Contents	Urban growth measured by ROXY Index
Metadata	Information about this file
TokyoDistance	The spatial agglomeration and deglomeration, measured by ROXY Index, weigh by distance, Tokyo, 1920-2010, (ROXY)
TokyoDichotomy	The spatial agglomeration and deglomeration, measured by ROXY Index, weigh by type, Tokyo, 1947-2005, (ROXY)
TokyoChuo	The spatial agglomeration and deglomeration, measured by ROXY Index, weigh by distance, Chuo railway-line region in Tokyo, 1947-2005, (ROXY)
JPlargeUrban	The spatial concentration and deconcentration, measured by ROXY index, weigh by population size, eight largest metropolitan areas in 1995, Japan, 1947-1995, (ROXY)
FinlandUrban	The spatial concentration and deconcentration, measured by ROXY index, weigh by population size, functional urban regions, Finland, 1875-1995, (ROXY)

http://www.dannydorling.org/

Metadata

These reference tables contain statistics of the ROXY Index and its absolute change. The ROXY Index can be used to measure many socio-economic changes, and it is used here to measure the urban growth of both intra-metropolitan and inter-metropolitan. In the first three sheets containing Tokyo data, the ROXY is used to measure the agglomeration and deglomeration of population within Tokyo. It should be noted that the weigh methods are different in these files such that the results are slightly different, even though they share the same dataset (census). In the last two sheets, ROXY is used to measure the concentration and deconcentration between metropolitan areas within the urban system.The graph beside each table shows the ROXY and the absolute change of ROXY over time. The x-axis is the absolute change while the y-axis is the ROXY. Each circle represents a certain period.

Contents

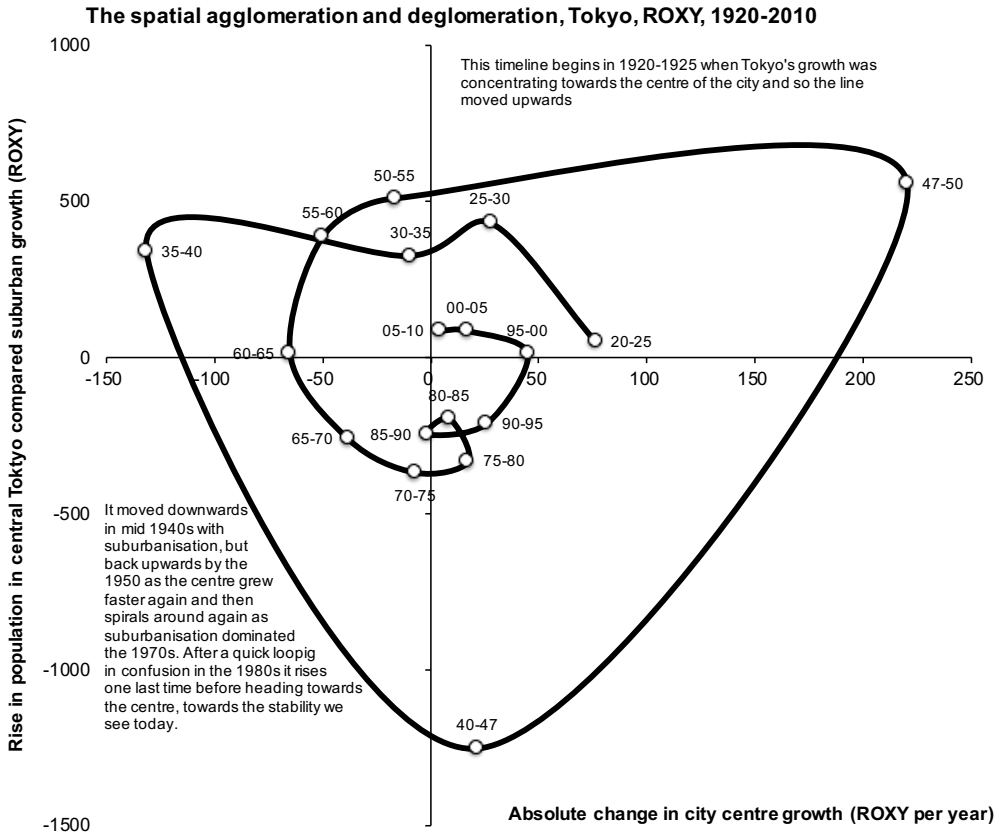
The spatial agglomeration and deglomeration, measured by ROXY Index, weigh by distance, Tokyo, 1920-2010, (ROXY)

