The Metropolisation of the FSU: Temptative Measurement via the Method of Hyperlinks Notoriety

With the collapse of the USSR it was assumed that Russia, like the rest of the CIS, would not adopt the logic of metropolisation in terms of spatial organisation. Historically, the Soviet urban world has been built on spatial principles other than occidental ones, a legacy which is reflected by the existence of large industrial city networks. Advanced services, considered as unproductive, are conspicuous by their absence. Today the FSU still manifests itself as an area of monopolar territorial organization, with only Moscow qualifying as a global city. However, this territory, being the largest in the world, can no longer operate from a single global city.

The measurement of cities’ metropolisation is not a simple task, especially in the post-Soviet context. On the basis of Brunn (2003) we devised a new method of measuring metropolisation according to the number of hyperlinks in Internet search engines. The aim of this paper is to tackle the question: Does the FSU follow Western patterns of metropolisation, or is it a specific model marked by the historical legacy that has emerged in the post-communist world? To answer this question the paper starts with the presentation of our tools of observation and the measurement of studied processes, it then develops the analysis and interprets the results.

1. INTRODUCTION

Historically global economic activity has been controlled by the established global cities, whose geographic distribution by continents is unbalanced. These global cities, concentrating advanced services of international level, also have decision-making abilities and represent a dimension of global economic command. It has even been written that, today, the power of a State is measured by the influence of its cities (Claval, 1997; Scott, 1998, 2001).

One of the geopolitical lessons of the world cities hierarchy conducted by the Globalization and World Cities Study Group and Network GaWC (Beaverstock, 1999, 2000; Taylor, 2001; Fossaert, 2001) is that under equal conditions, countries with multipolar urban networks are much better represented than countries with a monopolar network and tradition (P. Marchand, 2008). Within the Former Soviet Union (FSU) only Moscow achieves this ranking (Saint Petersburg, Almaty and Tashkent...
are considered as potential world cities), whereas five German cities and eleven in the USA are ranked as such.

Undoubtedly, since 1992 the CIS has begun to adapt to the process of globalisation. Consequently, this territory, being the largest in the world, can no longer operate from a single global city. In other words, structurally, the territorial configuration of the CIS is not adapted to the current phase of globalisation. In fact, the entire area of the CIS has not yet been introduced to the economic logic of metropolisation. As shown by P. Marchand (2007) for Russia, at least at regional level, the CIS is still organised by politico-administrative capitals with “vampire” behaviour towards their environment (Marchand, 2007).

The measurement of a city’s metropolisation is not a simple task, especially in the post-Soviet context. A number of studies have been devoted to Western cities and those in the Central European Committee of Construction Economists (Friedman, 1986; Samson, 1996; Sassen, 2001; GaWC, 1999, 2000, 2001; Cicille and Rozenblat, 2003; Bourdeau – Lepage, 2003; Brunn, 2003; Duflé, 2004; Agibetova, 2008). However, measurement methodologies are still rather vague. As for major cities of the FSU, they are currently a void in the global analysis of metropolisation.

2. THE QUESTIONS RAISED

This paper focuses on the evaluation of metropolisation throughout the FSU (twelve republics of the CIS, plus three Baltic States), represented by an observed sample of 58 large cities.

The general aim is to tackle the following question: Does this region follow Western patterns of metropolisation, or is it a specific model marked by the historical legacy that has emerged post-communism? Indeed, with the collapse of the USSR, the territory of Russia as well as that of the whole CIS, did not adopt the logic of metropolisation in terms of spatial organisation (Marchand, Samson, 2008). There are five characteristics that deprive the post-Soviet cities from any metropolitan function (Marchand, 2007; Marchand, Samson, 2003): cities as clusters of factories with internalised services; under-development of economics

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1 Let us not forget that among the international studies devoted to the hierarchy of world cities no one is devoted to the FSU space. The exception is the recent work of Marchand (2007) «The Geopolitics of Russia», where the author raises for the first time the issue of metropolisation in major Russian cities. Among others, there has been an ambitious project on the “Big Cities and Metropolisation in Russia and Western Europe: similarities of processes, convergence of paths?”, funded by CNRS (2003-2005), led by the team CIRUS-Cieu (Interdisciplinary Centre of Urban and Sociological Research - Interdisciplinary Centre of Urban Studies), University of Toulouse, under the coordination of D. Eckert and V. Koïossov, but no result has emerged.

2 Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldavia, Tajikistan, Turkmenistan, Uzbekistan, Russia, Ukraine.

and finance; innovation under the tight control of the political and security services; under-development of services; and regional discontinuities.

The main issue to be addressed includes six sub-issues which will serve as reference in the interpretation of observations.

1) Are we witnessing a **unipolar or multipolar metropolisation** across the FSU?

2) Considering the pre-eminence of Moscow, **is the city's polarization strengthening or fading?**

3) Are the dynamics of metropolisation converging towards certain privileged centres?

4) **Is the metropolisation we can observe driven by economic or political forces?** In other words, are the cities that emerge national capitals, or not?

