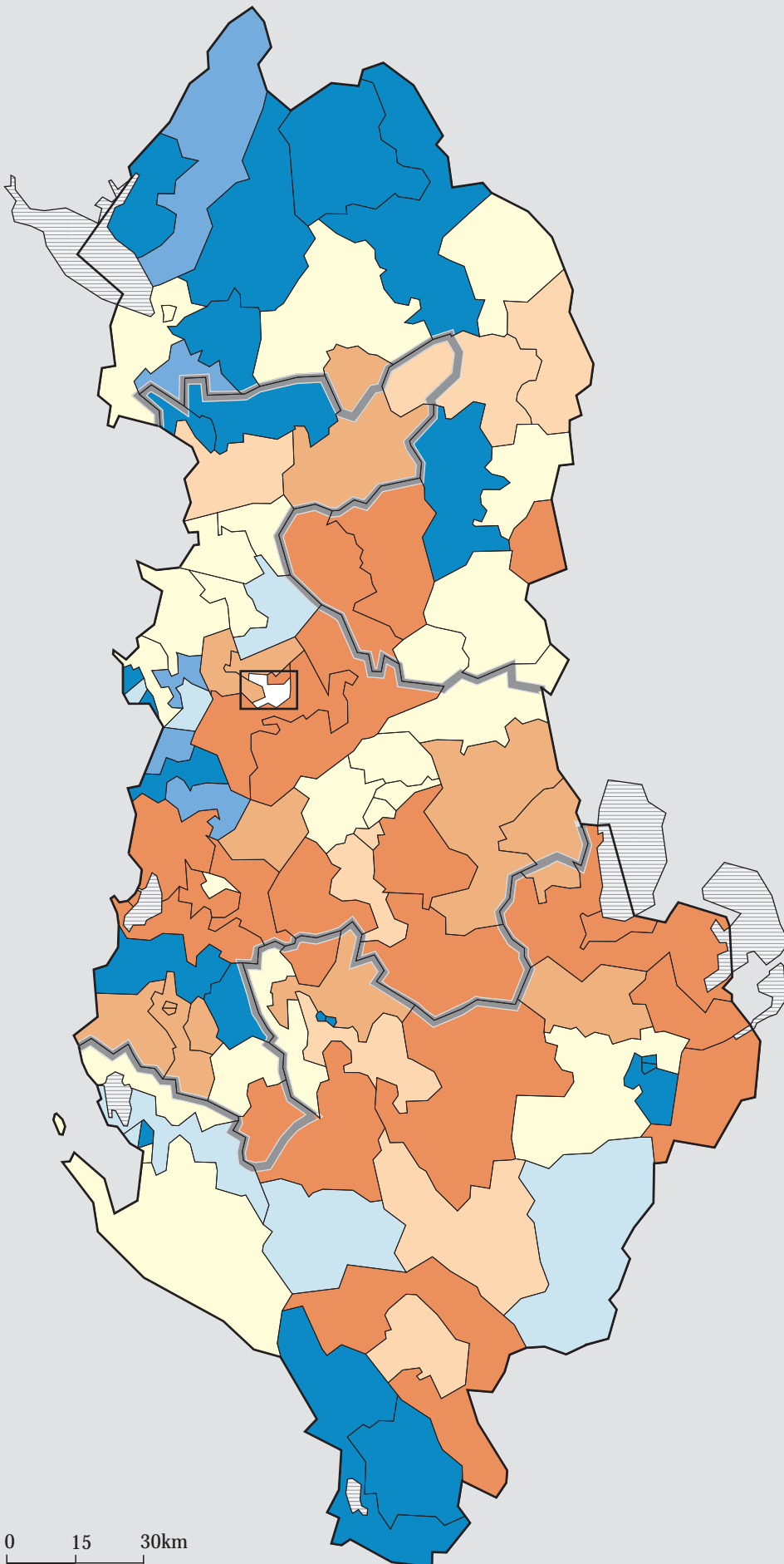
Parliamentary Election 1997

Deviation in voters allocation as % towards tolerated deviation

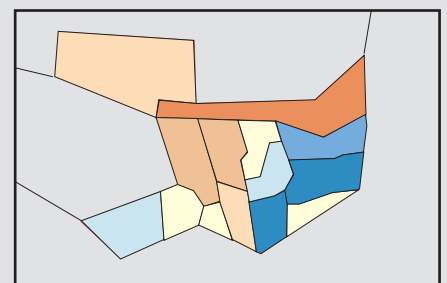


Average number of voters per constituency is 17.662

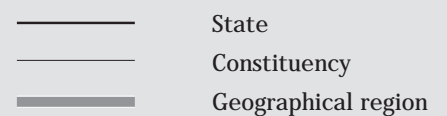
Tolerated deviation from the average number is +/-5%



