Research Statement - Seungyub Han[1] (UCLA) (October 25, 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 explored how changes in asset valuations affect international balance sheets. To study these topics, I employ a range of methods, including structural models (such as the two-country model with a housing sector and the small-open economy model with a banking sector), as well as empirical analyses like 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 delves into the impact of housing acquisitions on household stock market investments, examining how house prices influence household decisions to become an entrepreneur, and investigating the effects of housing supply policies on local economies. To shed light on these issues, I utilize a variety of models, such as life-cycle portfolio choice models and multi-region growth models, and conduct empirical analyses, including 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 delve into the integral role of housing in shaping international business cycles, 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 to other nontradables. Despite these important characteristics, previous literature has often overlooked housing's unique role, typically treating 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, aiming to eliminate the influence of nominal exchange rates. Using the Eurostat PPP database, which provides item-level price data for 224 goods and services covering the entire consumption basket, I construct real exchange rates (RER) and break them down into components: relative price levels of tradable, nontradable, and housing services. This decom-

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position allows for an assessment of each component's contribution to variations in RER. I find that relative rent is the most volatile component, playing 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 three-sector model with a realistically calibrated housing sector, combining the works 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 did with these model-generated panel data, I explore the role of the housing market, ensuring 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 being a critical input for construction, and the small flow of new housing compared to the large existing housing stock—act to dampen the conventional 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 to other countries. This discrepancy amplifies the textbook Balassa-Samuelson hypothesis mechanism exclusively 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, shifting the dynamics to be more influenced by wealth effects arising from incomplete markets. This results in a negative correlation, akin to a demand shock. Furthermore, the now more inelastic aggregate supply diminishes the impact of nontradable sector productivity shocks, which typically act as potent supply shocks generating a positive correlation.

In conclusion, my research offers a comprehensive analysis of housing's role in shaping the empirical regularities of the real exchange rate, 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 existing literature. My future endeavors include examining the effects of non-homothetic 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 a 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 delve into 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, resulting in a substantial demand for liquid dollar assets. If liquidity becomes an important factor in portfolio choices, the Uncovered Interest Parity (UIP) condition may not hold, as 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 utilize a proxy structural VAR used in Gertler and Karadi (2015). Based on Peru's heavy reliance on copper for its export revenue, we select 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, resulting 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, leading 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, aiming to refine its predictive accuracy. Ultimately, our research seek 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 are using 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, covering the international balance sheets of numerous countries.

Leveraging this dataset, we investigate the determinants of net foreign asset position sustainability and their return predictability. Furthermore, we 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 escalates, a wealth transfer happens from the United States 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—corroborating 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 reducing 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 utilized a unique Korean housing tenure type known as "jeonse." Jeonse is a 2-year long-term housing rental contract where tenants pay upfront deposits equivalent to 60-70 percent of the house price. During the 2-year period, they reside in the house 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. Additionally, 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 named 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, representing the liquidity constraint channel, only impacts young or low-net-wealth-to-income ratio households. Conversely, housing purchases, representing the sum of the liquidity constraint channel and the house price risk channel, reduce stock investment for all household types, validating 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. Young renters, lacking their own homes, typically face the most tight 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), discouraging them from investing in new businesses. While existing 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 utilize 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 median house price level for each CBSA (Core-Based Statistical Area). 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, utilizing housing supply elasticity from Albert (2010) and regional house price cycles from Guren et al. (2021) as instruments (IV). 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 contributing to the recent decline in business dynamism. Since the early 2000s, the house price-to-income ratio in the US has been rising to unprecedented levels. According to our hypothesis, this trend may discourage young renters from pursuing entrepreneurship, thereby contributing 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,"** co-authored 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 the regional-level land-use restrictions and total factor productivities (TFP) by interpreting the actual regional-level data through the lenses of the model. These land-use restrictions refer to regulations governing the extent to which land can be utilized for housing or construction. Our estimates show that 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, concentrating economic resources predominantly in the SMA.

Using these estimates and a comprehensive dataset detailing 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 proceed to perform various policy counterfactual analyses. Specifically, we aim to understand the impact of the 2nd New Town Project, which provided 666,000 new houses near the SMA in early 2000s. Our model analysis demonstrates that the 2nd New Town Project was cost-effective, resulting 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 more households being able to work near SMA with higher productivity. Also, it significantly affects regional resource reallocation by moving the population from rural areas to near 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 studying 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 total factor productivity (TFP). Their primary argument is that elevated housing prices can hinder workers from relocating to areas with high TFP, thereby preventing the 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, 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 CBP (County Business Pattern) 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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