5) **What are the metropolisation areas appearing in the FSU?**

6) **What global areas are associated with FSU sub-spaces?** The question of the geopolitics of the CIS anchoring into the global world is gaining in importance. In particular, we will try to identify areas that could help the large post-Soviet space to open up to the world. Eurasian integration comes on to the agenda, benefiting not only Russia but also the entire CIS (Mikami, 2005). However, the issues of CIS integration with Western and Eastern Europe, with Asia (China, Korea, Japan) and the South (India, Gulf), through energy policies, outsourcing operations and transportation, seem to have an impact on the Eurasian hypothesis (Linn, Tiomkin, 2005; Samaganova, 2008).

### The Population of Big Cities in FSU

![Figure 8.1 The population of Big Cities in FSU (2005)](image)

**Number of habitants per city:**

- 500,000 - 650,000
- 650,000 - 1,000,000
- 1,000,000 - 1,500,000
- 1,500,000 - 4,500,000
- 4,500,000 - 11,000,000
- the capitals
- the provinces
To answer these questions we will proceed, firstly, to the presentation of our tools of observation and measurement of studied processes, and then to analysis and interpretation of results.

3. TOOLS OF MEASUREMENT AND ANALYSIS

Throughout history cities have emerged and increased in economic, cultural, and political stature based on the number and extent of their linkages to other places. We are witnessing today in the urban world in many regions of the planet new urban geographies and geometrics or networks. These are “electronic” linkages and they are connecting ancient and new, large and small, cities (Brunn, 2003; Dodge, 2001). These linkages are attributed to advances in information and communications technology (ICT) and they form the backbone of knowledge economies (Janelle et Hodge, 2000). These specific technologies include Internet and World Wide Web resources. Most parts of the world have been affected by the wired and wireless innovations in ICT during the past decade (Kolarova et al., 2006). Few large cities in the world have not been linked or wired, at least to some extent.

The observation of these urban linkages or ICT networks within any country or region would demonstrate the degree to which these places are linked to others, either on a global or regional scale (Brunn and Dodge, 2001; Brunn et al., 2002).

Additionally, in the context of the FSU, we can get an understanding of the diffusion of internet technologies by considering the number of web-pages or hyperlinks which exist for major cities. For Brunn (2003), the founder of this approach, data sources as an instrument of measuring the number of hyperlinks for any city can be obtained by using Internet search engines. In our case, we used Google and Yahoo (global engines), Yandex and Rambler (local Russian engines). The number of hyperlinks obtained by entering the single city name as a key word represents its “Simple Notoriety”. Entering a pair of cities measures their “Joint Notoriety”. So, what does it mean for a city to feature in the WWW network via a hyperlink? What information do Simple and Joint Notorieties provide?

For a city, being quoted represents the level of its engagement in the global economy. The two Notorieties are the two levels of the modern city’s world-articulation. The “Simple Notoriety” is the capacity of a city to impose its notoriety within the world space as a centre of command. The “Joint Notoriety” is the degree of “connectivity” between two cities which evaluates their ability to work as a commuter with the global network of world-cities. At the same time, it is also an indicator of the city opening towards the global economy and its integration level on the international scene. In the context of the FSU space, the city’s notoriety obtained via global engines is qualified as its external notoriety. The same obtained by regional engines is its internal notoriety.

Therefore, following Brunn (2003), we have been trying to develop a new indicator of metropolisation – an “Internet-Notoriety” indicator,
which has proven to be a good instrument of the metropolisation measuring process, adding to the list of hierarchy indicators of world cities in the context of a knowledge economy. Moreover “Internet-Notoriety” perfectly reflects the cognitive function or reputation hub of a city, where people and activities agglomerate in order to benefit from the clustering of advanced services, such as finance, information, research or culture. In the urban context, cyberspace has contributed to the reconstruction of urban space by creating the social environment in which “being digital” is a factor increasingly crucial for knowledge, wealth, status and power (Wheeler, Aoyama, Warf, 2000). In this era of the “City of Bits” (Mitchell, 1995) when social life is mediated through computer networks, the reconstruction of interpersonal relationships around spaces and virtual societies gains the upper hand. In addition, at a time when the quantity of available information makes economic intelligence a strategic resource, the ability to exist in cyberspace is increasingly a condition for the exercise of economic command. For all these reasons, we believe that “Internet-Notoriety” is an indicator well-suited to the approaching reality of metropolisation.

The results of our investigation into the dynamics of the period 2004-2007 have demonstrated that global and regional search engines represent two different visions of the world (Agibetova, 2008). Global search engines provide a “global vision” that considers the state of the opening-up of the CIS “as seen by the outside world”, whereas regional search engines illustrate the vision from “the small world” perspective – opening-up to the world as viewed through internal “glasses”. In what measure do these two visions differ? Both are characterized by cultural polarization, which includes history, language, and cognitive proximity.

The Russian search engines Rambler, headquartered in Moscow, and Yandex, headquartered in Moscow with subsidiaries in Saint Petersburg, Yekaterinburg, Kiev, Odessa and Simferopol are extremely regional, reflecting trends that affect processes happening only within Russian territory. They “magnify” Russian and FSU cities with an “optical effect” that marginalises other FSU spaces. We are shown an image of metropolisation altered in favour of Russian cities whilst the Internet-Notoriety of other areas is understated.