Tirana Municipality



Boundaries



Source of data

Albanian Central Election Committee

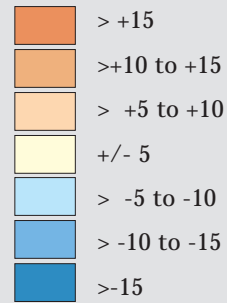
Demographic Atlas of Albania, 2003

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Voters allocation

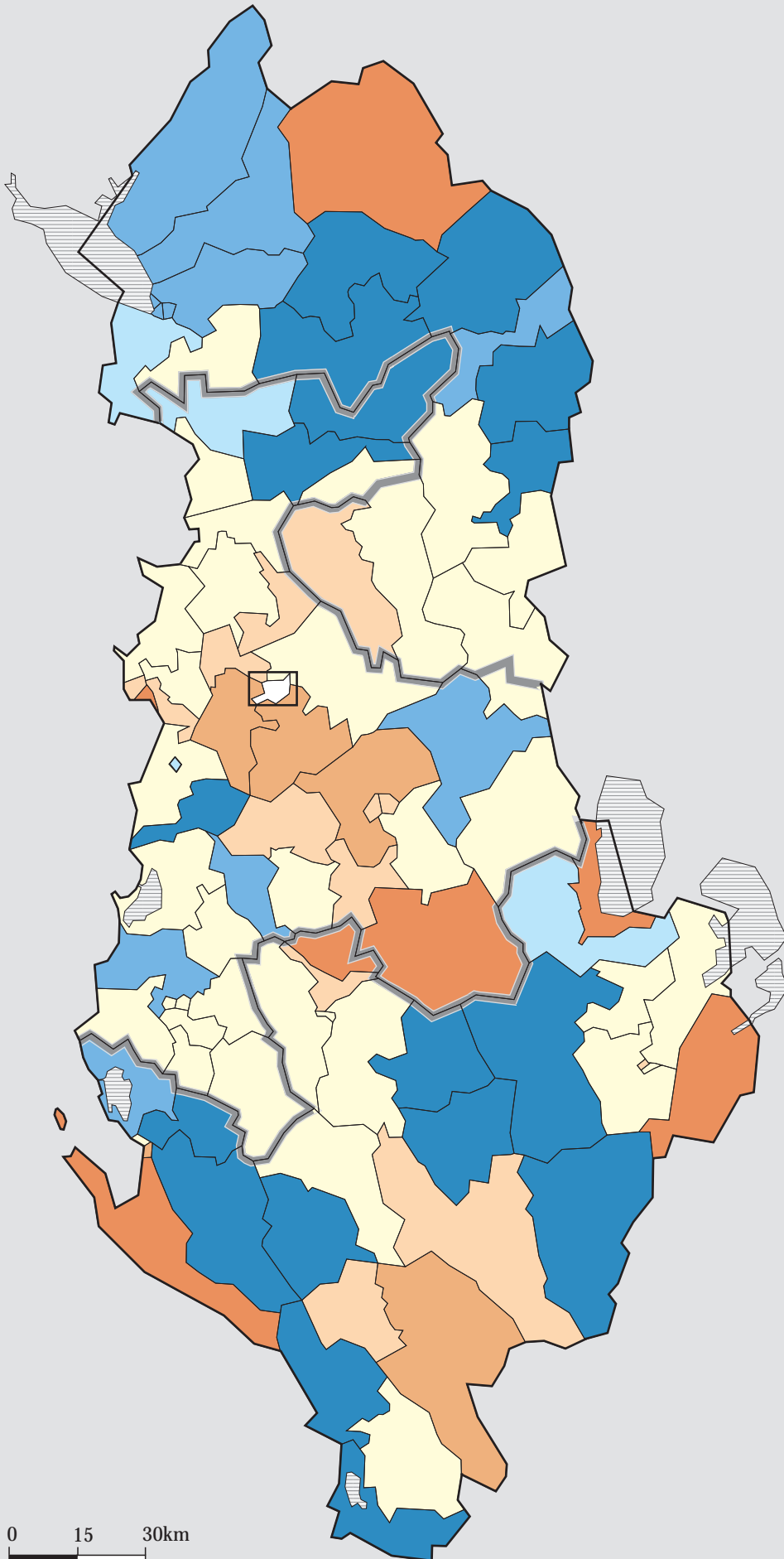
Parliamentary Election 1992

Deviation in voters allocation as % towards tolerated deviation

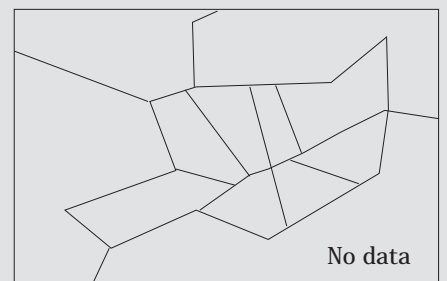


Average number of voters per constituency is 20.000

Tolerated deviation from the average number is +/-5%



Tirana Municipality



Boundaries



