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Handbook of Real Estate and Macroeconomics by Charles Ka Yui Leung (*ed.*), 480 pp, Edward Elgar Publishing Ltd (2022), £203

The real estate sector plays a vital function in an economy as a store of wealth. However, standard macroeconomics textbooks only loosely allude to the importance of the real sector by discussing the fluctuation in housing prices leading to a wealth effect, and thereby affecting consumption and gross domestic product (GDP). It is against this backdrop that the book "Handbook of Real Estate and Macroeconomics" edited by Charles Ka Yui Leung presents a set of academic papers to give a deeper exposure to the interactions between real estate and macroeconomics and their effects on economic conditions from various countries across the world.

The book is divided into four parts with separate themes. The first part is titled as "Real estate-related wealth and macroeconomics", which deals with the real estate-related wealth effects and related questions. The chapter "Real estate market and consumption: Macro and micro evidence of Japan" by Kazuo Ogawa discusses the interaction between the real estate market and consumption in Japan. The real estate market can affect consumption through two channels: one is the wealth effect channel on the lines of the life cycle permanent income hypothesis of consumption (LCY-PIH), wherein consumption is determined by total wealth, including tangible wealth. The second is the collateral channel, where consumption depends on net worth, which gets affected by the changes in the balance sheet due to changes in the valuation of real estate. This can affect the ability to raise external finance. Using a Vector Autoregression (VAR) model on the quarterly time series data from 1980 to 2018, the author finds the collateral channel to dominate in propagating the shocks in land prices to consumption through consumer borrowing. Another interesting finding of this paper is the significant positive impact of housing wealth on consumption in case of younger households (whose heads were aged below 50 years) and not for the older households.

In the chapter "The Bank of Japan as a real estate tycoon: Large-scale REIT purchases", Bank of Japan's (BOJ) real estate investment trusts (REIT) share purchase programme is studied in detail by Takahiro Hattori and Jiro

Yoshida; it highlights the discretionary purchases by BOJ of REIT shares, which effectively aimed at reducing the risk premiums.

In the chapter, "Land and macroeconomics" using a quasi-experimental setup with a flexible event-study design and the difference-in-differences technique to identify the causal effect of land reforms on urbanisation, Prasad Sankar Bhattacharya highlights land reform implementation across the world. Land reforms involving the transfer of end-user rights to beneficiaries led to an increased urbanisation over time as compared to land reforms without the provision of transfer of end-user rights.

Another essential issue connecting real estate and macroeconomics is housing affordability, which is dealt with in the second part of the book titled "Housing price dynamics and affordability". The chapter "Affordable housing conundrum in India" highlights that inadequate housing should not be simply seen as the need to build more houses. It is necessary to work on upgradation, extension, and rebuilding of the existing houses before building new houses. The authors, namely Piyush Tiwari and Jyoti Shukla, argue that policies that encourage the development of smaller houses with the possibility of extension in future would improve affordability of housing for low- and middle-income households in India.

The chapter "The effect of macroeconomic uncertainty on housing returns and volatility: Evidence from US state-level data" by Reneé van Eyden, Rangan Gupta, Christophe André and Xin Sheng estimates a dynamic factor model with time-varying loadings and stochastic volatility (DFM-TV-SV) using Bayesian methods to dissect national and local factors affecting housing returns and volatility in the 50 US states and the district of Columbia. They then employ panel data methods with heterogenous coefficients to relate the first and second order moments with corresponding state-level uncertainty. They find that almost all states have a positive and significant relationship between macroeconomic uncertainty and the stochastic volatility measure. However, only 12 to 14 states show a significant negative relationship between uncertainty and housing returns.

