Discussion of *Das House-Kapital* *A Long Term Housing & Macro Model* by V. Grossmann & T. Steger

P. Reichlin

May 25, 2017

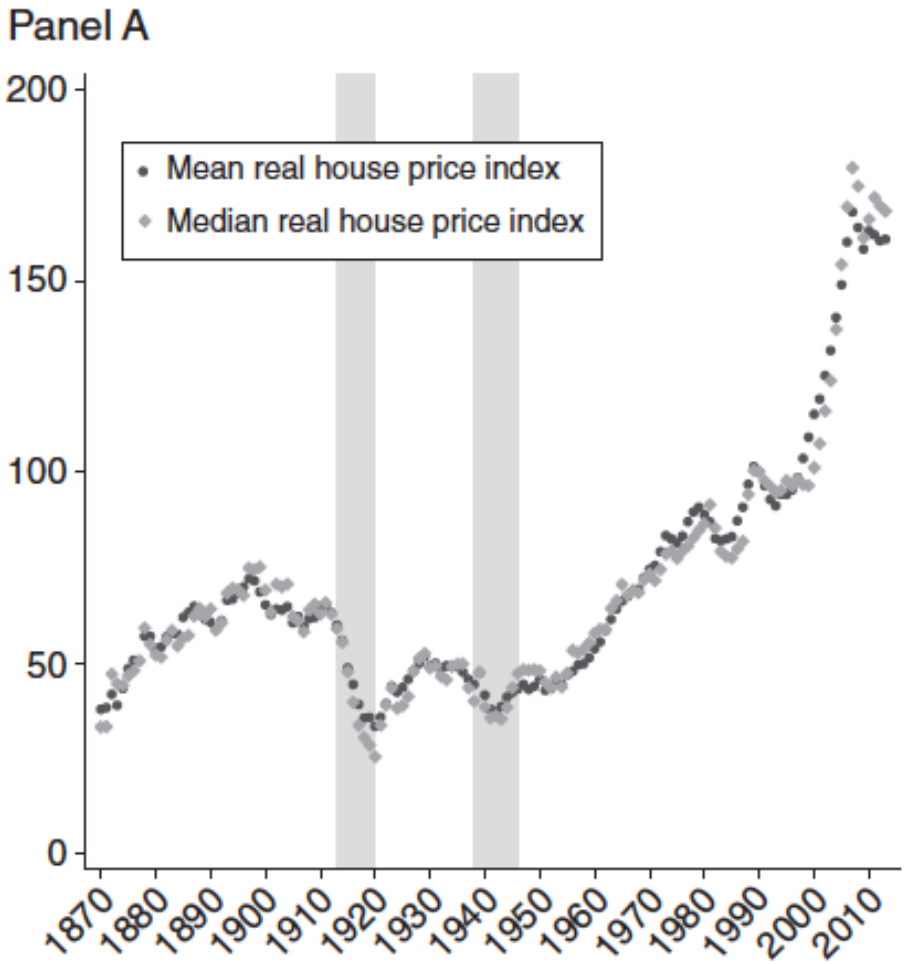
Research Question

Housing is an important component of private wealth

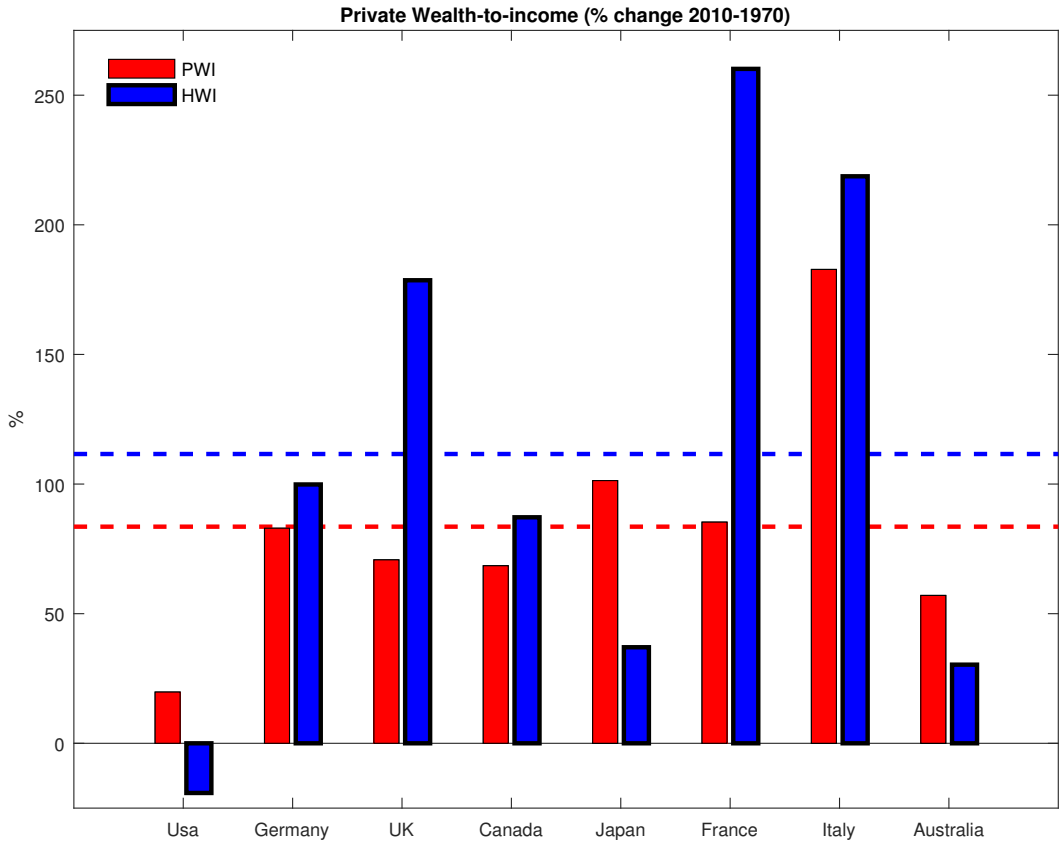
Why Macro-Economits have been interested in H?

