



# **Is Russia moving to the East? A simple spatial analysis**

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- To confirm if the Russian economy moves to the East / the Pacific Ocean.
- Russia's interest in the Asia/pacific-rim region are repeatedly announced.
  - Putin's policy / The shift of the world economy to the pacific rim.
    - Eurasian Economic Union, etc.
  - China-Russian economic relation.
    - One-band and one-road initiative
  - Japan-Russian economic relation.
    - Eight-points economic corporation plan (about 30 bill. USD)



# 8 points economic cooperation signed by Japan and Russia at Sochi in May 2016

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- **Medicine**
  - Intergovernmental cooperation for disease control
  - Medical equipment
- **Urban management**
  - Urban planning and management
  - Waste management in the eastern Cyberia
- **Support for Japanese SMEs to enter Russia**
- **Energy**
  - Enlargement of Sakhalin 2 production
  - Exploration in the Sakhalin offshore
- **Productivity**
  - Financing by JBIC
  - Long-term investment by a mother machine maker (Kawasaki HI)
- **Far-Eastern(F-E) region development**
  - Vegetables cultivation in green houses
  - Constructing hospitals for rehabilitation
- **Advanced technology**
  - Post distribution system (JP and PR)
  - IT network technology
- **Human exchange**
  - Inter-university cooperation
  - Relaxing visa issuance



- Aim and motivation
- Method and data
  - Calculating centroids: Just to see if it moves. No analysis of the reasons why they moved.
  - The data of 85 regional bodies at the 1st administration level (Federal subjects). To make them balanced, only 81 are used, excluding Crimea, Simferopol, Chechen, and North Ossetia.
- Result
- Outlook



# Method 1: Geo-centroid

- First, consider the area centroid (geo-centroid) of the whole Russia. Calculate the mean of the coordinates of the outline (state boarder) of Russia:

$$\left( x_{mean}^{RUS}, y_{mean}^{RUS} \right) = \frac{1}{n} \sum_{i=1}^n \left( x_i^{RUS}, y_i^{RUS} \right)$$

$n$ : the number of the points to draw the boarder of Russia;  $(x_i, y_i)$ : the coordinates of those points.

- Second, consider the area centroid of each region:

$$\left( x_{mean}^A, y_{mean}^A \right) = \frac{1}{m} \sum_{i=1}^m \left( x_i^A, y_i^A \right)$$

$A$ : the name of the area;  $m$ : the number of the points to draw the boarder of the region.



## Method 2: Economic centroid

- From the centroids of the 81 regions, we can calculate the mean coordinate of the 81 regions.

$$\left( X_{mean}^{RUS}, Y_{mean}^{RUS} \right) = \frac{1}{81} \sum_{j=1}^{81} \left( x_{mean}^j, y_{mean}^j \right)$$

The calculated centroid of the 81 centroids has no economic meaning. It serves only as a reference point.

- Third, consider the weighted mean of the 81 centroids, such as the investment-weighted mean:

$$\left( X_{mean}^{RusInv}, Y_{mean}^{RusInv} \right) = w_j \sum_{j=1}^{81} \left( x_{mean}^j, y_{mean}^j \right)$$

$$w_j = inv_j / \sum_{k=1}^{81} inv_k$$



## Method 3: ex. Investment centroid

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- $\left( X_{mean}^{RusInv}, Y_{mean}^{RusInv} \right)$  can be interpreted as the investment centroid of Russia.
- The latent assumption here is: the investment spreads uniformly in the area of a region.
- In the same way, we can calculate the centroids of population, GRP, agriculture, industry, labor, unemployed, and so on.



- The federal subjects are geographically large. We have to increase the resolution.
- However, Russia does not disclose the data on the municipalities at the 2nd administration level. So far as I know, they do not have them (an interview at Rosstat in October 2018).
- They publish data on the main cities, 200 or so. Separating those cities would significantly increase the resolution of the economic centroids. The assumption here is: 'the investments done in the cities' are (relatively) pin-pointed, while 'the total investment of the region *minus* the investment done in its cities' spreads uniformly in the region.





- I am afraid I did not include the main city data in the database yet. Making the original data fitting to the GIS database is time-consuming, although I made it half-automated. 'Half' is the problem: the other half should be done with manual toils.
- Sorry...
- For now, I can show only the movement of investment centroids of the 81 federal subjects. Nevertheless, Investment seems to be the most appropriate indicator to see the geographical movement of the economy in a relatively short period.



