The Relation between Aging and Housing Prices: A Key Indicator for the Housing Wealth Spatial Reshaping

- Yasmine Essafi, Center for Real Estate Management, DRM, Université Paris-Dauphine
- Raphaël Languillon, Geneva University
- Arnaud Simon, Center for Real Estate Management, DRM, Université Paris-Dauphine
1 - Introduction
• Recent evolutions in the regional geographies:
  • Metropolization / Gentrification
  • Rural desertification / Urban shrinkage / Urban expansion

• Moving of the baby-boomers cohorts
  (Baby-boomers) → Working-boomers → Elder-boomers

• How to deal and to connect globally and locally these phenomenon?
• Why the housing price?
  • Central to prepare retirement
  • Localized
  • Housing stock value: 6 300 billions euros
    • Multiplied by 3 in 20 years
    • Shift of the housing ownership toward retired people

• Multiple phenomenon converge into the housing price
  → Useful tool to analyze the French spatial recomposition

• Which areas benefit or lose the most in this spatial reallocation of the housing wealth?
2 – Literature review
Ageing

• A global phenomenon
  • Multiple scales in OECD countries
    • Rural territories  Burholt & Dobbs (2012)
    • Metropoles, suburbs  Abe (2015), Languillon (2016) ; Ghékière (2006)
    • Large regions  Eastern Europe : Lintz, Müller and Schmude (2007), Hoff (2011)
  • Outside OECD : China (Peng (2011)), Russia (Gavrilova and Gavrilov, (2009))

• Three combined factors
  • Increasing of the life expectancy
  • Decreasing of the birth rate
  • Retirement of the previous ‘baby-boomers’

• Two examples of aged societies:
  • Germany (Christensen et al. (2015)) : Forecast of the working population in 2050 between 37% and 40%
  • Japan (Hino and Tsutsumi (2015)) :
    • 50% of the territory hit by super-ageing / “Kasô” municipalities : - 10% population in 20 years
    • Decrease of the land prices / Urban regeneration / Skyscraper renewal
    • Gentrification in the urban centers / Ageing in the suburbs and price decline

• Spatially, ageing is : not systematic, strongly heterogeneous
Life-cycle theory, Modigliani (1963)

- **Theory and intuition**
  - During the active life: buyer of financial/real estate assets
  - During the retirement: consumption or resale the assets

\[
OLDDEP = \frac{\text{Retired}}{\text{Working population}} \approx \frac{\text{Supply}}{\text{Demand}} \rightarrow \text{Dynamic of the OLDDEP ratio} \approx \text{Dynamic of the prices}
\]

- Consequently, a distortion between the age groups should generate housing price distortion
  - At the global level / At the local levels

- **Two moments in the literature**
  - First period [1990-1995]
    - Context: progressive arrival of the baby-boomers on the labour market between 1970 and 1990
      → Effect on housing price between 1970 and 1990?
    - Mankiw et Weil (1989): Reference article. Conclusion globally positive, but moderate

  - Second period, since 2005
    - Context:
      - Beginning of the elder-boom;
      - Adding the period [1995; 2010] to the sample
        • Maximum of working-boomers in the working population
        • Sharp price increase
    - Numerous articles become strongly positive
      • Takàts (2012): article on 22 countries, between [1970;2010]
3 - Methodology
A panel model

- Data: 94 French departments / Annual basis, between 2000 et 2013

\[
\Delta P_{\text{appit}} \text{ (or } \Delta P_{\text{MAi}_{it}}) = \\
\alpha_i + \beta_1 \Delta \ln \text{REV}_{it} + \beta_2 \Delta \ln \text{TPPO}_{it} + \beta_3 \Delta \ln \text{OLDDEP}_{it} + \beta_4 \Delta \ln \text{OFF(PPP or MAI)}_{it} + \beta_5 \Delta \ln \text{TEG}_{it} + \beta_6 \Delta \ln \text{DIV}_{it} + \epsilon_{it}
\]

- Impact of ageing is constant across the departments
- Impact of total population and revenue may fluctuate:
  - In the young or urban or costly departments: Total population ↗ Revenue: ↘
  - In the aged or rural or cheap departments: Total population ↘ Revenue: ↗

→ But spatial dynamics are strongly heterogeneous: need for a more detailed analysis

Line of constant price and typology

- Coefficients of Revenue, Divorce, New supply, Interest rates: small or non-significant
  \[ \Delta P_{app_{it}} \text{ (or } \Delta P_{mai_{it}}) = \alpha_i + \beta_2 \Delta \ln TPOP_{it} + \beta_3 \Delta \text{OLDDEP}_{it} \]

- Housing price variations reduced to the demographic factors

- In the plan \((\Delta \ln TPOP, \Delta \text{OLDDEP})\):
  \[ \text{line of constant price: price variation equal zero, ageing and total population effects compensate} \]
Elder-boom and pre-elder-boom

