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Durable and nondurable consumption responses to indebtedness shocks: A cross-country analysis

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Abstract

Using a Panel-VAR model for 20 OECD countries from 2007Q3 to 2019Q4, we examine how durable and nondurable goods consumption responds to household indebtedness shocks. Our results indicate that durable good consumption responds more strongly and negatively to an indebtedness shock compared to nondurable consumption. Additionally, higher household indebtedness is associated with a decline in economic activity. These findings can inform policies aimed at mitigating the adverse effects of household indebtedness, particularly during periods of contractionary monetary policy, when higher interest rates increase debt service burdens and compromise future disposable income.

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1 Introduction

Analysts closely monitor consumer spending when forecasting the U.S. economy, as personal consumption expenditures make up about two-thirds of the nation's GDP (McCarthy, 1997). As a result, any factors influencing consumer spending can significantly impact the economy's overall health. Among these factors, household indebtedness draws attention because it increases both the share of future disposable household income allocated to loan repayment and the household's vulnerability to future shocks. These effects could lead apprehensive households to cut back on spending (McCarthy, 1997, Andersen et al., 2016).

This concern is exacerbated by economic conditions. For instance, during periods of contractionary monetary policy, when higher interest rates increase debt service burdens, the percentage of future income actually available to consumers decreases (Kukk, 2016). Furthermore, during economic crises, households commonly experience increased financial fragility and indebtedness. Indeed, according to Dynan and Kohn (2007), the relationship between household indebtedness and consumption is multifaceted, as it is influenced by factors such as credit supply, credit demand, and overall economic development.

At micro level the literature document a negative correlation between leverage and consumption spending (Mian and Sufi, 2010, Dynan et al., 2012, Baker, 2015, Andersen et al., 2016). For example, Andersen et al. (2016) study the link between leverage and spending at the household level and finds that the link between high pre-crisis leverage and weak spending growth afterward is due to a spending normalization trend. This pattern suggests that households that have taken on more debt to support a temporary increase in spending tend to return to a lower level of spending.

Another branch of literature examines the relationship between debt and economic fluctuations at the macro level (Cecchetti et al., 2011, Cecchetti and Kharroubi, 2012, Dabla-Norris and Srivisal, 2013, Korinek and Simsek, 2016, Mian et al., 2017, Mian and Sufi, 2018, Mian et al., 2020, Bahadir et al., 2020). These studies investigate the effects of credit supply shocks on the overall economy, highlighting that the impact of these shocks depends on important factors such as income distribution and inequality, as noted by Bahadir et al. (2020).

In the macroeconomic literature, McCarthy (1997) is an exception as he investigates the effects of indebtedness shocks on consumer spending by dividing it into two categories: durable goods, and nondurable goods and services. He analyzed the U.S. economy from 1960Q4 to 1996Q1. He finds that the estimated effect of an unexpected debt increase on spending for nondurable goods and services is negligible. In contrast, spending on durables appears to rise following a debt shock, which is an unexpected result, according to McCarthy (1997).

Despite the unexpected results of McCarthy (1997), there are several reasons to distinguish between nondurable and durable goods expenditures. First, consumers derive utility from the service flow of the stock of durable goods, which is usually assumed to be proportional to such stock (Bernanke, 1985, Ogaki and Reinhart, 1998a,b). Hence, consumer utility depends on the current consumption of nondurable goods, but on the stock of durable goods. Thus, after a negative shock, it is easier for households to postpone the purchase of durable goods as a way to smooth consumption.[1] Second, durable goods are typically pricier than nondurable ones, and are often bought in installments (Lee, 1962). Third, as households rely more on credit for purchasing durable goods, an indebtedness shock might limit their ability to buy such goods, and potentially lead to disparate effects on durable and nondurable consumption (Mian and Sufi, 2010). The spending normalization trend identified by Andersen et al. (2016), or even the compromising of future income due to debt increase, could also intensify the intratemporal trade-off between nondurable and durable consumption. For all these reasons, the analysis of both kinds of goods is important to shed light on consumer behavior. Knowledge of the differential responses of nondurable and durable goods expenditures to indebtedness shock can assist policymakers and business leaders in making better decisions.

Our contribution in this paper is twofold. First, we conduct a cross-country analysis using data from 20 OECD countries (2007Q3 to 2019Q4) instead of focusing on a single country. Second, we investigated the impact of indebtedness shocks on consumer behavior, distinguishing between the consumption of durable and nondurable goods. To achieve this, we performed an impulse-response function (IRF) analysis using a panel-VAR econometric model.