Source: Data until 2000 are retrieved from page 8 in 牛島千尋. 東京 60㎞ 圏の都市サイクルと都心回帰 (2005), http://repo.komazawa-u.ac.jp/opac/repository/all/17599/jfl063-06.pdf; Data since 2000 are estimated from Figure 2 in Chihiro Ushijima, The Urban Life Cycle in the Tokyo 60km Area and the Expansion and Contraction of City, Bulletin of Faculty of Literature, Komazawa University 70, 2012-13, pp.117-135 (in Japanese),

Note: the closer to the centre, the larger the weigh. Hence the positve ROXY value means that more population is gained in places closer to centre, which is agglomeration.

Frequency: Varied, End of period

Observation date	Change (ROXY)	ROXY Index	Label
1920-25	76.22	50.45	20-25
1925-30	27.52	431.53	25-30
1930-35	-9.18	325.61	30-35
1935-40	-131.54	339.68	35-40
1940-47	21.59	-1252.86	40-47
1947-50	220.34	555.61	47-50
1950-55	-16.70	509.89	50-55
1955-60	-49.89	388.56	55-60
1960-65	-65.09	11.00	60-65
1965-70	-38.02	-262.34	65-70
1970-75	-7.05	-369.16	70-75
1975-80	17.40	-332.86	75-80
1980-85	8.56	-195.20	80-85
1985-90	-1.62	-247.26	85-90
1990-95	25.97	-211.42	90-95
1995-00	44.77	12.43	95-00
2000-05	17.00	84.92	00-05
2005-10	4.00	86.00	05-10



