



**THE CIRCULATION OF WEALTH
BEYOND ECONOMIC BASE THEORY:
ALTERNATIVES TO PRODUCTIVE ECONOMICS?
THE ROLE OF THE RESIDENTIAL ECONOMY
IN ATTRACTING INCOME TO SWITZERLAND**

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ABSTRACT

The principal regional development theories are based on those activities whose export outside of the region drives local development. The increasing mobility of the workforce and resident population has changed the relevance of this approach. In fact, residency can also become pivotal to incomes within a region. This is what is known as the residential economy.

Based on this distinction, this article classifies the various regions of Switzerland according to three models: productive (based on income from exporting activities), residential (based on income from residents, whether this income derives from work, private wealth or annuities), or a combination thereof. In order to determine this, we have created two intensity indicators for both activities and incomes, thereby enabling us to compile a spatial typology breakdown using a Hierarchical Ascendant Classification (HAC) system. The results demonstrate that the residential economy plays an essential role in attracting high-income residents.

KEYWORDS

Regional and urban development, residential economy, productive economy, income, Switzerland, regions.

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INTRODUCTION

All models of regional or urban economics are based on more or less explicit postulates regarding the location of jobs and households and regarding the relationships between these two spaces.

We might firstly differentiate those models which posit that households are located where the jobs are, such as Hoyt's economic base theory (1954). Secondly, there are those theories which are primarily interested in the location of households, such as the theories on gentrification or amenity migration (Gosnell and Abrams, 2009; Rérat and Lees, 2011).

As far as the relationship between both residential and productive spaces is concerned, it is worth examining those approaches which describe the ways in which mobility (i.e. commuting) creates separate residential and employment spaces (Gottlieb, 1995; Taylor, 2009). According to Storper and Scott (2009), the location of businesses and the creation of jobs are the most significant factors governing urban development and the movement of workers. The picture is reversed with residential economics, which sees variations in regional incomes as influenced by residency (transfers, local employment, etc.) (Davezies, 2008; Dissart *et al.*, 2012). The more dynamic "Creative Class" theory posits that it is "tolerant" urban conditions that will attract highly qualified worker sector, which will in turn generate more productive jobs (Florida, 2002).

This article principally espouses the view that residency is crucial in attracting wealth and jobs to a region. In fact, residency can be the mainstay of various different income sources within a region, whether from work, wealth, annuities or transfers. Moreover, household residency also generates local business activity, employment and income (Markusen, 2007; Markusen and Schrock, 2009). Consequently, by correlating geography of income and geography of productive or residential employment, is it possible to create differentiated territorial development models? More specifically, is it possible to determine those regions whose development is predominantly based on productive, residential or mixed employment (Barbour and Markusen, 2007; Nolan *et al.*, 2011)? Does income from homes based in these regions come from work, transfers or a combination thereof, and in what proportion?

Moreover, in dense and urbanised countries such as Switzerland, these issues are connected to urban sprawl, intensive regional housebuilding programmes and the growing integration at urban regional level and between these regions (Dessemontet *et al.*, 2010; Perlik, 2011; Van der Heiden *et al.*, 2013).

This study develops its own original quantitative methodology, based on the creation of two indicators:

- The intensity level of activities, which can be productive, residential or a combination thereof. This indicator firstly distinguishes between exporting jobs (for the national or international market) and residential jobs (for the local or regional market), then relates these jobs to the resident population and the national average. It indicates to us whether a region is strongly based around economic production and whether the latter is largely destined for export or for residents.
- Income intensity levels, whether this income derives from workers, transfers, private wealth or a combination thereof. This indicator is then related to the resident population and the

national average. It denotes a region's ability to attract high/low incomes and whether these incomes derive from work or from annuities and transfers.

These two indicators are then successively tested by partial correlation and then through a Hierarchical Ascendant Classification (HAC) method. A typology of municipalities based on business activity and revenue intensity is then created using HAC.

In the first section (Part 1), we review the main territorial economics theories in order to describe regional development in terms of productive and/or residential orientation. The second section deals with method (Part 2). In the third section (Part 3), we present the typology of Swiss municipalities.

1 THE PRODUCTIVE AND/OR RESIDENTIAL ORIENTATION OF REGIONAL DEVELOPMENT THEORIES

Historically, economic theories and policies have largely looked to the productive aspect of business activities to explain regional development. From the early days of industrialisation, households have been clustered close to where jobs are, due to the high cost of transport (Storper and Walker, 1989; Massey, 1995). Thus, traditionally, Regional Science has tended to approach production with the view that *territory is an economic growth factor*. Hoyt's economic base theory (1954), regional production systems (RPS) and territorial innovation models (TIMs) always attract the attention of politicians and researchers (Porter, 1998; Moulaert and Sekia, 2003). These approaches tend to view industrial activities and high added value services as a prerequisite for regional development. However, these theories are predicated on the inherent assumption that place of residence and place of income expenditure are located in the same area as production. There is therefore little or no inter-regional household or income mobility.

From the late 20th century and early 21st century onwards, two important phenomena need to be taken into account (Zandvliet and Dijst, 2006; Talandier and Davezies, 2009):

- Individuals' forms of mobility have changed and expanded (commuters, students, tourists, retired people, etc.).
- Transfer incomes have increased, particularly with the ageing population (pension annuities, disability benefit, Social Security and various other welfare payments, income from private wealth, etc.).

Thus, the location of jobs is no longer a reliable indicator of geography of population, activities and income. On the one hand, it is less and less the case that income is spent where it is generated (i.e. at the site of production or where the job is based) (Markusen and Schrock, 2006). On the other hand, jobs within the same sector do not generate nearly the same income from one region to another within a given territory (Turok, 2009). Ultimately, certain sections of the population (annuitants and the economically inactive) do not figure in place-of-work statistics as they are economically inactive (Davezies, 2008). Moreover, with the constantly-improving quality of available statistical data, residents' inclusion in income flow analyses is now becoming increasingly feasible.