Regarding the indebtedness shocks, we follow Mian et al. (2017) in interpreting variations in household debt as being caused by changes in credit demand or credit supply. Positive demand shocks are associated with households' anticipation of future income, while positive supply shocks are linked to the relaxation of credit constraints, which can occur autonomously by financial institutions or in response to deregulation policies, such as those reported by Brady (2008). Regarding negative credit supply shocks, we can cite Credit Rationing as described by Stiglitz and Weiss (1981), Credit Crunches as described by Bernanke and Low (1991), and macroprudential and regulatory policies as discussed by Hilbers et al. (2005) and Crowe et al. (2013).

Ultimately, the impulse response functions of durable and nondurable consumption to an indebtedness shock are not homogeneous. The findings indicate a substantial decline in durable goods consumption in the third quarter after the shock—an effect not observed for

[1] Correspondingly, expenditures on durable goods are more volatile than those on nondurable goods.

nondurable goods.

The remainder of the paper is organized as follows. Section 2 describes the data and econometric model. Section 3 presents the results. Finally, Section 4 summarizes the main conclusions.

2 Data and Method

The data were collected on a quarterly basis from OECD databases.[2] Consumption refers to the expenditure made by resident households, while GDP is measured using the expenditure approach. As usual, interest rates are based on three-month money market rates. Unemployed individuals are defined as those of working age who do not have a job, are available for work, and have taken specific steps to find a job in the previous four weeks. Household indebtedness consists of loans – primarily home mortgage loans and other liabilities such as credit card and automobile loans. Finally, consumer confidence is measured by an index based on responses regarding households' expected financial situation, sentiment about the economic situation, unemployment, and savings. As a result, we employ the following variables: (log) per capita consumption of durable goods, $\ln(CD)$; (log) per capita consumption of nondurable goods, $\ln(CND)$; (log) per capita GDP, $\ln(GDP)$; interest rate, IR; unemployment rate, UR; household indebtedness as a percentage of disposable income, IDI; and the consumer confidence index, CCI.[3]

We excluded from our sample countries for which one or more series were not available. We also excluded the initial quarters for which the indebtedness information was unavailable, and the period after 2020 due to the COVID-19 pandemic.[4] As a result, our final sample contains 20 OECD countries and covers the period from 2007Q3 to 2019Q4.[5]

To investigate how aggregate consumption responds to indebtedness shocks, we estimate the impulse response functions using a panel-VAR econometric model given by:

$$Y_{it} = \phi_i + A(L)Y_{it-1} + \delta_t + \mu_{it}, \tag{1}$$

where the sub-indices i and t represent the country and time dimensions respectively. Y_{it} is

[2]OECD data were collected from: https://stats.oecd.org/.

[3]Nondurable consumption was computed by subtracting durable expenditures from total consumption. As a result, our nondurables series includes expenditures on services.

[4]The COVID-19 pandemic has led to an unprecedented increase in household debt levels worldwide. See Brickell et al. (2020) and Bilyk et al. (2020) for further details.

[5]The countries included in our analysis are Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, the United Kingdom, and the United States.

a vector of variables of interest: $\Delta \ln(GDP)$, ΔUR, IR, $\Delta \ln(CND)$, $\Delta \ln(CD)$, ΔIDI, and ΔCCI, where $\ln(\cdot)$ is the natural logarithm, and Δ denotes the first difference operator.[6] Furthermore, ϕ_i represents the country-specific time-invariant fixed effects, δ_t captures unobservable time effects, $\mu_{i,t}$ is the error term, and $A(L)$ is a lag polymonial of order P that captures the dynamic relationships between the variables of interest. This approach enables us to account for both cross-sectional and temporal heterogeneity in our analysis.

In a dynamic panel model, the fixed-effects estimator is not consistent because fixed effects are correlated with the lagged dependent variables. To address this, we adopt the approach proposed by Holtz-Eakin et al. (1988) and apply the GMM estimator to model (1), using lags 2 to 8 of Y_{it} as instruments. The optimal length of the Panel-VAR model was determined using the modified version of the Bayesian Information Criterion (MBIC) and the Hannan-Quinn Information Criterion (MHQIC) developed by Andrews and Lu (2001).

To compute the impulse response functions, we employed the Cholesky decomposition technique and ordered the variables as follows: we prioritized output first, then household debt, following Mian et al. (2017). After GDP, we ordered the unemployment rate and interest rate, in line with Louis and Balli (2013). Next, we ordered nondurable goods before durable goods, as done by McCarthy (1997). Spending on durable goods is more prone to fluctuations than spending on nondurable goods, suggesting that consumers tend to make quicker and more significant adjustments to their spending on durable items. Finally, we ordered the consumer confidence index last, following Kilic and Cankaya (2016). Thus, the ordering is $\Delta \ln(GDP)$, ΔUR, IR, $\Delta \ln(CND)$, $\Delta \ln(CD)$, ΔIDI, and ΔCCI.[7]

3 Results

Based on MBIC and MHQIC, we estimate the model with one lag ($P = 1$). The model is stable as the modulus of each eigenvalue related to the autoregressive polynomial is less than 1, as shown in Figure 1. As a result, the estimated Panel-VAR model is invertible and has an infinite-order Vector Moving Average representation, providing a well-defined interpretation of the estimated impulse response functions.