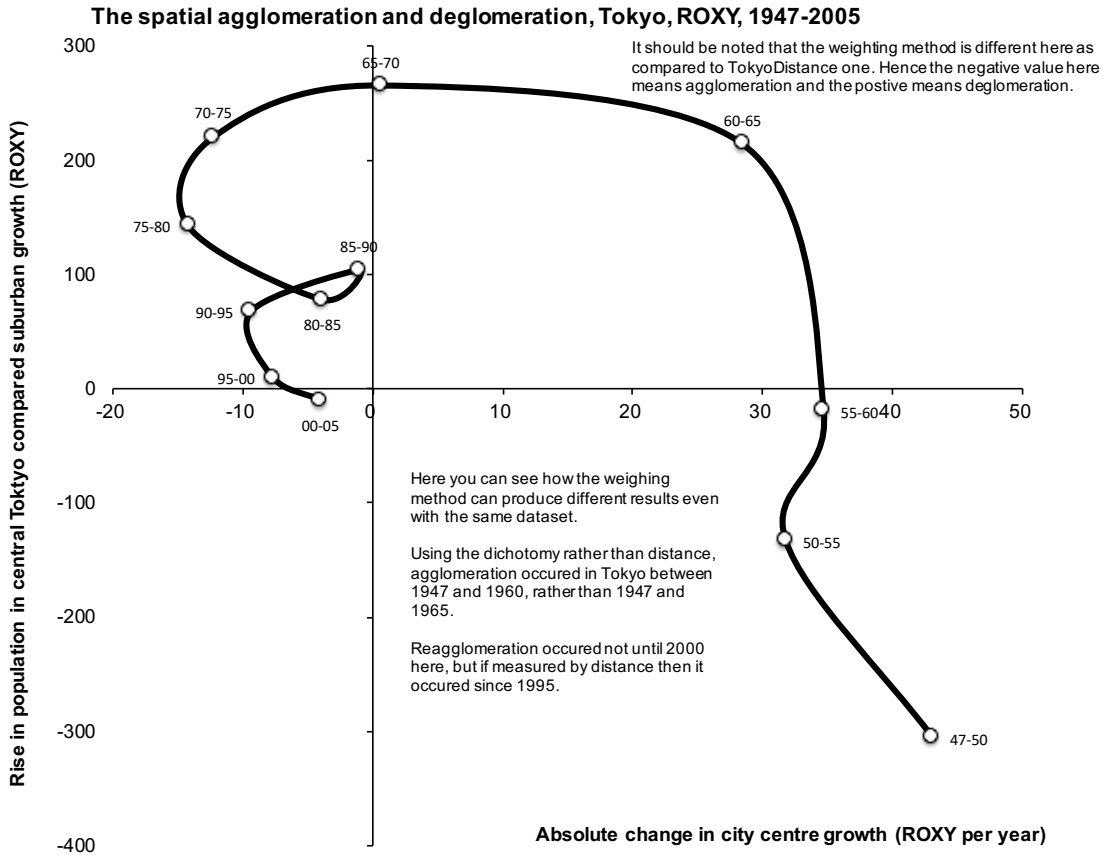
Contents

The spatial agglomeration and deglomeration, measured by ROXY Index, weigh by type, Tokyo, 1947-2005, (ROXY)

Source: Tatsuhiko Kawashima, Atsumi Fukatsu, and Noriyuki Hiraoka, Re-urbanization of Population in the Tokyo Metropolitan Area: ROXY-index / Spatial-cycle Analysis for the Period 1947-2005, Gakushuin Economic Papers, 2007, 44, 1, 19-46, https://ci.nii.ac.jp/naid/110007524073/en/?range=0&sortorder=0&start=0&count=0; July 22 2019

Note: the wighting factor of 'core =0, suburb = 1'. Hence the positve ROXY value means that more population is gained in suburbs than in the core, which is deglomeration.
Frequency: Varied, End of period

Observation date	Change (ROXY)	ROXY Index	Label
1947-50	43.10	-305.44	47-50
1950-55	31.78	-133.06	50-55
1955-60	34.69	-19.41	55-60
1960-65	28.47	213.88	60-65
1965-70	0.62	265.33	65-70
1970-75	-12.27	220.10	70-75
1975-80	-14.23	142.68	75-80
1980-85	-3.87	77.85	80-85
1985-90	-1.06	104.01	85-90
1990-95	-9.39	67.25	90-95
1995-00	-7.72	10.16	95-00
2000-05	-4.02	-9.95	00-05