Following these changes, a number of theoretical approaches have emerged (see Table 1). They no longer focus solely on production but also population and can be collectively referred to by the term "residential approaches". *Territory is seen as a living environment* where the location of residence becomes a factor in development. There are various geographical theories which take account of these phenomena. On the one hand, the concept of gentrification gives us a way of understanding the middle-classes' reinvestment in inner-city areas (Rérat and Lees, 2011). On the other hand, amenity migrations (Gosnell and Abrams, 2009) indicate the pursuit of natural or cultural amenities by residents, which leads to them basing themselves outside of city centres. Other approaches study peri-urbanisation as a spatial category in its own right (Taylor, 2009). Certain more economic approaches examine residential choices in terms of the quality of public goods available and the level of taxation (Tiebout, 1956). These choices lead to what Webster

(2002, 2003) and Charmes (2009) call the 'clubbisation' of urban life, which takes into account individuals' daily movements.

To conclude, certain theoretical approaches automatically consider the connections between production and consumption (residential and productive approaches). Firstly, the so-called 'people move to jobs' approaches take the prior existence of productive activity to explain regional development. Theories on Spatial Divisions of Labour (SDL) (Aydalot, 1985; Massey, 1995) and urban production patterns (Storper and Scott, 2009) explain how the various economic activities within a region (design and creation activities, etc.) or a city determine local trends, types of residents and the variety of their consumption patterns. In other words, regional growth is primarily determined by local production systems.

Conversely, those theories of urban growth based around consumption and amenities (Clark, 2004; Gottlieb and Glaeser, 2006), as well as the 'Creative Class' theory (Florida, 2002), posit that it is individuals' residential and consumer preferences which drive local growth. Thus, the so-called 'jobs move to people' approach posits that all measures which improve an area's amenities and therefore its attractiveness are liable to increase regional income and growth. Markusen and Schrock (2006, 2009) have demonstrated that by fostering specific and creative activities, cities can build comparative advantages which are not reproducible in other areas, and these may not necessarily be exporting activities. Similarly, residential economics, developed in France (Davezies, 2008), maintains that residential areas become distinct from productive areas through the development of an economy based on residents' demand to attract their income.

Those approaches which we have termed "residential" highlight the increasing disassociation between places of production and places of residency, leisure and income expenditure. Income is less and less spent in the place in which it is generated and is less focused on regional producers due to the increase in state transfers (redistribution). Incomes are therefore available to households right where traditional regional development theories do not expect them.

How, then, are we to determine whether changes in the location of households follow those to jobs and income or whether these dissociations require further examination?

TABLE 1. OVERVIEW OF THE MAIN THEORIES ATTRIBUTABLE TO THE RESIDENTIAL AND PRODUCTIVE APPROACHES.

Approach type	Spatial approach type	Theory, model and key authors	Period covered by theory	Spatial issue
Productive	Place of residence same as place of production	Economic base (Hoyt, 1954)	Mid 20 th C.	Regional exporting activities, growth
		Territorial Innovation Models (TIMs) (Moulaert and Sekia, 2003)	Late 20 th C.	Innovation-led development of exporting activities
Residential	Residency as a spatial category	Municipal collective amenities in an area (Tiebout, 1956)	Mid 20 th C.	Residential choices in accordance with local amenities and fiscal expectations, "voting with one's feet"
		Gentrification (Rérat and Lees, 2011)	Late 20 th C.	Upper-middle class migration to urban areas
		Amenity migration (Gosnell and Abrams, 2009) Peri-urbanisation (Taylor, 2009) "Clubbisation" (Webster, 2003)	Early 21 st C.	Rural migration in search of natural/cultural amenities, metropolitan fragmentation
		Spatial Division of Labour (SDL) (Aydalot, 1985)	1980s	The jobs and wages available determine the residential lifestyles of each area
Productive and Residential	Population tends to follow jobs	Urban production systems (Storper and Scott, 2009)	Early 21 st C.	Urban growth is linked to the geographical and organisational fragmentation of production
		"Creative Class" (Florida, 2002) "Entertainment City" (Clark, 2004) "Consumer City" (Gottlieb and Glaeser, 2006)	Early 21 st C.	Migration towards the tolerant urban environment and urban amenities by highly qualified groups working in productive jobs
	Jobs tend to follow the population	"Distinctive City" (Markusen and Schrock, 2006)	Early 21 st C.	Cities become distinctive by specialising in consumer activities and production and through their cultural identity
		Residential Economy revised economic base theory (Davezies, 2008)	Early 21 st C.	The mobility of individuals and transfers dissociates residential areas from productive areas

Source: Own work.

2 METHOD

A multivariate statistical analysis has been conducted in three stages. Firstly, we define two activity intensity indicators (productive and residential) and revenue intensity indicators (for workers and annuitants) which allow us to calculate four tested variables (2.1). Secondly, partial correlations are calculated to measure the connection between variables (2.2). Thirdly, using a Hierarchical Ascendant Classification (HAC), we group together municipalities with similar activity and income intensity profiles (2.3).

2.1 CONSTRUCTION AND CALCULATION OF VARIABLES

2.1.1 ACTIVITY INTENSITY INDICATOR

The activity intensity indicator shows the concentration levels of residential and productive employment in the resident population of each municipality. This indicator shows the level of specialisation within a municipality in either production for export or production primarily for the local population. Economic activities are classified as either productive or residential in accordance with the approaches taken by Hoyt (1954) and Davezies (2008).

An activity is referred to as productive when production is largely directed towards extra-municipal demand. This activity's production is therefore potentially aimed at consumers throughout the world. Such is the case for example with industrial activities.

An activity is referred to as residential when production is largely directed towards local demand (within the municipality) or even regional demand (several municipalities), i.e. towards resident consumers (hence the term residential economics). This includes for example cafes and restaurants, personal services (hairdressers, dry cleaners, etc.), repair services (car mechanics, shoe repairers etc.), or even retail trade (shopping centres, butchers, etc.).

We then link the type or types of economic activity present and the resident population. Our hypothesis is that municipalities with a significant per-capita concentration of residential activity respond on the one hand to local demand for these types of goods and services whilst also attracting other types of consumers (temporary visitors coming in from neighbouring municipalities or other regions). On the other hand, municipalities with low per-capita rates of residential jobs have a lower internal supply of residential services. A number of possible factors might explain the local population's residential choices in these municipalities. For example, residents may be attracted by natural amenities (Gosnell and Abrams, 2009), fiscal considerations (Tiebout, 1956), or even an attractive real estate and property development market (Alonso, 1964). We have not however included these aspects in our analysis.