Figure 2 displays the impulse response functions for a positive shock to the household indebtedness variable, with the 90% confidence interval indicated. As shown, the shock has a short-term negative impact on GDP and a positive impact on unemployment. Regarding the

[6] The Im et al. (2003) test suggests that these variables do not have a unit root at the 5% level. The individual Dickey-Fuller test yields the same conclusion.

[7] Several other orderings were estimated, and the results were not sensitive to them, as stated in the Online Appendix.

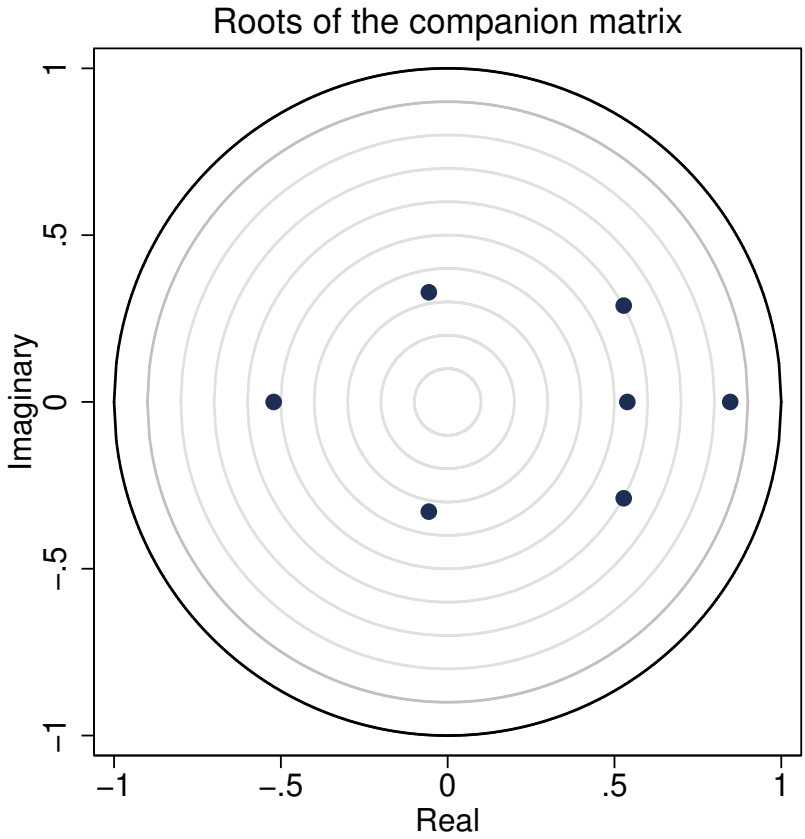

Figure 1: VAR model stability

consumer confidence, the negative response to the debt shock occurs quickly and intensely. These results are in line with the negative effect of household indebtedness on economic growth and consumer sentiment documented by Mian et al. (2017) and Di Maggio et al. (2020). However, there is no evidence of changes in the interest rate, as the 90% confidence interval consistently includes zero.

The responses of durable and nondurable consumption are not homogeneous. Figure 3 presents their impulse response functions together, facilitating this comparison. Consumption of nondurable goods slightly increases after one quarter, followed by modest declines in the second and fourth quarters post-shock. On the other hand, durable consumption shows a negative effect in the second, third, and fourth quarters post-shock. The reduction in durable goods consumption is much more pronounced compared to nondurable consumption oscillations, particularly two quarters after the shock. Our contribution in disaggregating the types of goods lies in identifying the heterogeneity demonstrated in Figure 3.

Our findings contrast with those of McCarthy (1997) for the U.S. economy, who found no

impact on nondurable goods following an indebtedness shock and reported an unexpected increase in spending on durables. However, our results align with previous studies using microdata, which have shown a negative relationship between household indebtedness and consumption (Dynan, 2012, Du-Caju et al., 2023).

