0.1 Related literature

The evidence for an excess initial MPC in Fagereng, Holm, and Natvik (2021) is consistent with longstanding as well as recent findings in the literature. Perhaps the closest direct comparison is to Kotsogiannis and Sakellaris (2024), who use data from a Greek (as opposed to Norwegian) lottery, and find that the induced extra monthly spending in the first three months is triple the induced extra spending in the remaining observed months.[1]

Because they are focused primarily on measuring empirical facts, neither of these papers proposes a specific model for the excess initial MPC (nor do most earlier papers, such as Parker, Souleles, Johnson, and McClelland (2013); Johnson, Parker, and Souleles (2006)). But a substantial literature has recently developed that both provides further evidence of an excess initial MPC and proposes a number of competing theoretical models of the phenomenon.

One strand of the theoretical literature explores the possibility that the burst of initial spending is rationalizable if the spending is on durables (Browning and Crossley (2009)). Mankiw (1982) showed that in the frictionless case, spending on durable goods should be vastly more responsive to a permanent income shock than spending on nondurables.[2,3] It seems plausible that a model in which consumers own a large number of goods that are durable at, say, the quarterly or annual frequency[4] could explain the 'excess initial MPC' as actually reflecting a rational marginal propensity to Expend (MPX).

Alternatively, Indarte, Kluender, Malmendier, and Stepner (2024) attribute the excess initial MPX to a form of "present bias" in which people have strongly time inconsistent preferences; Maxted, Laibson, and Moll (2024) offer a similar interpretation.

Laibson, Maxted, and Moll (2022) combine these two ideas in a simple model with both present bias and durables expenditures. A back-of-the-envelope calculation yields a rough estimate that the ratio of initial spending on durables to the spending that would coccur if all spending were nondurable is roughly 3.2 to one (not far from the ratio estimated in the Greek lottery episode studied by Kotsogiannis and Sakellaris (2024)).

A potential challenge to these interpretations is the now-substantial literature showing that even high-wealth households seem to have a high initial MPC out of income shocks.[5] If such houseolds achieved their high wealth because they are less present-biased than

[1] The paper also interestingly finds a close connection between reported preferences (what consumers *say* they will do in a hypothetical scenario) and their actual behavior when the scenario is realized. This suggests that it might be to fruitful to ask respondents *why* they expect to exhibit a high initial MPC.

[2] Much *more* responsive than the aggregate data indicate. Caballero (1993) proposed that a heterogeneous agent model might explain the 'slow adjustment,' but Carroll and Dunn (1997) have argued that when uncertainty is added to the problem, durable goods expenditures again become much more volatile than in the data.

[3] The NIPA accounts treat as 'durable' those goods whose expected lifetime is 3 years or more, but at the annual frequency many more things are arguably durable – for example, Hai, Krueger, and Postlewaite (2020) argue that many services are durable at the annual frequency, which explains why people take vacations once a year.

[4] Blinder and Deaton (1985) mention clothes and shoes as examples.

[5] In addition to Fagereng, Holm, and Natvik (2021), Graham and McDowall (2024), Crawley and

others, present-bias may not be a good explanation for their high MPCs; and it also seems likely to be difficult to explain why high-liquid-wealth households would have a high propensity to buy durables out of a (relatively) small transitory shock.

For our purposes, a further attraction to the idea that the initial excess MP[C/X] reflects durables expenditures is that the Mankiw (1982) model implies that the marginal value of an extra dollar of expenditures on durables is equal to the marginal utility of an extra unit of nondurables spending. At least to first order, this justifies our choice in the welfare analysis to assume that the marginal utility of splurge spending is equal to the marginal utility of nondurables consumption. Complications like convex adjustment costs can break this exact equality, but even in that case it seems likely that a variant of the arguments of Akerlof and Yellen (1985) and Cochrane (1989) would hold: Small deviations of actual behavior from the behavior in an idealized model are likely to have small consequences for utility.

Several papers have looked at fiscal policies that have been implemented in the U.S. under the lens of a structural model. Coenen, Erceg, Freedman, Furceri, Kumhof, Lalonde, Laxton, Lindé, Mourougane, Muir, et al. (2012) analyses the effects of different fiscal policies using seven different models. The models are variants of two-agent heterogeneous agent models and make no attempt to match the full distribution of liquid wealth as we do in this paper. We also attempt to match the microdata on household consumption behavior, much of which has come more recently. More closely aligned to the methodology of our paper are McKay and Reis (2016), McKay and Reis (2021), and Phan (2024) which look at the role of automatic stabilizers. By contrast, we consider discretionary policies that have been invoked after a recession has begun. Another related paper is Bayer, Born, Luetticke, and Müller (2023) who studies fiscal policies implemented during the pandemic. They find that targeted stimulus through an increase in unemployment benefits has a much larger multiplier than an untargeted policy. In contrast, we find that untargeted stimulus checks have slightly higher multiplier effects when compared with a targeted policy extending eligibility for unemployment insurance. Our results derive from the fact that—as in the data—even high liquid wealth consumers have relatively high MPCs in our model.

This paper is also closely related to the empirical literature that aims to estimate the effect of transitory income shocks and stimulus payments. We particularly focus on Fagereng, Holm, and Natvik (2021), who use Norwegian administrative panel data with sizable lottery wins to estimate the MPC out of transitory income in that year, as well as the pattern of expenditure in the following years. We build a model that is consistent with the patterns they identify. Examples of the literature that followed the Great Recession in 2008 are Parker, Souleles, Johnson, and McClelland (2013) and Broda and Parker (2014). These papers exploit the effectively random timing of the distribution of stimulus payments and identify a substantial consumption response. The results indicate an MPC that is difficult to reconcile with representative agent models.