We have taken our data from the Swiss Business Census for 2008. Data on the permanent resident population are taken from the Annual Population Statistics (ESPOP) of 31 December 2008. This population figure does not include individuals resident in Switzerland for less than twelve months, asylum seekers, cross-border workers or tourists.

Indicator calculation is a two-stage process. Firstly, economic activities are classified according to two categories (Table 2) (Segessemann and Crevoisier, 2013):

- The productive economy covers activities made up of export-led jobs and global services aimed at a global production market (e.g. manufacturing, farming, high-added-value services, tourist accommodation);
- The residential economy covers jobs serving the regional market (e.g. supermarkets, universities, hospitals, airports, etc.), or the local market (e.g. retail trade, intra-urban transport, restaurants and catering, schools, local government, etc.).

TABLE 2. TWO CATEGORIES OF ECONOMIC ACTIVITY.

MARKET ORIENTATION		ACTIVITIES	LOCATION OF EMPLOYMENT
Local ↓ Global	Regionally and locally-oriented economic activities	RESIDENTIAL ECONOMY For example: retail trade, restaurants and catering, personal services, local and regional bank branches, regional and local real estate activities, supermarkets, hospitals, airports, postal services, local government	Connected to the spatial distribution of the population for local services
	Nationally and even internationally-oriented economic activities		Central locations for certain regional services such as airports, hospitals, etc.
		PRODUCTIVE ECONOMY For example: manufacturing, agriculture, tourist accommodation* and global services (large banking and insurance company subsidiaries, national research centres, federal government)	Rural for agricultural, manufacturing and tourist jobs
			Urban for metropolitan services

* Tourist accommodation is productive when tourist consumption is residential.

Source: Own work.

The second stage consists of calculating the number of jobs for both economy types for every municipality on a per capita basis. Finally, the activity intensity indicator gives the number of residential economy jobs and the number of productive economy jobs per 1000-head of population for each municipality.

2.1.2 INCOME INTENSITY INDICATOR

The income intensity indicator shows income concentration in each municipality based on the permanent resident population. This indicator shows the overall level of residents' income. Our hypothesis is that municipalities' degree of specialisation in the residential economy depends on residents' income levels. Thus, municipalities with higher per-capita income levels offer a number of advantages (such as local services, local rural amenities, tax incentives, ease of access to the transport network, etc.) which will attract residents over and above neighbouring municipalities. Finally, we also posit that municipalities do not all attract the same income categories. Some attract more commuters whilst others have different residents (pensioners, those on benefits, etc.). Consequently, we also differentiate between working income and other forms of income such as pension annuities, welfare transfers, etc.

The income intensity indicator uses 2008 income data taken from the Swiss Federal Tax Administration (FTA). Most studies estimate income based on direct federal taxes as registered with the Swiss confederation (RegioSuisse, 2011). Therefore we are looking at taxpayers¹ total taxable income per municipality, broken down as follows:

- Taxable income for independent and dependent individuals, which we will henceforth refer to as workers' income. Note that this also contains income from private wealth for these households.
- Taxable income for annuitants² and the economically inactive (unemployed), which we will henceforth refer to as annuitants' income. Readers should bear in mind that the term annuitant does not specifically refer to pensioners, but includes all individuals whose revenue does not derive from work.

Finally, we relate workers' income and annuitants' income to the number of residents. The income intensity indicator expresses the total workers' and annuitants' income per 1000-head of population for each municipality.

2.2 CORRELATING ACTIVITIES AND INCOME

Pearson's linear correlation coefficient (Table 3) shows that there is a correlation between the four variables obtained (intensity of productive and residential activities, intensity of workers' and annuitants' incomes) but the linear associations are relatively weak.

TABLE 3. PEARSON'S LINEAR CORRELATION COEFFICIENT.

	Productive economy	Residential economy	Workers' income	Annuitants' income
Productive economy	1.000	0.143*	-0.161*	-0.092*
Residential economy	0.143*	1.000	0.105*	0.057*
Workers' income	-0.161*	0.105*	1.000	0.257*
Annuitants' income	-0.092*	0.057*	0.257*	1.000

*=p<0.01.

There is a positive correlation between productive and residential economies ($r=0.143$), indicating that the more one type of activity is present, the more the other is too. This might initially appear to confirm Hoyt's traditional economic base theory (1954). In fact, this is due to the fact that there is a higher number of municipalities in which both activity types are low or high than there are municipalities in which a single activity type clearly dominates.

When we also consider workers' and annuitants' income, the results actually confirm Davezies' revised economic base theory (2008). There is a positive correlation between the residential economy and both income types, whilst there is a negative correlation between the productive economy and these incomes (dissociation between places of production and places of residence). Consequently, this indicates that the residential economy reflects a municipality's income concentration level, whether this income derives from the economically active or from annuitants;

however, the linear association with income from economically active individuals is roughly twice as strong as the linear association with annuitants' incomes ($r=0.105$ as compared with $r=0.057$).

Another interesting result is that the strongest linear association is seen between the two income types; overall the association is positive ($r=0.257$), meaning that in those places where professional revenues are concentrated, we also see a concentration of annuitant incomes. This seems to indicate that the annuitant income category covers a number of highly diverse situations, (so those living on income from private wealth are included in the same category as those living on welfare benefits) and is dominated by income from private wealth and the annuities of wealthy pensioners.

