Research Statement - Seungyub Han[1] (UCLA) November 2023
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1 Introduction

I am a macroeconomist, specializing in international economics and housing economics (household finance and urban/spatial economics).

In the field of international economics, my primary focus is on understanding international business cycles and the role of international financial markets. My recent research has delved into the mechanics of real exchange rates, examined the impact of liquidity demand on the determination of nominal exchange rates, and examined how changes in asset valuations affect international balance sheets. To study these topics, I employ a range of methods to study these topics, including structural models (such as the two-country model with a housing sector and the small-open economy model with a banking sector) and empirical analyses such as proxy structural VAR.

In the realm of housing economics, I primarily focus on understanding the implications of housing on household investment decisions and the broader resource allocations within a general equilibrium framework. My recent research investigates into the impact of housing acquisitions on household stock market investments: I examine how house prices influence household decisions to become an entrepreneur and the effects of housing supply policies on local economies. To shed light on these issues, I use a variety of models—such as life-cycle portfolio choice models and multi-region growth models—and conduct empirical analyses, such as household-level panel regressions, while instrumenting for house price changes.

2 Job Market Paper

My job market paper, titled **"Housing Rent, Inelastic Housing Supply, and International Business Cycles,"** serves as a convergence of my interests in international economics and housing economics. In this work, I examine the integral role of housing in shaping international business cycles, and especially the real exchange rate dynamics. Housing rent constitutes a significant portion of total expenditures, and housing services demonstrate an exceptionally inelastic supply when compared with other nontradables. Despite these important characteristics, previous studies have often overlooked housing's unique role and typically treated it as just another nontradable service. My paper aims to fill this gap by placing a distinct focus on housing services.

To analyze the role of housing in the real exchange rate in the data, I study eurozone countries with the aim of eliminating the influence of nominal exchange rates. Using the Eurostat PPP database, which provides item-level price data for 224 goods and services that cover an entire consumption basket, I construct real exchange rates (RER) and break them down into components: the relative price levels of tradable, nontradable, and housing services. This decomposition allows for an assessment of each component's contribution to variations in

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RER. I find that relative rent is the most volatile component, and plays a significant role in both cross-sectional and time-series fluctuations of RER. Moreover, relative rents account for over half of the Balassa-Samuelson effect and the negative Backus-Smith correlation in these eurozone economies.

To understand why relative rent is so important for various dimensions of RER, I construct a two-country model with a realistically calibrated housing sector, combining the work of Berka et al. (2018) and Davis and Heathcote (2005). Using this model, I simulate Eurozone economies with sectoral productivity shocks, calibrated directly from the EUKLEMS database. This simulation yields simulated panel data of RER and other macroeconomic variables. By replicating the empirical analysis I performed with these model-generated panel data, I explore the role of the housing market and ensures full integration of general equilibrium forces.

This simulation study provides several insights into the relationship between housing, real exchange rates, and their components. First, due to the highly inelastic housing supply in the model, demand shocks stemming from an incomplete market are necessary to generate relative rent volatility comparable to that observed in the data.

In addition, the simulation reveals that the unique characteristics of housing services—such as land's role as a critical input for construction and the small flow of new housing compared with the large existing housing stock—act to dampen the conventional textbook Balassa-Samuelson hypothesis mechanism. The model demonstrates that the dominant influence of the Balassa-Samuelson effect through housing rent is attributed to the distribution of sectoral productivities among Eurozone countries. Data from the EUKLEMS database indicates that countries with higher tradable sector productivities also exhibit higher nontradable sector productivities, yet their construction sector productivities are lower compared than in other countries. This discrepancy makes the textbook Balassa-Samuelson hypothesis mechanism exclusively work via housing rent. The simulation also demonstrates that the wealth effect, intensified by an incomplete market, serves to amplify the model-generated Balassa-Samuelson effect.

Lastly, the inclusion of housing proves beneficial in addressing the Backus-Smith puzzle. In the model, an inelastic housing supply renders the aggregate supply curve more inelastic, and changes the model-generated RER by causing it to be more influenced by the wealth effects that arises from incomplete markets. This results in a stronger negative Backus-Smith correlation, in which both relative prices and relative consumption increase. Furthermore, the now more inelastic aggregate supply diminishes the impact of nontradable sector productivity shocks, which typically act as potent supply shocks that generate a positive correlation. These two forces together enable my model to generate a more realistic Backus-Smith correlation.

In conclusion, this study offers a comprehensive analysis of housing's role in shaping the empirical regularities of the real exchange rate, which is an important general equilibrium object in international economics in both data and theory. Building upon these results, I aim to further enrich this research by exploring several underexamined aspects of housing in the literature. My future endeavors include examining the effects of nonhomothetic preferences for

housing consumption, evaluating the impacts of rent-control policies, and investigating the influence of housing finance systems on international business cycles. Through this extended analysis of housing dynamics, I aspire to provide more holistic understanding of housing's influence on international business cycles.