Figure 1-a: [2000;2006]

Figure 1-b: [2007;2014]
Completing with a principal component analysis

- PCA with 19 variables → 2 very structuring axis

1/ DREG logic  → 37% - 56% of the explained variance

2/ UNP logic  → 15% - 32% of the explained variance

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **DREG : Demographic, Real Estate, Gentrified** | - Important and young population, not affected by ageing, with increasing population  
- High real estate prices, low vacancy rate, low ownership rate, high level of construction  
- Rich departments in terms of GDP and revenues  
- High percentage of executive  
- Unequal life standard |
| **UNPREM (UNP)**     | - High unemployment and poverty rate ( = UNP)  
- Low average revenues  
- Equal life standard  
- Negative or null net migration |
4 - Results
<table>
<thead>
<tr>
<th>Axis</th>
<th>Axis characterization</th>
<th>Explained variance (%)</th>
<th>Positive example</th>
<th>Negative example</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>DREG</td>
<td>50%</td>
<td>Ain, Alpes-Maritimes, Bas-Rhin, Bouches-du-Rhône, Gironde, Haute-Garonne, Haute-Savoie, Hérault, Ille-et-Vilaine, Isère, Loire-Atlantique, Nord, Rhône, Var</td>
<td>Allier, Ariège, Aveyron, Cantal, Creuse, Haute-Marne, Indre, Lot, Lozère, Meuse, Nièvre, Orne</td>
</tr>
<tr>
<td>F2</td>
<td>UNP</td>
<td>15%</td>
<td>Bouches-du-Rhône, Nord, Pas-de-Calais</td>
<td>Haute-Savoie, Savoie, Vendée</td>
</tr>
<tr>
<td>F3</td>
<td>High percentage of secondary residences</td>
<td>11%</td>
<td>Aude, Hérault, Pyrénées-Orientales, Var</td>
<td>Côte-d'Or, Haut-Rhin</td>
</tr>
</tbody>
</table>
For sub-groups
### Extended Parisian region

#### F1

- **DREG**
  - Reduced role of increasing population
  - Negative net migration

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>56%</th>
<th>Hauts-de-Seine, Paris, Val-de-Marne</th>
<th>Aisne, Aube, Yonne</th>
</tr>
</thead>
</table>

#### F2

- **UNP**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>17%</th>
<th>Seine-Saint-Denis</th>
<th>Yvelines</th>
</tr>
</thead>
</table>
### Regional capitals

**Graph**

- Y-axis: Delta olddep (2%, 1%, 0%, -1%)
- X-axis: Variation totop (0%, 1%, 2%)

**Map**

- Departments of the regional capitals (Paris excluded)

<table>
<thead>
<tr>
<th>F1</th>
<th>Description</th>
<th>%</th>
<th>Departments</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>DREG</td>
<td>- reduced role of increasing population and vacancy rate</td>
<td>40%</td>
<td>Haute-Garonne, Rhône</td>
<td>Côte d’Or, Loiret</td>
</tr>
<tr>
<td></td>
<td>- no role of revenues and unequal life standard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNPREM</td>
<td>- Constant or decreasing population</td>
<td>32%</td>
<td>Bouches-du-Rhône, Nord, Seine-Maritime</td>
<td>Haute-Garonne, Loire-Atlantique</td>
</tr>
</tbody>
</table>

**Legend**

- DREG: Reduced role of increasing population and vacancy rate
- UNPREM: Constant or decreasing population
Littoral departments

- **DREG**
  - reduced role of real estate prices, unequal life standard
  - no role of increasing population, vacancy rate
  - 37% Bouches-du-Rhône, Gironde, Loire-Atlantique, Nord
  - Aude, Côtes-d’Armor, Manche

- **UNPREM**
  - 22% Aude, Nord, Pas-de-Calais

- **HIGH PREM**
  - High percentage of secondary residences, high house prices
  - 17% Alpes-Maritimes, Pyrénées-Orientales, Var
  - Eure
Border departments

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Percentage</th>
<th>Regions</th>
<th>Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>DREG</td>
<td>47%</td>
<td>Alpes-Maritimes, Haute-Garonne, Haute-Savoie</td>
<td>Ardennes, Ariège, Meuse</td>
</tr>
<tr>
<td>F2</td>
<td>MMASR</td>
<td>21%</td>
<td>Hautes-Alpes, Haute-Savoie, Savoie</td>
<td>Nord</td>
</tr>
<tr>
<td>F3</td>
<td>High percentage of secondary residences</td>
<td>11%</td>
<td>Alpes-Maritimes, Pyrénées-Orientales</td>
<td>Ain</td>
</tr>
</tbody>
</table>
Size, socio-professional status, unemployment, affordability?
Bad affordability
Average affordability
Good affordability
Thank you