2.3 HIERARCHICAL ASCENDANT CLASSIFICATION

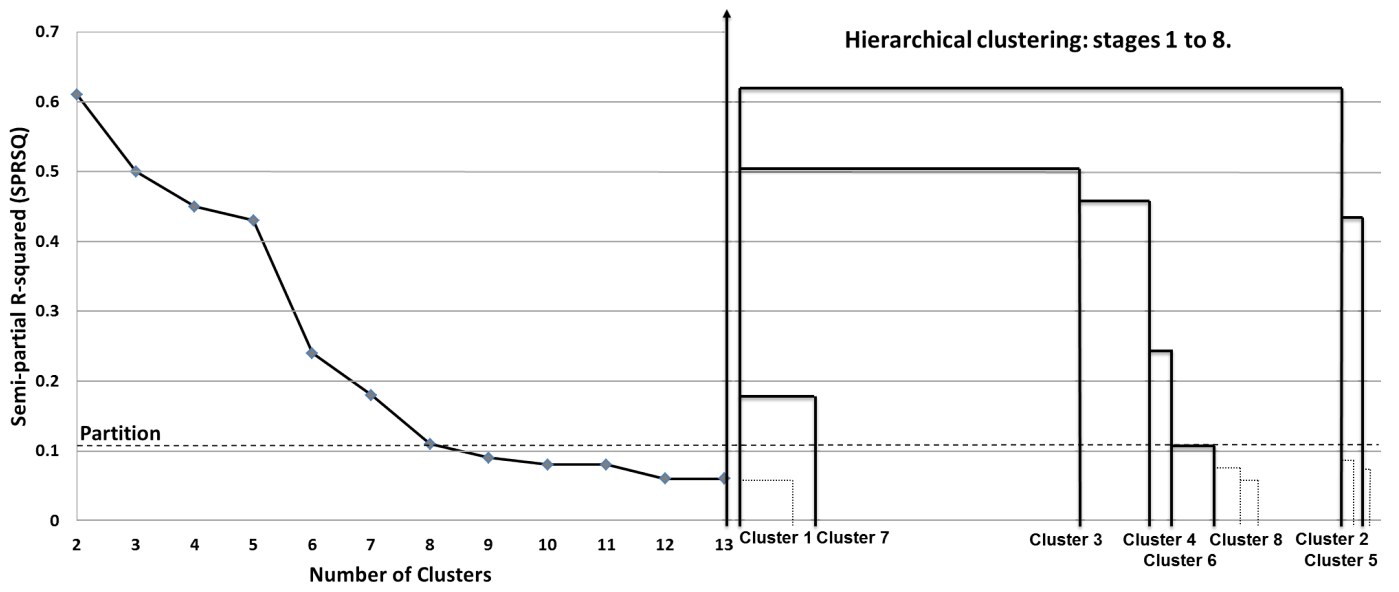
The main aim of classification is to create groups of similar statistical units (in this case, municipalities) and to separate out those differentiated by a certain number of quantitative variables (Jayet, 2001). It therefore involves creating groups which are as far apart as possible. The analytical technique used in this article is Hierarchical Ascendant Classification (HAC). On the one hand, HAC enables the meticulous construction of interconnecting typologies, often considered by geographers to be compound regional entities (Fotheringham et al., 2000). On the other hand, this method enables the analysis of variables taken from successive clusters of increasingly general statistical units (Cliff and Ord, 1981; Fraley and Raftery, 1998). This HAC analysis method is therefore ideal for classifying regional development models.

The HAC principle is based on the division of data into n clusters (or classes) obtained by aggregating the closest elements (in this case, municipalities) two by two. Statistically speaking, for agglomerative clustering we have chosen the Ward Method with Euclidian distance, based on inertia (or variance). The idea is to agglomerate Swiss municipalities by minimising intra-class inertia and by maximising inter-class inertia.

The HAC draws on the four variables from the intensity indicators for activities and income. With Ward's minimum variance method, for each iteration we agglomerate those clusters for which the agglomeration gives the lowest loss of inter-class inertia. The selection of the number of clusters therefore depends on the inter-class inertia value, given that for each aggregation, distance between clusters diminishes. Generally speaking, the best place for a cut-off point is just preceding a value from a dramatically lower inter-class distance. Thus the cut (and thus the number of resulting clusters) is made at the level of the dramatic jump in inter-class inertia. Figure 1 indicates the changes in inter-class inertia and the dendrogram in terms of the number of clusters. The semi-partial R-squared (SPRSQ) measures the loss of inter-class inertia which occurs when regrouping 2 clusters. As the aim is to achieve maximum interclass inertia, what is required is a low SPRSQ followed by a high SPRSQ for the subsequent agglomeration. The eighth cluster has a relatively low SPRSQ, whilst the seventh cluster has a markedly higher SPRSQ. Finally, eight clusters have been selected with an inter-class variance of 0.64. On the one hand, this cut-off point gives homogeneous clusters which are sufficiently distant from each other. On the other hand, the limited number of clusters makes it easier to interpret them.

In the next section, we present the typology of Swiss municipalities thus obtained. The map also assists with this interpretation.

FIGURE 1. CHANGES IN INTER-CLASS INERTIA AND THE DENDROGRAM.



3 RESULTS

The eight clusters (Table 4) are interpreted in order of appearance (Figure 1) according to their distance from the averages expressed as a standard deviation of each variable.

Firstly, we set out this typology by showing the detailed activity and income intensity indicator results (3.1). Secondly, we discuss the spatial distribution of municipalities in the light of the various theories presented in the first section of this article (3.2).

3.1 TYPOLOGY OF INCOME AND ACTIVITY INTENSITY

Figure 2 shows the differentials in activity and income intensity for the eight clusters.

First and foremost, with regard to activity intensity, *productive-residential centres* have the highest productive activity intensity in Switzerland. Given that there are equally intense levels of residential activities there, they have the highest cumulative level of activity intensity, with more jobs than inhabitants. Next are the *residential centres*, characterised by the highest intensity of residential activities. These centres also have the highest proportion of residential activities (78%) of all eight types, with very little productive activity there.

Conversely, *productive-residential centres* have the highest intensity of productive activities, ahead of *productive centres*. On the other hand, *productive centres* have the highest proportion of productive activities in Switzerland (73%), ahead of *productive-residential centres* (66%) and *fairly productive zones* (58%).

There are three distinct so-called "residential" municipality types. Firstly, the *dormitory towns* have lower levels of both residential and productive activities than the Swiss average, with an even lower rate of productive activities. The proportion of residential activities is comparable with the other two types of residential municipality (between 65 and 75%). Then there is the *fairly exclusive residential area*, with residential activity intensity at a slightly higher rate than the Swiss average, just as for the *residential area*. In both of these "residential" clusters, the intensity of productive activities is lower than the Swiss average, although the *fairly exclusive residential area* stands out due to its very low proportion of productive activities (25%).