3 Other Research in International Economics

In one of my ongoing projects in the field of international economics, titled **"Dollar Liquidity Flows in Small Open Economies,"** I am collaborating with Saki Bigio and Paul Castillo to examine the intricate relationship between nominal exchange rates and the banking sector's demand for liquidity, with a particular focus on the Peruvian economy. In Peru, as a dollarized economy, the banking sector holds a significant dollar-denominated deposit, which results in substantial demand for liquid dollar assets for addressing the potential withdrawal requests. If liquidity becomes an important factor in portfolio choices, the uncovered interest parity (UIP) condition may not hold, because banks might accept lower returns in exchange for the liquidity benefit. This opens the door for quantity, not price, to influence nominal exchange rates.

To investigate the presence of this mechanism in real-world data, we employ the proxy structural VAR used in Gertler and Karadi (2015). Based on Peru's heavy reliance on copper for its export revenue, we use copper prices as a proxy to represent shocks to the supply of liquid dollar assets into the Peruvian banking sector. Our estimation results indicate that exogenous increases in copper prices lead to a greater inflow of dollar deposits into the banking sector, which results in the appreciation of the Peruvian sol and a reduction in the dollar liquidity ratio within the banking sector.

We interpret these empirical results as indicative of the banking sector's endogenous reaction to an unexpected abundance of dollars, which leads to the appreciation of the sol. In an effort to provide a theoretical underpinning for these observations, we have constructed a small open-economy model that features a banking sector under withdrawal shocks. Preliminary results show that our model successfully replicates many of the impulse response functions found in estimated VAR. Nonetheless, as we move forward, we plan to enhance the model by integrating bonds with the aim of refining its predictive accuracy. Ultimately, our research seeks to shed light on the role and efficacy of the foreign exchange (FX) intervention policies in dollarized economies.

In another research project, titled **"International Balance Sheet: A Deep Dive,"** I am working in collaboration with Allen Cian and Luciana Juvenal to explore the implications of valuation effects on international balance sheets. We use data from the Stock-Flow Reconciliation Survey, provided by the IMF, which elucidates the extent to which fluctuations in net foreign asset positions are attributable to changes in asset prices or nominal exchange rates. This comprehensive dataset encompasses a wide array of asset and liability categories, and covers the international balance sheets of numerous countries.

By leveraging this dataset, we investigate the determinants of net foreign asset position sustainability and their return predictability. We also examine the presence of the "exorbitant

duty" conceptualized by Gourinchas et al. (2017). Our findings reveal a tangible manifestation of this phenomenon: whenever the VIX increases, a wealth transfer occurs from the US to emerging economies. This transfer occurs through a twofold dynamic—a contraction in the global equity value coupled with the maintained valuation of U.S. debt liabilities—which corroborates the existence of the "exorbitant duty" in empirical data.

4 Other Research in Housing Economics

4.1 Household Finance

In my working paper, titled **"The Effect of Housing on Portfolio Choice: House Price Risk and Liquidity Constraints,"** I explore how housing choice affects the stock investment decisions of households. Housing purchases are known to crowd out stock holdings, primarily due to liquidity constraints (households lacking funds for stock investment after buying a house) and house price risk (households intentionally reduce stock holdings to lower their risk because housing is a risky asset). However, distinguishing between these channels has been challenging due to simultaneity. To fill this gap in the literature, I created a life-cycle portfolio choice model with endogenous housing tenure choice and stock market participation. The model predicts that the liquidity constraint channel mainly affects young and low-net-wealth-to-income ratio households, while the house price risk channel affects all household types, including those with a high net wealth-to-income ratio.

To validate these model predictions, I employ a unique Korean housing tenure type known as "jeonse." This is a 2-year long-term housing rental contract in which tenants pay upfront deposits equivalent to 60%-70% of the house price. They reside in the house during the 2-year period without paying rent and are assured of receiving their full deposit back, with no change in its value, at the end of the contract. This contract structure eliminates house price risk for tenants, since they are guaranteed to recoup their entire deposit. Also, the substantial deposit, amounting to 60-70 percent of the house price, is sufficient to trigger the liquidity constraint channel. Using household survey panel data from the Korean Labor and Income Panel Study, which offers detailed housing tenure and stock investment information, I found that the crowding-out effect of jeonse, which represents the liquidity constraint channel, only impacts young or low-net-wealth-to-income ratio households. Conversely, housing purchases, which represents the sum of the liquidity constraint channel and the house price risk channel, reduce stock investment for all household types, which validates the model prediction. This study shows differential impacts of housing purchase on households' stock investment decisions, depending on their ages and wealth.