- Role of H. in amplifying business cycles, due to wealth effects and mortgage lending
- Long-run trends in wealth composition, surge in housing prices, inequality,.. (very recent research)

Data: Knoll, Schularick & Stegler (2017)



Data: Piketty & Zucman



Main Drivers

Knoll, Schularick & Stegler (2017)'s empirical strategy specifically highlights **Land Scarcity** as a key driver:

$$\text{H. Prices} = \underbrace{\text{Cost of Structures}}_{\textit{flat}} + \underbrace{\text{Cost of Land}}_{\textit{rising}}$$

Which model is, at the same time,

- able to deliver this phenomenon?
- consistent with economic logic?

A model with sound micro foundations should deliver

H. Prices $= f$ (TFP, demand elasticities, Factor Endowments)

Canonical Model

$$
\begin{aligned}
Y^C &= F(K^c, L^c), \qquad Y^H = G(K^H, L^H, Z) \\
K &= K^C + K^H, \qquad L = L^C + L^H, \qquad Z = \Delta \text{ Land} \\
U &= U(C, H) \qquad H = \text{proxy for housing services,} \\
\Delta H &= Y^H - \delta H \\
\Rightarrow \qquad & q^H = \frac{U_C(Y^C, Y^H)}{U_H(Y^C, Y^H)} = \frac{F_N(K^c, L^c)}{G_N(K^H, L^H, Z)}
\end{aligned}
$$

Land scarcity plays a role, but how strong?

G&S criticism

- With $\Delta Land > 0$ we have Land $\to \infty$
- Land available for residential investment is limited by "nature" (fixed supply) and rival (not available for other uses)
- Land not useful for investment in structures (size of houses?)
- Total housing services:

$$S = \underbrace{h}_{\text{per house: Intensive margin}} + \underbrace{N}_{\text{numb. of houses}}$$

- Land is an input of non-housing final goods

G&S Main Point

All these points are well taken and paper has the potential for providing a more rigorous analysis of the role of land and structures in generating housing price dynamics

Most important point of G&S paper:

- Land scarcity plays a large role in generating long-run rising trends in housing prices
- Not so much in the behaviour of wealth-to-income ratios (although this conclusion depends on special assumptions about preferences)

G&S Model in a nutshell

$$N = \text{n. of houses} \qquad X = \text{structures}$$

$$\begin{aligned} Y^C &= F(K^C, L^C, Z^C), & X &= X(K^X, L^X), \\ Z^N/N &= \psi, & h &= h(X/N) \end{aligned}$$

$$\Rightarrow \qquad S = N \times h = h\left(\frac{X}{Z^N}\psi\right)\frac{Z^N}{\psi} \equiv G(K^X, L^X, Z^N)$$

A simplified Scheme: No Capital - 1

$$\text{Preferences:} \qquad U = C^{\eta}(H)^{1-\eta}$$

$$\text{Full Empl.:} \qquad L^C + L^H = L$$

Canonical Model

$$C = Y^C = L^C, \qquad H = Y^H = (L^H)^{1-\alpha} Z^{\alpha}$$

$$\log q^H = \text{constant} + \alpha \times \underbrace{\log \frac{L}{Z}}_{\text{pop. density}}$$