Finally, *zones without bias* show very low residential and productive intensity.

For income intensity, the eight clusters all differ from each other, but these differences do not mirror those for activity intensity (Figure 2).

The first commonly-acknowledged result is that so-called "residential" municipalities, namely *fairly exclusive residential areas*, *residential areas* and *dormitory towns* have the highest (cumulative) income intensity in Switzerland. Income types in these three residential municipality types do however vary considerably. The *fairly exclusive residential area* has a resident population of both very wealthy annuitants and workers, whilst the *residential area* is primarily characterised by a very high intensity of annuitant income (representing 44% of total income, compared with the Swiss average of 24%). Finally, *dormitory towns* essentially have a concentration of workers' incomes, with workers forming the majority of the resident population (83%). Given that the intensity of productive activities in *dormitory towns* is largely lower than the Swiss average, a significant

proportion of these workers therefore leave their resident municipality to work elsewhere (commuters).

Consequently, we see that *residential centres* and *productive-residential centres* have an income intensity on a par with the Swiss average, the difference being that *productive-residential centres* have slightly more intense worker income levels. This is undoubtedly explained by their far greater proportion of productive activities compared with *residential centres*.

Finally one noteworthy result is that the so-called "productive" municipalities record the lowest intensity of incomes in Switzerland, even lower than the *zones without bias*. Might this surprising result be due to these productive activities only yielding low incomes, or perhaps to these incomes being leached away from these municipalities? Our results tend to show that it is the *dormitory towns*, *residential areas* and *fairly exclusive residential areas*, and indeed to a lesser extent, the *residential centres* which attract well off workers from productive municipalities.

TABLE 4. TYPOLOGY OF SWISS MUNICIPALITIES BASED ON CLUSTERING.

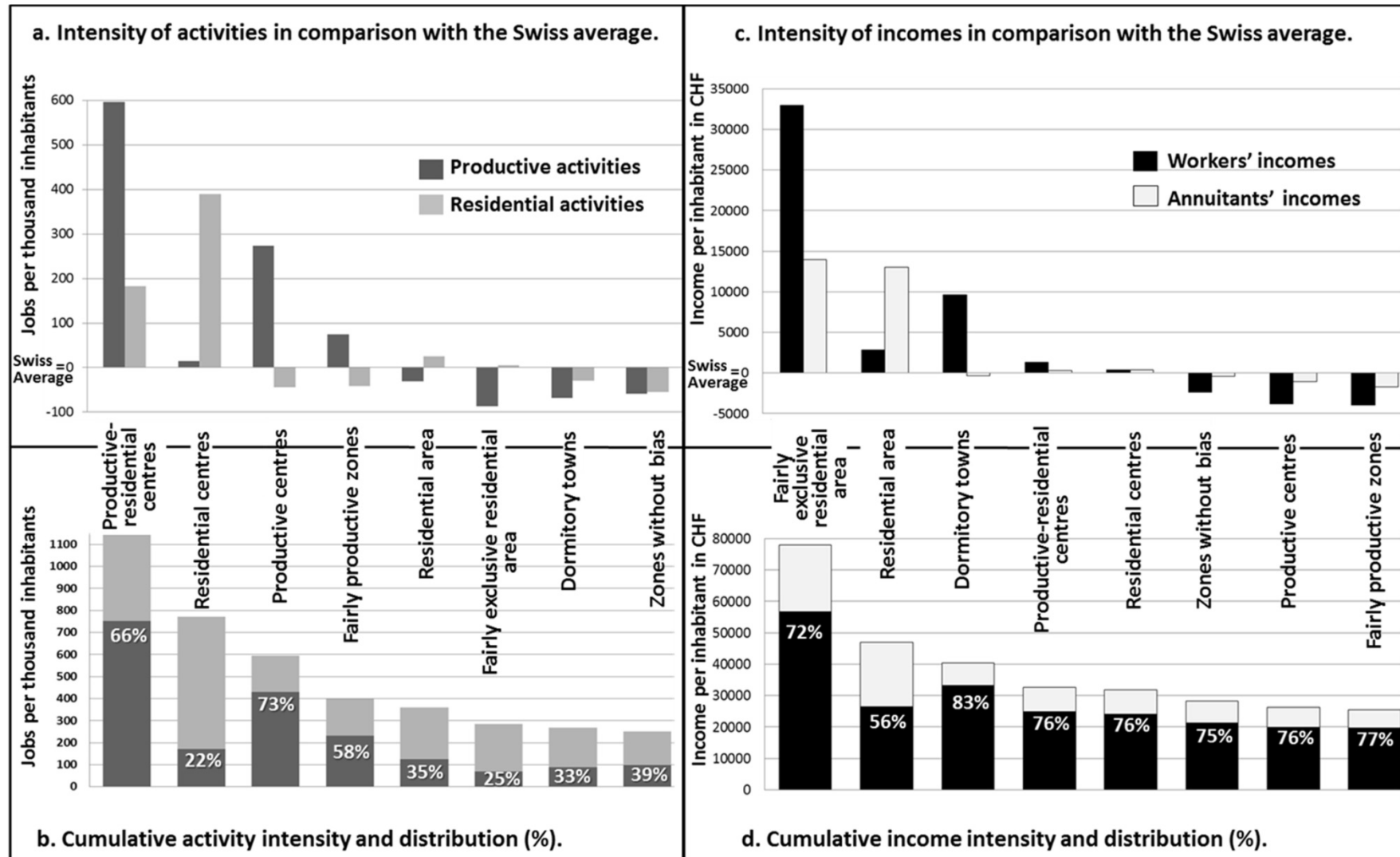
Cluster number	Type of Activities	Type of Incomes	N	Intensity (standard deviation of Mean distances)				Type of Space**
				Productive activities	Residential activities	Labour Incomes	Social Transfers	
1	Dormitory towns	High-earning workers	320	-0.52	-0.16	1.11	-0.06	Suburban and peri-urban
2	Residential area	Wealthy annuitants	56	-0.23*	0.15*	0.33	2.19	Suburban and peri-urban
3	Residential centres	Middle-income workers and annuitants	251	0.11	2.15	0.04	0.05	City centre
4	Productive-residential centres	Middle-income workers and annuitants	43	4.54	1.02	0.15	0.05	Semi-rural
5	Fairly exclusive residential area	Very high income workers and annuitants	69	-0.66*	0.05*	3.82	2.35	Suburban and peri-urban
6	Productive centres	Low income workers and annuitants	106	2.09	-0.25	-0.44	-0.18	Semi-rural
7	Zones without bias	Low income workers and annuitants	1243	-0.45	-0.30	-0.27	-0.11	Rural
8	Fairly productive zones	Low income workers and annuitants	589	0.58*	-0.23	-0.46	-0.29	Semi-rural

Note: Values printed in bold were used for a meaningful interpretation of the clusters ($\sigma > 1.00$).