Besides, the second feature of regional search engines, discovered thanks to the construction of regression charts and the ratio of connectivity (Agibetova, 2008), is that in the measurement of metropolisation they are significantly affected by the size of a city’s population. This distortion can be corrected via the global search engines, Google and Yahoo, whose “global vision” of the integration and liberalization processes helps to provide balance. Analysis of global search engines’ data (including the construction of ratios, regression charts and zone typologies) has demonstrated their heuristic power.

The analysis of the phenomena of metropolisation through the prism of the Internet represents, in our opinion, a double improvement. It is
Measuring Regional Integration and Economic Development

important to take into account the real importance of the knowledge economy in the contemporary world and its spatial organisation. It is also a new form of “subjectivity” that appears through cyberspace, structured here by the search engines: the indirect capture of metropolisation through the Internet and the occurrence of hyperlinks produces a “reflected” image produced by one of the communities that make up cyberspace, as described by a search engine. In other words, we start analysing the relations between the immediate areas of the spatial economy and the replicated or “reflected” dimensions of cyberspace. In this sense the use of “regional” search engines is able to provide new information reflecting the specificity of the post-Soviet space of intermediation. It proved to be quite efficient for reflecting the complex Russian gravitation and influence within the FSU, difficult to capture with other tools. The hyperlink notoriety thus provides an original contribution to the analysis of globalisation, and to describing the relationship between regional integration and globalization.

Like any tool, the use of Internet hyperlinks contains biases that must not be neglected. There are homonyms of some cities, such as Samara, for example, which is a Russian city and a car model, or Odessa, which is a Ukrainian port and a district of New York. Results may also be affected by breaking news such as elections and a referendum in Belarus (October 17, 2004) or Transnistria (December 6, 2006). As our tool is a measurement of occurrence of the names, these phenomena artificially boost the presence of some cities in cyberspace at a given moment. These biases were corrected.

4. THE OVERALL DEFICIT OF METROPOLISATION IN THE FSU

The analysis of all rankings shows that post-Soviet cities, mostly leaving the USSR after seventeen years of transition to adopt a market economy and democracy, have failed to integrate into the modern world order and to win a worldwide reputation. This observation is valid even for Moscow, a global city of beta-category according to the classification of GaWC (Taylor, 2001). In fact, it was found that the number of regional search engines’ hyperlinks is double that of global search engines. It means that in 2007 the simple notoriety of FSU cities has a regional character.

Thus, taking into consideration the specificities of the post-Soviet mono-centred economy we can say that the FSU space does not follow the classic patterns of metropolisation. In order to be “metropolised” it needs some impulses from the top. Here, we distinguish the notion of economic metropolisation (“bottom-up”) and political metropolisation (“top-down”). The first, known also as “western-like metropolisation” is initially caused by the market, driven by economic processes via local actors. The second is primarily an administered process where

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4 Nova Odessa in Brazil, 2 cities named Odessa in Canada (in Ontario and Saskatchewan), 8 cities and a lake named Odessa in USA (in Delaware, in Florida, Minnesota, Missouri, Nebraska, New York, Texas, Washington and Michigan).
metropolisation, hampered by spatial discontinuity and various conflicts, must be supported by the top – the government (Marchand, Samson, 2008). This metropolisation “from the top” may or may not favour the construction of a homogenous economic space, and promote, or not, economic metropolisation ensuring the space-market continuity.