Source of data

Archive of Parliament of Albania, 1992

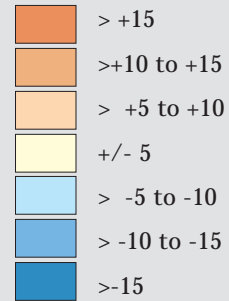
Demographic Atlas of Albania, 2003

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Voters allocation

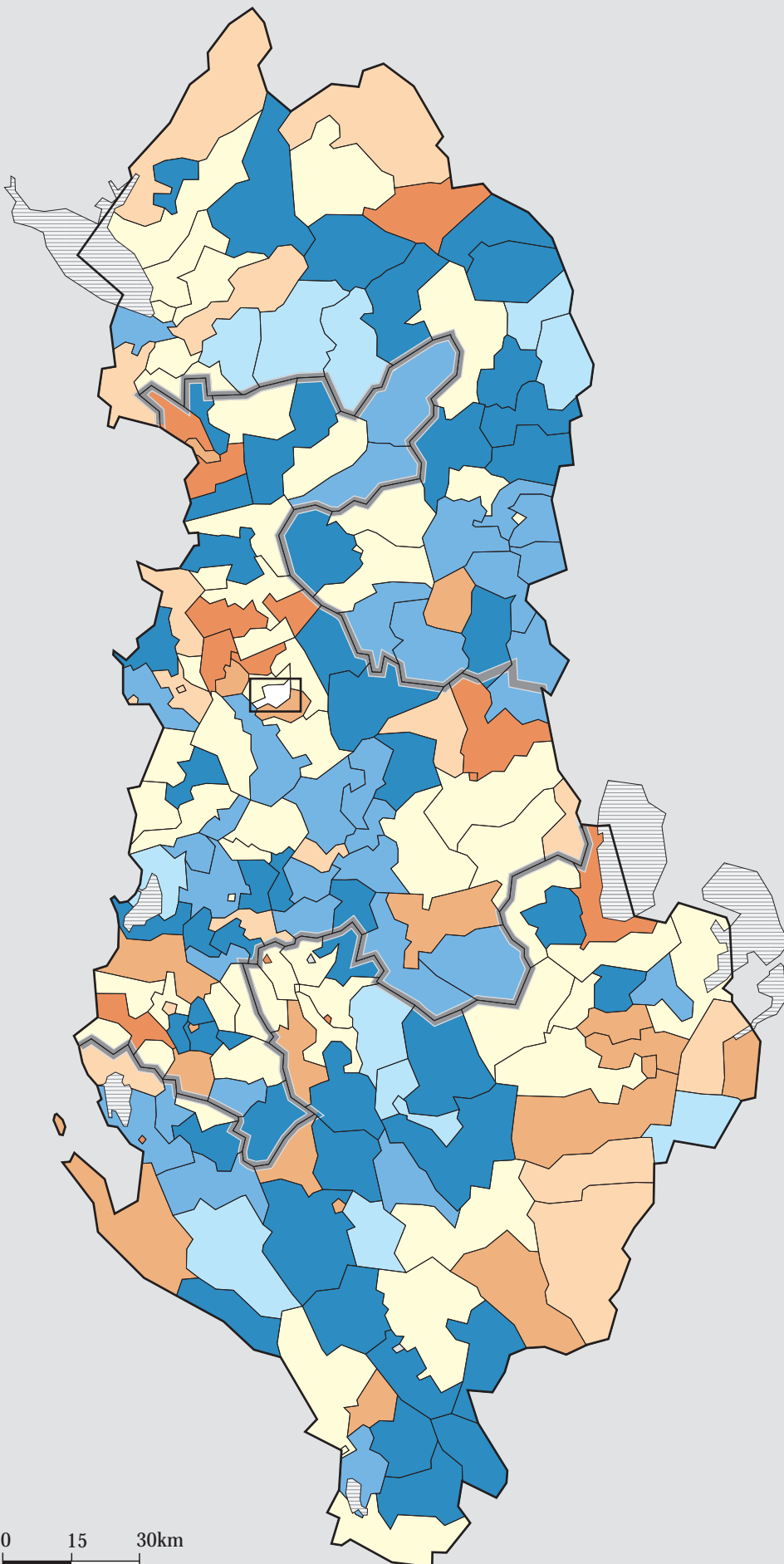
Parliamentary Election 1991

Deviation in voters allocation as % towards tolerated deviation

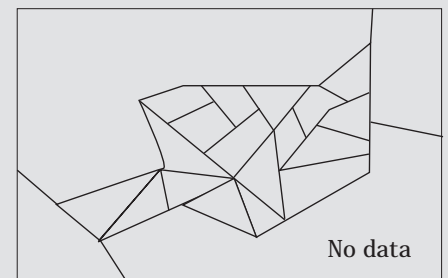


Average number of voters per constituency is 7939

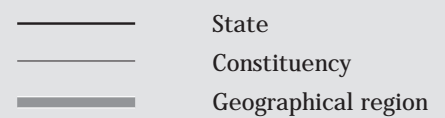
Tolerated deviation from the average number is +/-5%



Tirana Municipality



Boundaries



Source of data