* These values ($\sigma < 1.00$) are used for the interpretation after consulting their distribution (Figure 2).

**Based on the interpretation of spatial distribution of municipalities (Map 1). So-called "semi-rural" spaces are essentially rural spaces with a level of productive activity intensity (i.e. big businesses) which is higher than the Swiss average.

FIGURE 2. ACTIVITY AND INCOME INTENSITY FOR THE EIGHT CLUSTERS.



Source : Own work.

3.2 SPATIAL DISTRIBUTION AND INTERPRETATION

Based on the spatial distribution of different municipality types, (Map 1), we have made an interpretation of their location and interdependencies based on the various theories outlined in the first section of this article.

“Residential” Clusters

Residential area, *fairly exclusive residential area* and *dormitory town* municipalities form suburban and peri-urban rings around the main urban centres of the Swiss Plateau (Zürich, Geneva, Basel, Lausanne, Bern and Lugano). We note that the residential area, in which wealthy annuitants are over-represented, is also found in specific regions, for example tourist resorts in Alpine areas such as Montana and Verbier, as well as certain picturesque lakeside areas such as Ascona on Lake Maggiore.

The interpretation of the "residential" cluster results is along two main lines.

Firstly, these municipalities are situated outside of city centres and productive zones. Here we see one of the principal results attributable to the residential economy theory (Davezies, 2008), namely that residential areas tend to be dissociated from productive areas. On the one hand, “residential” clusters attract the highest incomes, undoubtedly generated in the productive municipalities. On the other hand, they seem to develop specific residential services in accordance with the resident population (e.g. the affluent retired, wealthy economically active individuals, etc.). In fact, although cumulative activity intensity is relatively low in these municipalities, we see a higher income intensity in *fairly exclusive residential areas* and *residential areas* (annuitants) than we do in *dormitory towns*. And yet the two former categories also show a higher intensity of residential activities than the *dormitory towns*. The residential economy therefore seems to play a role in these differing income levels. *Dormitory towns*, whose residential economy is of very low intensity, seem to depend on residential services concentrated in accessible residential centres for work and/or consumer activities (Gottlieb and Glaeser, 2006; Markusen and Schrock, 2009).

Secondly, the concept of amenity migration (Gosnell and Abrams, 2009) might equally apply here, as residential municipalities are largely situated outside of the main city centres and normally benefit from a more rural environment, with more natural amenities. This result is noticeable for those municipalities which attract annuitants. Consequently, the attraction of high-income residents to a region is often associated with a picturesque environment with a low intensity of activities.

In certain residential Alpine municipalities, the presence of second homes has a strong impact (Clivaz and Nahrath, 2010), for example in places such as Verbier and Montana. Unlike the majority of Alpine tourist resorts with considerable hotel-related activities, these residential Alpine municipalities essentially have a high concentration of residential jobs serving a population of temporary residents. It is therefore interesting to note that income intensity in these municipalities is comparable to that of the major urban areas of the Swiss Plateau region. Moreover, the term "Alpine gentrification" has been used to describe the phenomenon of pockets of upper middle class settlement within certain very exclusive alpine regions (Perlik, 2011; Camenisch and Debarbieux, 2011). Gentrification, a phenomenon originally seen in urban environments (Rérat and Lees, 2011; Rérat, 2012), tends to include more distant spaces, mainly thanks to improvements in

communication infrastructures. Populations thus become more mobile, with their movements dictated by their daily activities for example working in municipal centres in the suburbs, consuming in the major suburban supermarkets and engaging in leisure activities in Alpine municipalities. Webster (2003) and Charmes (2009) coined the phrase the "clubbisation" to describe this fragmentation of urban (or metropolitan) life which tends to integrate other spaces.

Urban Residential Centres

Residential centres cover all of Switzerland's city centres (Map 1). Zürich, Geneva, Basel, Bern, Lausanne, Lugano and St.-Gallen are all included in this municipality type which represents the heart of urban activity and serves a considerable hinterland. This concentration of residential activities in cities responds on one hand to the higher consumption needs of these densely populated areas; *residential centres* are therefore the other major category of municipalities in which the population are resident. On the other hand, the high intensity of residential services also responds to external needs, for instance the commuter populations of *dormitory towns* whose consumer activities take place partly in city centres. Finally, unlike residential municipalities, *residential centres* have a far greater intensity of residential activities, but with a lower intensity of income, which corresponds to the highly varied social mix of the population (Rérat, 2012).

Residential centres also cover other types of space than cities, situated for example in Alpine regions. These include mountain resorts where the high intensity of residential activity responds not only to the needs of the resident population, but also to those of the transient population (tourists, valley inhabitants, etc.). It is worth noting that these *residential centres* (for example Interlaken, Zermatt, Gstaad, St. Moritz and Davos) offer extensive hotel facilities (tourist accommodation provision counting as a productive activity). However, the residential economy is clearly the dominant activity there.

The results for the activity centres may be interpreted as follows.

The role of urban (and tourist) centres in providing employment appears to be borne out by the results. The average income intensity seems to indicate, as per Storper and Scott (2009), that these centres have both high and low-income residents who are mutually reliant in the running of the whole urban system, with highly qualified individuals rubbing shoulders with security guards, transport workers, nannies, etc.

Residential centres are surrounded by residential municipalities which are home to the commuter populations who work or consume in the centres. The very high intensity of residential activities in relation to productive activities seems to fit in with those approaches which view the city as the centre of regional consumption and where urban amenities play a major role in attracting populations (Christaller, 1933; Glaeser *et al.*, 2001; Clark, 2004; Markusen and Schrock, 2009).