# Data 3: West and East by Federal District

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- We see the movements of the investment centroids for Russia, and the eastern and western parts of Russia. The east and west were separated as follows:
- The West of Ural Mts.
  - Northwest F/D
  - Central F/D
  - South F/D
  - Volga F/D
  - North Caucasus F/D
- The East of Ural Mts.
  - Siberia F/D
  - Ural F/D
  - Far East F/D



# Result: Preparation 1

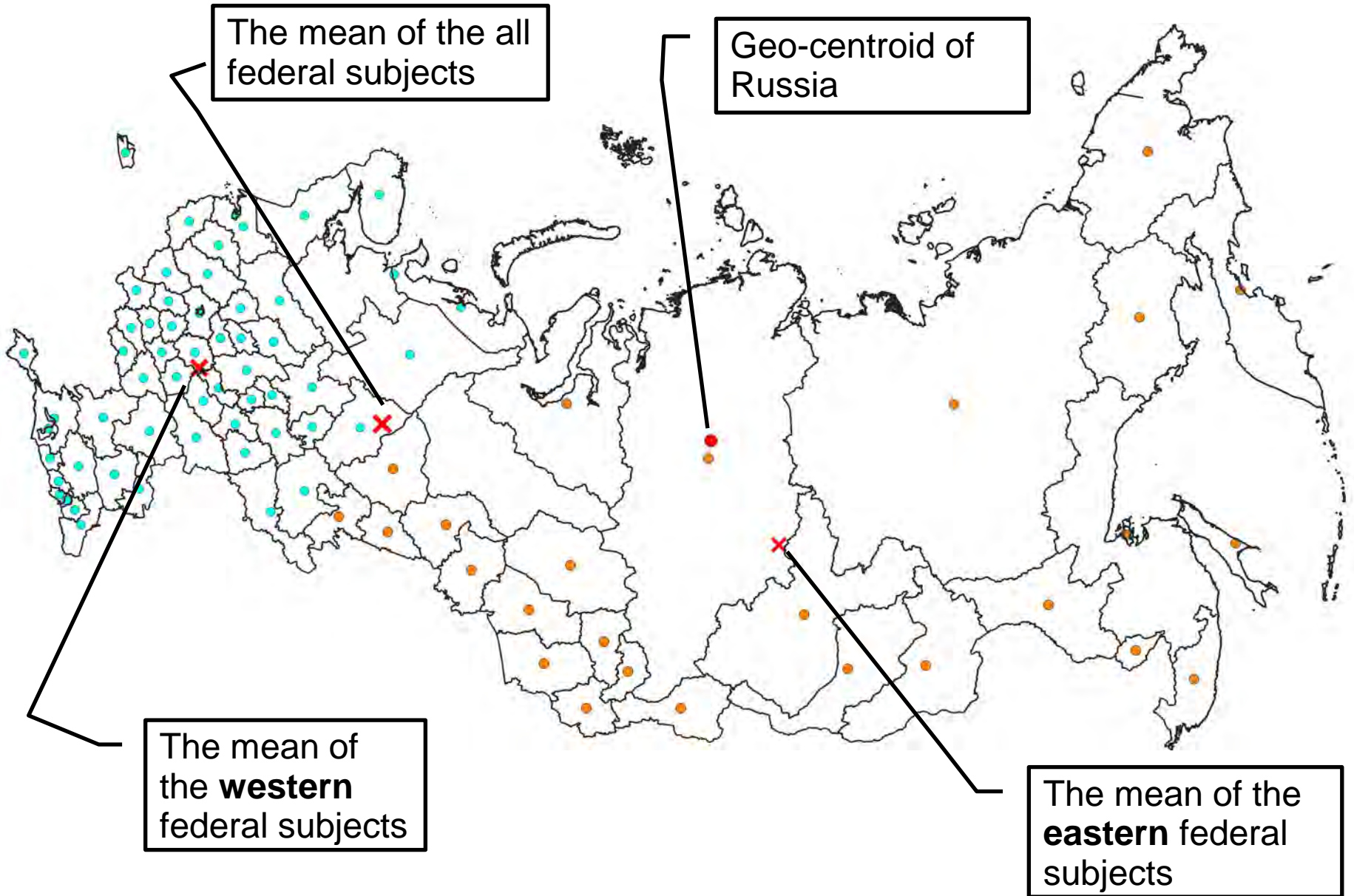
- I use the **Lambert azimuthal equal-area projection / North Pole**. Not very convenient for our purpose because the longitude lines are the spokes radiating from the hub of the north pole or the latitude lines are curved (circles).