On the whole, the post-Soviet urban space shows some zonal distortions. In particular, the polarity which “East-West” imposes and the “North-South” divide dominates. The “East-West” polarity dominates the post-Soviet space. It is due to the seemingly highly pronounced attraction of Europe to nearby Western cities such as Moscow, St-Petersburg, Kiev, Odessa, Minsk, Riga, Tallinn and Vilnius. The further we go East, the less FSU space is “metropolised”. The “North-South” divide is the logic by which the weight of Russia slows down the metropolisation of the Southern CIS. Central Asia, Caucasus and some Russian and Ukrainian cities seem to be poorly integrated into the global space. In this divide we observe, however, three Southern cities – Baku, Tbilisi and Odessa – with a relatively significant simple notoriety.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Global Search Engines</th>
<th>City</th>
<th>Category</th>
<th>Rank</th>
<th>Regional Search Engines</th>
<th>City</th>
<th>Category</th>
</tr>
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<tr>
<td>1</td>
<td>63 700 000</td>
<td>Moscow</td>
<td>Russian Capital</td>
<td>1</td>
<td>283 107 018</td>
<td>Moscow</td>
<td>Russian Capital</td>
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<tr>
<td>2</td>
<td>29 200 000</td>
<td>Kiev</td>
<td>FSU Capital</td>
<td>2</td>
<td>72 598 323</td>
<td>Saint-Petersburg</td>
<td>Russian Non-capital</td>
</tr>
<tr>
<td>3</td>
<td>24 435 000</td>
<td>Tallinn</td>
<td>FSU Capital</td>
<td>3</td>
<td>45 870 520</td>
<td>Kiev</td>
<td>FSU Capital</td>
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<tr>
<td>4</td>
<td>19 735 000</td>
<td>Saint-Petersburg</td>
<td>Russian Non-capital</td>
<td>4</td>
<td>38 935 087</td>
<td>Novosibirsk</td>
<td>Russian Non-capital</td>
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<tr>
<td>5</td>
<td>19 100 000</td>
<td>Riga</td>
<td>FSU Capital</td>
<td>5</td>
<td>26 716 641</td>
<td>Yekaterinburg</td>
<td>Russian Non-capital</td>
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<td>6</td>
<td>16 150 000</td>
<td>Vilnius</td>
<td>FSU Capital</td>
<td>6</td>
<td>24 604 706</td>
<td>Saratov</td>
<td>Russian Non-capital</td>
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<tr>
<td>7</td>
<td>8 775 000</td>
<td>Minsk</td>
<td>FSU Capital</td>
<td>7</td>
<td>23 743 651</td>
<td>Lvov</td>
<td>FSU Non-capital</td>
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<tr>
<td>8</td>
<td>8 700 000</td>
<td>Perm</td>
<td>Russian Non-capital</td>
<td>8</td>
<td>22 281 839</td>
<td>Penza</td>
<td>Russian Non-capital</td>
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<tr>
<td>9</td>
<td>8 385 000</td>
<td>Odessa</td>
<td>FSU non-capital</td>
<td>9</td>
<td>21 813 066</td>
<td>Astrakhan</td>
<td>Russian Non-capital</td>
</tr>
<tr>
<td>10</td>
<td>6 870 000</td>
<td>Baku</td>
<td>FSU Capital</td>
<td>10</td>
<td>21 489 200</td>
<td>Orenburg</td>
<td>Russian Non-capital</td>
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</tbody>
</table>
5. THE PRE-EMINENCE OF MOSCOW

Moscow is the absolute leader according to regional and global search engines. It is in the forefront of all rankings. Its values are far above other cities, which is no longer the case for any other observed city (tab.1). This leads us to talk about “monocentrism”. The “jealous” Russian capital city is strongly monopolising almost all advanced services, and through this most connections with outside channels. The conclusion is that the overwhelming weight of Moscow is blocking the influence of any other centres. In fact, the advanced services of other cities are limited to within their own territory. Moscow’s advanced services companies have financial bargaining power in negotiations with regional authorities in developing their activities throughout the territory of the whole CIS. This “feudalisation” is prolonging the centralisation which promotes the economic expansion of Moscow groups and blocks the development of metropolitan services in the biggest post-Soviet centres (P. Marchand, 2007). We are currently witnessing a unipolar metropolisation across the CIS space. Nevertheless, a very light diminishing of Moscow’s pre-eminence occurred during the period of 2004-2007.

6. A CONVERGENCE OF METROPOLISATION TO WHICH CENTERS?

During the period 2004-2007 we examined whether or not alternative candidate cities to Moscow are emerging, either in Russia or elsewhere in the FSU. One issue of interest is the measure of resilience to administrative metropolisation. We will analyse the results using the various different methods which we developed, and shall begin by measuring the Simple Notoriety.

As a basis for our rankings, a typology of integration ratios has been developed. It gives us a valuable interpretation, including a general overview of the metropolisation process within the FSU space. The observed cities are grouped according to the strength of their simple notoriety into 4 categories:

1. **Confirmed candidate global cities**: strong in external and internal notoriety
2. **Extraverted candidate global cities**: strong in external notoriety
3. **Introverted cities**: strong in internal notoriety
4. **Cities with weak simple notoriety**

For better classification purposes two metropolitan trajectories have been identified. The first is the dynamic where a city owns, or earns over time, a strong simple notoriety, both internal and external. We will say that this city is a candidate global city in the strict sense that the city installs its command on its territory (the hinterland) while highlighting its connection (hub) with the global space. The second trajectory is the dynamic where a city opens, first of all, with a strong external notoriety. Thus, it is an extraverted candidate global city. In this case, it is possible that over time, it also opens internally, winning a strong internal notoriety.

What are the engines of such logic of metropolisation? We consider that a city which is already open to the outside world will use these resources to integrate into its own regional environment afterwards.
Let us divide the cities into 4 sub-categories: Russian capital-cities and FSU capital-cities; Russian non-capital-cities and FSU non-capital-cities.

<table>
<thead>
<tr>
<th>GLOBAL ENGINES</th>
<th>Strong</th>
<th>Weak</th>
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<tr>
<td>Strong</td>
<td>Confirmed Candidate-metropolises:</td>
<td>Introverted Cities:</td>
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<tr>
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<td>Moscow</td>
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<td>Minsk (negative bias)</td>
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<td>Vladivostok</td>
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<td>Samara (positive bias)</td>
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<td>Weak</td>
<td>Extraverted Candidate-metropolises:</td>
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<td>Chisinau (negative bias)</td>
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Confirmed Candidate Global Cities

In the category of “confirmed candidate global cities” among capital-cities and non-capital-cities we find, firstly, two Ukrainian cities, Kiev the capital and Odessa a port city and second economic centre of Ukraine, whose rankings have proven their metropolitan potential (Agibetova, 2008). Minsk’s ranking is altered by bias caused by the presidential elections (March 19, 2006). Baku is placed here thanks to its oil resources and its strategic position on the Baku-Tbilisi-Ceyhan pipeline which benefits global players (Samson, 2008). Nevertheless, dynamics cause it to drop in ranking. Riga, which dropped in the hierarchy due to dynamics, is the only Baltic capital-city which appears as an influential city both in the CIS space and Europe, despite its integration into the EU and the disintegration of the FSU.