There is little or no evidence of gentrification (Rérat and Lees, 2011) in *residential centres*, which have an average level of revenue intensity. We posit that this is primarily an infra-municipal phenomenon which is not observable at municipal level. In fact the concentration of the more disadvantaged sections of the population in cities, a phenomenon referred to in Germany as "A-Stadt", seems to counteract the gentrification (Rérat, 2012) process. However in order to draw any conclusions on the existence or otherwise of gentrification, a temporal analysis is required to see

whether there is any evidence of income levels in municipal centres catching up with those in residential clusters.

Productive-residential Centres

Productive-residential centres cover so-called "semi-rural" environments, i.e. essentially rural spaces with intensity of productive activity above the Swiss average (see Table 4).

These centres have higher income levels than exclusively productive zones and residential activities therefore seem to play a significant role in attracting higher-income resident populations. Up to a certain limit, it would seem advisable for those municipalities wishing to attract a high-income population to develop their residential services. This cluster is close to both the theories of residential economy (Davezies, 2008) and city-oriented theories such as the "Distinctive City" (Markusen and Schrock, 2006). According to these approaches, a combination of productive and residential activities is vital in ensuring diversity of income sources and brings a certain stability to the economic fabric of the area.

Productive Centres and Fairly Productive Zones

Productive regions are predominantly located in rural or semi-rural environments. They also have fairly diverse activity profiles, including industrial areas (e.g. the Jura region, eastern Switzerland), agricultural areas (e.g. the Pre-Alps region) and even tourist areas (accommodation) within the Alps region.

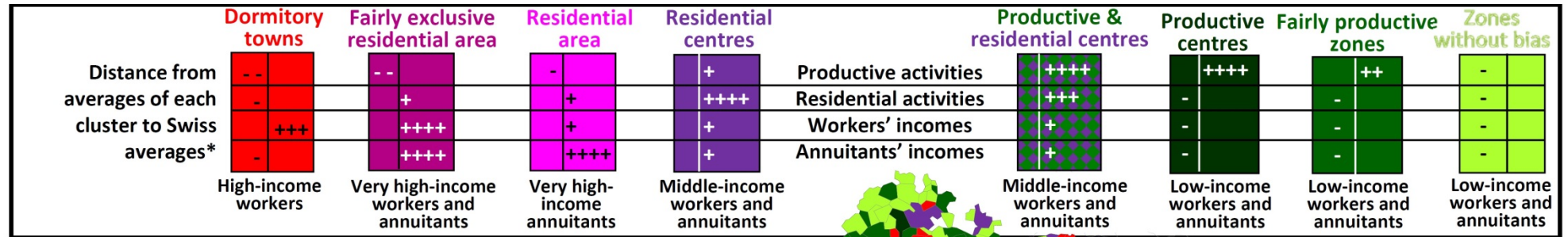
Undoubtedly the most surprising result is that which shows the very low income intensity in the productive municipalities, the lowest of all our municipality types. Productive municipalities seem to be the very archetypes of Hoyt's traditional economic base theory (1954), the only difference being that the income flows generated do not stay within the municipality but are spread over a wider area by commuter activity. This result tends to show once again the usefulness of Davezies' revised economic base theory (2008) as a conceptual framework for understanding the new processes and regional development.

Zones Without Bias

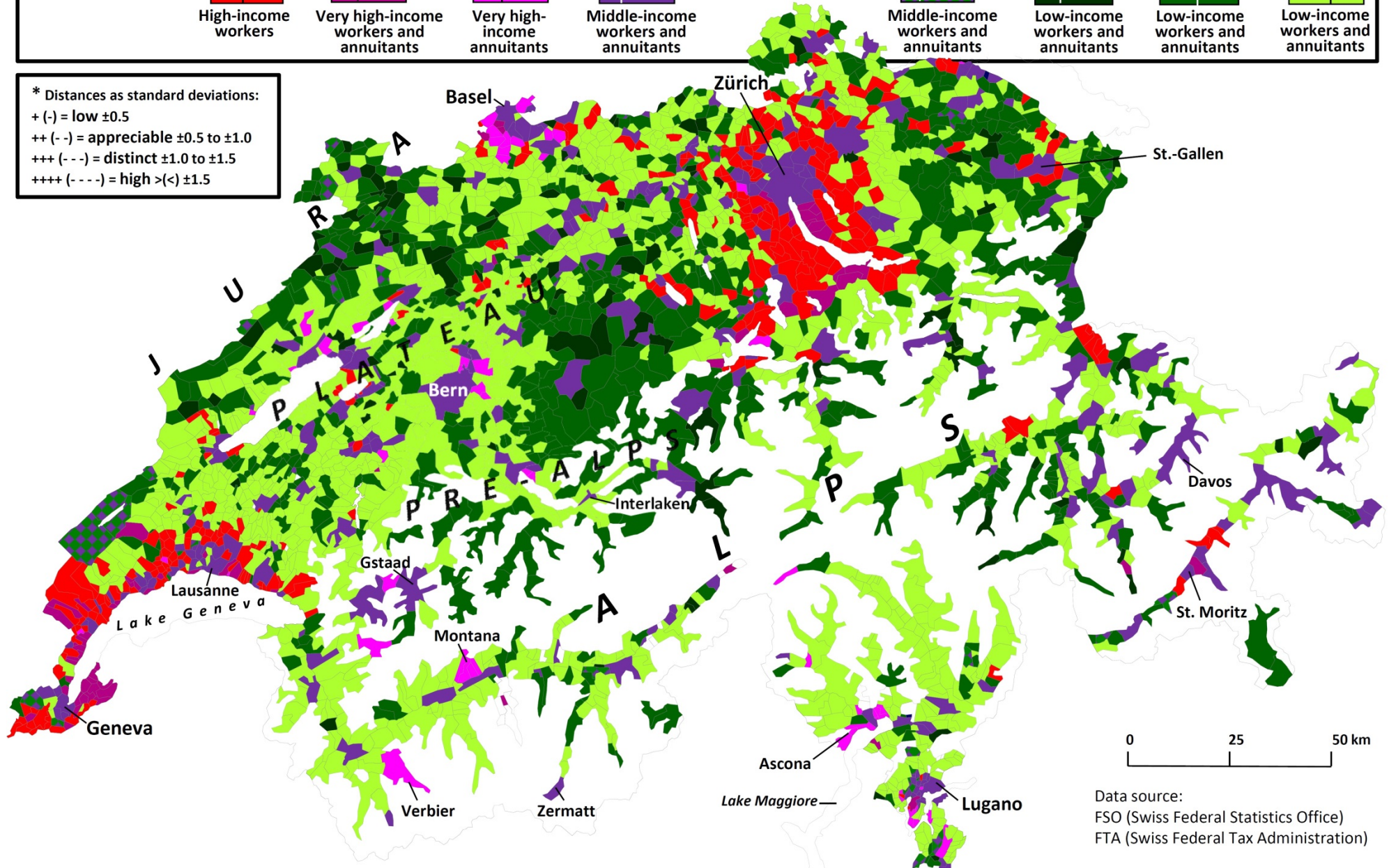
This cluster covers the majority of municipalities (45% of all Swiss municipalities) located particularly in the regions surrounding the Swiss Plateau or the valleys of the Alps.

