No Price Like Home: Global House Prices, 1870–2012

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Replication Package - Explanation

The zip-file contains two folders:

- `KSS_NPLH_FiguresTables` contains the code that replicates the figures and tables in the published article and Online Appendix A "Supplementary Material"
- `KSS_NPLH_Decomposition` contains an xls file that replicates the decomposition of house prices into the replacement values and land prices, as reported in Section III of the published article.

1. Figures 1–16 and Summary Statistics (`KSS_NPLH_FiguresTables`)

You will need Stata to run the code in this folder. The folder contains Stata code to replicate the figures and tables in the published article and Appendix A.

The folder contains the following contents:

- `"data"`: folder with all data used in the analysis. It contains the following three datasets: `"NPLH.dta"`, `"NPLH_UrbanRural.dta"`, `"NPLH_Decomposition.dta"`.
- `"tablesfigures"`: folder with all figures.
- `"programs"`: folder with the individual Stata do files that take the raw data to the final data, and create Figures 1–16 and summary statistics in Table . `"meta.do"` is the Stata do file that can be used to run all steps of the analysis. `"data.do"` creates the variables, `"fig1-8.do"` creates Figures 1–8, `"app_fig9-16.do"` creates Appendix Figures 9-16 and summary statistics for Table 4. You will need to change the working directory to your own. All graphs are exported as pdf files to the folder `"tablesfigures"`.

Notes to structural break tests (Table 3)

Structural break tests were performed using EViews. k is the maximum number of structural breaks in the log-level of the real house price index determined using the Bai and Perron (2003) methodology with a trimming parameter of 10 percent and a significance level of 0.05, using White heteroskedasticity-consistent standard errors and heterogeneous error distributions across breaks. Break dates correspond to first date of new regime.

2. Decomposition in Section III (`KSS_NPLH_Decomposition`)

The folder contains an xls file `"KSS_NPLH_Decomposition.xls"` with five sheets.

- Sheet `"1_Figure 7 (panel b)"` constructs the mean imputed land price index (11 countries) displayed in Figure 7 (panel b) in Section III.B using a mean real

house price index (11 countries) and a mean real construction cost index (11 countries). Under Cobb-Douglas technology, the equilibrium house price reads $p_t^H = B\left(p_t^Z\right)^{\alpha}\left(p_t^X\right)^{1-\alpha}$, where p_t^H denotes the real house price index in year t, p_t^X the real price of residential structures (measured by the real construction cost index), $B := \alpha^{-\alpha}(1-\alpha)^{-(1-\alpha)}$, and α a constant technology parameter (measured by the share of land in the total value of housing), respectively. The imputed real land price can therefore be expressed as $p_t^Z = B^{-\frac{1}{\alpha}}\left(p_t^H\right)^{\frac{1}{\alpha}}\left(p_t^X\right)^{\frac{\alpha-1}{\alpha}}$. The normalization of the resulting index series to 100 percent in a chosen base year removes the constant term $B^{-\frac{1}{\alpha}}$ from the calculation formulae. Applying $p_t^Z = \left(p_t^H\right)^{\frac{1}{\alpha}}\left(p_t^X\right)^{\frac{\alpha-1}{\alpha}}$ with $\alpha = 0.5$ yields the imputed real land price index.

- Sheet "2_Figure 8" constructs imputed land price indices for Autralia, Belgium, Switzerland and the United Kingdom displayed in Figure 8 (Section III.B) using the respective real house price index and the respective real construction cost index. See notes to Figure 7 above.

- Sheet "3_Figure 12" uses different values of α, the share of land in the total value of housing, to construct the mean imputed land price indices displayed in Figure 12 in Appendix A.4. See explanation for Figure 7 above. The share of land in the total value of housing is set to $\alpha = \{0.25, 0.5, 0.75\}$.

- Sheet "4_Figure 13" considers the case of an elasticity of substitution equal to zero (Leontief technology) when constructing a mean imputed land price index (11 countries). Under Leontief technology, the equilibrium house price reads $p_t^H = a \cdot p_t^Z + b \cdot p_t^X$, where $a, b > 0$ denote technological constants. To ease comparison with the Cobb-Douglas case (and due to data availability), we express the imputed land price as a function of the land share in the value of housing $w_t = \frac{p_t^Z Z_t}{p_t^H H_t}$, in addition to the real house price index and the real construction cost index, according to $\frac{p_{t+1}^Z}{p_t^Z} = \frac{1}{w_t}\frac{p_{t+1}^H}{p_t^H} - \frac{(1-w_t)}{w_t}\frac{p_{t+1}^X}{p_t^X}$. Applying the preceding formulae, starting with an (arbitrary) initial condition $p_0^Z = 1$, yields the imputed real land price index.

- Sheet "5_Decomposition Section III.C" determines the contributions of land prices and construction costs to the late 20th and early 21st century global house price boom country by country. As described in the main text, the share of house price growth between 1950 and 2012 that can be attributed to land price growth may be expressed as $\alpha\frac{\ln\left(\frac{p_{2012}^Z}{p_{1950}^Z}\right)}{\ln\left(\frac{p_{2012}^H}{p_{1950}^H}\right)}$, where p_t^Z denotes the imputed real land price in year t and p_t^H the real house price index, respectively. Calculating the preceding expression yields the contributions of land prices in explaining house price growth, as reported in Section III.C.