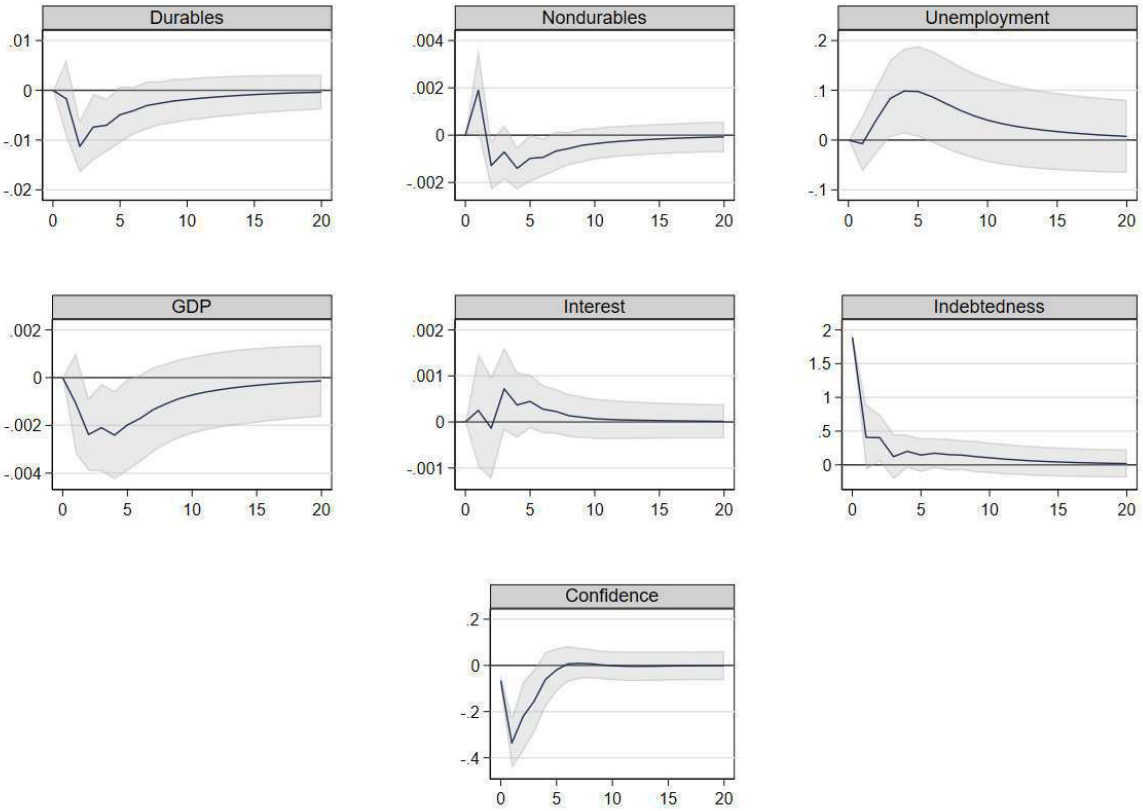

Figure 2: Responses to an indebtedness shock (the shaded area represents 90% confidence interval).

The distinct reaction of nondurable and durable goods consumption to the indebtedness shock is not surprising, given their distinct features. Unpredictable debt increases could lead consumers to postpone durable expenditures, which can be seen as a strategy to smooth the shock, as the consumer derives utility from the stock of durable goods instead of just the current purchases. The shock in indebtedness may restrict the acquisition of durable goods that are comparatively more expensive and reliant on credit. Regardless of the underlying cause, deferring the purchase of durable goods could potentially release resources for funding nondurable goods purchases, offering an explanation for the relatively stability of expenditures on these goods.

