Inequality, Home Production, and Monetary Policy

Vanessa B. Schmidt*

November 3, 2025

Job Market Paper

Abstract

I study the role of home production in determining the labor income channel through which monetary policy affects consumption inequality. To this end, I develop a Two-Agent New Keynesian model with home production. In the context of my model, hand-to-mouth households experience a sharper decline in labor income compared to richer households in response to a contractionary monetary policy shock. However, they increase home production to a greater extent than richer households do. The resulting labor income channel is therefore one third the size when accounting for home production. In line with my theoretical results, I show empirically that individuals living hand-to-mouth respond to contractionary monetary policy shocks by increasing home production by more than richer people do.

Keywords: constrained households, consumption inequality, home production, monetary policy, TANK models

JEL Codes: E21, E52, J22

*Berlin School of Economics and Humboldt-Universität zu Berlin, vanessa.barbara.schmidt@hu-berlin.de.
I thank Veljko Bojovic, Michael C. Burda, Daniel Hamermesh, Sebastian Hildebrand, Jonas Jessen, Johanna Krenz, Konrad Kuhmann, Mauricio Salgado-Moreno, Clara Schaeper, Ben Schumann, Johannes Seebauer, Hannah Seidl, Fabian Seyrich, Lutz Weinke, Leopold Zessner-Spitzenberg, and participants at several conferences and seminars for their helpful comments.

1 Introduction

Does home production have an impact on the labor income channel through which monetary policy affects consumption inequality?[1] The literature has identified various channels through which monetary policy affects consumption inequality. One of these channels is the labor income channel: it is empirically well documented that contractionary monetary policy[2] reduces labor income by more for poor households than for richer ones, yielding an increase in consumption inequality (see, e.g., McKay and Wolf (2023)). In this context, I make the following observation: while consumption typically refers to consumption of goods bought on the market, households can also produce consumption goods at home (Becker, 1965). Compared to richer households, poor households—whose labor income is more sensitive to monetary policy shocks—may rely relatively more on home production to smooth consumption. This motivates the question stated above.

In this paper, I proceed in two steps. First, I show empirically that time spent on home production is affected by monetary policy, and that this effect differs across rich and poor individuals. In the following, I refer to poor individuals as individuals whose net wealth is less than twice their monthly net labor income (Zeldes, 1989), and therefore, live hand-to-mouth (HtM), while richer individuals are called savers, because they can save and borrow in the financial market. More concretely, my empirical specification estimates how time use of the HtM and of savers changes in response to a contractionary monetary policy shock. I use monetary policy surprises from Altavilla et al. (2019), and I distinguish between pure monetary policy and information shocks as in Jarociński and Karadi (2020). I obtain individual time-use data from the Socio-Economic Panel (SOEP), which is an annual survey in Germany.

In response to a 100-basis-point increase in the annualized nominal interest rate, I find that individuals who are HtM increase home production by more than savers do. To be precise, I focus on time spent on housework and on running errands as consumption smoothing devices, and I find that everyone increases time spent on housework to the same extent. However, the HtM increase time spent on running errands by more than savers do. Increasing time spent on running errands in response to a contractionary monetary policy shock could mean that the HtM spend more time on searching for low prices.

In the second step, I develop a Two-Agent New Keynesian (TANK) model that is consistent with my empirical results to assess the impact of home production on the trans-

[1] It is particularly interesting to study consumption inequality, as it is directly related to households' well-being (see, e.g., McKay and Wolf (2023)).

[2] Note that my analysis abstracts from asymmetries in the dynamic consequences of monetary policy shocks. However, for the sake of concreteness, I always refer to a contractionary monetary policy shock.

mission from monetary policy to aggregate output[3] and to consumption inequality. I use a TANK model instead of a Heterogeneous Agent New Keynesian (HANK) model for two reasons. First, in contrast to a HANK model, a TANK model is more parsimonious, and therefore, tractable. Second, while household heterogeneity in the form of unconstrained and constrained households is empirically relevant for aggregate fluctuations (Campbell and Mankiw, 1989), it is still an open research question whether household heterogeneity that goes beyond distinguishing constrained and unconstrained households matters empirically for explaining aggregate fluctuations.[4]

I expand the standard TANK model by adding home production as in Gnocchi et al. (2016), such that all households[5] allocate their time optimally among market work, home production, and leisure. There are two types of consumption goods—consumption goods bought on the market and consumption goods produced at home—that are aggregated via a constant elasticity of substitution (CES) aggregator. Households produce consumption goods at home with hours worked in home production. I consider two different degrees of nominal wage stickiness in the sense that the wage of HtM households is sticker compared to the one of savers (see Komatsu (2023) and the references therein). As I will explain further below, this feature allows me to generate different labor income responses of HtM households and savers to monetary policy shocks in my model. I further include sticky prices into the model to allow for fluctuations in real wages. If only wages were sticky and prices flexible, the price markup and thus, also the real marginal cost would be constant.[6]

Through the lens of my model, I find that the gap in total consumption between HtM households and savers is 0.08 percentage points (pp) on impact following a 100-basis-point increase in the annualized nominal interest rate, compared to 0.24 pp in a model without home production. Thus, home production reduces the size of the labor income channel by two thirds. The reason is that even though HtM households experience a sharper decline in market hours and thereby in labor income compared to savers, the drop in consumption of the HtM is partially offset through a larger increase in home production.

In the baseline model, I assume that the government taxes the firms' profits at rate one. I choose such an extreme form of taxation in order to isolate the effect of changes in labor income on consumption inequality. In a model extension, I show that my results are similar

[3]Looking at the transmission from monetary policy to aggregate output demonstrates that my model yields an empirically relevant monetary transmission mechanism.

[4]For instance, the analysis in Debortoli and Galí (2025) appears to suggest that household heterogeneity that goes beyond distinguishing constrained and unconstrained households does not matter empirically for explaining aggregate fluctuations.

[5]Note that my empirical results are based on individual-level data. In the context of my theoretical model there is no distinction between a household and an individual, and I therefore use those words interchangeably.

[6]For a discussion of this point, see, e.g., Auclert et al. (2020).

if households receive profit income. The reason for the small difference is that profit income and labor income decrease (in response to the monetary policy shock under consideration) to a similar extent in my model. Yet, the decrease in profit income yields slightly less substitution towards the home sector, as households compensate for the profit income loss with higher labor supply in the market.

My paper contributes to the empirical literature on consumption smoothing with home production. Aguiar and Hurst (2005) show that retired and unemployed people smooth consumption by increasing time spent on searching for lower prices. Cacciatore et al. (2024) and Burda and Hamermesh (2010) document cyclical adjustments in home production.

Let me also note that my paper is complementary to the work by Boerma and Karabarbounis (2021). While they focus on the effect of home production on inequality in standards of living in the context of a steady-state analysis, I look at the change in consumption inequality in response to a monetary policy shock.

The theoretical part of my paper builds on the literature on home production brought forward by Becker (1965). In the field of macroeconomics, Benhabib et al. (1991), Greenwood and Hercowitz (1991), and McGrattan et al. (1997) are seminal contributions. They show that home production matters for business cycle fluctuations. More recently, Olovsson (2015) and Gnocchi et al. (2016) consider a model with a representative household and home production. The former considers an optimal taxation problem and the latter analyzes the size of the fiscal multiplier. Similar to my paper, also Aruoba et al. (2016) look at the interaction of monetary policy and home production. However, the focus in their work is on housing as a form of home capital in a representative agent New Keynesian (RANK) model. By way of contrast, my contribution analyzes the interaction of monetary policy and consumption inequality in the context of a TANK model with home production. For this reason, my paper also contributes to the large and rapidly growing literature on household heterogeneity and monetary policy.[7]

The rest of the paper is organized as follows. Section 2 presents the empirical analysis. Section 3 outlines the model, and section 4 contains the theoretical results. Section 5 conducts a robustness analysis, and section 6 concludes.

2 Empirical evidence

I analyze individual-level time use, both on average between 2002 and 2017 in Germany, and in response to monetary policy shocks. I further estimate the size of the labor income

[7]See, e.g., Ahn et al. (2018), Auclert (2019), Bayer et al. (2024), Bilbiie (2008) and Kaplan et al. (2018), among many others.

channel in my data. I use the average time use of HtM and savers, and the estimated size of the labor income channel to calibrate my model. I then compare the theoretical impulse response functions of time use to monetary policy shocks with my empirical results.

2.1 Data description

I construct an annual panel dataset to estimate the time-use responses of HtM individuals and savers to monetary policy shocks. The sample period starts with the introduction of the Euro in 1999 and ends in 2019, before the start of the Covid-19 pandemic.

Monetary policy shocks. For the European Central Bank monetary policy shocks, I use the monetary policy surprises from Altavilla et al. (2019), and I distinguish between monetary policy and information shocks as in Jarociński and Karadi (2020). The latter propose to look at stock prices in addition to interest rates to distinguish between monetary policy and information shocks. The reason is as follows. When interest rates increase and stock prices decrease, the shock is a classical contractionary monetary policy shock. However, when interest rates and stock prices increase simultaneously, the resulting shock is rather a positive information shock and not a contractionary monetary policy shock. As proposed by Jarociński and Karadi (2020), I use the "poor man's" sign restriction to implement the identification of a monetary policy shock. The key assumption is that in each month, either a pure monetary policy or a pure information shock can hit the economy. Thus, a simple identification with sign restrictions is sufficient to distinguish between monetary policy and information shocks. I aggregate the monthly data to the annual frequency by summing up all monetary policy surprises in one year (see, e.g., Amberg et al. (2022)).

Individual-level data. For the individual-level data on the allocation of time and the HtM classification, I use data from the SOEP, which is a yearly panel survey with around 20,000 households in Germany since 1984. The survey includes information on individuals and on the corresponding households. Data on wealth is collected every 5 years, starting in 2002.[8] For more information on the SOEP see Goebel et al. (2019).

According to Aguiar and Hurst (2016) core home production includes activities related to home ownership, obtaining goods and services, and care for other adults. These activities correspond to the following four time-use variables in the SOEP: "Errands (shopping, trips to government agencies, etc.)," "Housework (washing, cooking, cleaning)," "Care and support

[8]Wealth data from 2002, 2007, 2012 and 2017 is currently available. The wealth data was collected again in 2019 for administrative reasons, but this data is not yet available.

for persons in need of care," and "Repairs on and around the house, car repairs, garden work." I use the data on the allocation of time on weekdays, as it is collected every year.

As mentioned above, for the classification of being HtM I follow Zeldes (1989): HtM are those individuals whose net wealth is less than two months of their net labor income.

Table 1 presents the number of observations in the raw dataset and in the processed one. In the processed dataset, wealth and wages are trimmed at the 1st and the 99th percentile. I further exclude individuals whose time spent on leisure, market work, home production, childcare, education and training exceeds 16 hours per day,[9] and individuals who do not spend any time on home production and market work at all. Finally, I only include the working-age population, as defined by the Organisation for Economic Co-operation and Development (OECD), that is individuals aged between 15 and 64 years.[10] The resulting panel is unbalanced, as for example individuals drop out of the selection when they become unemployed or retire, and individuals enter the panel (again) when they become employed. The data on wealth, and therefore also the information on being HtM, is only available every five years.

Table 1: Observations

Observations in raw dataset	525,211
Observations in processed dataset	196,299
Observations in processed dataset with HtM information	38,496

Notes: (i) source: SOEP, DOI: 10.5684/soep.v37, (ii) period: 1999-2019.

Table 2 reports the summary statistics of the individual-level data. The main finding in this table is that time spent on market work and home production is similar across the HtM and savers. As explained above, home production is the standard definition (i.e., the sum of housework, running errands, repairs and care for others), which amounts to a mean of 2.7 hours per day for savers and of 2.5 hours per day for the HtM between 2002 and 2017. The median time allocation of both groups is the same in all time-use categories except for weekly overtime.

As savers have higher wages than the HtM, it is somewhat surprising that they do not specialize in market work compared to the HtM. However, this finding is in line with the literature. For instance, Boerma and Karabarbounis (2021) conclude from data from the American Time Use Survey that there is no negative correlation between wages and time

[9] See, e.g., Ehrenberg and Smith (2012), who argue that individuals need at least 8 hours a day for "eating, sleeping and otherwise maintaining herself/himself."

[10] See https://www.oecd.org/en/data/indicators/working-age-population.html.

Table 2: Time allocation of savers and individuals who are HtM

	HtM			Savers		
	Mean	Median	SD	Mean	Median	SD
Population share	26%			74%		
Net wealth	-7,300	0	57,300	143,900	74,000	351,700
Net wage monthly	1,400	1,300	760	1,900	1,700	1130
Market work	8.2	9	2.4	8.3	9	2.4
Weekly overtime	1.9	0	3.3	2.2	0.9	3.4
Hobbies	1.4	1	1.2	1.4	1	1.2
Sports	0.4	0	0.6	0.5	0	0.6
Housework	1.2	1	1.0	1.2	1	1.0
Running errands	0.9	1	0.6	0.8	1	0.6
Repairs	0.4	0	0.6	0.6	0	0.7
Care for others	0	0	0.3	0.1	0	0.3
Childcare	0.8	0	1.5	0.8	0	1.4
Age	40	40	11	46	46	10
No. of minor kids	0.8	0	1.1	0.8	0	1.0
Share with minor kids	32%			33%		
Share women	47%			45%		
Share cohabiting	59%			74%		
Share partner is HtM	57%			10%		

Notes: (i) source: SOEP, DOI: 10.5684/soep.v37, (ii) period: average from 2002, 2007, 2012 and 2017, (iii) time use is in hours per weekday except overtime which is in hours per week, and wealth and wage is in Euro, (iv) "SD" refers to standard deviation.

spent on home production, and Bick et al. (2018) show in a cross-country analysis that in rich countries, hours worked in the market are flat or even increasing in the wage.

The share of individuals who are HtM in the working population is 26%. This number is in line with Aguiar et al. (2025), who find that 23% are HtM based on net worth in the US between 1999 and 2019.

2.2 Heterogeneous responses to monetary policy shocks

Specification. To study the time-use responses of the HtM and savers to a contractionary monetary policy shock, I estimate variants of the following empirical specification

$$tu_{it} = \alpha + \beta mps_t + \gamma(mps_t \times HtM_{it}) + \sum_j \delta_j X_{it} + \sum_k \psi_k Y_{t-1} + \varepsilon_{it}. \quad (1)$$

The dependent variable, tu_{it}, is time use of individual i at time t. The monetary policy shock is denoted by mps_t, and $mps_t \times HtM_{it}$ is an interaction term that measures the difference in the time-use reaction to monetary policy of savers and that of individuals who are HtM. Consequently, β is the response of savers to a monetary policy surprise, and $\beta + \gamma$ is the response of the HtM.