Archive of Parliament of Albania, 1991

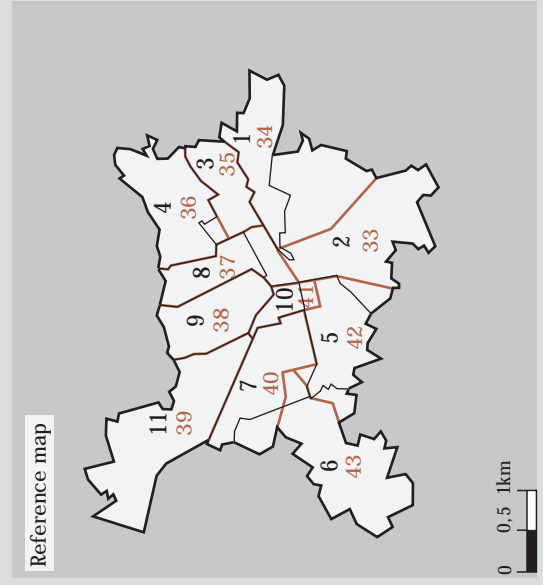
Demographic Atlas of Albania, 2003

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Voters allocation
Municipality of Tirana
Parliamentary Election 2001



Reference map

Codes of administrative and electoral divisions

5 Municipality unit
42 Constituency

Boundaries

Municipality
Constituency 1:50 000
Constituency 1:100 000

Source of data
Demographic Atlas of Albania 2003
Albanian Central Election Committee
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Appendix 1