As for Russian non-capital-cities, Saint-Petersburg is in the lead position. Speaking of metropolitan functions, by its demographic weight, its cultural status, its advanced services, functions of command, and its nodal position in the flows, the city is in a favourable situation compared to other Russian cities (Agibetova, 2008). The impetuous development of its software cluster contributes to its strength (Samaganova, 2008). On the post-Soviet scale, the question that arises is the future of its influence in the Baltic area, especially because of the rivalry between Riga and Tallinn.

Russian non-capital-cities of the regions of Ural-Siberia and Volga, as Yekaterinburg (descending in dynamics), Novosibirsk, Kazan, Samara (ascending in dynamics) and Perm (descending in dynamics) are also situated in this category. Their good internal and external integration is confirmed by all available analytical tools, which designate them without hesitation as candidate global cities. The presence of Russian Eastern non-capital-cities, such as Vladivostok and Irkutsk (descending in dynamics), also attracts attention. Our multivariate territorial analyses dedicated solely to Russian cities have shown that those Eastern cities situated far from Moscow in terms of geographical location, currently influence their Asian neighbourhood and have increasing success in their rivalry with Western Russia (Agibetova, 2008).

Extraverted Candidate Global Cities

The first observation to be made with regard to the extraverted cities sub-group is the absence of a Russian city. The second is that most are FSU capitals. This conforms to the precedent of the capital-city opening to the world space primarily, followed by the rest of the country (Samson, 1996).

Tallinn and Vilnius, strongly integrated into Europe due to EU membership, are not a surprise in this category. Tbilisi, with the pro-Western orientation of the government, combined with a bias related to the cyclical conflicts with Russia in 2007, demonstrates a strong external influence.

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5 A positive bias must be stressed, the EU-Russia summit on May 15, 2007.
notoriety. Yerevan, the pro-Russian capital-city boosted by its global diaspora, is also found in the category of extraverted cities. The presence of Chisinau is due primarily to cyclical bias: the presidential elections and tensions surrounding Transnistria.

The major capitals of Central Asia, such as Tashkent, Astana (descending in dynamics) and Almaty, the former capital of Kazakhstan persisting today as an economic, financial and scientific centre, demonstrate openness to the world space. Let us not forget that Tashkent, Almaty and Saint-Petersburg are the only cities across the CIS space which are designated as potential global cities by GaWC (Taylor, 2001).

The only city in the non-capital category is Kharkov, which despite its geographical location and pro-Russian policy orientation, manages to integrate outside of the CIS space. This shows a certain general disintegration of the Ukraine from the CIS space and an orientation towards Europe due to a change of political course by President Yuchenko.

**Introverted Cities**

In this category we find only large Russian cities: Nizhny Novgorod, Chelyabinsk, Krasnoyarsk, Rostov, and Omsk (descending in dynamics). These are the towns which are in rivalry to become global cities with a Russian dimension, as a consequence of their vocation as historical regional centres during the Soviet era, and they manage to keep a strong internal command over a relatively narrow section of the country (Agibetova, 2008). In order to integrate into the globalised world, much remains to be done for these cities compared to extraverted cities.

The arrival in dynamics of five Russian cities (Saratov, Penza, Astrakhan, Orenburg, and Ulyanovsk) is not surprising. Thanks to their economic development, they gained strength in 2007 and imposed greater command. Noting that the category of introverted cities serves as a link between candidate global cities and cities weak in simple notoriety, the question of their future integration remains open.

Taking into account the pro-western orientation of Lvov, its ascension to the introverted cities subgroup does not conform to reality. First, this is conditioned by the presence in Ukraine (Kiev, Odessa, Simferopol) of Yandex’ subsidiaries. Second, the test showed the presence of strong negative bias due to the multiple spellings of this city, which have not been counted in all our observations.

In conclusion, we can say that despite the strong rule of Moscow, a convergence process towards candidatures to the metropolitan function is beginning in the post-Soviet space. It deals more with capital-cities. This reflects the strong legacy of the Soviet mono-centred system which distinguishes this territory from the Western world in terms of territorial organisation and metropolitan articulations. It is quite logical that capital-cities by their vocation of centres (administrative, economic, political, commercial, and cultural) open-up to the global space first. Thus, almost all FSU capitals are involved, with the exception of Minsk, Chisinau and
some Central Asian capitals (Bishkek, Dushanbe and Ashgabat). Capital-cities able to compete with Moscow over the long term are likely to be Kiev and Riga. Among FSU non-capitals (non-Russian) which may function both as command centres and hubs, we identify the Ukrainian city of Odessa. Most Russian non-capital-cities appear as regional cities in conception whose influence does not extend beyond the Russian space. Among those managing to enter the ranking of confirmed candidates global cities are large cities like Saint-Petersburg, Yekaterinburg, Novosibirsk, Samara, Kazan and Vladivostok.