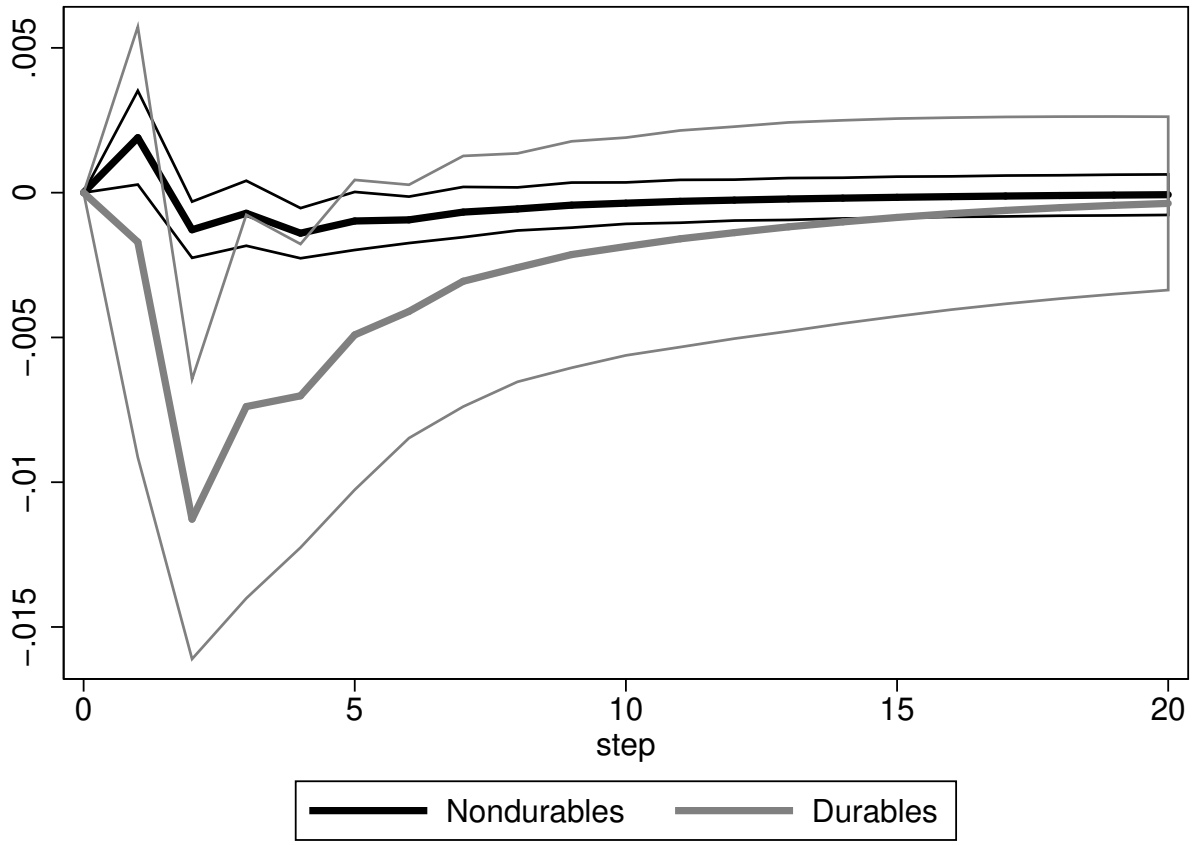

Figure 3: Responses to an indebtedness shock – durables and nondurables goods (the shaded area represents 90% confidence interval).

Figure 4 presents the indebtedness response to shocks in other variables. These impulse response functions are suggestive of the relationship between economic activity and household indebtedness. A shock in GDP is associated with a decrease in indebtedness, while a shock in unemployment has the opposite result. Regarding the shock to the consumer confidence index, in general, the confidence interval does not reject the possibility of a null impact. There is only a negative effect that is barely significant after 5 periods, which is consistent with the findings of Du-Caju et al. (2016). Finally, a shock in the interest rate is positively associated with an increase in household indebtedness. This latter result suggests a sensitivity of household indebtedness to contractionary monetary policy shocks.

Figure 4 displays the response of household indebtedness to shocks in other variables. These impulse response functions provide evidence of the relationship between economic activity and indebtedness. A positive GDP shock is associated with a decline in household indebtedness, while an unemployment shock produces the opposite effect. Regarding the

consumer confidence index, the confidence interval generally does not reject the possibility of a null impact. A small negative effect emerges after five periods, but it is only barely significant. This negative impact is consistent with the findings of Du-Caju et al. (2016). Finally, a shock to the interest rate is positively associated with household indebtedness, suggesting that indebtedness is sensitive to contractionary monetary policy shocks.