Thus, the paper relates to the literature presenting HA models that aim to be consis-

Kuchler (2023), and Kueng (2018) among others all provide strong evidence of high MPCs for high-liquid-wealth households.

tent with the evidence from the micro-data. An example is Kaplan and Violante (2014), who build a model where agents save in both liquid and illiquid assets. The model yields a substantial consumption response to a stimulus payment, since MPCs are high both for constrained, low-wealth households and for households with substantial net worth that is mainly invested in the illiquid asset (the "wealthy hand-to-mouth"). Carroll, Crawley, Slacalek, and White (2020) present an HA model that is similar in many respects to the one we study. Their focus is on predicting the consumption response to the 2020 U.S. CARES Act that contains both an extension of unemployment benefits and a stimulus check. However, neither of these papers attempts to evaluate and rank the effectiveness of different stimulus policies, as we do.

Kaplan and Violante (2022) discuss different mechanisms used in HA models to obtain a high MPC and the tension between that and fitting the distribution of aggregate wealth. We use one of the mechanisms they consider, *ex-ante* heterogeneity in discount factors, and build a model that delivers both high average MPCs and a distribution of liquid wealth consistent with the data. The model allows for splurge consumption and thus also delivers substantial MPCs for high-liquid-wealth households. This helps the model match not only the initial MPC, but also the propensity to spend out of a windfall for several periods after it is obtained.[6]

In our model, consumers do not adjust their labor supply in response to the stimulus policies. Our assumption is broadly consistent with the empirical findings in Ganong, Greig, Noel, Sullivan, and Vavra (2022) and Chodorow-Reich and Karabarbounis (2016). However, the literature is conflicted on this subject and Hagedorn, Manovskii, and Mitman (2017) and Hagedorn, Karahan, Manovskii, and Mitman (2019) find that extensions of unemployment insurance affect both search decisions and vacancy creation leading to a rise in unemployment. Kekre (2022), on the other hand, evaluates the effect of extending unemployment insurance in the period from 2008 to 2014. He finds that this extension raised aggregate demand and implied a lower unemployment rate than without the policy. However, he does not attempt to compare the stimulus effects of extending unemployment insurance with other policies.

One criterion to rank policies is the extent to which spending is "multiplied," and our paper therefore relates to the vast literature discussing the size and timing of any multiplier. Our focus is on policies implemented in the aftermath of the Great Recession, a period when monetary policy was essentially fixed at the zero lower bound (ZLB). We therefore do not consider monetary policy responses to the policies we evaluate in our primary analysis, and our work thus relates to papers such as Christiano, Eichenbaum, and Rebelo (2011) and Eggertsson (2011), who argue that fiscal multipliers are higher in such circumstances. Hagedorn, Manovskii, and Mitman (2019) present an HA model with both incomplete markets and nominal rigidities to evaluate the size of the fiscal multiplier and also find that it is higher when monetary policy is constrained. Unlike us, they focus on government spending instead of transfers and are interested in different

[6]Our modeling focus is to match the micro evidence on the intertemporal MPC. Other aspects of household behavior—such as stock market participation examined in Melcangi and Sterk (2024)—are less directly relevant to the questions addressed in this paper.

options for financing that spending. Broer, Krusell, and Öberg (2023) also focus on fiscal multipliers for government spending and show how they differ in representative agent and HA models with different sources of nominal rigidities. Ramey and Zubairy (2018) investigate empirically whether there is support for the model-based results that fiscal multipliers are higher in certain states. While they find evidence that multipliers are higher when there is slack in the economy or the ZLB binds, the multipliers they find are still below one in most specifications. In any case, we condition on policies being implemented in a recession—when, this literature argues, multipliers are higher—but it is not crucial for our purposes whether the multipliers are greater than one or not. We are concerned with relative multipliers, and the multiplier is only one of the two criteria we use to rank policies.

The second criterion to rank policies is our measure of welfare. Thus, the paper relates to the recent literature on welfare comparisons in HA models. Both Bhandari, Evans, Golosov, and Sargent (2021) and Dávila and Schaab (2022) introduce ways of decomposing welfare effects. In the former case, these are aggregate efficiency, redistribution and insurance, while the latter further decomposes the insurance part into intra- and intertemporal components. These papers are related to ours, but we do not decompose the welfare effects. Regardless of decomposition, we want to (1) use a welfare measure as an additional way of ranking policies and (2) introduce a measure that abstracts from any incentive for a planner to redistribute in the steady state (or "normal" times).

0.2 Organization

The paper is organized as follows. Section 2 presents our baseline partial equilibrium model of households' consumption and saving problem as well as how we model a recession and the potential response in terms of three different consumption stimulus policies. Section 3 describes the steps we take to parameterize the model and discusses the implications for some moments that we do not target. In section 4 we compare the three policies implemented in a recession both in terms of their multipliers and in terms of a welfare measure that we introduce. Section 5 presents a general equilibrium HANK and SAM model where we compare the multipliers of the same three policies to the partial equilibrium results. Section 6 concludes, and, finally, the appendix shows results from a version of the model without splurge consumption and provides more details of the HANK and SAM model discussed in Section 5.

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