In my empirical specification, it is not possible to include year fixed effects and individual fixed effects to isolate the change in individual's time use that is only due to monetary policy. Including year fixed effects into my regression is not possible, because I am interested in a shock that is constant across individuals. Including individual fixed effects into my regression is not possible, because I study heterogeneous responses of time use of the HtM and of savers to monetary policy, and the HtM classification does not vary much over time. Therefore, I include a set of individual-specific and aggregate control variables. The individual-specific control variables are denoted by X_{it} and include age, the number of kids, a dummy for gender, a dummy for being married, a dummy for whether the individual lives in East Germany—the area of the former German Democratic Republic—or not, and fixed effects (FE) for the region ("Bundesland"), for housing (being a renter or an owner), and for the occupation ("International Standard Classification of Occupations", ISCO). As in Koeniger et al. (2022), I further control for the month of the interview to account for seasonal effects. The aggregate control variables are denoted by Y_{t-1} and include the lag of the Gross Domestic Product (GDP) and of Consumer Price Index (CPI) inflation.

The error term is denoted by ε_{it}, and I cluster the standard errors at the individual level.

As the main focus of this paper is on consumption smoothing with home production, I focus on time spent on housework and on running errands. An increase in time spent on housework could mean that individuals go less often to restaurants, or prepare snacks at home instead of buying them. Running errands could serve as a consumption smoothing device if individuals spend more time on trying to find cheaper offers, or on going to cheaper supermarkets that are located further away from home. However, spending more time on running errands could also mean that individuals buy more goods. While an increase in time spent on running errands during an economic boom that is concentrated among rich households points towards buying more goods, an increase in time spent on running errands during an economic downturn that is concentrated among poor households suggests more search effort for cheaper products. As mentioned above, core home production also includes time spent on repairs. However, in economically difficult times, it would be reasonable that poor individuals do not spent time on repairs that are not absolutely necessary. Thus, I do not include time spent on repairs into the main analysis on consumption smoothing with home production. The same holds true for time spent on care for other adults. Individuals could rather cut back on time spent on caring for other adults if they are living through economically difficult times. Selecting those home production activities for which it is obvious how they can serve as consumption smoothing devices is in line with Been et al. (2020), who find that only a limited share of spending can be replaced by home production, as home-produced goods are very different to most goods bought on the market. Furthermore, housework and running errands are the most relevant home production activities, as they account for around 80% of total time spent on home production (see table 2).

Results. Table 3 reports the results from estimating specification (1) with housework as the dependent variable, table 4 with running errands, and table 5 with weekly overtime as the dependent variable. My main finding is that the HtM use home production as a consumption smoothing device to a greater extent than savers do, and consistent with this finding, weekly overtime of the HtM decreases by more than that of savers.

Table 3: Heterogeneous responses of time spent on housework work to monetary policy

	(1)	(2)	(3)	(4)
mps	0.809***	0.704***	0.520***	0.532***
	(13.60)	(11.36)	(6.33)	(6.44)
mps×HtM	0.105	0.00357	-0.00915	-0.0900
	(0.80)	(0.03)	(-0.07)	(-0.66)
East Germany		-0.114***	-0.115***	-0.0553
		(-9.27)	(-9.31)	(-1.60)
Month of the interview		-0.00453*	-0.00276	-0.00348
		(-1.86)	(-1.12)	(-1.43)
CPI inflation			0.00639	-0.0000415
			(0.61)	(-0.00)
GDP			-0.00472***	-0.00619***
			(-4.58)	(-5.96)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	37925	31882	31882	31635
R^2	0.0119	0.0110	0.0133	0.0187

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

More concretely, table 3 shows that all individuals increase time spent on housework in response to a 100-basis-point increase in the nominal interest rate by around 0.5 hours per day (see table 3, column 4, first line), and individuals who are HtM do not react differently than savers (see table 3, second line). Thus, all individuals spend more time on washing, cooking and cleaning. To give an example, spending more time on cooking might save money, as individuals then go less often to restaurants.

Table 4: Heterogeneous responses of time spent on running errands to monetary policy

	(1)	(2)	(3)	(4)
mps	0.422***	0.404***	0.254***	0.268***
	(10.19)	(9.07)	(4.19)	(4.42)
mps×HtM	0.434***	0.387***	0.378***	0.286***
	(4.87)	(3.89)	(3.80)	(2.86)
East Germany		0.113***	0.113***	0.0540**
		(13.59)	(13.57)	(2.25)
Month of the interview		-0.0106***	-0.00841***	-0.00803***
		(-6.06)	(-4.76)	(-4.53)
CPI inflation			-0.00237	-0.00390
			(-0.32)	(-0.52)
GDP			-0.00503***	-0.00543***
			(-7.42)	(-7.94)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	37896	31859	31859	31613
R^2	0.00491	0.00577	0.00519	0.0112

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

In contrast, table 4 shows that the HtM increase time spent on running errands by around 0.3 hours per day more than savers do in response to a contractionary monetary policy shock (see table 4, column 4, second line). As mentioned above, spending more time on running errands could either mean buying more products or searching for cheaper ones. My results favor the latter interpretation: as HtM households increase time spent on running errands in response to a contractionary monetary policy shock by more than savers do, the reason might be that they increase their effort in searching for cheaper products. This result is in line with Aguiar and Hurst (2005), who find that unemployed and retired individuals spend more time on running errands to smooth consumption, as they spend more time on searching for cheaper products, sales and offers, and thereby, try to spend less money on grocery shopping. Furthermore, Nord (2023) shows that households with higher expenditure tend to make less shopping effort, which is in line with my result that HtM individuals spent more time on running errands in response to a contractionary monetary policy shock compared to savers. My results regarding consumption smoothing with home production are in line with the empirical literature. For instance, Cacciatore et al. (2024) and Burda and Hamermesh (2010) document cyclical adjustments in home production.[11]

Table 5 shows that weekly overtime of the HtM falls by more than that of savers in response to a contractionary monetary policy shock except when controlling for occupations. This finding indicates that market work of the HtM is more responsive to a contractionary

Table 5: Heterogeneous responses of weekly overtime to monetary policy

	(1)	(2)	(3)	(4)
mps	-0.113	0.00718	-1.939***	-1.853***
	(-0.42)	(0.02)	(-4.95)	(-4.74)
mps×HtM	-1.412***	-0.982*	-1.112*	-0.959
	(-2.69)	(-1.68)	(-1.90)	(-1.61)
East Germany		0.0364	0.0291	0.226
		(0.63)	(0.50)	(1.28)
Month of the interview		0.0661***	0.0751***	0.0705***
		(5.78)	(6.52)	(6.15)
CPI inflation			0.227***	0.217***
			(4.84)	(4.55)
GDP			-0.0149***	-0.0180***
			(-3.32)	(-3.96)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	34147	28770	28770	28563
R^2	0.0000637	0.00539	0.00995	0.0138

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

[11] As explained above, I focus on time spent on running errands and on housework, as these two activities are especially relevant for consumption smoothing. In Appendix A, I show that the change in time spent on care for people apart from their own children in response to a monetary policy shock is not significant, and that savers increase their time spent on repairs by more than the HtM.

monetary policy shock compared to market work of savers, and that the reason for this effect is that HtM households have different occupations compared to savers. However, note that in Appendix A, I show that the effect on total time spent on market work does not differ across the two types of individuals. One explanation could be that total market hours worked vary little. Not least because I only look at employed individuals to capture the trade-off between market work and home production. Thus, the estimates do not capture the effect of becoming unemployed. Yet, the relatively larger decrease in weekly overtime of the HtM compared to savers indicates that their time spent on market work decreases to a greater extent compared to savers, which allows them to spend more time on home production.

Empirical evidence on the labor income channel. Finally, I estimate the size of the labor income channel in my dataset. Precisely, I estimate specification 1 with the logarithm of net wages as the dependent variable. Table 6 presents the results. Net wages of the HtM

Table 6: Heterogeneous responses of net wages to monetary policy

	(1)	(2)	(3)	(4)
mps	-0.375***	-0.351***	0.199***	0.127***
	(-13.66)	(-12.12)	(5.41)	(3.41)
mps×HtM	-0.504***	-0.292***	-0.242***	-0.0620
	(-7.44)	(-4.18)	(-3.60)	(-0.93)
East Germany		-0.159***	-0.155***	-0.112***
		(-17.60)	(-17.16)	(-4.65)
Month of the interview		0.00598***	0.00288**	0.00297**
		(4.29)	(2.12)	(2.27)
CPI inflation			-0.0270***	-0.0193***
			(-5.30)	(-3.79)
GDP			0.0148***	0.0155***
			(26.34)	(28.69)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	38496	32391	32391	32141
R^2	0.0160	0.0516	0.177	0.180

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

decrease to a greater extent than those of savers in response to a contractionary monetary policy shock, thus, I can confirm the finding of the labor income channel in the literature. In line with the results on weekly over hours, the greater decrease in net wages of the HtM in response to a contractionary monetary policy shock vanishes when controlling for occupations. This is an intuitive result: the reason for the sharper decrease in labor income of the HtM is that they work in different occupations compared to savers. Net wages of the HtM decrease by 0.24 pp on average more than those of savers (see table 6, second line, third column).

3 A TANK model with home production

I develop a TANK model to study the effects of home production on the labor income channel. As outlined in figure 1, my model consists of a monetary authority, a fiscal authority, firms, HtM households, and savers.

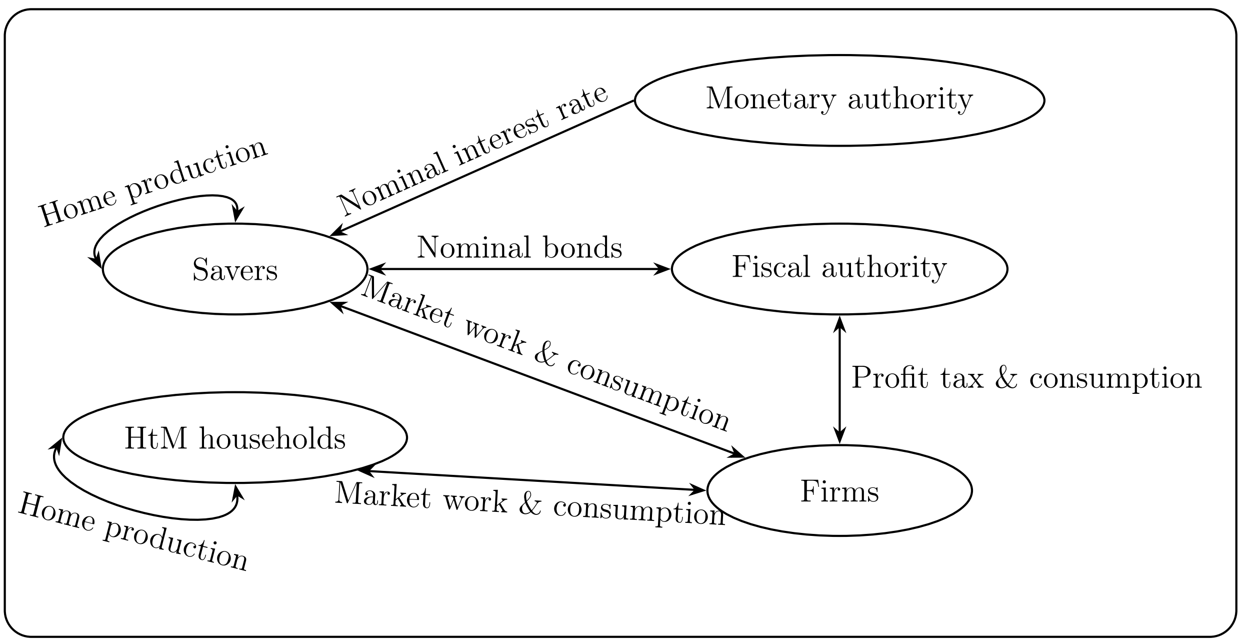


Figure 1: Bird's Eye View on the Model

3.1 Households

There is a continuum of households j who face sticky wages. As in standard TANK models, households fall into two groups—HtM households and savers—denoted by $z \in (h, s)$, and both measure and identity of households belonging to each group are assumed to be constant. I follow Gnocchi et al. (2016) for the specification of preferences with home production and for the consumption aggregator of home-produced goods and goods bought on the market. However, unlike my model, the model in Gnocchi et al. (2016) features a representative household and flexible wages.

Households' preferences are specified as in King et al. (1988) (KPR for short),

$$E_0 \sum_{t=0}^{\infty} \beta^t \frac{[C_t^z(j)^b L_t^z(j)^{1-b}]^{1-\sigma} - 1}{1-\sigma}, \tag{2}$$

where $C_t^z(j)$ denotes consumption of household type z, $L_t^z(j)$ is leisure, and $1-b$ stands for the weight the household puts on leisure relative to total consumption. Parameter σ is the inverse of the intertemporal elasticity of substitution and $\beta \equiv \frac{1}{1+\rho}$ is the discount factor, with ρ denoting the time preference rate. KPR preferences with home production yield empirically relevant effects such as a balanced growth path, complementarity between hours worked in the market and market consumption, and a wealth effect on labor supply.

Consumption consists of market consumption, $C_{m,t}^z(j)$, and consumption of home-produced goods, $C_{n,t}^z(j)$, and is aggregated via a constant elasticity of substitution (CES) aggregator,

$$C_t^z(j) \equiv [\alpha C_{m,t}^z(j)^\eta + (1-\alpha) C_{n,t}^z(j)^\eta]^{(1/\eta)}, \tag{3}$$

where $(1-\eta)^{-1}$ is the elasticity of substitution between market and home consumption and α is the market consumption share.

Market consumption denotes a Dixit-Stiglitz consumption aggregate that is defined as

$$C_{m,t}^z(j) \equiv \left(\int_0^1 C_{m,t}^z(i,j)^{\frac{\epsilon_p - 1}{\epsilon_p}} di \right)^{\frac{\epsilon_p}{\epsilon_p - 1}}, \tag{4}$$

where ϵ_p is the elasticity of substitution between differentiated goods, and $C_{m,t}(i,j)$ is a good produced by firm i that household j consumes.