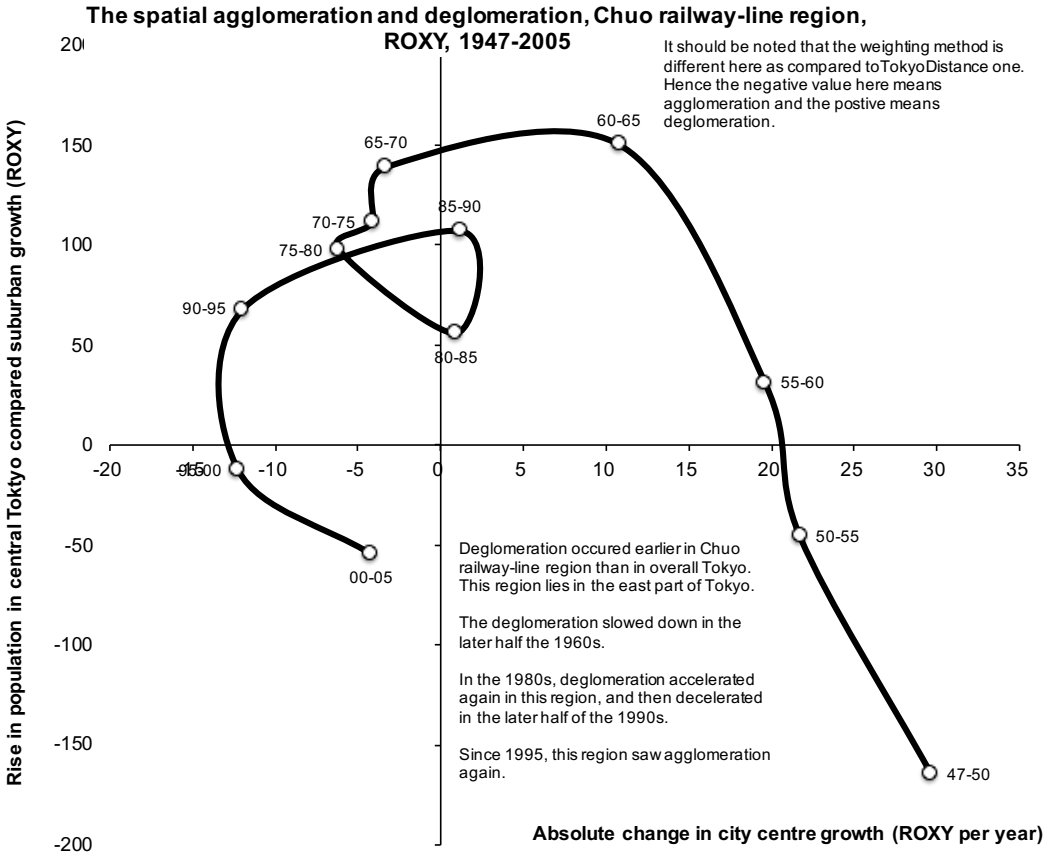
Contents

The spatial agglomeration and deglomeration, measured by ROXY Index, weigh by distance, Chuo railway-line region in Tokyo, 1947-2005, (ROXY)

Source: Tatsuhiko Kawashima, Atsumi Fukatsu, and Noriyuki Hiraoka, Re-urbanization of Population in the Tokyo Metropolitan Area: ROXY-index / Spatial-cycle Analysis for the Period 1947-2005, Gakushuin Economic Papers, 2007, 44, 1, 19-46, https://ci.nii.ac.jp/naid/110007524073/en/?range=0&sortorder=0&start=0&count=0; July 22 2019

Frequency: Varied, End of period

Observation date	Change (ROXY)	ROXY Index	Label
1947-50	29.66	-164.58	47-50
1950-55	21.73	-45.93	50-55
1955-60	19.61	30.98	55-60
1960-65	10.80	150.12	60-65
1965-70	-3.28	139.02	65-70
1970-75	-4.15	111.34	70-75
1975-80	-6.14	97.51	75-80
1980-85	0.95	55.90	80-85
1985-90	1.18	107.03	85-90
1990-95	-11.98	67.71	90-95
1995-00	-12.23	-12.75	95-00
2000-05	-4.19	-54.63	00-05