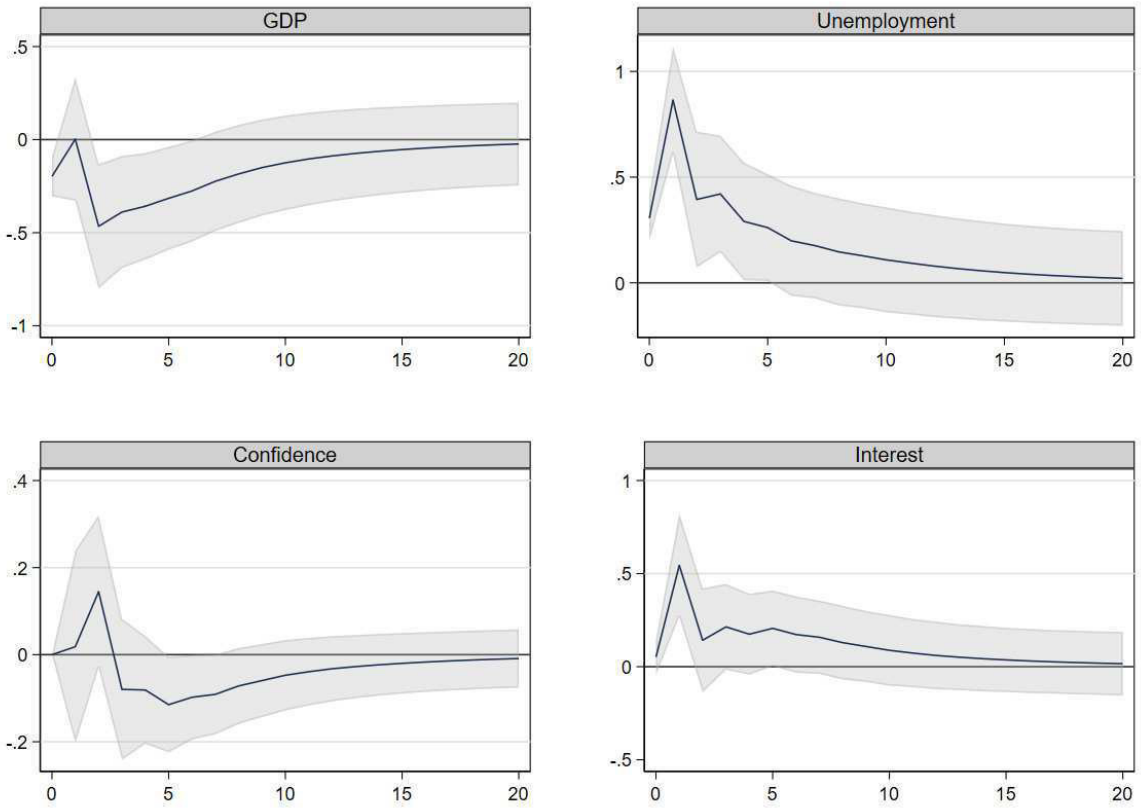

Figure 4: Indebtedness response for a shock – GDP, Unemployment, Confidence and Interest rate (the shaded area represents 90% confidence interval).

To evaluate the robustness of our main results, we report the impulse response functions of durable and nondurable consumption to a debt shock under two alternative specifications. Figure 5 presents the results using 2 to 10 lags of Y_{it} as instruments. Figure 6 restores the original set of instruments but excludes the 2007-2008 period due to the international financial crisis. Taken as a whole, the results from the three specifications point to a substantial decline in durable goods consumption in the third quarter after the shock – an effect not observed for nondurable goods. Indeed, the analysis of the confidence intervals of the impulse response functions supports the notion that durable goods respond differently than non-

durable goods, consistent with the distinct characteristics of these categories, as previously discussed.