Political parties	Initials
<i>Center-left</i>	
Socialist Party	PSSH
Democratic Alliance	AD
Union of Human Rights	PBDNJ
Socialist Movement for Integration	LSI
Movement for National Development- Leka I Zogu	LZHK
Social Democratic Party	PSD
Agrarian Environmentalist Party	PAA
New Democratic Party	PDR
Communist Party	PKSH
Party of Labour of Albania	PPSH
Party of National Safety	PSKSH
Party of Freedom and Human Rights	LDLNJ
<i>Center-Right</i>	
Democratic Party	PD
Republican Party	PR
Christian Democratic Party	PDK
Legality Party	PL
National Front	PBK
Liberal Democratic Union	BLD
Union of Veterans	BKV
Independent candidate	IC

Summary

Exploring elections features from *a geographical perspective* is the focus of this study. Its primary objective is to develop a scientific approach based on geoinformation technology (GIT) that promotes deeper understanding how geographical settings affect the spatial and temporal variations of voting behaviour and election outcomes. For this purpose the five parliamentary elections (1991-2005) following the political turnaround in 1990 in the South East European reform country Albania have been selected as a case study.

Elections, like other social phenomena that do not develop uniformly over a territory, inherit a spatial dimension. Despite of fact that elections have been researched by various scientific disciplines ranging from political science to geography, studies that incorporate their spatial dimension are still limited in number and approaches. Consequently, the methodologies needed to generate an integrated knowledge on many facets that constitute election features are lacking.

This study addresses characteristics and interactions of the essential elements involved in an election process. Thus, the baseline of the approach presented here is the exploration of relations between three entities: electorate (political and sociodemographic features), election process (electoral system and code) and place (environment where voters reside). To express this interaction the concept of *electoral pattern* is introduced. Electoral patterns are defined by the study as the final view of election results, chiefly in tabular and/or map form, generated by the complex interaction of social, economic, juridical, and spatial features of the electorate, which has occurred at a specific time and in a particular geographical location. GIT methods of *geoanalysis and geovisualization* are used to investigate the characteristics of electoral patterns in their spatial and temporal distribution. Aggregate-level data modelled in map form were used to analyse and visualize the spatial distribution of election patterns components and relations. The spatial dimension of the study is addressed in the following three main relations: One, the relation between *place and electorate* and its expression through the social, demographic and economic features of the electorate resulting in the profile of the electorate's context; second, the *electorate-election* interaction which forms the baseline to explore the perspective of local contextual effects in voting behaviour and election results; third, the relation between *geographical location and election outcomes* reflecting the implication of determining constituency boundaries on election results. To address the above relations, three types of variables: geo, independent and dependent, have been elaborated and two models have been created.

The *Data Model*, developed in a GIS environment, facilitates structuring of election data in order to perform spatial analysis. The peculiarity of electoral patterns - a multidimensional array that contains information on three variables, stored in data layers of dissimilar spatial units of reference and scales of value measurement - prohibit spatial analysis based on the original source data. To perform a joint spatial analysis it is therefore mandatory to restructure the spatial units of reference while preserving their semantic content. In this operation, all relevant electoral as well as socio-demographic data referenced to different administrative spatial entities are re-referenced to uniform grid cells as virtual spatial units of reference. Depending

on the scale of data acquisition and map presentation, a cell width of 0.5 km has been determined. The resulting fine grid forms the basis of subsequent data analyses and correlations. Conversion of the original vector data layers into target raster layers allows for unification of spatial units, at the same time retaining the existing level of detail of the data (variables, uniform distribution over space). This in turn facilitates the integration of the variables studied and the performance of GIS-based spatial analysis. In addition, conversion to raster format makes it possible to assign new values to the original data, which are based on a common scale eliminating existing differences in scale of measurement. Raster format operations of the type described are well-established data analysis techniques in GIT, yet they have rarely been employed to process and analyse electoral data.

The *Geovisualization Model*, developed in a cartographic environment, complements the Data Model. As an analog graphic model it facilitates efficient communication and exploration of geographical information through cartographic visualization. Based on this model, 52 choropleth maps have been generated. They represent the outcome of the GIS-based electoral data analysis. The analog map form allows for in-depth visual analysis and interpretation of the distribution and correlation of the electoral data studied. For researchers, decision makers and a wider public the maps provide easy-to-access information on and promote easy-to-understand insight into the spatial dimension, regional variation and resulting structures of the electoral patterns defined.