QGIS, the free GIS soft I use, is not good at handling areas straddling 180E.

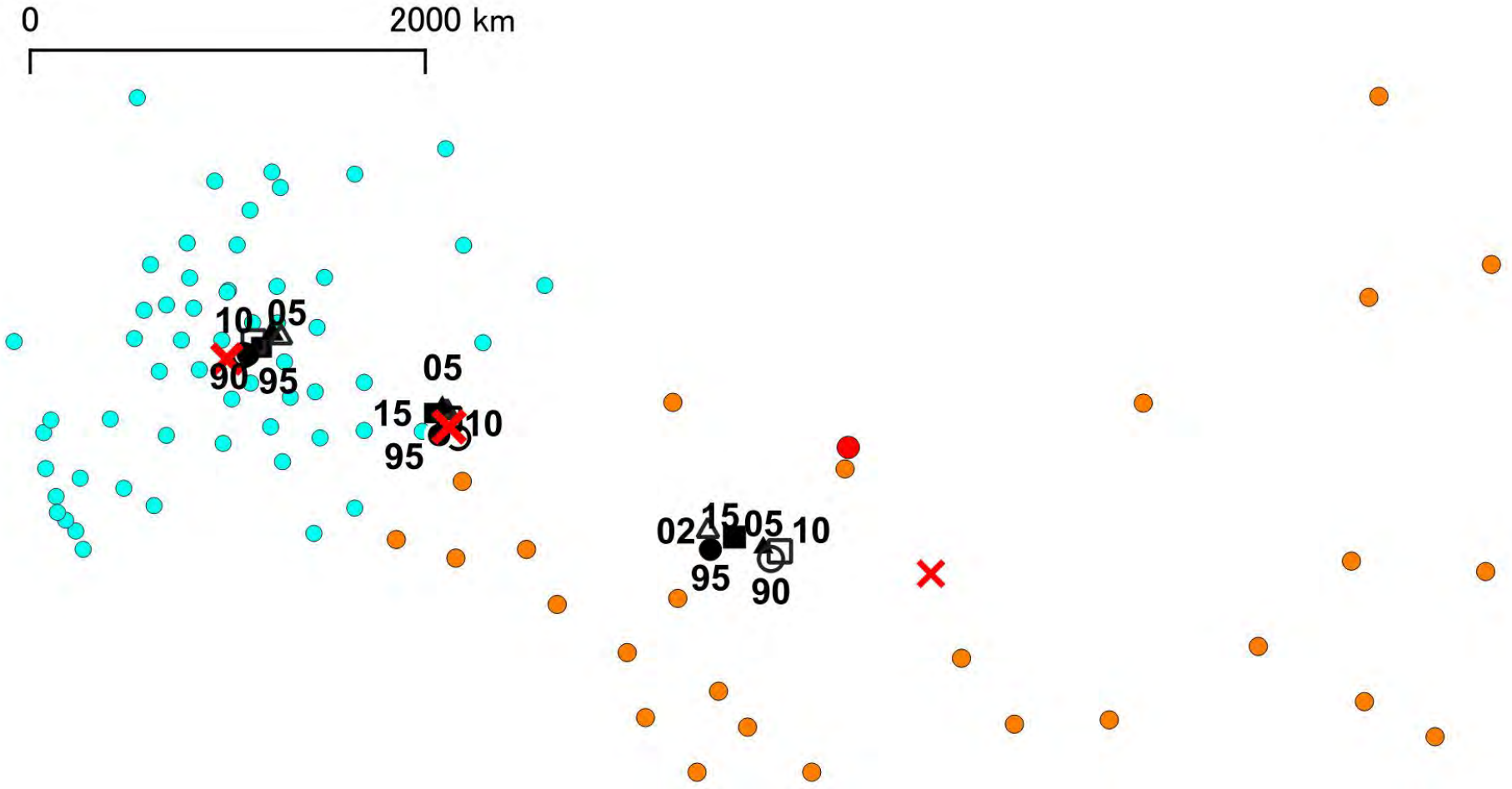


# Result: Preparation 2

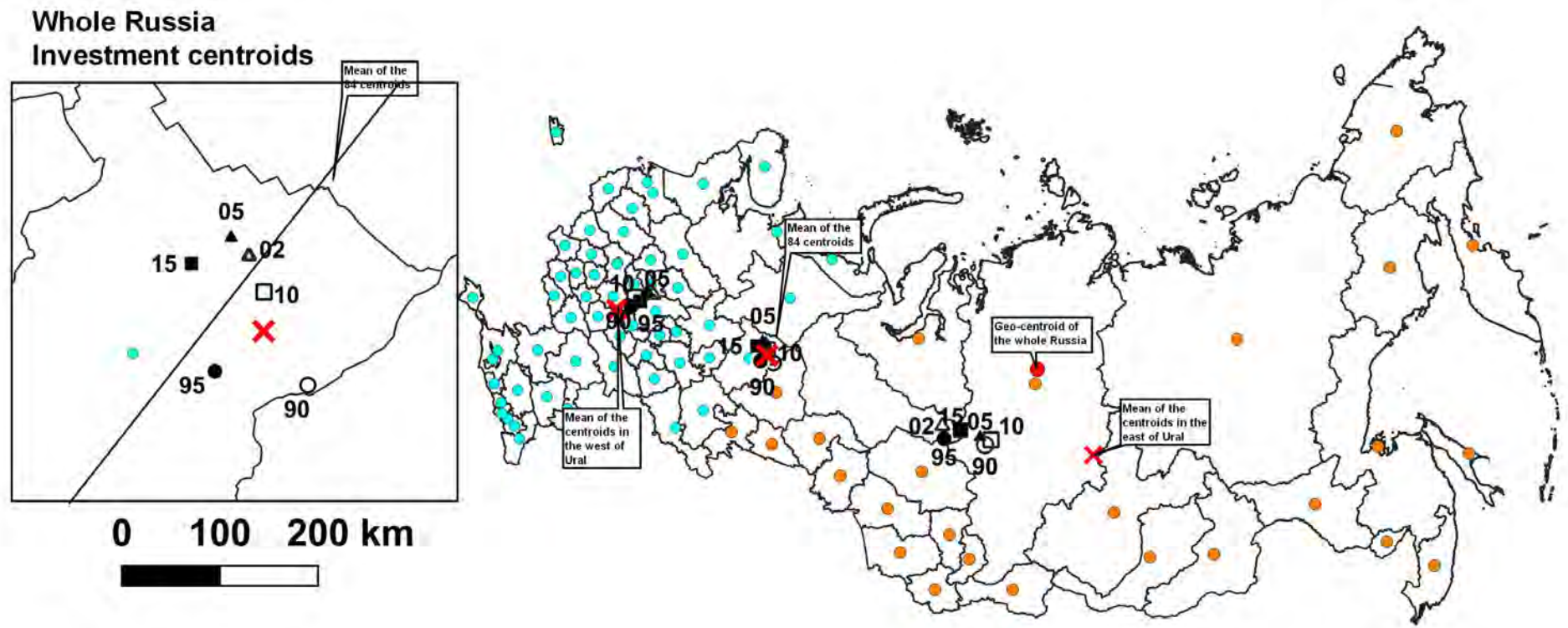




# Result: Preparation 3 just for reference



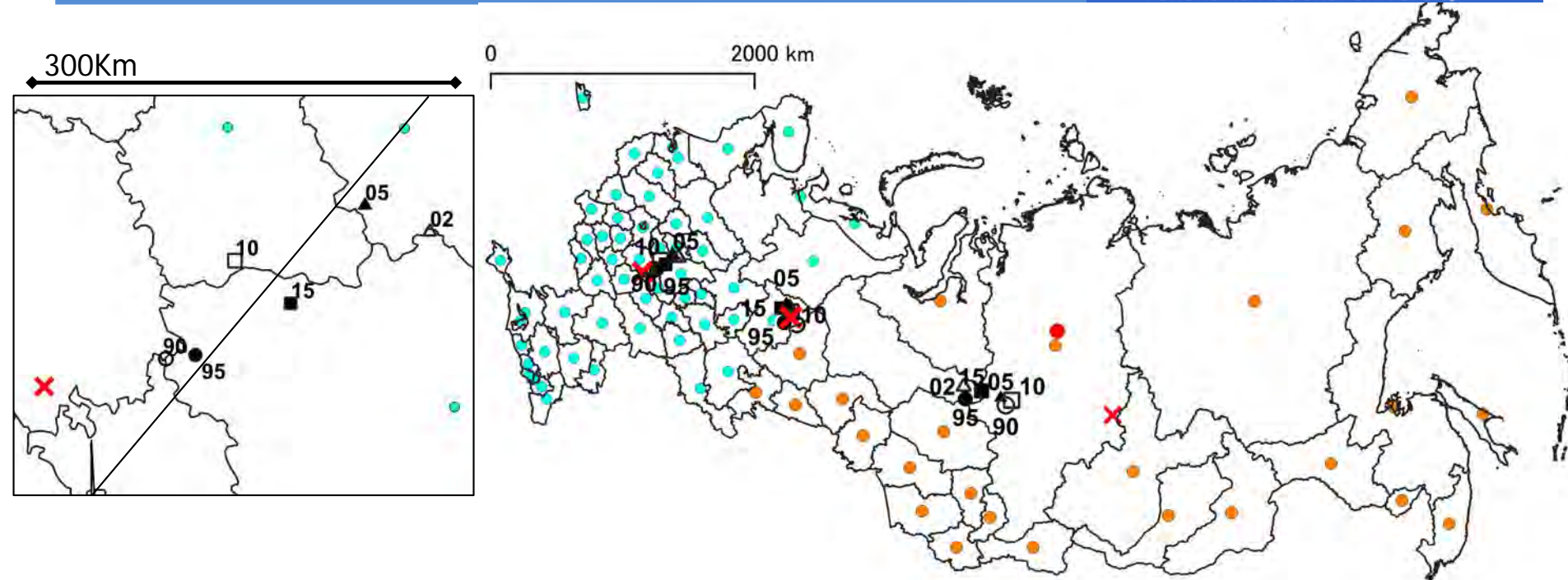
# Result: Investment centroids (All Russia)



- The investment centroids are at