Time is normalized to 1,

$$1 = L_t^z(j) + H_{n,t}^z(j) + H_{m,t}^z(j), \tag{5}$$

where $H_{m,t}^z(j)$ denotes market work and $H_{n,t}^z(j)$ denotes time spent on home production. Home consumption is not storable and produced according to a linear production function,

$$C_{n,t}^z(j) = H_{n,t}^z(j). \tag{6}$$

The budget constraint of savers is given by

$$
\begin{aligned}
P_t C^s_{m,t}(j) + B^s_t(j) = B^s_{t-1}(j)(1+i_{t-1}) &+ W^{n,s}_t(j) H^s_{m,t}(j) \\
&- \frac{\xi^s}{2}\left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right)^2 W^{n,s}_t(j) H^s_{m,t}(j) - T_t,
\end{aligned} \tag{7}
$$

and that of HtM households by

$$
P_t C^h_{m,t}(j) = W^{n,h}_t(j) H^h_{m,t}(j) - \frac{\xi^h}{2}\left(\frac{W^{n,h}_t(j)}{W^{n,h}_{t-1}(j)} - 1\right)^2 W^{n,h}_t(j) H^h_{m,t}(j) - T_t. \tag{8}
$$

Nominal bonds are denoted by $B^s_t(j)$, the nominal interest rate is i_t, and as in standard TANK models, I assume that only savers can save or borrow in nominal bonds. Thus, HtM households consume their entire income every period. Lump-sum taxes and transfers are denoted by T_t, and P_t denotes a Dixit-Stiglitz aggregate price index that is defined as

$$
P_t \equiv \left(\int_0^1 P_t(i)^{1-\epsilon_p} di\right)^{\frac{1}{1-\epsilon_p}}, \tag{9}
$$

where $P_t(i)$ is the price of an individual good i. When working in the market, households earn a nominal wage, $W^{n,z}_t(j)$, and when adjusting the wage, they pay Rotemberg-type adjustment costs. The size of the adjustment cost is given by ξ^z, and wages of HtM households are stickier compared to those of savers (as in Komatsu (2023)). The reason is that HtM households are usually low-skilled workers (in line with their lower hourly wage as indicated in table 2), and thus, their wages are typically negotiated to a larger extent by labor unions, and these wages are stickier (see, e.g., Franz and Pfeiffer (2006), and Babecký et al. (2010)). Furthermore, HtM households more often work for the minimum wage, which cannot be adjusted downwards. For wealthier people, it is easier to raise their real wage through better negotiating, or by changing jobs. Heterogeneity in wage stickiness allows me to incorporate differentiated labor income responses to monetary policy shocks of HtM households and savers. The reason is that, as wages of the HtM are stickier, the demand for labor of the HtM falls by more, and thereby, also their labor income falls by more compared to savers in response to a contractionary monetary policy shock.

Households choose consumption, labor supply in the home and the market sector, the nominal wage, and savers further choose nominal bonds to maximize their life-time utility (equation (2)) subject to total time endowment (equation (5)), the production of home goods (equation (6)), and the budget constraint (equation (7) or (8) respectively). There is a monopolistically competitive labor market in the model, and therefore, households take the demand of firms for labor of household j and of type z into account, which is given by

$$H_{m,t}^{z}(j)=\left(\frac{W_t^{n,z}(j)}{W_t^{n,z}}\right)^{-\epsilon_w}H_{m,t}^{z}, \tag{10}$$

where ϵ_w is the elasticity of substitution between differentiated labor types, $H_{m,t}^{z}$ is total labor input of householdsof type z, and $W_t^{n,z}$ is the Dixit-Stiglitz aggregate nominal wage index that is defined as

$$W_t^{n,z}\equiv\left(\int_{j\in\mathcal{Z}}W_t^{n,z}(j)^{1-\epsilon_w}dj\right)^{\frac{1}{1-\epsilon_w}}, \tag{11}$$

where $\mathcal{Z}$ is the subset of households belonging to group z. See Appendix B.2.1 for the derivation of the labor demand equation.

Symmetry implies that, in equilibrium, the nominal wage is the same for all households in group z, $W_t^{n,z}(j)=W_t^{n,z}$. Thus, the first-order conditions are given by the following equations. The optimal allocation of time to home production is given by

$$\frac{1-b}{b(1-\alpha)}\left(\frac{C_t^z}{C_{n,t}^z}\right)^{\eta}=\frac{L_t^z}{H_{n,t}^z}. \tag{12}$$

The share of of home-produced goods in total consumption is $(1-\alpha)$, and to achieve the desired composition of total consumption, households increase home production if total consumption increases. Furthermore, they increase leisure if total consumption increases, as they aim for a ratio between total consumption and leisure of $b/(1-b)$. The increase in leisure then yields again a decrease in both types of consumption.

Households choose their optimal wage according to the following wage Phillips curves

$$\begin{aligned}&\epsilon_w MRS_t^z\frac{1}{W_t^z}+(1-\epsilon_w)-\xi^z\left(\Pi_t^{w,z}-1\right)\left(\Pi_t^{w,z}+\frac{1-\epsilon_w}{2}\left(\Pi_t^{w,z}-1\right)\right)\\&+\beta E_t\left(\frac{U_{C_{m,t+1}^z}}{U_{C_{m,t}^z}}\left(\Pi_{t+1}\right)^{-1}\xi^z\left(\Pi_{t+1}^{w,z}-1\right)\left(\Pi_{t+1}^{w,z}\right)^2\frac{H_{t+1}^z}{H_t^z}\right)=0,\end{aligned} \tag{13}$$

where MRS_t^z is the marginal rate of substitution between consumption and leisure, $U_{C_{m,t}^z}$ is the marginal utility of market consumption, and W_t^z denotes the real wage that is given by $W_t^z=W_t^{n,z}/P_t$. Gross price inflation is Π_t, and gross wage inflation is $\Pi_t^{w,z}$. The two types of inflation types are defined as $\Pi_t\equiv P_t/P_{t-1}$ and $\Pi_t^{w,z}\equiv W_t^z/W_{t-1}^z$ respectively, and their accounting identity is given by

$$\frac{W_t^z}{W_{t-1}^z}=\frac{W_t^{n,z}/P_t}{W_{t-1}^{n,z}/P_{t-1}}=\frac{W_t^{n,z}/W_{t-1}^{n,z}}{P_t/P_{t-1}}=\frac{\Pi_t^{w,z}}{\Pi_t}. \tag{14}$$

According to the wage Phillips curve, the marginal rate of substitution between consumption and leisure is—up to the fraction $\epsilon_w/(1-\epsilon_w)$ that arises due to the wage stickiness—equal to the real wage in steady state. When inflation deviates from its steady state, the household adjusts the wage considering the current adjustment cost and the expected future cost weighted by the change in utility.

HtM households consume their entire income every period by assumption,

$$P_t C_{m,t}^h = W_t^{n,h} H_{m,t}^h - \frac{\xi^h}{2}\left(\frac{W_t^{n,h}}{W_{t-1}^{n,h}} - 1\right)^2 W_t^{n,h} H_{m,t}^h - T_t. \tag{15}$$

and savers' consumption is described by the following standard Euler equation

$$\beta E_t \left(\frac{\lambda_{t+1}^s}{\lambda_t^s}\frac{1+i_t}{\Pi_{t+1}}\right) = 1, \tag{16}$$

where λ^s denotes savers' marginal utility of market consumption given by

$$\lambda_t^s = \alpha b \left(1 - H_{m,t}^s - H_{n,t}^s\right)^{(1-b)(1-\sigma)} (C_{m,t}^s)^{\eta-1} (C_t^s)^{b(1-\sigma)-\eta}. \tag{17}$$

See Appendix B.1 for the derivation of the households' problems.

3.2 Firms

There is a continuum of monopolistically competitive firms denoted by i. Firm i produces output, $Y_t(i)$, according to a linear production function,

$$Y_t(i) = H_{m,t}(i) \tag{18}$$

where $H_{m,t}(i)$ denotes labor input of firm i. It takes the form of a CES aggregator,

$$H_{m,t}(i) \equiv [\psi H_{m,t}^h(i)^\zeta + (1-\psi) H_{m,t}^s(i)^\zeta]^{\frac{1}{\zeta}}, \tag{19}$$

where $(1-\zeta)^{-1}$ denotes the elasticity of substitution of labor of the two household types, and ψ is the population share of HtM households. Firm i's input of HtM households' labor is denoted by $H_{m,t}^h(i)$, and $H_{m,t}^s(i)$ is firm i's input of savers' labor. The two types of labor input are defined as

$$H_{m,t}^h(i) \equiv \left(\int_{j\in\mathcal{H}} H_{m,t}^h(i,j)^{\frac{\epsilon_w - 1}{\epsilon_w}} dj\right)^{\frac{\epsilon_w}{\epsilon_w - 1}}, \tag{20}$$

and

$$H^h_{m,t}(i) \equiv \left(\int_{j \in \mathcal{S}} H^s_{m,t}(i,j)^{\frac{\epsilon_w - 1}{\epsilon_w}} dj \right)^{\frac{\epsilon_w}{\epsilon_w - 1}}, \tag{21}$$

where $\mathcal{H}$ denotes the group of households that are HtM, and $\mathcal{S}$ denotes the group of households that are savers.

Firms set prices as in Calvo (1983), and thus, their price-setting scheme is given by

$$P_{t+k+1}(i) = \begin{cases} P^*_{t+k+1}(i) & \text{with probability } (1-\theta), \\ P_{t+k}(i) & \text{with probability } \theta, \end{cases} \tag{22}$$

where θ is the Calvo parameter, and thus, with probability θ, the price of firm i does not change, and with probability $1-\theta$ firm i can set a new price. Including sticky prices on top of sticky wages into the model allows for fluctuations in real wages, which is particularly relevant given that the research questions is about labor income.

The discounted sum of firm i's current and future profits is given by

$$E_t \left(\sum_{k=0}^{\infty} \theta^k Q_{t,t+k} [P_t(i) Y_{t+k}(i) - W^n_{t+k} H_{m,t+k}(i)] \right), \tag{23}$$

where $Q_{t,t+k}$ denotes the savers' stochastic discount factor (as I assume that savers own the firms) that is defined as

$$Q_{t,t+k} \equiv \beta^k \frac{\lambda^s_{t+k}}{\lambda^s_t} (\Pi_{t,t+k})^{-1},$$

and the aggregate wage, W^n_{t+k}, is the average wage across HtM households and savers,

$$W^n_{t+k} = \psi W^{n,h}_{t+k} + (1-\psi) W^{n,s}_{t+k}.$$

Firms maximize the sum of their current and future profits (equation (23)) subject to three constraints: the production function (equation (18)), the Calvo price-setting scheme (equation (22)), and the goods demand constraint that is given by

$$Y_t(i) = \left(\frac{P_t(i)}{P_t} \right)^{-\epsilon_p} Y^d_t, \tag{24}$$

where Y^d_t is aggregate demand that firms take as given. See Appendix B.1.1 for the derivation of demand for good i.

The firms' demand for labor of household type z is given by

$$W^z_t = \zeta MC[(1-\psi)(H^s_{m,t})^{\zeta} + \psi (H^h_{m,t})^{\zeta}]^{\frac{1}{\zeta}-1} (H^z_m)^{\zeta-1}, \tag{25}$$

where MC_t denotes the real marginal cost.

The firms' optimal price-setting decision is described by the following equation that relates the ratio of the optimal price, P_t^*, and the actual price in the economy to the ratio of two auxiliary variables, $x_{t,1}$ and $x_{t,2}$ (see, e.g., Gnocchi et al. (2016)),

$$\frac{P_t^*}{P_t} = \frac{x_{1,t}}{x_{2,t}}. \tag{26}$$

The auxiliary variables are given by

$$x_{1,t} = Y_t \left(\frac{\epsilon_p}{\epsilon_p - 1}\right) MC_t + \beta\theta E_t \left(\frac{\lambda_{t+1}^s}{\lambda_t^s}(\Pi_{t+1})^{\epsilon_p} x_{1,t+1}\right), \tag{27}$$

and

$$x_{2,t} = Y_t + \beta\theta E_t \left(\frac{\lambda_{t+1}^s}{\lambda_t^s}(\Pi_{t+1})^{\epsilon_p - 1} x_{2,t+1}\right), \tag{28}$$

where aggregate output, Y_t, is defined as

$$Y_t \equiv \left(\int_0^1 Y_t(i)^{\frac{\epsilon_p - 1}{\epsilon_p}} di\right)^{\frac{\epsilon_p}{\epsilon_p - 1}}. \tag{29}$$

The relation between inflation and the relative price charged by re-optimizing firms is given by

$$\frac{P_t^*}{P_t} = \left(\frac{1 - \theta(\Pi_t)^{\epsilon_p - 1}}{1 - \theta}\right)^{\frac{1}{1 - \epsilon_p}}. \tag{30}$$

See Appendix B.2 for the derivation of firm i's maximization problem.

3.3 Government

The fiscal authority's budget constraint is given by

$$D_t + \frac{B_{t+1}}{(1 + i_t)} = B_t + P_t G_t, \tag{31}$$

where D_t denotes the firms' profits that the fiscal authority taxes at rate one. I choose such an extreme taxation of the firms' profits to isolate the effects of changes in labor income, as households do not receive any profit income, if it is taxed at rate one by the government. In an extension in section 5.1, I assume a more realistic distribution of profits, and I show that the results are similar. Furthermore, the fiscal authority can borrow one-period nominal bonds. Thus, $B_{t+1}/(1 + i_t)$ denotes bonds borrowed in t, and B_t are the bonds borrowed in the previous period that the government pays back in t. Finally, the fiscal authority buys market goods, G_t, and G_t denotes a Dixit-Stiglitz aggregate that is defined as

$$G_t \equiv \left(\int_0^1 G_t(i)^{\frac{\epsilon_p - 1}{\epsilon_p}} di\right)^{\frac{\epsilon_p}{\epsilon_p - 1}}. \tag{32}$$

The central bank sets the nominal interest rate according to a Taylor rule,

$$i_t = \rho + \phi_\pi \pi_t + \nu_t, \tag{33}$$

where $\phi_\pi > 1$ denotes the reaction of the central bank to inflation, π_t is net price inflation defined as $1 + \pi_t \equiv \Pi_t$, and ν_t is the monetary policy shock.

The monetary policy shock process is given by

$$\nu_t = \rho_\nu \nu_{t-1} + \epsilon_t^\nu, \tag{34}$$

where ρ_ν denotes the persistence of the shock and ϵ_t^ν is white noise.

According to the Fisher equation, the real interest rate is given by

$$1 + r_t = \frac{1 + i_t}{1 + \pi_{t+1}}. \tag{35}$$

3.4 Market clearing

The goods market clearing condition for an individual good i is given by

$$Y_t(i) = G_t(i) + C_{m,t}(i) + (1 - \psi) Y_t(i) \frac{\xi^s}{2} (\Pi_t^{w,s} - 1)^2 + \psi Y_t(i) \frac{\xi^h}{2} (\Pi_t^{w,h} - 1)^2, \tag{36}$$

where $C_{m,t}(i) = \int_0^1 C_{m,t}(i,j) dj$ and ψ denotes the share of HtM households.

Using the goods market clearing condition of individual good i, I obtain the following aggregate goods market clearing condition,

$$Y_t = Y_t^d = G_t + C_{m,t} + (1 - \psi) Y_t \frac{\xi^s}{2} (\Pi_t^{w,s} - 1)^2 + \psi Y_t \frac{\xi^h}{2} (\Pi_t^{w,h} - 1)^2, \tag{37}$$

with $C_{m,t} = (1 - \psi) C_{m,t}^s + \psi C_{m,t}^h$. Note that $C_{m,t}^s$ and $C_{m,t}^h$ are per capita market consumption of savers and HtM households, and $C_{m,t}$ denotes total market consumption.