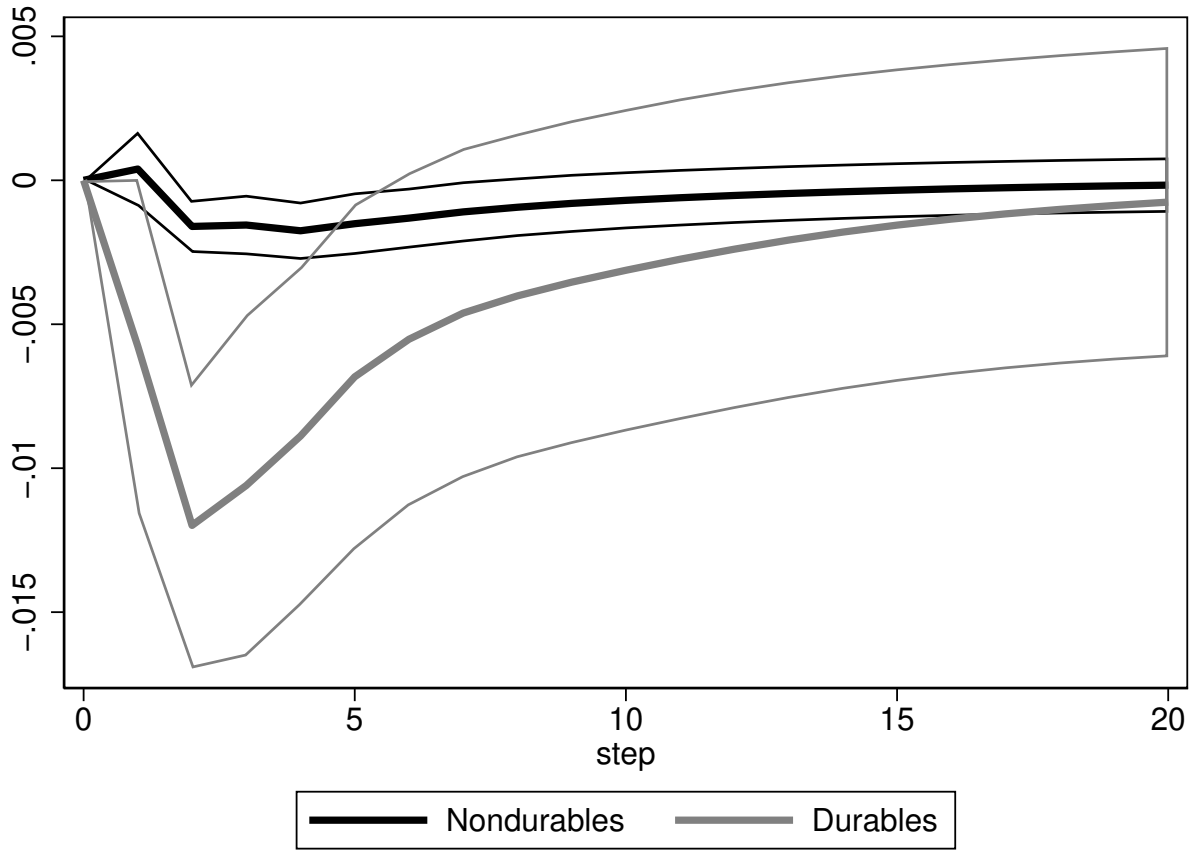

Figure 5: Responses to an indebtedness shock – durable and nondurable goods (2 to 10 lags in the instruments; the shaded area represents 90% confidence interval)

4 Conclusion

Our findings highlight the importance of distinguishing between durable and nondurable consumption when assessing the impact of household indebtedness using aggregate data. For the reasons discussed above, it is not surprising that these classes of goods have different responses to debt shocks. In particular, the more pronounced short-term decline in durable goods expenditures after a debt shock is compatible with a smoothing mechanism, given that the consumer derives utility from the stock rather than just current purchases of durable goods. Future research could use micro-level data to better understand the mechanisms behind the relationship between indebtedness and consumption of durable and nondurable

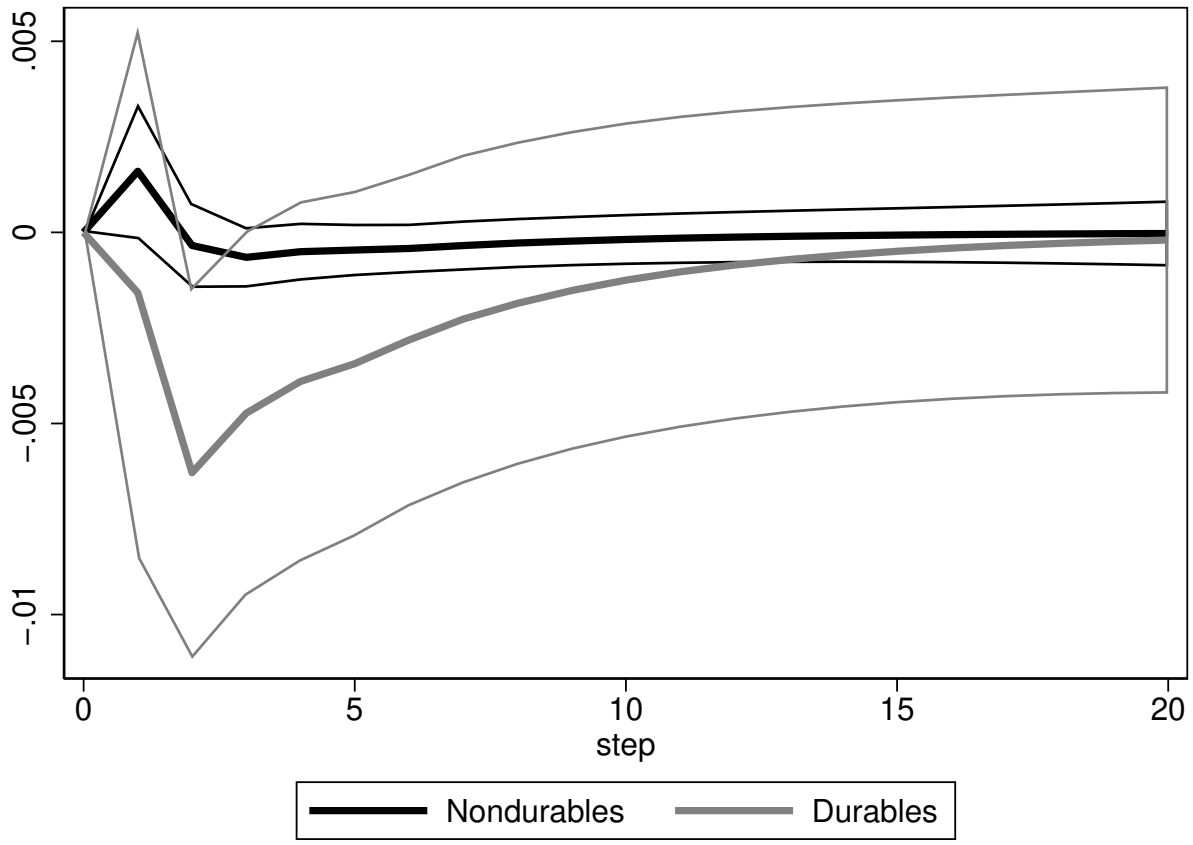

Figure 6: Responses to an indebtedness shock – durable and nondurable goods (excluding the 2007-2008 period; the shaded area represents 90% confidence interval)

goods.