Perm'. It was in the east of the reference point **X** only in 1990.
- Then, it moved mostly westwards.
- It moved a bit eastward around 2010; it, nevertheless, fell in the east of the reference point.

# Result: Investment centroids (West of Ural)

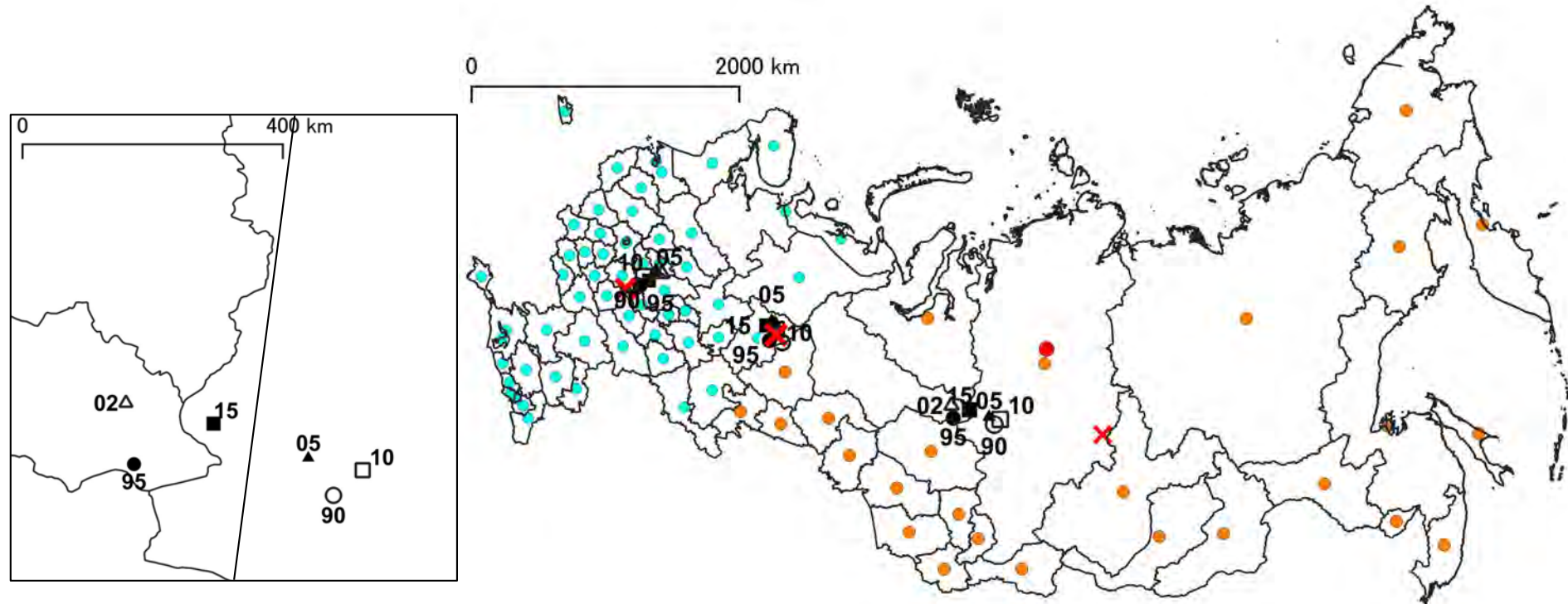
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- The investment centroids are in the Ryaza-Vladimir-Ivanovo-Nizhegorad -Mordova bodars area. All centroids are in the east of the reference point **X**. This and the following surprised me.
- Both eastward and westward moves are unlikely. That is, even Moscow and St. Petersburg could not pull the centroids **westward**. Rather, northward movements seem more prominent. Mining?