The labor market clearing condition is given by

$$H_{m,t} = \int_0^1 H_{m,t}(i) di = \int_0^1 \left(\int_0^1 H_{m,t}(i,j)^{\frac{\epsilon_w - 1}{\epsilon_w}} dj\right)^{\frac{\epsilon_w}{\epsilon_w - 1}} di, \tag{38}$$

where $H_{m,t}(i,j)$ is labor input of household j at firm i.

In Appendix B.3 and B.4, I briefly describe the model's steady state and how I solve it.

3.5 Calibration

Table 7 presents the calibration of the model. The discount factor is calibrated to 0.99, as it yields a steady-state interest rate of 1%. I follow Gnocchi et al. (2016) and set the inverse of the elasticity of intertemporal substitution to 2 to obtain a wealth effect on market consumption of 0.5. The wealth effect on market consumption measures to what extent market consumption reacts to changes in wealth. The elasticity of intertemporal substitution allows me to match this wealth effect, as changes in the interest rate reflect changes in households' wealth, and the elasticity of intertemporal substitution measures how strong households' consumption reacts to changes in the interest rate. For the elasticity of substitution between market and home consumption goods, I choose $\eta = 0.5$, as it lies in between estimates in the literature. Chang and Schorfheide (2003) find a value of 0.57, while McGrattan et al. (1997) report 0.429. This calibration yields an elasticity of substitution of $(1-\eta)^{-1} = 2$.[12] I use the SOEP data presented in table 2 to calibrate the market consumption share, the total consumption share and the share of HtM households. The market consumption share, α, is set to 0.71 to match the average market to home work ratio in the data. The total consumption share, b, is set to 0.87 to match the average work to leisure ratio in the data. In line with my empirical results in 2, the share of HtM households, ψ, is set to 26%.

As in Komatsu (2023), I calibrate the average duration of wages of HtM households to one and a half years. In line with Galí (2015), the average duration of the savers' wages is set to one year. I calculate the corresponding Rotemberg adjustment costs as in Born and Pfeifer (2020), and I find that the two Calvo probabilities corresponds to Rotemberg adjustment costs of $\xi^h = 1810$ for HtM households and $\xi^s = 740$ for savers.[13] I calibrate the elasticity of substitution between labor input of savers and of the HtM to match the heterogeneous income responses documented in section 2, thus, I set ζ to 0.997, which makes the two labor inputs highly substitutable.

The Calvo parameter is calibrated to 0.75 to match the average duration of a price of four quarters as in Nakamura and Steinsson (2008). I follow Galí (2015) for the calibration of the elasticity of substitution between different labor types, the elasticity of substitution between differentiated market consumption goods, ϵ_p, and the inflation feedback of the Taylor rule. The elasticity of substitution between different market consumption goods, ϵ_p, is set to 9 to match a steady-state markup of 12.5%. The elasticity of substitution between different

[12] In Appendix D, I show that with a value for parameter η as low as 0.1, my main result still holds.

[13] See Appendix C for details.

Table 7: Calibration

Parameter	Description	Value	Source/Target
Households			
β	Discount factor	0.99	Match steady-state interest rate of 1%.
σ	Inverse of elasticity of intertemporal substitution	2	See Gnocchi et al. (2016).
$(1-\eta)^{-1}$	Elasticity of substitution between market and home consumption goods	2	Estimates from Chang and Schorfheide (2003) and McGrattan et al. (1997).
b	Total consumption share	0.87	Match time use from table 2.
α	Market consumption share	0.71	Match time use from table 2.
ψ	Share HtM households	0.26	See table 2.
Price and wage rigidities			
θ	Calvo parameter for prices	0.75	See Nakamura and Steinsson (2008).
ϵ_p	Elasticity of substitution between different types of market consumption goods	9	See Galí (2015).
ϵ_w	Elasticity of substitution between different types of labor	4.5	See Galí (2015).
ζ	Inverse of the elasticity of substitution between labor of savers and the HtM	0.997	Match heterogeneous income responses from section 2.
ξ^h	Wage adjustment costs HtM households	1810	
	Corresponding Calvo probability	*0.83*	See Komatsu (2023).
ξ^s	Wage adjustment costs wages savers	740	
	Corresponding Calvo probability	*0.75*	See Galí (2015).
Monetary policy			
ϕ_π	Inflation feedback Taylor Rule	1.5	See Galí (2015).
ρ_ν	Persistence of monetary policy shock	0.25	Match output response in Christiano et al. (2005).

labor types, ϵ_w, is calibrated to 4.5, which is consistent with an average unemployment rate of 5%. The inflation feedback of the Taylor rule is calibrated to 1.5 that is consistent with Taylor's original rule.

The persistence of the monetary policy shock is calibrated to 0.25, which yields an output response of 0.5% in the baseline model in line with the estimates in Christiano et al. (2005).

4 Results

This section presents the steady state of the model, analyzes the impulse response functions of the baseline model, and compares them to those of a model without home production in order to examine the role of home production in the transmission mechanism of a monetary policy shock.

4.1 Steady state

Table 8 presents the steady-state time allocation of the HtM and savers. The model predicts

Table 8: Time allocation in the data and in the model

	HtM		Savers	
	Data	Model	Data	Model
Market work	66%	65%	65%	65%
Home production	20%	20%	21%	20%
Leisure	14%	15%	13%	15%

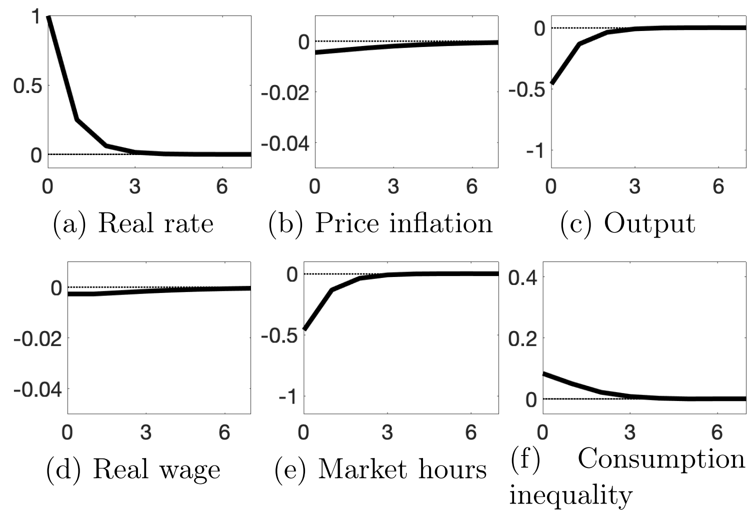
Note: the data source is table 2.

the same allocation of time across savers and HtM households. The sum of time spent on market work, home production and leisure is slightly higher for savers compared to HtM households in the data (12.7 versus 12.5 hours per day, see table 2). Thus, savers spend a slightly lower share of their total time on market work compared to HtM households (65% versus 66%, see table 8), even though, the absolute time spent on market work of savers is slightly higher than that of HtM households (8.3 versus 8.2 hours per day, see table 2). Furthermore, the model does not reflect the empirical finding that savers work a bit more in home production compared to the HtM (2.7 versus 2.5 hours per day, see table 2). However, the overall differences are small, and it is fair to say that the model matches the allocation of time in the data very well.

4.2 Impulse response functions of the baseline model

Figure 2 shows the aggregate impulse response functions (IRFs) in response to a 100-basis-point increase in the annualized nominal interest rate.

Figure 2: Aggregate results



Notes: (i) shock size: 100 basis points (annualized), (ii) consumption inequality is the difference in the consumption responses (measured in percentage changes from the steady state) between HtM and savers, (iii) responses: quarterly, rates and inequality are in pp deviations, and all other variables in %-deviations from the steady state, (iv) inflation and the interest rate are annualized.

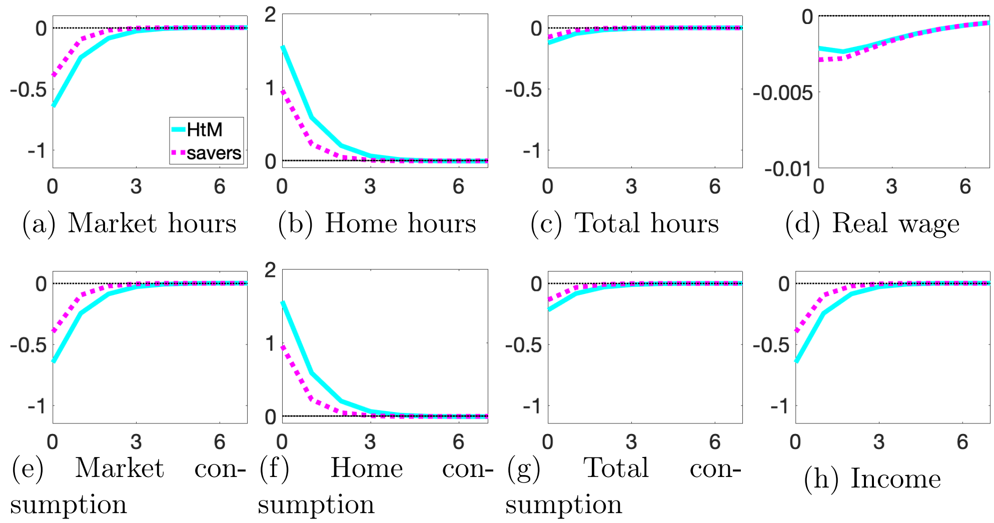
The monetary policy shock yields an increase in the nominal interest rate, and because of the nominal rigidities in my model, the real interest rate also increases (see panel 2a). The increase in the real interest rate yields a decrease in savers' demand for market goods. As prices and wages are sticky, firms cannot lower their prices to increase the demand for their goods. Therefore, firms reduce their production, and thus, their labor demand. The decrease in labor demand yields a decrease in labor income for both types of households, which further amplifies the decrease in goods' demand. In line with the empirical evidence in Christiano et al. (2005), output drops by 0.5% on impact (see panel 2c), and also market hours worked drop substantially (see panel 2e). The average real wage does not change much (see panel 2d) and therefore, also price markups react little, which yields the relatively small response of inflation (see panel 2b).[14] Since inflation decreases only slightly, the annualized nominal interest rate increases almost one-to-one with the shock size. The reason is the assumed form of monetary policy (see equation (33)). Furthermore, the small decrease in inflation yields an increase in the real rate that is almost of the same size as the increase in the nominal rate. Overall, the monetary transmission mechanism in the model is in line with empirical evidence (see, e.g., Christiano et al. (2005)). Consumption inequality—defined as the difference in the change in consumption across HtM households and savers—increases in

[14] See also Galí (2015) for a discussion about the small inflation response in models with sticky prices and sticky wages.

response to the shock. Below, I explain what causes the increase in consumption inequality.

Figure 3 shows the IRFs of consumption, hours worked, wages, and income of savers (pink dotted lines) and of HtM households (turquoise solid lines) to the shock under consideration. As explained above, labor demand of the firms decreases in response to the shock. The

Figure 3: Distributional effects



(a) Market hours (b) Home hours (c) Total hours (d) Real wage

(e) Market consumption (f) Home consumption (g) Total consumption (h) Income

Notes: (i) shock size: 100 basis points (annualized), (ii) responses are quarterly and in %-deviations from the steady state.

nominal wage of HtM households is stickier than that of savers, thus, the wage of the HtM decreases slightly less than that of savers (see panel 3d). As labor input of HtM households and savers is highly substitutable, the demand for labor of HtM households decreases to a greater extent than that of savers. Consequently, market hours of HtM households fall by more compared to those of savers (see panel 3a). As mentioned above, I calibrate the elasticity of substitution between labor of HtM households and savers in a way that the difference in the labor income response of HtM households and savers matches the empirical result in table 6. The difference in the labor income response of HtM households and savers is 0.25 pp in the model (see panel 3h) and 0.24 pp in the data. Particularly the decrease in labor income of the HtM yields a large decrease in their demand for market goods, as their marginal propensity to consume is equal to one.

Market consumption decreases sharply for both types of households in response to the shock, and the difference in market consumption between the two types of households increases to a great extent (see panel 3f). However, the decrease in total consumption is much smaller for both types of households (see panel 3g) compared to market consumption. Total consumption of savers decreases by 0.14% on impact and of HtM households by 0.22%.

Thus, the difference in total consumption between HtM households and savers is only 0.08 pp on impact, while the difference in market consumption is 0.25 pp. The reason is that HtM households substitute towards home production by more than savers do (see panel 3b). Thus, home production can—at least partially—offset the consumption inequality that arises in the market.

My theoretical results are in line with my empirical findings in section 2. More concretely, in the model and in the data, savers and the HtM increase home production in response to a contractionary monetary policy shock, and the HtM do so to a greater extent. Moreover, my theoretical results are in line with empirical findings in the literature. For instance, a sharper decrease in market consumption of HtM households compared to savers is in line with Aguiar et al. (2025) who find that spending of HtM households is more volatile than that of savers. Furthermore, the small effect on leisure matches the empirical evidence in Cacciatore et al. (2024), who find that the cyclical effects on leisure time are modest. Finally, the increase in market consumption inequality in response to a monetary policy shock is in line with empirical evidence by, e.g., Coibion et al. (2017), and Mangiante and Meichtry (2025).

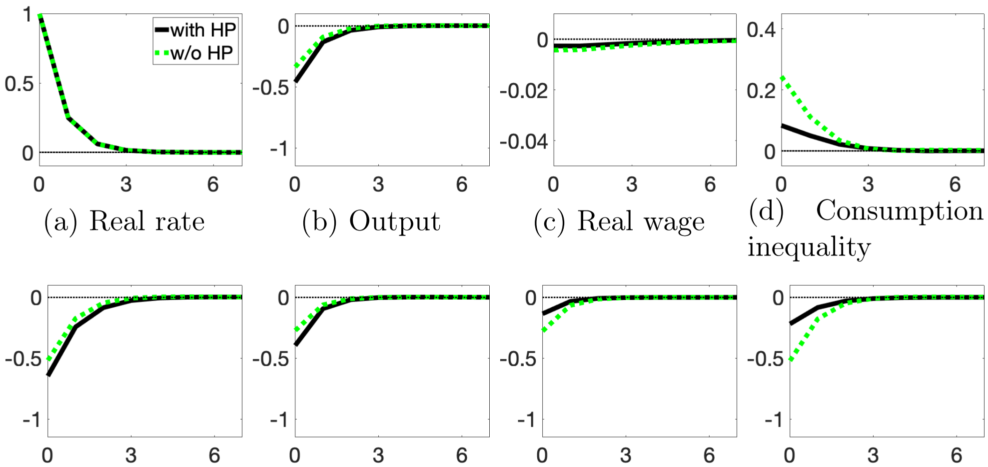
4.3 Inspecting the mechanism

To quantify the effect of home production on the labor income channel and the transmission of monetary policy to aggregate output, I compare the model with home production to a model without it.

