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# A Pair-wise Analysis of Intra-city Price Convergence Within the Paris Housing Market

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## Abstract

We examine long-run house price convergence across the twenty Paris districts using a quarterly dataset that spans from 1991 to 2014. Our approach is based on two stages. In the first stage, we apply methods of unit root testing. Our econometric modelling exercise adopts a pair wise approach that is built on a probabilistic test for convergence based on all house price differentials across the Paris districts. We find that more than 50 % of the intra-city house price differentials that can be computed are stationary. In the second stage of our investigation, we analyse the drivers of convergence. The probability of stationarity is negatively affected by unemployment differentials across districts, demographics differentials and supply-side characteristics. Our findings further

reveal that the half-life of a shock to long-run price equilibrium is affected positively by unemployment, distance and housing supply. Our analysis suggests that smaller distances between Parisian districts are associated with a faster speed of adjustment back towards long-run equilibrium.



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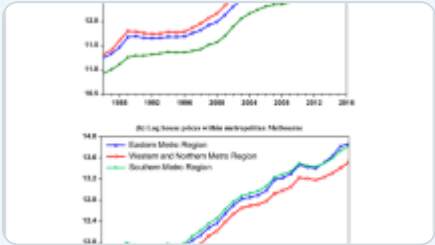
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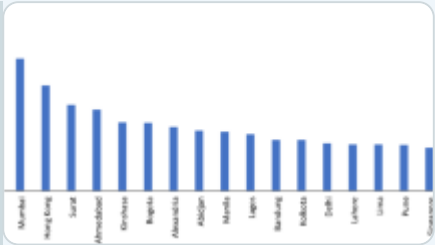
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1. There is considerably variability across the regions with the most expensive regions to be found in the west, the medium priced in the centre and in the south and lower priced in the north; see Roehner ([1999](#)) for more.
2. The reader is referred to the [Appendix](#) for the data sources used in the paper.
3. In an additional set of estimations we also apply the Kapetanios et al. ([2003](#)) test for a unit root, against the alternative of non-linear smooth transition autoregressive (STAR) adjustment. At the 10 % significance level the relative frequency of rejection of the unit-root null is 32.1 %, a percentage that is slightly higher than the one obtained when using the MAIC to select the optimal number of lags
4. The half-life of a shock is estimated with the formula  $\frac{-\ln(2)}{\ln(1 + \hat{\delta})}$ , where  $\hat{\delta}$  is the autoregressive coefficient in the corresponding ADF test regression; see e.g. Goldberg and Verboven ([2005](#)).
5. Please refer to the data [Appendix](#) for the sources of the data.
6. Although it is possible to argue that the variables unemployment and/or old-age index have fluctuated over time, so that looking at one value in a specific time period is not representative, we are implicitly assuming that differences across districts have remained relatively the same.
7. In addition to the variables listed above, we also consider other potential determinants such as population growth, and a measure of the relative strength of speculative trading versus price-supply elasticity, the latter as taken from Roehner ([1999](#)). However, all of these yield inferior results and for this reason were not included in the model specification that was finally chosen.

8. Perhaps there are less doubts regarding the exogeneity status of the other right-hand-side variables. That is, distance is not expected to be affected by relative housing prices nor by their speed of adjustment. In turn, unemployment differentials are expected to depend on changing supply/demand conditions in the labour market. Lastly, the old-age index is more related to demographic transformations that change little over time.

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Constructive comments from an anonymous referee are gratefully acknowledge. The usual disclaimer applies.

# Appendix: Data Appendix

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The following sources of data were consulted:

House prices: [www.paris.notaires.fr/outil/immobilier/prix-et-nombre-de-ventes-paris-idf](http://www.paris.notaires.fr/outil/immobilier/prix-et-nombre-de-ventes-paris-idf)

Housing units: [www.map-france.com/Paris-75000/](http://www.map-france.com/Paris-75000/)

Unemployment: 2014 <http://www.urbistat.it/AdminStat/en/fr/classifiche/tasso-disoccupazione/comuni/paris/75/3>

Old-age index: 2014 [www.urbistat.it/AdminStat/en/fr/classifiche/indice-vecchiaia/comuni/paris/75/3](http://www.urbistat.it/AdminStat/en/fr/classifiche/indice-vecchiaia/comuni/paris/75/3)

Distance: This variable is calculated using the “greater-circle” formula based on information on latitude and longitude for the town halls in each administrative district. The geographic coordinates can be found in: [www.map-france.com/Paris%209e%20Arrondissement-75009/](http://www.map-france.com/Paris%209e%20Arrondissement-75009/)

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