# Result: Investment centroids (East of Ural)

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- The investment centroids are in the west far from the reference point **X**.
- No clear eastward movements were observed.





- Geographically, **eastward movements of the Russian economy were not observed.**
- Anecdotal facts also support the result.
  - Some Russian experts said: The present priority of the Russian government is to keep the state budget balanced to prepare for a tightening of the sanction. The investment projects in the F-E region lost their priority.
  - Japanese plant engineering companies say they do nothing because the sanction made them difficult to get financing.
  - China committed to no large-scale investment projects in the F-E region despite plans and talks.
  - Russia modernizes Trans-Sib. It costs a lot, while there are little to be transported. Now, it transports the coal that Japan buys for electricity.



# Outlook 0: technical issues

- I am going to include the main cities to increase the resolution.
- Agriculture and construction centroids will be calculated. They must be the foundation of the regional economies.
- The difference of regional gross saving and investments (financial absorber/supplier centroid) will be calculated. I am afraid that they exclude the cities for the lack of the data.



# Outlook 1: Japan and the F-E region

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- What can Japan do to promote the F-E economy?
- The best thing is to sign the peace treaty. That means, Japan accepts a 50-50 solution of the northern territory.
- It will define the national boarder clearly. This is important. The northern territory itself has no economic meaning. The Hokkaido island is already a net absorber of the state budget, suffering a rapid decrease in the population. A number of municipalities in Hokkaido will disappear in 10 years; Japan Rail (JR) Hokkaido is planning to close a number of its railway lines. No economic meaning to add municipalities in red to them.



## Outlook 2: Japan and the F-E region

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- The problem is political: less foreign affairs, more domestic politics in Japan. Thus, it is difficult to solve. LDPJ has kept a double-standard position about the pacific war: it tells outwards we keep the post-war order, while it tells inwards the northern territory is ours. I am not supporting Russia, but it is clear that LDPJ is inconsistent.
- LDPJ seems unable to make a decision when the matter became decisive, because they could not build consensus even within the party.
  - Hashimoto (Mori) - Yeltsin talks in Krasnoyarsk in 1997 and in Kawana (Japan) in 1998
  - Abe - Putin talk in 2016



## Outlook 3: Japan and the F-E region

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- I am sure 95% of the Japanese people do not know the history like that a large part of present Poland was the pre-war German territory.
- LDPJ intentionally had not touched this kind of issue. Because it leads to discussion on the war responsibility of Japan **within Japan**.
- Without assuming that the people have modest understanding of the WW2 (not the Pacific War) history, it is difficult to persuade the people on the territorial issue. LDPJ created this situation by itself.



## Outlook 4: No prospective easy way-out

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- So, what can we do? **It is unlikely that the big project approach will bring sustainable and steady economic development in the F-E region, and the problem of not-clearly defined national border between Japan and Russia continues to humper regional, grass-roots economic activities of both countries in the border region.**
- An easy solution does not seem to exist.



**Thank you for your attention!**  
**ご清聴ありがとうございます!**  
**Kiitos mielenkiinnostasi!**