I obtain a model without home production by setting the market consumption share and the elasticity of substitution between different types of consumption goods to one, i.e., $\alpha = 1$ and $\eta = 1$, which yields $C_t = C_{m,t}$ (see equation (3)). When households divide their time only between leisure and market work, the total consumption share, b, that matches the data decreases to 0.79, whereas in the model with home production the parameter b is set to 0.87. Figure 4 shows the results of the model without home production (green dotted lines) compared to the model with home production (black solid lines).

Comparing the responses of market hours of savers and of HtM households illustrates the role of home production for the size of the labor income channel. The difference in total consumption across the two types of households is 0.24 pp on impact in the model without home production, but 0.08 pp in the model with home production (see panel 4d). Thus, the difference in total consumption in the model with home production is one third the size compared to the model without home production, as HtM households use home production disproportionately more for consumption smoothing. Thus, home production is

Figure 4: Results with and without home production



(a) Real rate (b) Output (c) Real wage (d) Consumption inequality

(e) Market hours HtM household (f) Market hours saver (g) Total consumption savers (h) Total consumption HtM households

Notes: (i) shock size: 100 basis points (annualized), (ii) consumption inequality is the difference in the consumption responses (measured in percentage changes from the steady state) between HtM and savers, (iii) responses: quarterly, interest rate and inequality are in pp deviations, and all other variables in %-deviations from the steady state, (iv) the interest rate is annualized.

a quantitatively relevant consumption smoothing device for both types of households, and particularly for HtM households.

Comparing the model with home production to the model without it further reveals that home production amplifies the transmission from monetary policy to output. Output falls by 0.46% on impact in the model with home production, compared to 0.34% in the model without it (see panel 4b). Thus, one fourth of the decrease in output in response to a contractionary monetary policy shock is due to the availability of home production. The reason is as follows. The availability of home production yields a greater reduction in the demand for market goods of both types of households in an economic downturn, and in particular of HtM households. This is because in a model with home production, market goods become relatively more expensive compared to leisure and to home-produced goods, while in a model without home production, households can only substitute towards leisure. As HtM households experience a sharper decline in labor income compared to savers in response to a contractionary monetary policy shock, market goods become even less affordable for them.

Taken together, the findings suggest that home production stabilizes consumption, but it comes at a cost: the transmission from monetary policy to aggregate output is amplified in a model with home production.

5 Robustness

In this section, I present two robustness analyses. The first one is a model variation where households receive profit income, and the second one is a model variation where HtM households are assumed to be less productive than savers.

5.1 The role of profits

The distribution of profits can play an important role in TANK and HANK models (see, e.g., Broer et al. (2020)). However, in the baseline analysis of this paper, I abstract from profit income. To be precise, I isolate the effects of changes in labor income by assuming that the government taxes profit income at rate one. In this section, I assume a more realistic distribution: savers and HtM households receive profit income according to the size of their capital income in the SOEP data.[15] I show that this assumption does not meaningfully alter the main results, because profit income decreases to a similar extent as labor income.

Model adjustment. The baseline model and the model with profit income are identical, except that in the latter, profit income is added to the budget constraint. The budget constraint of savers is then given by

$$\begin{aligned} P_t C^s_{mjt} + B^s_t(j) = B^s_{t-1}(j)(1+i_{t-1}) + W^{n,s}_t(j) H^s_{m,t}(j) \\ - \frac{\xi^s}{2}\left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right)^2 W^{n,s}_t(j) H^s_{m,t}(j) - T_t(j) + \frac{1-\tau_r}{1-\psi} P_t D_t, \end{aligned} \tag{39}$$

and of HtM households it is then given by

$$P_t C^h_{m,t}(j) = W^{n,h}_t(j) H^h_{m,t}(j) - \frac{\xi^h}{2}\left(\frac{W^{n,h}_t(j)}{W^{n,h}_{t-1}(j)} - 1\right)^2 W^{n,h}_t(j) H^h_{m,t}(j) - T_t(j) + \frac{\tau_r}{\psi} P_t D_t. \tag{40}$$

Recall that D_t denotes real profits and $(1-\psi)$ is the population share of savers. Profit income is redistributed across households at rate τ_r. If $\tau_r = 0$, there is no profit redistribution, and all profits go to savers, as they own the firms.

I use the SOEP to calculate the capital income of HtM households and savers. More concretely, I use the selection of individuals, as described in section 2.1, and aggregate it to the household level. I then calculate the per capita capital income in each household,[16] as the information regarding the capital income is only available at the household level. Table

[15]Note that there is no profit income in the data, and therefore, I use capital income to match the distribution of profit income across HtM households and savers in the model.

[16]Note that per capita refers to adults in the household, it does not include children.

9 presents the different income sources that I use to calibrate the profit income distribution in the model. Monthly capital income as shown in the first line of table 9 is negligible for

Table 9: Per capita profit income of savers and HtM households

	HtM		Savers	
	Mean	Median	Mean	Median
Capital income	0	0	30	0
Home repayment	300	300	210	105
Rent	300	275	330	300
Share home owners	36%		86%	
Share home paid	20%		44%	

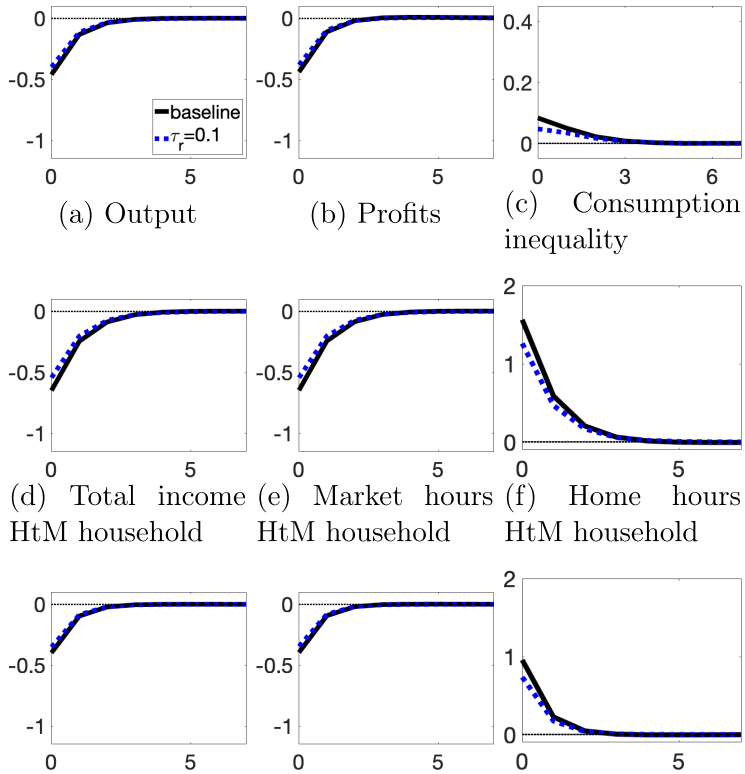
Notes: (i) source: SOEP, DOI: 10.5684/soep.v37, (ii) period: average from 2002, 2007, 2012 and 2017, (iii) capital income, home repayment and rent are monthly payments in Euro, (iv) no. of observations: 21,412.

both types of households. Capital income in the data includes interest income from assets and income from renting and leasing less the interest and maintenance costs. To account for home ownership, I add owner-occupied housing to capital income. More concretely, I calculate the saved rent by multiplying the share of home-owning households with the rent paid by renters. Monthly capital income of savers is then 315 Euro, and of HtM households it is 110 Euro, on average between 2002 and 2017 in Germany. Adding the saved rent to capital income may seem problematic when a large share of households still repays their house, and thus, has monthly home repayment costs. However, the home repayment costs lead to capital accumulation, whereas rent payment does not, so I treat rent payment and home repayment differently. Summing up, profit income of savers is three times larger than that of HtM households, therefore, I set the profits redistribution parameter, τ_r, to 10%.[17]

Results. Figure 5 presents the results when households receive profit income (blue dotted lines) compared to the baseline results presented in section 4.2 (black solid lines). As wages are sticky, profits decrease, and thus, households experience a large drop in their total income (see panel 5d and 5g). To compensate for the profit income loss, labor supply of both types of households is higher compared to the model without profit income, and thus, also market hours of both types of households fall by less (see panel 5e and 5h). In response to the shock, both types of households work more in the market, and consequently, they increase home production to a smaller extent compared to the model without profit income. Consumption inequality increases to a smaller extent in the model with profit income compared to the model without it (see panel 5c). The reason is that market consumption accounts

[17] HtM households then receive $\frac{0.1}{0.26}D_t = 0.4D_t$ per capita profit income, and savers $\frac{0.9}{0.74}D_t = 1.2D_t$.

Figure 5: The role of profit income



(a) Output

(b) Profits

(c) Consumption inequality

(d) Total income HtM household

(e) Market hours HtM household

(f) Home hours HtM household

(g) Total income saver

(h) Market hours saver

(i) Home hours saver

Notes: (i) shock size: 100 basis points (annualized), (ii) consumption inequality is the difference in the consumption responses (measured in percentage changes from the steady state) between HtM and savers, (iii) responses: quarterly, inequality is in pp deviations, and all other variables in %-deviations from the steady state.

for a larger fraction of total consumption compared to home-produced goods. Therefore, a smaller difference in the decrease in market consumption results in less overall consumption inequality. However, the effect of profit income on the results is small. The reason is that, as wages are sticky, profits decrease to a similar extent as labor income. The income composition channel—heterogeneous effects of monetary policy on different types of income—is weak in this model. Empirically, it is still an open question which channel is more important. While Coibion et al. (2017) find empirical evidence for a strong income composition channel for the effects of monetary policy on consumption inequality in the United States, Lenza and Slacalek (2024) find that the labor income channel is more important for the effect of monetary policy on income and wealth inequality in Europe.

5.2 The role of income differences across HtM households and savers

As shown in table 2, the median HtM household works the same amount of time as the median saver, but earns less. Specifically, in both groups, the median worker spends 9 hours per day on market work. While the median saver earns 1.700 Euro net per month, the median HtM household only earns 1.300 Euro. Thus, it is a natural question to ask how these hourly wage differences affect my main results.

To answer that question, I include a productivity wedge between HtM households and savers into the model. More concretely, I include efficiency units of market labor into the model that are denoted by $M_t^z(j)$, and are given by

$$M_t^s(j) = H_{m,t}^s(j), \tag{41}$$

and

$$M_t^h(j) = \omega H_{m,t}^h(j), \tag{42}$$

where $\omega \in (0, 1]$ is the productivity wedge between HtM households and savers. For savers, each hour worked in the market is equal to one efficiency unit of market labor, while for HtM households, one hour worked yields ω efficiency units of labor. The productivity wedge is calibrated to 0.76 to match the income differences described above.

The resulting steady state is presented in table 10. The model with the productivity

Table 10: Time allocation in the model with a productivity wedge and in the data

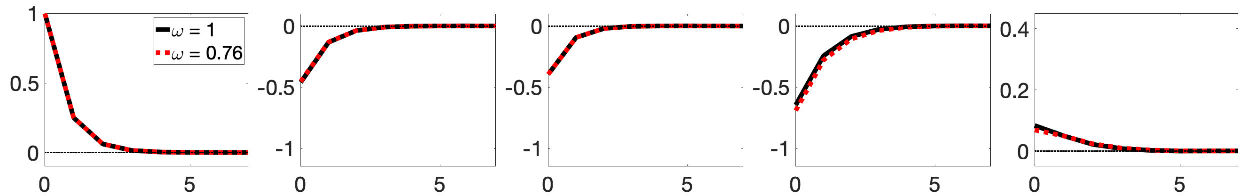
	HtM		Savers	
	Data	Model	Data	Model
Market work	66%	60%	65%	65%
Home production	20%	25%	21%	20%
Leisure	14%	15%	13%	15%

Note: the data source is table 2.

wedge predicts that HtM households do more home production than savers, while savers work more time in the market compared to HtM households. The reason is that both types of households are equally productive in home production, but savers are more productive in the market than HtM households. The steady-state labor income ratio of the HtM relative to savers is 0.71 in the model and 0.76 in the data. Thus, there is a trade-off between matching the steady-state income differences and matching the steady-state allocation of time. The baseline model matches the allocation of time better (see table 8), but the steady-state income is the same for both types of households in the baseline model.

Figure 6 presents the IRFs with a productivity wedge (red dotted lines) compared to the baseline IRFs (black solid lines). In the baseline model, the difference in the change in

Figure 6: The role of the productivity wedge



(a) Real rate (b) Output (c) Market hours savers (d) Market hours HtM household (e) Consumption inequality

Notes: (i) shock size: 100 basis points (annualized), (ii) consumption inequality is the difference in the consumption responses (measured in percentage changes from the steady state) between HtM and savers, (iii) responses: quarterly, interest rate and inequality are in pp deviations, and all other variables in %-deviations from the steady state, (iv) the interest rate is annualized.

market hours between HtM households and savers is due to a different effect on labor demand across the two types of households, as wages of HtM households are stickier compared to those of savers. In the model with a productivity wedge, there is a second reason why hours worked of HtM households fall by more compared to those of savers: labor supply of HtM households is lower compared to that of savers in response to the monetary policy shock, as they are less productive. To be precise, the productivity wedge yields, on impact, a 0.05 pp larger decrease of market hours worked of HtM households (see panel 6d). However, the size of the effect is very small. The IRFs of the aggregate variables are almost identical in the two models. The reason is that the responses of savers remain fairly unchanged, because they are not directly affected by the productivity wedge, and the change in the reaction of HtM households is small.

6 Conclusion

In this paper, I show empirically that individuals living HtM increase home production by more than savers do in response to a contractionary monetary policy shock. Through the lens of a TANK model with home production that is consistent with my empirical results, I find that HtM households reallocate hours worked to the home sector by more than savers do, because their labor income decreases to a greater extent compared to savers. The possibility of producing consumption goods at home yields a labor income channel (through which monetary policy affects consumption inequality) that is one third the size of the corresponding outcome in a model without home production. Furthermore, the transmission from monetary policy to aggregate output is stronger in a model with home production.

My paper contributes to the large literature on the interaction of household heterogeneity and monetary policy, and it is the first one to study the role of home production in that context. I use a TANK model instead of a HANK model, as it is empirically well established that the presence of HtM households matters empirically for aggregate fluctuations (Campbell and Mankiw, 1989), while it is still an open question whether household heterogeneity that goes beyond distinguishing HtM households and savers matters empirically for aggregate fluctuations (see, e.g., Debortoli and Galí (2025)).[18] My paper shows that home production is relevant for the analysis of inequality and macroeconomics, because it affects key macroeconomic variables such as hours worked, and thereby, output, and it is particularly relevant for households with limited access to financial markets.