The very low intensity of residential activities in *zones without bias* seems to be consistent with the low intensity of income, as also seen in productive municipalities. One of the development alternatives certainly seems to be a firmer emphasis on residential activities, whether or not in connection with productive activities relating to local needs and preferences (Talandier and Davezies, 2009). In all cases, a single trend in productive activities rarely bodes well for attracting higher incomes.

MAP 1. TYPOLOGY OF MUNICIPALITIES.



* Distances as standard deviations:
 + (-) = low ± 0.5
 ++ (-) = appreciable ± 0.5 to ± 1.0
 +++ (-) = distinct ± 1.0 to ± 1.5
 ++++ (-) = high $>(<) \pm 1.5$



4 LINKS BETWEEN ACTIVITIES AND INCOMES IN SWITZERLAND

The approach we have developed here based on the residential economy has enabled us to demonstrate the relative interdependency between productive and residential activities on the one hand, and income and activities on the other. These spatial interdependencies vary considerably, from overlapping to disconnected through to articulated exclusion.

Income intensity in Swiss municipalities seems to be connected, up to a certain threshold, to intensity of residential activities, regardless of municipality type. In other words, the results show that the higher a municipality's income levels, the higher the proportion of residential activities within the overall distribution of activities. On the other hand, a high concentration of productive activities generally means low-income intensity. However, the intensity and distribution of residential activities is highest in *residential centres*, whilst income intensity there tends towards the average. Consequently, the concentration of residential activities goes hand-in-hand with higher incomes only to a certain point, after which the municipality in question becomes a *residential centre*, where the increasingly heterogeneous population has a lower average income level. Thus whilst their activity distribution is largely focused on residential activities residential regions with a more moderate intensity of residential activities seem to attract the highest incomes. Moreover, these results seem to fit with such approaches as amenity or urban amenity migration, where environment (countryside, lakeside and mountain settings, cultural amenities etc.) play an important role in attracting residents, annuitants in particular. The results effectively show that certain residential regions in the Alps, at a remove from urban centres, have a relatively intense residential economy which attracts high-income annuitants and workers.

Subsequently, the results also show that the municipalities have highly diverse profiles. Urban *residential centres*, which have a high intensity of residential services, attract a socially diverse population with average overall income levels. The surrounding suburban and peri-urban areas are divided into two main types. Firstly, *dormitory towns* are closely connected to *productive centres* and *residential centres*, and attract high incomes without necessarily developing their own residential economy. Conversely, the (*fairly exclusive*) *residential area* is more oriented towards its own residential economy.

At Swiss regional level, the metropolitan areas in their widest sense accommodate the bulk of the active resident population and higher incomes. However, analysis clearly shows that the regions with the highest incomes tend to encircle towns, rather than being situated in town centres themselves. In these outlying municipalities, *productive-residential centres* see development skewed strongly towards both productive and residential activities. Interestingly, the higher intensity of residential activities seems to explain why *productive-residential centres* attract higher incomes than *productive centres* and *fairly productive zones*. One of the hypotheses put forward to explain this surprising result is that income generated by productive activities is captured by the area's "specialised" municipalities. Finally, *zones without bias* do not have a clearly defined productive or residential bias, and their low income intensity seems to go hand-in-hand with low activity intensity.

5 CONCLUSION

This research allows us to reframe and to discuss the normative aspect of the economic geography and land use planning issues which now predominate in Switzerland and elsewhere.

The first question which arises is: should we favour the overlapping or the separation of productive and residential spaces at municipality level? The results suggest that productive activities tend to drive out resident populations, particularly those with higher incomes. This is not the case for residential activities. Certain populations, however, are found in areas where there are few residential activities, perhaps due to the cost of land. Although *dormitory towns* are well connected to centres of urban services, the same cannot be said for the *zones without bias*, where there are either low income homes or households which invariably have to travel in order to consume.

The second normative question is: should annuitants (elderly and disabled individuals) receive preferential treatment in relatively isolated municipalities with residential activities, in municipalities with few activities (and which are consequently more affordable) or in urban centres? The results suggest that high-income annuitants tend to be concentrated in certain peri-urban municipalities with high levels of residential services and in the main Alpine resorts.

Finally, the third question: is the compact city (Boussauw *et al.*, 2012) both a liveable and desirable model? Our results suggest that it is difficult to have a spatial overlap of productive activities which bring life to the region, residential activities which enable consumption and differing income levels and types (annuities or economic activity-generated incomes). Urban annuity phenomena remain highly influential, as evidenced by the fact that most municipality types identified in this study reflect the urban-rural gradient. The exceptions to this being productive municipalities, although they seem to be particularly unfavourable to residency, particularly to those with high incomes.

6 NOTES

1. The FTA definition of a taxpayer is a natural person (married couples with or without children constitute a single taxpayer) whose income or a part of it is taxable within their municipality of residence.
2. Annuitants are retired people, people with disabilities, those in receipt of pensions and benefit payments, students who are dependent on their parents.

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