7. WHAT ARE THE INTEGRATION AREAS OF FSU CITIES?

The measurement of the Joint Notoriety associates the name of a FSU city with that of another city, FSU or non-FSU, when counting the number of occurrences in search engines. It helps indentify the areas of integration to which the sample cities are anchored.

The Joint Notoriety is discussed in two environments – the regional environment (RE) and the global environment (GE) – always measured by two types of search engines. The first is provided by the association of the cities to 20 cities in the observed FSU area, most of which are the capitals of the 15 relevant countries (Moscow, Kiev, Minsk, Chisinau, Riga, Tallinn, Vilnius, Baku, Tbilissi, Yerevan, Tashkent, Astana, Bishkek, Ashgabat, Dushanbe) plus four Russian cities, the largest in population (Saint-Petersburg, Yekaterinburg, Novosibirsk, Nizhny Novgorod) and the former capital of Kazakhstan (Almaty). These twenty cities are seen as centres of command in the regional environment, to which is anchored the process of regional integration. Thus, this environment will help us to question the process of convergence and to identify city networks in the light of the integration process.

The global environment is reproduced by the association of FSU cities to 18 world cities of alpha, beta and gamma category according to the GaWC (Shanghai, Delhi, Beijing, Seoul, Istanbul, Tokyo, New York, London, Hong Kong, Los Angeles, Singapore, Chicago, Toronto, Paris, Milan, Zurich, Dubai, Frankfurt) plus Cyprus which is regarded as an off-shore area of Russia. The choice of this particular list of world cities was based on the importance of their potential command on the space of the CIS. The geographic proximity, as well as geopolitical trends within the CIS space towards global cities, and vice versa, were also taken into account. The global environment is used to estimate the degree of commitment of CIS cities within the network of global cities, as well as to reveal potential candidate-cities.

To characterise the phenomena, large matrix tables of city-pairs were constructed (Agibetova, 2008). For better visibility, the data was sorted so that we could focus on cities demonstrating a strong joint notoriety.

The terms of “opening” and “integration” will no longer be used as synonyms. “Opening” will deal with the global environment, “integration” – the regional one, presuming that “opening” refers to “integration” in the global economy.
We will rely mainly on the results of global search engines because according to our observations regional ones have demonstrated poor performance in the measurement of joint notoriety.

**Regional Environment**

For simplicity a zonal typology was used. In 2004, we observed a split into two sub-zones between the Slavic-European zone (Russia, Belarus, Ukraine plus the Baltic states) with a strong joint notoriety, and the zone of “Southern Caucasus and Central Asia” where the processes of integration are occurring to a lesser degree. This zonal divide clearly demonstrates a delay in terms of integration into the regional environment for the Southern Caucasus and Central Asia.

Thus, internal integration processes are concentrated in the Slavic-European zone of the CIS territory. All cities are relatively well integrated, and the Baltic region, followed by Kiev and Minsk, influence by their command. In contrast to its simple notoriety rankings, Saint-Petersburg has a very low degree of integration. This means that the city has an international image, but it does not act as a command centre in its region.

Because of ethno-territorial conflicts (the conflict of Nagorno-Karabakh between Armenia and Azerbaijan) and their remote location (Central Asia to the East) from the Slavic-European area, the integration processes in Southern Caucasus and Central Asia are much less strong. The heterogeneous Southern Caucasus is moving towards integration with the Slavic-European zone, while Central Asia, more homogenous being land-locked and isolated from other regions, is focusing on internal integration processes in this region only.

\[\text{It must be said that the region of Central Asia manifests the largest deficit in the process of metropolisation. Thanks to a strong industrial base built during the Soviet era and the presence of oil resources, Tashkent and Almaty fit well within the CIS by inertia expressing a regional command. Bishkek and Ashgabat are the two capitals of the FSU space which are the less involved in metropolisation. As we indicated earlier, Turkmenistan (Ashgabat) is a special case despite its wealth in oil resources, it is a country absolutely introverted under the authoritarian political regime. Regarding Bishkek, its integration and economic development have suffered from an acute political instability since the Tulip Revolution. Dushanbe, leaving the war (1992-1997) having just recovered from the military disaster, gradually integrated with the countries of Central Asia as with the CIS.}

\[\text{Baku and neighbouring Yerevan barely integrate together, while Tbilisi is open to both. This disintegration of Azerbaijan and Armenia is explained by the territorial conflict over the Armenian enclave Nagorno-Karabakh.}