An avenue for future research is to investigate how the size of the home sector influences state dependencies of monetary policy, as it varies largely across countries (see, e.g., Miranda (2011)). Furthermore, the substitutability of home-produced goods and goods bought on the market might vary over time and across countries. This substitutability is crucial for the size of the fluctuations in market labor supply, and thereby, output. It is also interesting to study the effects of the provision of goods by the government that would otherwise be part of home production, and whether the government could thereby stabilize consumption, equality, and output simultaneously. Home production might also impact other channels through which monetary policy affects consumption inequality. Taking a stand on the overall impact of home production on the transmission from monetary policy to consumption inequality requires an evaluation of how other channels are affected by home production. Finally, another promising avenue for further research is to look at the role of gender and age in consumption smoothing with home production.

[18] Note, however, that there are other research questions for which HANK models are clearly relevant. For instance, only in a HANK models the fraction of borrowing-constrained households is endogenous, and Schmidt and Seidl (2025) show that this fraction matters for the transmission of changes in loan-to-value constraints to output.

References

Aguiar, M., M. Bils, and C. Boar (2025): "Who are the Hand-to-Mouth?" *Review of Economic Studies*, 92, 1293–1340.

Aguiar, M. and E. Hurst (2005): "Consumption versus Expenditure," *Journal of Political Economy*, 113, 919–948.

——— (2016): "The Macroeconomics of Time Allocation," *Handbook of Macroeconomics*, 2, 203–253.

Ahn, S., G. Kaplan, B. Moll, T. Winberry, and C. Wolf (2018): "When Inequality Matters for Macro and Macro Matters for Inequality," *NBER Macroeconomics Annual*, 32, 1–75.

Altavilla, C., L. Brugnolini, R. S. Gürkaynak, R. Motto, and G. Ragusa (2019): "Measuring euro area monetary policy," *Journal of Monetary Economics*, 108, 162–179.

Amberg, N., T. Jansson, M. Klein, and A. R. Picco (2022): "Five facts about the distributional income effects of monetary policy shocks," *American Economic Review: Insights*, 4, 289–304.

Aruoba, S. B., M. A. Davis, and R. Wright (2016): "Homework in monetary economics: Inflation, home production, and the production of homes," *Review of Economic Dynamics*, 21, 105–124.

Auclert, A. (2019): "Monetary policy and the redistribution channel," *American Economic Review*, 109, 2333–67.

Auclert, A., M. Rognlie, and L. Straub (2020): "Micro Jumps, Macro Humps: Monetary Policy and Business Cycles in an Estimated HANK Model," *NBER Working Paper No. 26647*.

Babecký, J., P. Du Caju, T. Kosma, M. Lawless, J. Messina, and T. Rõõm (2010): "Downward nominal and real wage rigidity: Survey evidence from European firms," *Scandinavian Journal of Economics*, 112, 884–910.

Bayer, C., B. Born, and R. Luetticke (2024): "Shocks, Frictions, and Inequality in US Business Cycles," *American Economic Review*, 1211–1247.

Becker, G. S. (1965): "A Theory of the Allocation of Time," *The Economic Journal*, 75, 493–517.

Been, J., S. Rohwedder, and M. Hurd (2020): "Does home production replace consumption spending? Evidence from shocks in housing wealth in the Great Recession," *Review of Economics and Statistics*, 102, 113–128.

Benhabib, J., R. Rogerson, and R. Wright (1991): "Homework in Macroeconomics: Household Production and Aggregate Fluctuations," *Journal of Political Economy*, 99, 1166–1187.

Bick, A., N. Fuchs-Schündeln, and D. Lagakos (2018): "How do hours worked vary with income? Cross-country evidence and implications," *American Economic Review*, 108, 170–199.

Bilbiie, F. O. (2008): "Limited asset markets participation, monetary policy and (inverted) aggregate demand logic," *Journal of Economic Theory*, 140, 162–196.

Boerma, J. and L. Karabarbounis (2021): "Inferring inequality with home production," *Econometrica*, 89, 2517–2556.

Born, B. and J. Pfeifer (2020): "The New Keynesian Wage Phillips Curve: Calvo vs.

Rotemberg," *Macroeconomic Dynamics*, 24, 1017–1041.
Broer, T., N.-J. Harbo Hansen, P. Krusell, and E. Öberg (2020): "The New Keynesian transmission mechanism: A heterogeneous-agent perspective," *The Review of Economic Studies*, 87, 77–101.
Burda, M. C. and D. S. Hamermesh (2010): "Unemployment, market work and household production," *Economics Letters*, 107, 131–133.
Cacciatore, M., S. Gnocchi, and D. Hauser (2024): "Time use and macroeconomic uncertainty," *Review of Economics and Statistics*, 1–36.
Calvo, G. A. (1983): "Staggered prices in a utility-maximizing framework," *Journal of Monetary Economics*, 12, 383–398.
Campbell, J. Y. and N. G. Mankiw (1989): "Consumption, income, and interest rates: Reinterpreting the time series evidence," *NBER Macroeconomics Annual*, 4, 185–216.
Chang, Y. and F. Schorfheide (2003): "Labor-supply shifts and economic fluctuations," *Journal of Monetary Economics*, 50, 1751–1768.
Christiano, L. J., M. Eichenbaum, and C. L. Evans (2005): "Nominal rigidities and the dynamic effects of a shock to monetary policy," *Journal of Political Economy*, 113, 1–45.
Coibion, O., Y. Gorodnichenko, L. Kueng, and J. Silvia (2017): "Innocent Bystanders? Monetary policy and inequality," *Journal of Monetary Economics*, 88, 70–89.
Debortoli, D. and J. Galí (2025): "Heterogeneity and Aggregate Consumption: an Empirical Assessment," *mimeo*.
Ehrenberg, R. G. and R. S. Smith (2012): *Modern Labor Economics: Theory and Public Policy*, Edition 11, Pearson Education, Inc.
Franz, W. and F. Pfeiffer (2006): "Reasons for wage rigidity in Germany," *Labour*, 20, 255–284.
Galí, J. (2015): "Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications," *Princeton University Press*.
Gnocchi, S., D. Hauser, and E. Pappa (2016): "Housework and fiscal expansions," *Journal of Monetary Economics*, 79, 94–108.
Goebel, J., M. M. Grabka, S. Liebig, M. Kroh, D. Richter, C. Schröder, and J. Schupp (2019): "The German Socio-Economic Panel (SOEP)," *Jahrbücher für Nationalökonomie und Statistik*, 239, 345–360.
Greenwood, J. and Z. Hercowitz (1991): "The Allocation of Capital and Time over the Business Cycle," *Journal of Political Economy*, 99, 1188–1214.
Jarociński, M. and P. Karadi (2020): "Deconstructing monetary policy surprises—the role of information shocks," *American Economic Journal: Macroeconomics*, 12, 1–43.
Kaplan, G., B. Moll, and G. L. Violante (2018): "Monetary policy according to HANK," *American Economic Review*, 108, 697–743.
King, R. G., C. I. Plosser, and S. T. Rebelo (1988): "Production, growth and business cycles: I. The basic neoclassical model," *Journal of Monetary Economics*, 21, 195–232.
Koeniger, W., B. Lennartz, and M.-A. Ramelet (2022): "On the transmission of monetary policy to the housing market," *European Economic Review*, 145.
Komatsu, M. (2023): "The effect of monetary policy on consumption inequality: An analysis of transmission channels through TANK models," *Journal of Money, Credit and Banking*, 55, 1245–1270.

Lenza, M. and J. Slacalek (2024): "How does monetary policy affect income and wealth inequality? Evidence from quantitative easing in the euro area," *Journal of Applied Econometrics*, 39, 746–765.

Mangiante, G. and P. Meichtry (2025): "On the Distributional Effects of Conventional Monetary Policy and Forward Guidance," *Banque de France Working Paper No. 996.*

McGrattan, E. R., R. Rogerson, and R. Wright (1997): "An Equilibrium Model of the Business Cycle with Household Production and Fiscal Policy," *International Economic Review*, 38, 267–290.

McKay, A. and C. K. Wolf (2023): "Monetary Policy and Inequality," *Journal of Economic Perspectives*, 37, 121–144.

Miranda, V. (2011): "Cooking, caring and volunteering: Unpaid work around the world," *OECD Social, Employment and Migration Working Papers No. 116.*

Nakamura, E. and J. Steinsson (2008): "Five Facts about Prices: A Reevaluation of Menu Cost Models," *The Quarterly Journal of Economics*, 123, 1415–1464.

Nord, L. (2023): "Shopping, demand composition, and equilibrium prices," *mimeo.*

Olovsson, C. (2015): "Optimal taxation with home production," *Journal of Monetary Economics*, 70, 39–50.

Schmidt, V. and H. Seidl (2025): "Aggregate Lending Standards and Inequality," *Berlin School of Economics Working Paper No. 71.*

Zeldes, S. P. (1989): "Consumption and liquidity constraints: an empirical investigation," *Journal of Political Economy*, 97, 305–346.

A Additional empirical results

Table 11: Heterogeneous responses of time spent on care for others to monetary policy

	(1)	(2)	(3)	(4)
mps	-0.0221	-0.0191	-0.0202	-0.0285
	(-0.84)	(-0.65)	(-0.51)	(-0.71)
mps×HtM	-0.0705	-0.0431	-0.0429	0.00631
	(-1.53)	(-0.85)	(-0.85)	(0.12)
East Germany		0.0159***	0.0159***	0.0263**
		(2.91)	(2.90)	(2.18)
Month of the interview		-0.000288	-0.000577	-0.000340
		(-0.30)	(-0.60)	(-0.35)
CPI inflation			0.00388	0.00331
			(0.82)	(0.69)
GDP			0.000733	0.000704
			(1.61)	(1.54)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	36370	30634	30634	30406
R^2	0.000487	0.00155	0.00237	0.00826

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

Table 12: Heterogeneous responses of time spent on repairs to monetary policy

	(1)	(2)	(3)	(4)
mps	1.615***	1.655***	1.271***	1.229***
	(30.27)	(28.66)	(16.68)	(16.24)
mps×HtM	-1.227***	-1.137***	-1.160***	-0.602***
	(-11.80)	(-9.95)	(-10.13)	(-5.29)
East Germany		0.176***	0.175***	0.107***
		(14.74)	(14.69)	(3.30)
Month of the interview		-0.00474**	-0.00119	0.00184
		(-2.25)	(-0.56)	(0.89)
CPI inflation			0.0193**	0.00857
			(2.10)	(0.94)
GDP			-0.00788***	-0.00852***
			(-9.04)	(-9.94)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	37282	31436	31436	31197
R^2	0.0279	0.0297	0.0269	0.0412

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

Table 13: Heterogeneous responses of time spent on market work to monetary policy

	(1)	(2)	(3)	(4)
mps	-0.239*	0.0253	-0.219	-0.300*
	(-1.91)	(0.19)	(-1.26)	(-1.72)
mps×HtM	-0.0547	0.0546	0.0279	0.266
	(-0.19)	(0.17)	(0.09)	(0.86)
East Germany		0.534***	0.532***	0.488***
		(16.01)	(15.99)	(5.07)
Month of the interview		0.0118**	0.0166***	0.0157***
		(1.97)	(2.75)	(2.63)
CPI inflation			-0.0322	-0.00486
			(-1.35)	(-0.21)
GDP			-0.0155***	-0.0107***
			(-6.39)	(-4.48)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	38474	32373	32373	32123
R^2	0.0000214	0.0117	0.0140	0.0355

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

Table 14: Heterogeneous responses of time spent on childcare to monetary policy

	(1)	(2)	(3)	(4)
mps	1.000***	0.149	-0.320***	-0.278**
	(11.05)	(1.63)	(-2.78)	(-2.39)
mps×HtM	0.199	0.340	0.321	-0.00792
	(0.90)	(1.58)	(1.49)	(-0.04)
East Germany		-0.0434**	-0.0449***	-0.0918
		(-2.50)	(-2.60)	(-1.63)
Month of the interview		0.00694*	0.00203	0.00149
		(1.68)	(0.49)	(0.36)
CPI inflation			0.142***	0.141***
			(8.29)	(8.14)
GDP			0.0144***	0.0142***
			(9.08)	(8.78)
Individual controls		✓	✓	✓
FE for Region, Housing & Occupation				✓
Observations	36759	30978	30978	30750
R^2	0.0108	0.189	0.187	0.195

Notes: (i) t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; (ii) individual controls are gender, minor kids, marital status, years of education.

B The Model

B.1 Households' problem and first-order conditions

Household j of type $z \in (h, s)$ maximizes lifetime utility given by

$$E_0 \sum_{t=0}^{\infty} \beta^t U(C_t^z(j), L_t(j)) = E_0 \sum_{t=0}^{\infty} \beta^t \frac{[C_t^z(j)^b L_t^z(j)^{1-b}]^{1-\sigma} - 1}{1-\sigma}$$

subject to the following four constraints.

$$C_t^z(j) = [\alpha C_{m,t}^z(j)^\eta + (1-\alpha) C_{n,t}^z(j)^\eta]^{1/\eta}$$

$$L_t^z(j) = 1 - H_{m,t}^z(j) - H_{n,t}^z(j)$$

$$C_{n,t}^z(j) = H_{n,t}^z(j)$$

$$H_t^z(j) = \left(\frac{W_t^{n,z}(j)}{W_t^{n,z}} \right)^{-\epsilon_w} H_t^z$$

The budget constraints differ across HtM households and savers, and are given by

$$W_t^{n,h}(j) H_{m,t}^h(j) - \frac{\xi^h}{2} \left(\frac{W_t^{n,h}(j)}{W_{t-1}^{n,h}(j)} - 1 \right)^2 W_t^{n,h}(j) H_{m,t}^h(j) - T_t \leq P_t C_{m,t}^h(j),$$

$$W_t^{n,s}(j) H_{m,t}^s(j) - \frac{\xi^s}{2} \left(\frac{W_t^{n,s}(j)}{W_{t-1}^{n,s}(j)} - 1 \right)^2 W_t^{n,s}(j) H_{m,t}^s(j) + B_t^s(j) - T_t \leq E_t\{Q_{t,t+1} B_{t+1}^s(j)\} + P_t C_{m,t}^s(j).$$