A simplified Scheme: No Capital - 2

G-S Model

$$C = Y^C = (L^C)^{1-\beta}(Z^C)^{\beta}, \qquad X = L^H, \qquad h = \left(\frac{X}{N}\right)^{1-\alpha}$$

$$Z^C + Z^N = Z, \qquad Z^N = N$$

$$\Rightarrow \qquad H = X \times N = (L^H)^{1-\alpha}(Z^N)^{\alpha}$$

$$\log q^H = \text{constant} + (\alpha - \beta) \times \underbrace{\log \frac{L}{Z}}_{\text{pop. density}}$$

(Rybczynski theorem)

A simplified scheme: No capital - 3

- G-S Model = Canonical Model when $\beta = 0$, i.e., land not an input in non-housing sector
- Pop. Density increases p^H iff $\alpha > \beta$, i.e., by doubling the dimension of a house we (much) less than double housing services
- BUT: Asymmetry in how land enters production of the two goods:
- No new houses w/out extra land but we can increase capital and labor to produce C with no change in land use

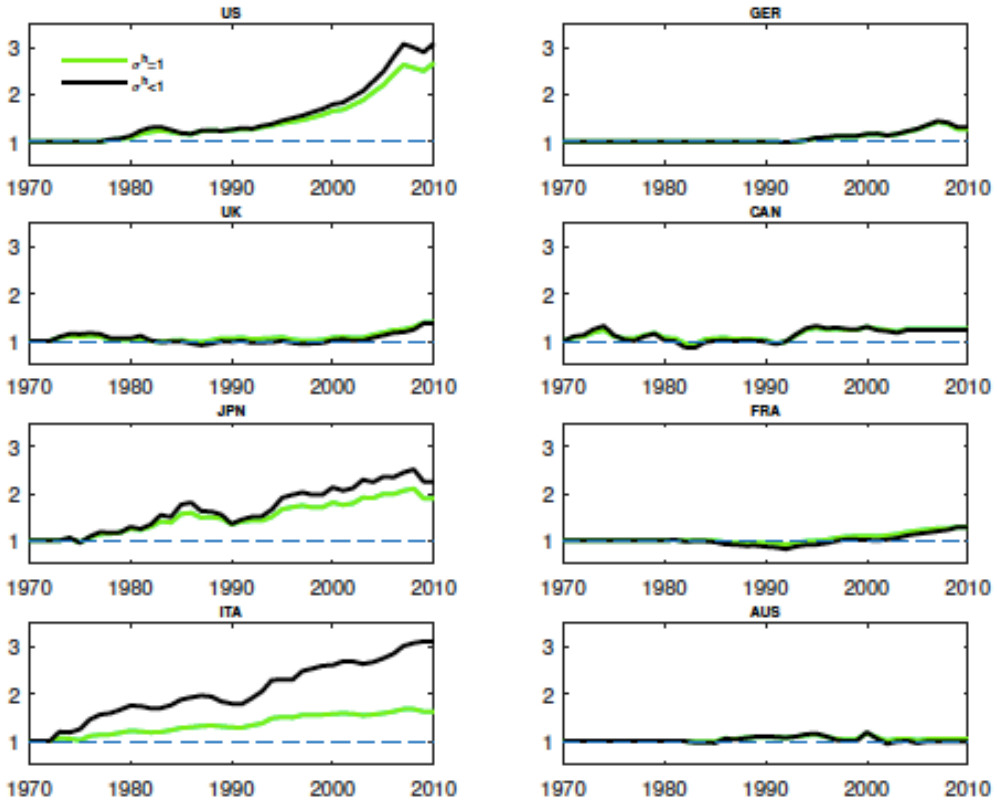
Further comments - 1

- Unit elastic demands for consumption and housing services + Cobb-Douglas tech. is a strong assumption (it washes out any effect of relative TFP on long-run asset prices and wealth to income)

$$\text{H. Prices} = f\left(\underbrace{\text{TFP, demand elasticities}}_{\text{they vanish}}, \text{Factor Endowments}\right)$$

Data: Borri & Reichlin

Relative Labor Efficiency in manufacturing vs. construction sector (CLEMS with CES specifiction)



Further comments - 2

- Is land scarcity the main factor behind the secular rise in housing prices and housing wealth as a share of total wealth? Is Land a truly fixed factor?

Glaeser, Gyourko & Saks ('05):
The supply of housing includes three elements: land, a physical structure, and government approval to put the structure on the land

There is evidence that rising density is not strong enough to explain large declines in construction - man-made scarcity more important than geography

Conclusions

- paper very interesting, helps in developing a consistent theory of housing demand
- I am not totally confident that the premises have strong consequences on the way we should think about long run trends in housing prices
- I would like to see more evidence based on disaggregated data that technology and preferences are not important