\[\text{Unlike the Southern Caucasus, the process of integration in the central Asian network between countries of this region is sufficiently strong and homogeneous. We can see that all the capitals of Central Asia integrate well among themselves, except Ashgabat the Turkmen capital. This is because of the introverted politics of Turkmen-Bachy. The closure of the real space and cyberspace, as we see, is quite pronounced even within this region. It is worth noting that the first Internet cafe in Ashgabat was opened on February 16, 2007 at the request of the new President of Turkmenistan, Berdymuhamedov (www.centrasia.ru, 2007). Today, their number is growing at a moderate pace, but they are not popular. It should be noted that one hour of Internet connection costs about three euros (average monthly wages did not exceed 30 € in 2005), and most comprehensive information sites are blocked by the sole Internet server. In addition, the presentation of an identity document is required and the name of the Internet user goes straight into the archives of the Ministry of Communications.} \]
In 2007, the zonal break of the regional environment into two clubs, the “high” and “low” in terms of level of integration, became obsolete, distortion decreased and integration was widespread. In contrast to the year 2004, values rebounded and converged towards a relative balance: Moscow is losing some joint notoriety while, conversely, some other cities have seen an increase. This trend reflects a decline in the pre-eminence of Moscow on the one hand and the convergence of metropolisation to the FSU capital cities and some major Russian cities on the other hand. The relational integration between cities becomes more visible over the Internet via the global search engines: indeed regional integration can be viewed as part of the globalization process.

In addition, the rate of ‘internetisation’ of central and eastern regions of Russia, as well as in the rest of the CIS, increased significantly between 2004 and 2007 (Agibetova, 2008). This increased penetration of the WWW system into the FSU space has a certain impact on the image of convergence.

At the end of 2007, some centrifugal forces were in operation in the territory of Russia, despite Moscow’s resistance. The Baltic capitals lost much influence in the CIS after their integration with, and eventual accession to, the EU. The Southern Caucasus region is experiencing an attractive trend in intra-regional integration while Central Asia is opening-up more towards Russia.

Reading the observations in turn, it is still the category of FSU capital-cities (as per the analyses of simple notoriety) which shows the convergence of metropolisation towards certain privileged centres. Baltic capital-cities are leading as the strongest gravitational cities. As for non-capital cities, Yekaterinburg, Novosibirsk, Odessa, Vladivostok and Irkutsk dominate this sector.

In conclusion, the results of analysis of the regional environment demonstrated the presence of certain centrifugal forces à la Krugman (1991) affecting both Russia and the whole FSU territory, despite the resistance of jealous Moscow. The latter, as a result of centripetal forces, is still a leader, but facing a rise in opposing forces penetrating the CIS. They come primarily from capitals, which are in a favourable situation in terms of metropolisation. The metropolisation area taking shape in the FSU is the Slavic-European zone, with Kiev, Minsk, Odessa and the Baltic capitals commanding the post-Soviet space. The Caucasus is experiencing attractive dynamic trends in integrating more at an intra-regional level and with the Slave-European area. Central Asia manifests the largest deficit of metropolisation, but cooperation in energy and aerospace drives the recent dynamism of integration between Central Asia and Russia.

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9 The three capitals are better integrated and more open to the Slavic-European zone with the leadership of Baku.

10 The dynamism of the recent integration of Central Asia with Russia is especially marked by the integration process in the fields of energy and aeronautics (Vinokurov, 2007 a,b). In 2006, the Eurasian Development Bank with its headquarters in Almaty was inaugurated by Putin and Nazarbayev.
Global Environment

The 19 cities forming the global environment of CIS cities can be divided into four geographical areas: Europe, Pacific (East Asia + West of the USA), Atlantic (East USA + Canada), and the Middle East-South Asia.

The issue of convergence towards capital-cities is still relevant in this global environment. Among the nineteen cities ranked, ten are capitals. This confirms that the trend towards the dominance of capitals strongly marks the FSU space. Moreover, if we compare the list of cities of both environments, it is almost the same, except for Astana and Irkutsk which disappear from the global environment.

It is interesting to note that the triad of Sassen (2001) – London, New York, Tokyo – does not have equal influence within the CIS: the first two have strong links with this space whereas Tokyo has only a slight presence there. The behaviour of the Japanese global city in terms of hyperlinks coincides with the geopolitical strategies whereby Tokyo is turning towards the Pacific area, with little involvement in “CIS-World” networks. In terms of dynamics the triad improves its cohesion.

The Atlantic zone also has a very stable situation where Chicago and Toronto have strong links with the post-Soviet gravitational cities. Despite somewhat complicated “USA-Russia” relations, North America exerts a strong influence in the FSU.

Europe reinforces its influence in the post-Soviet space via Paris, defined as a “soft global city” that is catching up with London and New York (Sassen, 2001). But in terms of dynamics, Frankfurt, Milan, Zurich and Cyprus appear as the least active. Europe is in the process of being overtaken by the Pacific.

The Pacific zone marks a very pronounced presence due to the high command of Singapore, Hong Kong, Beijing, Seoul and Los Angeles. In 2007, Hong Kong showed a very considerable increase in influence on the space of the CIS, which even surpassed that of the triad. Shanghai, which in 2004 was one of the weaker centres of world command, in 2007 reached the level of Beijing. Henceforth, the Pacific as a whole wins in influence, reaching the levels of the Atlantic and Europe. This logic reflects the recent development trends of China and Southeast Asia. This should be considered as a major geopolitical turning point where the attraction of the FSU of the East becomes stronger than that of the West.