The Lagrange function of savers is given by:

$$\begin{aligned}
\mathcal{L} \equiv E_0 \sum_{t=0}^{\infty} \beta^t & \left(\frac{\left[\left([\alpha C_{m,t}^s(j)^\eta + (1-\alpha) C_{n,t}^s(j)^\eta]^{1/\eta} \right)^b (1 - H_{m,t}^s(j) - H_{n,t}^s(j))^{1-b} \right]^{1-\sigma} - 1}{1-\sigma} \right) \\
& + \lambda_t^s(j) [W_t^{n,s}(j) H_{m,t}^s(j) - \frac{\xi^s}{2} \left(\frac{W_t^{n,s}(j)}{W_{t-1}^{n,s}(j)} - 1 \right)^2 W_t^{n,s}(j) H_{m,t}^s(j) + B_t^s(j) \\
& \qquad - T_t - E_t\{Q_{t,t+1} B_{t+1}^s(j)\} - P_t C_{m,t}^s(j)] \\
& + \mu_t^s(j) \left[H_{m,t}^s(j) - \left(\frac{W_t^{n,s}(j)}{W_t^{n,s}} \right)^{-\epsilon_w} H_{m,t}^s \right] \\
& + \chi_t^s(j) \left[H_{n,t}^s(j) - C_{n,t}^s(j) \right]
\end{aligned}$$

The first-order conditions are derived as follows.

$$\frac{\partial \mathcal{L}}{\partial C^s_{m,t}(j)} : U_{C^s_t(j)} \frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)} - P_t \lambda^s_t(j) = 0 \leftrightarrow \lambda^s_t(j) = \frac{U_{C^s_t(j)}}{P_t} \frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)}$$

$$\begin{aligned}
\frac{\partial \mathcal{L}}{\partial H^s_{m,t}(j)} :& U_{H^s_{m,t}(j)} + \lambda^s_t(j)(W^{n,s}_t(j) - \frac{\xi^s}{2}\left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right)^2 W^{n,s}_t(j)) + \mu^s_t(j) = 0 \\
&\leftrightarrow \mu^s_t(j) = -U_{H^s_{m,t}(j)} - \frac{U_{C^s_{m,t}(j)}}{P_t} \frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)} (W^{n,s}_t(j) - \frac{\xi^s}{2}\left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right)^2 W^{n,s}_t(j))
\end{aligned}$$

$$\begin{aligned}
\frac{\partial \mathcal{L}}{\partial H^s_{n,t}(j)} :& \frac{U_{L^s_t(j)}(C^s_t(j), L^s_t(j))}{(1-\alpha)U_{C^s_t(j)}(C^s_t(j), L^s_t(j))} \left(\frac{C^s_{n,t}(j)}{C^s_t(j)}\right)^{1-\eta} = \frac{C^s_{n,t}(j)}{H^s_{n,t}(j)} \\
&\leftrightarrow \frac{1-b}{b(1-\alpha)} \left(\frac{C^s_t(j)}{C^s_{n,t}(j)}\right)^{\eta} = \frac{L^s_t(j)}{H^s_{n,t}(j)}
\end{aligned}$$

$$\begin{aligned}
\frac{\partial \mathcal{L}}{\partial W^{n,s}_t(j)} :& \lambda^s_t(j) \left(H^s_{m,t}(j) - \frac{\xi^s}{2} H^s_{m,t}(j) \left[2\left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right) \frac{1}{W^{n,s}_{t-1}(j)} W^{n,s}_t(j) + \left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right)^2 \right] \right) \\
&+ \mu^s_t(j) \left[-\epsilon_w \left(\frac{W^{n,s}_t(j)}{W^{n,s}_t}\right)^{-\epsilon_w - 1} \frac{1}{W^{n,s}_t} H^s_{m,t}(i) \right] \\
&+ \beta E_t \left(\lambda^s_{t+1}(j) \left[-\xi^s \left(\frac{W^{n,s}_{t+1}(j)}{W^{n,s}_t(j)} - 1\right) W^{n,s}_{t+1}(j) H^s_{m,t+1}(j) \frac{W^{n,s}_{t+1}(j)}{W^{n,s}_t(j)^2} (-1) \right] \right) = 0 \\
\leftrightarrow& \frac{U_{C^s_t(j)} H^s_{m,t}(j)}{P_t} \frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)} \{ \epsilon_w MRS^s_t(j) \frac{1}{\frac{W^{n,s}_t(j)}{P_t}} + (1-\epsilon_w) \\
&- \xi^s \left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right) \left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} + \frac{1-\epsilon_w}{2} \left(\frac{W^{n,s}_t(j)}{W^{n,s}_{t-1}(j)} - 1\right)\right) \\
+\beta E_t& \left(\frac{U_{C^s_{t+1}(j)}}{U_{C^s_t(j)}} \left(\frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)}\right)^{-1} \left(\frac{\partial C^s_{t+1}(j)}{\partial C^s_{m,t+1}(j)}\right) \frac{P_t}{P_{t+1}} \xi^s \left(\frac{W^{n,s}_{t+1}(j)}{W^{n,s}_t(j)} - 1\right) \frac{W^{n,s}_{t+1}(j)}{W^{n,s}_t(j)} \frac{W^{n,s}_{t+1}(j) H^s_{m,t+1}(j)}{W^{n,s}_t(j) H^s_{m,t}(j)} \right) \} \\
&= 0 \\
\leftrightarrow& \epsilon_w MRS^s_t \frac{1}{W^s_t} + (1-\epsilon_w) - \xi^s \left(\Pi^{w,s}_t - 1\right) \left(\Pi^{w,s}_t + \frac{1-\epsilon_w}{2} \left(\Pi^{w,s}_t - 1\right)\right) \\
+\beta E_t& \left(\frac{U_{C^s_{t+1}}}{U_{C^s_t}} \left(\frac{\partial C^s_t}{\partial C^s_{m,t}}\right)^{-1} \left(\frac{\partial C^s_{t+1}}{\partial C^s_{m,t+1}}\right) \left(\Pi_{t+1}\right)^{-1} \xi^s \left(\Pi^{w,s}_{t+1} - 1\right) \left(\Pi^{w,s}_{t+1}\right)^2 \frac{H^s_{t+1}}{H^s_t} \right) = 0
\end{aligned}$$

$$\frac{\partial \mathcal{L}}{\partial B^s_{t+1}(j)} : -\lambda^s_t(j)Q_{t,t+1} + \beta E_t\left(\lambda^s_{t+1}(j)\right) = 0 \leftrightarrow \lambda^s_t(j)Q_{t,t+1} = \beta E_t\left(\lambda^s_{t+1}(j)\right)$$

$$\leftrightarrow Q_{t,t+1} = \beta E_t\left(\frac{\lambda^s_{t+1}(j)}{\lambda^s_t(j)}\right) = \beta E_t\left(\frac{U_{C^s_{t+1}(j)}}{U_{C^s_t(j)}}\left(\frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)}\right)^{-1}\left(\frac{\partial C^s_{t+1}(j)}{\partial C^s_{m,t+1}(j)}\right)(\Pi_{t+1})^{-1}\right)$$

$$\leftrightarrow \beta E_t\left(\frac{U_{C^s_{t+1}(j)}}{U_{C^s_t(j)}}\left(\frac{\partial C^s_t(j)}{\partial C^s_{m,t}(j)}\right)^{-1}\left(\frac{\partial C^s_{t+1}(j)}{\partial C^s_{m,t+1}(j)}\right)(1+i_t)(\Pi_{t+1})^{-1}\right) = 1$$

HtM households have exactly the same first-order conditions as savers except that they do not have a first-order condition with respect to nominal bonds.

B.1.1 Households' demand for good i

The households' demand for good i is derived as follows.[19] Household j's optimization problem for choosing the optimal consumption bundle is given by

$$\max_{C_t(i,j)} \quad C_t(j) \equiv \left(\int_0^1 C_t(i,j)^{\frac{\epsilon-1}{\epsilon}} di\right)^{\frac{\epsilon}{\epsilon-1}} \text{ subject to } \quad \int_0^1 P_t(i)C_t(i,j)di = Z_t(j),$$

where $Z_t(j)$ is any given expenditure level. The corresponding Lagrangian is given by

$$\mathcal{L} \equiv \left(\int_0^1 C_t(i,j)^{\frac{\epsilon-1}{\epsilon}} di\right)^{\frac{\epsilon}{\epsilon-1}} - \lambda_t\left(\int_0^1 P_t(i)C_t(i,j)di - Z_t(j)\right).$$

The first-order condition with respect to a particular good k is given by

$$\begin{aligned}
\frac{\partial \mathcal{L}}{\partial C_t(k,j)} = \quad & \frac{\epsilon}{\epsilon-1}\left(\int_0^1 C_t(i,j)^{\frac{\epsilon-1}{\epsilon}} di\right)^{\frac{\epsilon}{\epsilon-1}-1}\frac{\epsilon-1}{\epsilon}C_t(k,j)^{\frac{\epsilon-1}{\epsilon}-1} - \lambda_t P_t(k) = 0 \\
\leftrightarrow \quad & \left(\int_0^1 C_t(i,j)^{\frac{\epsilon-1}{\epsilon}} di\right)^{\frac{\epsilon}{\epsilon-1}-1} C_t(k,j)^{-\frac{1}{\epsilon}} = \lambda_t P_t(k) \\
\leftrightarrow \quad & \left(\int_0^1 C_t(i,j)^{\frac{\epsilon-1}{\epsilon}} di\right)^{\frac{\epsilon}{\epsilon-1}-1} C_t(n,j)^{-\frac{1}{\epsilon}} = \lambda_t P_t(n),
\end{aligned}$$

with n denoting another variety out of the goods bundle. Dividing the two last lines by each

[19]Note that this derivation is the same for both types of households, thus, deriving the demand equation separately for the two types, and aggregating it afterwards yields the same result.

other yields

$$\left(\frac{C_t(k,j)}{C_t(n,j)}\right)^{-\frac{1}{\epsilon}} = \frac{P_t(k)}{P_t(n)} \leftrightarrow \frac{C_t(k,j)}{C_t(n,j)} = \left(\frac{P_t(k)}{P_t(n)}\right)^{-\epsilon} \leftrightarrow C_t(k,j) = P_t(k)^{-\epsilon} P_t(n)^{\epsilon} C_t(n,j).$$

Hence, it follows that

$$\begin{aligned}
Z_t(j) &= \int_0^1 P_t(i) C_t(i,j) di = \int_0^1 P_t(i) P_t(i)^{-\epsilon} P_t(n)^{\epsilon} C_t(n,j) di = P_t(n)^{\epsilon} C_t(n,j) \int_0^1 P_t(i)^{1-\epsilon} di \\
&= P_t(n)^{\epsilon} C_t(n,j) \left(\left(\int_0^1 P_t(i)^{1-\epsilon} di\right)^{\frac{1}{1-\epsilon}}\right)^{1-\epsilon} = P_t(n)^{\epsilon} C_t(n,j) P_t^{1-\epsilon} \\
&\leftrightarrow C_t(n,j) = \left(\frac{P_t(n)}{P_t}\right)^{-\epsilon} \frac{Z_t(j)}{P_t} \leftrightarrow C_t(i,j) = \left(\frac{P_t(i)}{P_t}\right)^{-\epsilon} \frac{Z_t(j)}{P_t}.
\end{aligned}$$

Aggregating the equilibrium goods demand equation over all households j yields

$$\int_0^1 C_t(i,j) dj = \left(\frac{P_t(i)}{P_t}\right)^{-\epsilon} \frac{1}{P_t} \int_0^1 Z_t(j) dj \rightarrow C_t(i) = \left(\frac{P_t(i)}{P_t}\right)^{-\epsilon} \frac{Z_t}{P_t}.$$

B.2 Firms' problem and first-order conditions

Firm i maximizes profits,

$$\max_{H_{m,t}(i), Y_t(i), P_t(i)} P_t(i) Y_t(i) - W_t^n H_{m,t}(i),$$

subject to the following constraints,

$$Y_t(i) = H_{m,t}(i),$$

$$H_{m,t}(i) \equiv [(1-\psi) H_{m,t}^s(i)^{\zeta} + \psi H_{m,t}^h(i)^{\zeta}]^{\frac{1}{\zeta}},$$

$$Y_t(i) = \left[\frac{P_t(i)}{P_t}\right]^{-\epsilon_p} Y_t^d,$$

$$P_{t+k+1}(i) = \begin{cases} P_{t+k+1}^*(i) & \text{with probability } (1-\theta), \\ P_{t+k}(i) & \text{with probability } \theta. \end{cases}$$

The Lagrangian is given by

$$
\begin{aligned}
\mathcal{L} \equiv & E_t \left(\sum_{k=0}^{\infty} \theta^k Q_{t,t+k} \{ [P_t^*(i) Y_{t+k}(i) - W_{t+k}^n H_{m,t+k}(i)] \right) \\
& - \lambda_{t+k}(i) \left(Y_{t+k}(i) - \left[\frac{P_t^*(i)}{P_{t+k}} \right]^{-\epsilon_p} Y_{t+k}^d \right) - \mu_{t+k}(i) (Y_{t+k}(i) - H_{m,t+k}(i)) \}.
\end{aligned}
$$

The first-order conditions are given by

$$
\frac{\partial \mathcal{L}}{\partial H_{m,t+k}(i)} = -W_{t+k}^n + \mu_{t+k}(i) = 0 \leftrightarrow MC_{t+k}^n \equiv \mu_{t+k}(i) = W_{t+k}^n \leftrightarrow MC_{t+k} = W_{t+k},
$$

$$
\begin{aligned}
\frac{\partial \mathcal{L}}{\partial H_{m,t+k}^z(i)} &= -W_{t+k}^{n,z} + \mu_{t+k}(i) [(1-\psi) H_{m,t}^s(i)^\zeta + \psi H_{m,t}^h(i)^\zeta]^{\frac{1}{\zeta}-1} \zeta H_m^z(i)^{\zeta-1} = 0 \\
& \leftrightarrow W_t^z = \zeta MC [(1-\psi) H_{m,t}^s(i)^\zeta + \psi H_{m,t}^h(i)^\zeta]^{\frac{1}{\zeta}-1} H_m^z(i)^{\zeta-1}
\end{aligned}
$$

$$
\frac{\partial \mathcal{L}}{\partial Y_{t+k}(i)} = P_t^* - \lambda_{t+k}(i) - \mu_{t+k}(i) = 0 \leftrightarrow \lambda_{t+k}(i) = P_t^* - \mu_{t+k}(i) = P_t^* - MC_{t+k}^n,
$$

$$
\begin{aligned}
\frac{\partial \mathcal{L}}{\partial P_t^*(i)} &= E_t \left(\sum_{k=0}^{\infty} \theta^k Q_{t,t+k} [Y_{t+k}(i) - \lambda_{t+k}(i) \epsilon_p \left[\frac{P_t^*}{P_{t+k}} \right]^{-\epsilon_p - 1} \frac{1}{P_{t+k}} Y_{t+k}^d \right) = 0 \\
& \leftrightarrow E_t \left(\sum_{k=0}^{\infty} \theta^k Q_{t,t+k} [Y_{t+k}(i) - \lambda_{t+k}(i) \epsilon_p \frac{Y_{t+k}(i)}{P_t^*}] \right) = 0 \\
& \leftrightarrow E_t \left(\sum_{k=0}^{\infty} \theta^k Q_{t,t+k} Y_{t+k}(i) \left[\frac{P_t^*}{P_t} - MC_{t+k} \left(\frac{\epsilon_p}{\epsilon_p - 1} \right) \right] \right) = 0 \\
\leftrightarrow \frac{P_t^*}{P_t} &= \frac{[C_{m,t} + G_t] \left(\frac{\epsilon_p}{\epsilon_p - 1} \right) MC_t + \beta \theta E_t \left(\frac{\lambda_{t+1}^s}{\lambda_t^s} (\Pi_{t+1})^{\epsilon_p} x_{1,t+1} \right)}{[C_{m,t} + G_t] + \beta \theta E_t \left(\frac{\lambda_{t+1}^s}{\lambda_t^s} (\Pi_{t+1})^{\epsilon_p - 1} x_{2,t+1} \right)} = \frac{x_{1,t}}{x_{2,t}}.
\end{aligned}
$$