In a subsequent work in progress, titled **"Skyrocketing House Prices and Squeezed Young Entrepreneurs,"** Jinseok Park and I investigate the impact of housing on another form of investment: entrepreneurship. Our hypothesis posits that an exogenous increase in house prices should hinder young renters from transitioning into entrepreneurship. Because young renters do not own a home, they typically face the most tightest borrowing constraints. In such a scenario, an increase in exogenous house prices is expected to raise their expenditures (whether for buying a house or paying rent) and thus discourage them from investing in new

businesses. Although the literature often emphasizes the benefits of rising house prices for entrepreneurs with homeownership, we provide an alternative perspective on this economic issue.

To test our hypothesis, we use two primary datasets. The first is the CPS ASEC household survey, which contains detailed information on demographics, homeownership status, and entrepreneurship decisions. The second is the Zillow home value index, which provides the median house price level for each core-based statistical area (CBSA). By combining these datasets, we construct individual-level house price-to-income ratios as proxies for the housing purchase burden faced by each individual. To address potential endogeneity concerns, we employ exogenous variations in the house price-to-income ratio, using housing supply elasticity from Albert (2010) and regional house price cycles from Guren et al. (2021) as instrumental variables (IVs). Our household-level regression using these IVs indicates that whenever there is an exogenous increase in the house price-to-income ratio, young renters experience the most significant decline in their transition to entrepreneurship.

This finding suggests a potential factor that contributes to the recent decline in business dynamism. Since the early 2000s, the house price-to-income ratio in the US has risen to unprecedented levels which may come from low interest rate, rapid urbanization or tighter land-use regulations. According to our hypothesis, this trend may discourage young renters from pursuing entrepreneurship, and thereby contribute to the decline in business dynamism. We plan to develop a life-cycle model that incorporates endogenous housing tenure and entrepreneurship choices. By using this model, we aim to quantify the extent to which the decline in business dynamism can be attributed to the secular increase in the house price-to-income ratio in the US.

4.2 Urban and Spatial Economics

In my recent working paper, titled **"Building Housing: The Allocative Efficiency of Creating New Cities Versus Expanding Existing Cities,"** coauthored with Sunham Kim, we assess the impact of two distinct land-use policies in South Korea using multi-region growth models from Herkenhoff et al. (2018).

Our study begins by estimating regional-level land-use restrictions and total factor productivities (TFP) by interpreting actual regional-level data through the lenses of the model. These land-use restrictions refer to regulations that govern the extent to which land can be used for housing or construction. Our estimates show that the Seoul metropolitan area (SMA) has experienced relatively lenient land-use restrictions. While this has contributed to an enhancement in South Korea's aggregate TFP, it has also inadvertently resulted in regional decline by concentrating economic resources predominantly in the SMA.

Using these estimates and a comprehensive dataset that details the project costs associated with all New Town Projects initiated by the South Korean government—programs aimed at developing infrastructure and supplying new houses in previously undeveloped areas—we perform various policy counterfactual analyses. Specifically, we aim to understand the impact of the second New Town Project, which provided 666,000 new houses near the SMA in the early 2000s. Our model analysis demonstrates that the second New Town Project was cost-

effective and resulted in a 0.4% increase in real aggregate GDP flow relative to a one-time cost of 4.05% of GDP. This is attributed to the fact that more households are able to work near the SMA with higher productivity. Also, it significantly affects regional resource reallocation by moving the population from rural areas to near the SMA. Our estimates indicate that this project decreased the overall rural population by 4%.

My coauthor and I are currently planning our next project, which will delve deeper into the role of the housing market in misallocation, while considering job heterogeneities. Recent research, such as Herkenhoff et al. (2018) and Hsieh and Moretti (2019), has estimated the impact of misallocation caused by the housing market on aggregate TFP. Their primary argument is that elevated housing prices can hinder workers from relocating to areas with high TFP, and thereby preventing full utilization of the potential productivity in those regions. While this misallocation effect has been a central focus for many urban economists, we argue that the influence of job heterogeneity on it is important but often overlooked. The rationale is straightforward. Even if housing prices are exceptionally high, as is the case in San Francisco, high TFP in certain industries in those regions, such as the IT sector, can still be fully exploited because computer programmers, for instance, receive sufficiently high wages to afford living in such areas.

The interplay between high TFP, elevated housing prices, and substantial labor income can significantly impact recent estimates of resource misallocation attributed to the housing market. We are currently combining data from the County Business Pattern (CBP) database, which provides information on wage heterogeneity by industry and skills, with data from the CPS ASEC household survey, which offers insights into migration patterns. This combined dataset will enable us to explore the relationship between job heterogeneity, housing market dynamics, and resource misallocation in greater depth.

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