Another interesting area of study is the structural change in housing market following a major event. A natural candidate in the recent past for this is the Global Financial Crisis (GFC), which is the theme of the third part of the book titled "Financial crisis and structural change". The chapter "Is housing still the business cycle?" revisits residential investment's impressive ability to predict US GDP in the years before the GFC. The author (Richard K. Green) conducts Granger causality tests with the new data available after GFC and finds no evidence of residential investments causing GDP once data from 2008 onward is considered. On whether housing has ceased to be an instrument of monetary policy, the chapter argues that the Federal funds rate no longer influences new constructions. Quantitative easing as a new policy lever after GFC allowed the Federal Reserve to influence mortgage rates and other long-term rates leading to attenuation of the influence of short-term rates. However, even though long-term rates continued to influence new construction, the levels of new construction relative to GDP remained quite low by historical standards. As has been reported in the literature[1], the regulatory constraints against housing are responsible for undermining the efficacy of this channel.

In the chapter "International macroeconomic aspect of housing", the author (Joe Cho Yiu Ng) investigates the relationship among the business cycle components of housing prices and macroeconomic variables in 22 Organisation for Economic Cooperation and Development (OECD) countries. The idea is to examine whether the correlations have changed since the GFC among the real housing prices and other macroeconomic variables such as real GDP, unemployment rate, current account balance, real short-term interest rate, real credit to households, real consumption, and consumer price index (CPI). The author concludes that the strength of the linear association between housing prices and many macroeconomic variables has changed since the GFC. For instance, the correlation between housing prices and GDP has weakened in real terms in many countries, whereas the correlation between housing prices and unemployment rate has strengthened in countries like France and Italy.

The issues related to non-residential estate are dealt in the fourth part of the book titled as "Non-residential real estate". The chapter "From the regional economy to the macroeconomy" discusses the importance of the spatial distribution of economic activity for its fluctuations and aggregate outcomes. The authors, Santiago M. Pinto and Pierre-Daniel G. Sarte, build

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[1] See Hsieh, Chang-Tai, and Enrico Moretti. (2019). Housing constraints and spatial misallocation. *American Economic Journal: Macroeconomics,* 11(2):1-39.

their analytical model on the framework provided by Roback (1982), where spatial equilibrium is a state with no incentive to move to any other region, *i.e.*, profits for firms and utilities for households are equal across space. It shows that to the extent that factors of production are spatially mobile, land rent and wages will reflect the region's attributes in equilibrium. Moving from the regional level to the aggregate level, the transportation system is found to be a key determinant in the economic performance of regions, as it improves spatial access to jobs and increases connectivity between high-unemployment neighbourhoods and locations with an abundance of jobs.

The chapter "Pension funds and private equity real estate" traces the long-term relationship between private equity real estate and pension funds, as the latter hold major investments in the former. According to the author Timothy J. Riddiough, pension funds pose risks to economic and financial stability due to concentrated levels of pension fund ownership in commercial real estate (CRE). These risks include sponsor concentration risks, and geographical concentration risks with high ownership of CRE assets by pension funds in the largest cities in the US and other countries.

The chapter "A mayor's perspective on tackling air pollution" by Shihe Fu and V. Brian Viard describes the sources, social costs and mitigation policies relating to air pollution. Air pollution imposes costs on cities *via* its impact on health, mortality, psychological well-being, labour productivity, labour mobility, and out-migration. The chapter has outlined multiple policies that are effective in reducing air pollution, ranging from some forms of driving restrictions, appropriately set congestion tolls, targeted public transit infrastructure, and incentive-aligned emissions standards. The other set of policies could be to encourage active commuting (walking or biking to work), subsidised green vehicles, increased percentage of prefabricated materials in construction, and use of water-canon trucks to suppress road dust.

In conclusion, the book presents interesting insights from real-life cases across countries on the interaction of real estate and macroeconomics, having implications for households, producers, and policymakers. It could also perhaps pave the way for a deeper incorporation of real estate dynamics in the standard macroeconomics texts. The book holds useful policy implications arising from the application of real estate in areas encompassing consumption, investment, affordability of houses, and other externalities. These policy prescriptions backed by the rigorous empirical work can help address a variety of emerging concerns ranging from macroeconomic management at the national level to air pollution at the city level.

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