B.2.1 Firms' demand for labor of household j and type z

The firms' demand for labor of household j and of type z is derived as follows. Firm i's optimization problem for choosing the optimal labor bundle is given by

$$
\max_{H_{m,t}^z(i,j)} H_{m,t}^z(i) = \left(\int_{j \in \mathcal{Z}} H_{m,t}^z(i,j)^{\frac{\epsilon_w - 1}{\epsilon_w}} dj \right)^{\frac{\epsilon_w}{\epsilon_w - 1}} \quad \text{subject to} \quad \int_{j \in \mathcal{Z}} W_t^{n,z}(j) H_{m,t}^z(i,j) dj = Z_t^z(i),
$$

where $Z^z_t(i)$ is any given expenditure level. The corresponding Lagrangian is given by

$$\mathcal{L} \equiv \left(\int_{j\in\mathcal{Z}} H^z_{m,t}(i,j)^{\frac{\epsilon_w-1}{\epsilon_w}} dj\right)^{\frac{\epsilon_w}{\epsilon_w-1}} - \lambda_t \left(\int_{j\in\mathcal{Z}} W^{n,z}_t(j) H^z_{m,t}(i,j)dj - Z^z_t(i)\right).$$

The first-order condition with respect to a particular labor unit k is given by

$$\begin{aligned}
\frac{\epsilon_w}{\epsilon_w-1}\left(\int_{j\in\mathcal{Z}} H^z_{m,t}(i,j)^{\frac{\epsilon_w-1}{\epsilon_w}} dj\right)^{\frac{\epsilon_w}{\epsilon_w-1}-1} \frac{\epsilon_w-1}{\epsilon_w} H^z_{m,t}(ik)^{\frac{\epsilon_w-1}{\epsilon_w}-1} - \lambda_t W^{n,z}_t(k) = 0 \\
\leftrightarrow \left(\int_{j\in\mathcal{Z}} H^z_{m,t}(i,j)^{\frac{\epsilon_w-1}{\epsilon_w}} dj\right)^{\frac{\epsilon_w}{\epsilon_w-1}-1} H^z_{m,t}(ik)^{\frac{\epsilon_w-1}{\epsilon_w}-1} = \lambda_t W^{n,z}_t(k) \\
\leftrightarrow \left(\int_{j\in\mathcal{Z}} H^z_{m,t}(i,j)^{\frac{\epsilon_w-1}{\epsilon_w}} dj\right)^{\frac{\epsilon_w}{\epsilon_w-1}-1} H^z_{m,t}(in)^{\frac{\epsilon_w-1}{\epsilon_w}-1} = \lambda_t W^{n,z}_t(n),
\end{aligned}$$

with n denoting another variety of the labor bundle. Dividing the last two lines by each other yields

$$\left(\frac{H^z_{m,t}(ik)}{H^z_{m,t}(in)}\right)^{\frac{\epsilon_w-1}{\epsilon_w}-1} = \frac{W^{n,z}_t(k)}{W^{n,z}_t(n)} \leftrightarrow H^z_{m,t}(i,j) = W^{n,z}_t(j)^{-\epsilon_w} W^{n,z}_t(n)^{\epsilon_w} H^z_{m,t}(in).$$

Hence it follows that

$$\begin{aligned}
Z^z_t(i) = W^{n,z}_t(j) H^z_{m,t}(i,j)dj = \int_{j\in\mathcal{Z}} W^{n,z}_t(j) W^{n,z}_t(j)^{-\epsilon_w} W^{n,z}_t(n)^{\epsilon_w} H^z_{m,t}(in)dj \\
= W^{n,z}_t(n)^{\epsilon_w} H^z_{m,t}(in) \int_{j\in\mathcal{Z}} W^{n,z}_t(j)^{1-\epsilon_w} dj = W^{n,z}_t(n)^{\epsilon_w} H^z_{m,t}(in)(W^{n,z}_t)^{1-\epsilon_w} \\
\leftrightarrow H^z_{m,t}(i,j) = \left(\frac{W^{n,z}_t(j)}{W^{n,z}_t}\right)^{-\epsilon_w} \frac{Z_t(i)}{W^{n,z}_t} = \left(\frac{W^{n,z}_t(j)}{W^{n,z}_t}\right)^{-\epsilon_w} H^z_{m,t}(i).
\end{aligned}$$

Aggregating the labor demand equation over all firms yields

$$\int_{j\in\mathcal{Z}} H^z_{m,t}(i,j)di = \left(\frac{W^{n,z}_t(j)}{W^{n,z}_t}\right)^{-\epsilon_w} \int_{j\in\mathcal{Z}} H^z_{m,t}(i)di \rightarrow H^z_{m,t}(j) = \left(\frac{W^{n,z}_t(j)}{W^{n,z}_t}\right)^{-\epsilon_w} H^z_{m,t}.$$

B.3 Steady state

I assume a zero inflation steady state, i.e., $\bar{\Pi} = 1$ and $\Pi^{\bar{w},z} = 1$. The monetary policy shock is zero in steady state, $\bar{\epsilon}^\nu = 0$, so $\bar{\nu} = 0$. The Euler equation yields $(1+\bar{i}) = \frac{1}{\beta}$.

The two auxiliary equation give the steady state of the real marginal costs, $\bar{MC}$,

$$\bar{x}_1 = [\bar{C}_m + \bar{G}]\left(\frac{\epsilon_p}{\epsilon_p-1}\right)\bar{MC} + \beta\theta\frac{\bar{\lambda}^s}{\bar{\lambda}^s}\bar{\Pi}^{\epsilon_p}\bar{x}_1 \leftrightarrow \bar{x}_1(1-\beta\theta\bar{\Pi}^{\epsilon_p}) = [\bar{C}_m + \bar{G}]\left(\frac{\epsilon_p}{\epsilon_p-1}\right)\bar{MC}$$

$$\bar{x}_2 = [\bar{C_m} + \bar{G}] + \beta\theta\frac{\bar{\lambda}^s}{\bar{\lambda}^s}\bar{\Pi}^{\epsilon_p - 1}\bar{x}_2 \leftrightarrow \bar{x}_2(1 - \beta\theta\bar{\Pi}^{\epsilon_p - 1}) = \bar{C_m} + \bar{G}$$

since $\bar{\Pi} = 1$, $\bar{\Pi}^{\epsilon_p - 1} = \bar{\Pi}^{\epsilon_p} = 1$ and $\bar{P} = \bar{P}^{*}$, and because $\frac{\bar{x}_1}{\bar{x}_2} = \frac{\bar{P}^*}{\bar{P}} = 1$, it follows that $\bar{x}_1 = \bar{x}_2$. This gives

$$[\bar{C_m} + \bar{G}]\left(\frac{\epsilon_p}{\epsilon_p - 1}\right)\bar{MC} = \bar{C_m} + \bar{G} \leftrightarrow \bar{MC} = \frac{\epsilon_p - 1}{\epsilon_p}$$

Using the production function, the real wage in steady state is given by

$$\bar{W} = \bar{MC}\left(\frac{\bar{Y}}{\bar{M}}\right) = \bar{MC}.$$

As wages are sticky, the marginal rate of substitution between consumption and leisure is up to a fraction equal to the real wage,

$$\frac{\epsilon_w}{(\epsilon_w - 1)}\left(\frac{-\bar{U}_{H_m^z}}{\bar{U}_{C_m^z}}\right) = \bar{W}.$$

I use the function *fsolve* in Matlab to solve for output, and hours worked and consumption of savers and HtM households at home and in market.

B.4 Model solution

I solve the model using Dynare 5.0 in Matlab R2024b. My code builds upon the replication code of Galí (2015) by Johannes Pfeifer (Github repository "JohannesPfeifer/DSGE_mod") and the replication code of Gnocchi et al. (2016) from the Macroeconomic Model Data Base.

C Details on the calibration of wage stickiness

I follow Born and Pfeifer (2020) to calculate the Rotemberg-wage-adjustment parameters from Calvo probabilities. According to section 2.4. in Born and Pfeifer (2020), it holds that

$$\frac{(1-\theta_w)(1-\beta\theta_w)}{\theta_w(1+\epsilon_w\epsilon_{tot}^{mrs})} = \frac{(\epsilon_w - 1)(1-\tau^n)\chi}{\xi} \leftrightarrow \xi = (\epsilon_w - 1)(1-\tau^n)\chi\frac{\theta_w(1+\epsilon_w\epsilon_{tot}^{mrs})}{(1-\theta_w)(1-\beta\theta_w)},$$

where ϵ_{tot}^{mrs} is the total elasticity that is (in case of multiplicatively separable preferences) given by

$$\epsilon_{tot}^{mrs} = \left[1 - \frac{(1-b)(\sigma-1)}{b(1-\sigma)-1}\right] \times \frac{N}{1-N},$$

with $N/(1-N)$ being the ratio of hours worked to leisure. The steady-state labor share is denoted by χ, and is given by

$$\chi = \frac{WN}{\Xi} = \frac{\epsilon_p - 1}{\epsilon_p}(1-\alpha),$$

where Ξ is the nominal adjustment cost base, and $(1-\alpha)$ is the steady-state elasticity of the production function with respect to labor. Labor taxes are denoted by τ^n.

The baseline calibration of my model is given by $\alpha = 0$, $\epsilon_p = 9$, $\epsilon_w = 4.5$, $\beta = 0.99$, $\sigma = 2$, $b = 0.865$ and $\tau^n = 0$. Thus, it follows that $\chi = \frac{\epsilon_p - 1}{\epsilon_p}(1-\alpha) = 0.89$. The ratio of market work to leisure is given by $0.64/0.16 = 4$. The total elasticity of substitution for both types of households is then given by $\epsilon^{mrs}_{tot,h} = \left[1 - \frac{(1-0.865)(2-1)}{0.865(1-2)-1}\right] \times 4 = 1.07 \times 4 = 4.3$. Note that Born and Pfeifer (2020) report much smaller values for the total elasticity of substitution, as assume they a work leisure share of around 0.5.

The savers' Calvo parameter for wage stickiness is 3/4, which yields the following Rotemberg-adjustment-costs parameter,

$$\xi^s = (4.5-1) \times 0.89 \times \frac{0.75(1 + 4.5 \times 4.3)}{(1-0.75)(1-0.99 \times 0.75)} \approx 740,$$

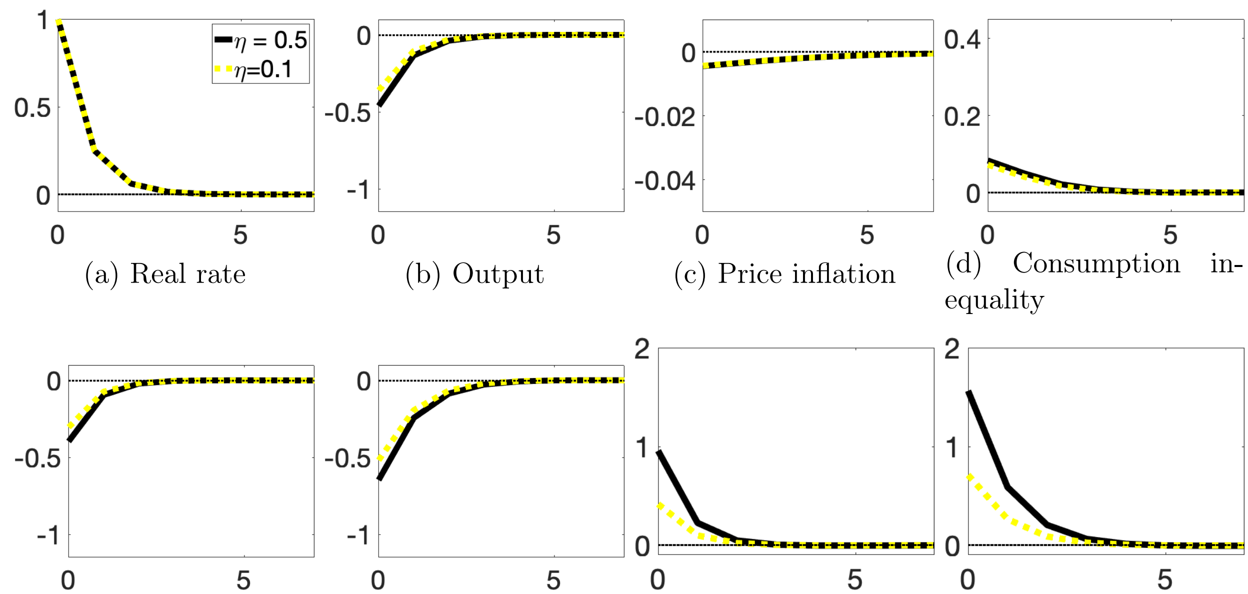
and for HtM households the Calvo parameter for wage stickiness is 5/6, and this yields the following Rotemberg-adjustment-costs parameter,

$$\xi^h = (4.5-1) \times 0.89 \times \frac{5/6(1 + 4.5 \times 4.3)}{(1-5/6)(1-0.99 \times 5/6)} \approx 1810.$$

D The role of the elasticity of substitution between goods bought on the market and produced at home

The size of the elasticity of substitution between goods bought on the market and produced at home is crucial for the results. Yet, as explained in the calibration in section 3.5, evidence on the size of this parameter is rather scant. Therefore, figure 7 presents the results with a value of as low as 0.1. With a lower elasticity of substitution, the substitution towards the home sector becomes lower for both types of households. However, the main result still holds: HtM households substitute towards the home sector to a greater extent compared to savers.

Figure 7: The role of the elasticity of substitution between goods bought on the market and produced at home



(a) Real rate (b) Output (c) Price inflation (d) Consumption inequality

(e) Market hours savers (f) Market hours HtM household (g) Home hours savers (h) Home hours HtM household

Notes: (i) shock size: 100 basis points (annualized), (ii) consumption inequality is the difference in the consumption responses (measured in percentage changes from the steady state) between HtM and savers, (iii) responses: quarterly, rates and inequality are in pp deviations, and all other variables in %-deviations from the steady state, (iv) inflation and the interest rate are annualized.