The Middle East-South Asia area (Istanbul, Dubai and New Delhi) has the least influence in the CIS. Nevertheless, this area increases via trade flows with the Caucasus, Central Asia and the Far East of Russia.

Reading the matrix in rows allows us to identify in the FSU area the gravitational centres which are beginning to anchor to world growth poles. In turn, Moscow has started disintegrating from the Pacific and the Middle East, which opens a small window of opportunity for the rest of
the FSU space to catch up. The profile for the integration of the Russian
capital-city is aimed primarily at the European triad, Paris, and then the
Atlantic zone (Chicago) and the Pacific zone (Hong Kong and the Los
Angeles).

Kiev and Riga as gravitational cities are the most open to the global
space. Slightly less open are Tallinn, Odessa, Vilnius, Saint Petersburg
and Samara. Let’s not forget that the opening of the Baltic capitals is
conditioned by their membership of the EU. Among the Russian non-
capitals significant cities are Novosibirsk and Vladivostok. The orientation
of their international opening is marked by their immediate neighbours.
Novosibirsk fits better with the zones of Europe and Atlantic while
Vladivostok turned to the Pacific.

Therefore, it appears that the opening of post-Soviet metropolisation
areas is strongly marked by their geographical neighbourhood and
geopolitical trends. The Slavic-European zone anchors to Europe and
Atlantic, while the Far East of Russia, Southern Caucasus and Central
Asia are turning increasingly towards the Pacific and Middle East. The
proximity of the EU, with its enhanced integration across the European
continent and with its recent enlargement of the CEECs and extension
of neighbourhood policies seems, to exert a strong attraction for some
members of the CIS. Thus, Ukraine, Belarus, Moldova, without mentioning
the Baltic countries which are already a part of the EU, and Western
Russia as far as Siberia (Irkutsk) are open to Western Europe.

The “East-CIS” zone is attracted by Asian proximity and influence.
In this sense, the concept of Eurasia (Linn, Tiomkin, 2005) appears to
be seriously questionable, or considerably reduced for the Asian side. In
any case the CIS is under the double attraction of the West and the East,
through which it is being integrated into the global economy. One of the
challenges of the metropolisation of this immense space is the design of
its internal organisation, namely the internal extension of the benefits of
economic integration in the context of extraversion.

8. GENERAL CONCLUSION

Metropolisation is a key-issue, which is essential to the CIS for its
contemporary economic modernization and its opening to the world
space.

The method we developed based on the enumeration of occurrence
of hyperlinks in global and regional search engines for potential global
cities, and analysing their simple and joint notoriety, produced valuable
tools for measuring the situation in 2004 and 2007. It helped enrich the
knowledge of the studied phenomena by providing new information which
proved to be robust.

It also helped to develop two new concepts of analysis of regional
economic integration. The first one is a new reading of economic
integration in the context of a knowledge economy through the concept
of the image reflected by the virtual community in a cyberspace formed by
“regional” search engines, namely Russian ones. This regional specificity of the representation of the world, be it global or CIS, is identified by comparison with the images reflected by global search engines. Furthermore, analysing the joint notoriety linking two cities allows a new measurement of economic integration. This approach, which paves the way for an alternative to existing gravity theories, is promising because it is more relevant to economic processes dominated by information and knowledge flows.

Our analysis showed that currently, marked by the Soviet legacy, the CIS space still functions as a mono-centred space, where the only commuter into the world is Moscow. Moscow cannot be the only centre of such an immense territory and the deficit in metropolisation is therefore clear and measurable. In dynamics, both simple and joint notorieties in the regional environment show a slight decline in Moscow’s pre-eminence and some convergence of the metropolisation process towards certain privileged cities.

These cities are primarily capital-cities such as Kiev, Riga, Tallinn, Vilnius, Baku, Tbilissi, Erevan, Tashkent, and “Almaty”, but they are also large urban centres such as Saint-Petersburg, Odessa, Yekaterinburg, Novosibirsk, Samara and Vladivostok. There is thus a simultaneous movement from the top and from the bottom of the metropolisation process, in other words administrative-political and economic. However, the discontinuity of the economic space in the vast territory could endanger the trend to economic gestation of metropolisation and create a post-Soviet specificity with dominance of movement from the top.

The analysis of the joint notoriety in the global environment provided a new grid for analysis of international integration with a twofold anchoring of the CIS with Europe and Asia. Located in the middle of the “super-continent” of Eurasia, the CIS, since the fall of the Iron Curtain, is experiencing geopolitical change. At the regional level the ambitions of Russian domination are in place. Regional integration with Central Asia is increasingly expanding, unlike with Southern Caucasus. However, from a global point of view, Russia seems a little lost in its immensity and is not yet able to generate its own metropolisation through its homogenous economic space. For metropolisation as well as for the integration of global areas, the Russian territory is divided into two zones: West and East. The dream of building a large Eurasia is not necessarily ill-fated if it is the path towards CIS metropolisation. However, Russia is now facing the challenge of its own metropolisation, with the need to develop and to preserve its unity.

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