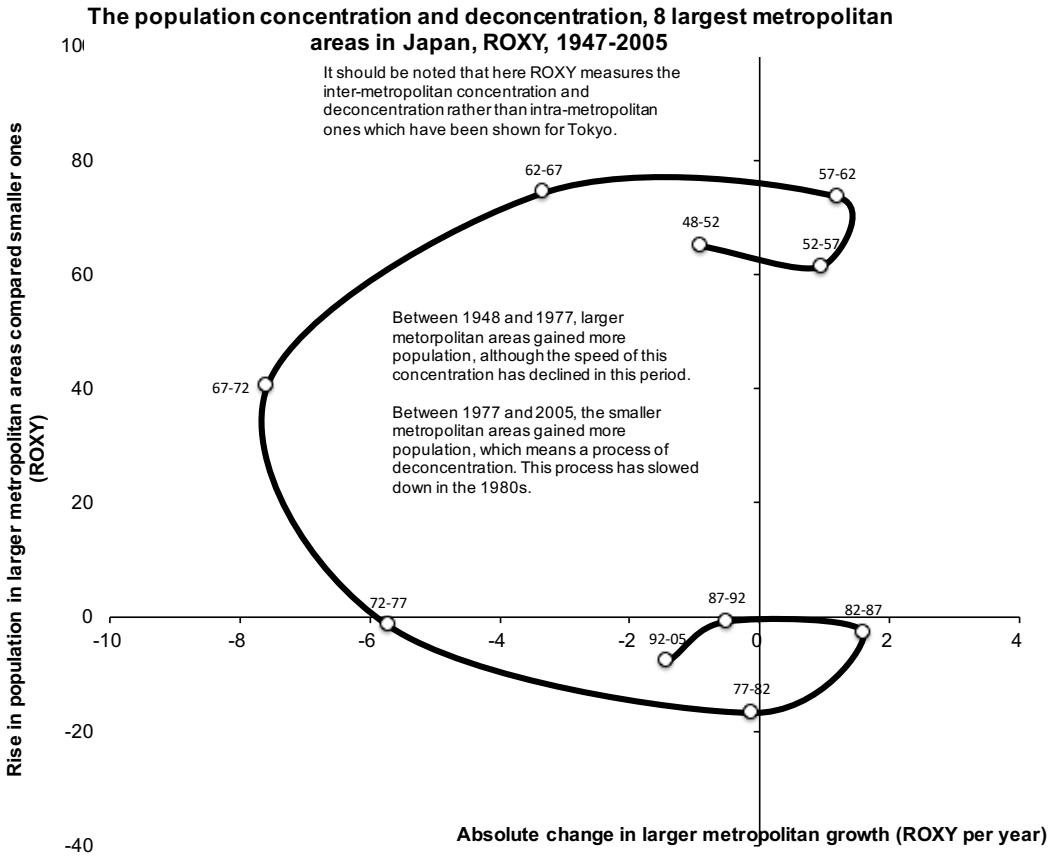
Contents

The spatial concentration and deconcentration, measured by ROXY index, weigh by population size, eight largest metropolitan areas in 1995, Japan, 1947-1995, (ROXY)

Source: Tatsuhiko Kawashima and Norijuki Hiraoka, Spatial cycles for population changes in Japan: Larger metropolitan areas and smaller-and-non-metropolitan area, Gakushuin Economics Papers, January 2001, 37, 3, 4, http://www.gakushuin.ac.jp/univ/eco/gakkai/pdf_files/keizai_ronsyuu/contents/3703=04/3703=04-18kawashima,hiraoka.pdfJuly 22 2019

Note: the larger the size, the higher the weigh. Hence the positve ROXY value means that more population is gained in places with larger population, which is concentration.
Frequency: Varied, End of period

Observation date	Change (ROXY)	ROXY Index	Label
1948-52	-0.90	64.94	48-52
1952-57	0.95	61.36	52-57
1957-62	1.20	73.53	57-62
1962-67	-3.32	74.27	62-67
1967-72	-7.58	40.34	67-72
1972-77	-5.71	-1.53	72-77
1977-82	-0.12	-16.76	77-82
1982-87	1.60	-2.74	82-87
1987-92	-0.50	-0.75	87-92
1992-05	-1.41	-7.77	92-05



Contents

The spatial concentration and deconcentration, measured by ROXY index, weigh by population size, functional urban regions, Finland, 1875-1995, (ROXY)

Source: Martti Hirvinen, Norijuli Hiraoka, and Tatsuhiko Kawashima, Long-term urban development of the Finnish Population: Application of the ROXY-index analytical method, Gakushuin Economic Papers, August 1999, 36, 2, 243-263, http://www.gakushuin.ac.jp/univ/eco/gakkai/pdf_files/keizai_ronsyuu/contents/3602/3602-21hirvonen,hiraoka.pdf. July 22 2019

Note: the larger the size, the higher the weigh. Hence the positve ROXY value means that more population is gained in places with larger population, which is concentration.
Frequency: Varied, End of period

Observation date	Change (ROXY)	ROXY Index	Label
1875-80	-2.55	9.34	1875-80
1880-90	0.60	2.01	1880-90
1890-00	3.07	28.99	1890-00
1900-10	-7.68	54.91	1900-10
1910-20	-3.49	-13.71	1910-20
1920-30	1.21	-14.92	1920-30
1930-40	-2.35	10.40	1930-40
1940-50	1.35	-61.91	1940-50
1950-60	4.90	37.49	1950-60
1960-70	0.37	36.15	1960-70
1970-75	-4.67	41.70	1970-75
1975-80	-2.20	0.28	1975-80
1980-95	3.75	19.65	1980-95
1985-90	3.60	37.76	1985-90
1990-95	3.56	55.66	1990-95