In our empirical results, the impact of household indebtedness shocks on durable consumption is more pronounced than on nondurable consumption. While nondurable spending shows only a modest adjustment, durable expenditures decline more substantially following the shock. This asymmetry is consistent with the notion that consumers can postpone purchases of durable goods more easily, particularly when facing tighter credit conditions or expectations of lower future income.

One limitation of our analysis is its focus on OECD countries, where credit markets are relatively developed and households generally have greater access to financial services and formal credit. As a result, the consumption responses observed in our panel may not be generalizable to developing economies. In these countries, higher levels of household indebtedness relative to income, weaker social safety nets, and limited access to formal credit may lead to more pronounced or structurally different consumption responses to debt shocks.

Future research should examine whether the heterogeneity we observe across consumption types in OECD economies is amplified or attenuated in low- and middle-income countries.

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References

Andersen, Asger Lau, Charlotte Duus, and Thais Lærkholm Jensen, "Household debt and spending during the financial crisis: Evidence from Danish micro data," *European Economic Review*, 2016, *89*, 96–115.

Andrews, Donald W. K. and Biao Lu, "Consistent model and moment selection procedures for GMM estimation with application to dynamic panel data models," *Jornal of Econometrics*, 2001, *101* (1), 123–164.

Bahadir, Berrak, Kuhelika De, and William D Lastrapes, "Household debt, consumption and inequality," *Journal of International Money and Finance*, 2020, *109*, 102240.

Baker, Scott R, "Debt and the consumption response to household income shocks," *Available at SSRN 2541142*, 2015.

Bernanke, Ben Shalom, "Adjustment costs, durable goods and aggregate consumption," *Journal of Monetary Economics*, 1985, *15* (1), 41–68.

_ **and Cara S Low**, "The Credit Crunch," *Brookings Papers on Economic Activity*, 1991, (2), 205–247.

Bilyk, Olga, Anson TY Ho, Mikael Khan, and Geneviève Vallée, "Household indebtedness risks in the wake of COVID-19," Technical Report, Bank of Canada 2020.

Brady, Ryan R., "Structural breaks and consumer credit: Is consumption smoothing finally a reality?," *Journal of Macroeconomics*, 2008, (30), 1246–1248.

Brickell, Katherine, Fiorella Picchioni, Nithya Natarajan, Vincent Guermond, Laurie Parsons, Giacomo Zanello, and Milford Bateman, "Compounding crises

of social reproduction: Microfinance, over-indebtedness and the COVID-19 pandemic," *World Development*, 2020, *136*, 105087.

Cecchetti, Stephen G and Enisse Kharroubi, "Reassessing the impact of finance on growth," 2012.

_ , Madhusudan S Mohanty, and Fabrizio Zampolli, "The real effects of debt," 2011.

Crowe, Christopher, Giovanni Dell'Ariccia, Deniz Igan, and Pau Rabanal, "How to deal with real estate booms: Lessons from country experiences," *Journal of Financial Stability*, 2013, *9* (3), 300–319.

Dabla-Norris, Era and Narapong Srivisal, *Revisiting the link between finance and macroeconomic volatility*, International Monetary Fund, 2013.

Du-Caju, Philip, François Rycx, and Ilan Tojerow, "Unemployment Risk and Over-Indebtedness," *ECB Working Paper*, 2016, (1908).

_ , Guillaume Perilleux, François Rycx, and Ilan Tojerow, "A bigger house at the cost of an empty stomach? The effect of households' indebtedness on their consumption: micro-evidence using Belgian HFCS data," *Review of Economics of the Household*, 2023, *21* (1), 291–333.

Dynan, Karen, "Is a household debt overhang holding back consumption?," *Brookings Papers on Economic Activity*, 2012, *92*, 47–73.

_ , Atif Mian, and Karen M Pence, "Is a household debt overhang holding back consumption?," *Brookings Papers on Economic Activity*, 2012, pp. 299–362.

Dynan, Karen E. and Donald L. Kohn, "The Rise in U.S. Household Indebtedness: Causes and Consequences," 2007. FEDS Working paper.

Hilbers, Paul, Inci Otker-Robe, Ceyla Pazarbasioglu, and Gudrun Johnsen, "Assessing and Managing Rapid Credit Growth and the Role of Supervisory and Prudential Policies," *International Monetary Fund - Working Paper 05/151*, 2005.

Holtz-Eakin, Douglas, Whitney Newey, and Harvey S Rosen, "Estimating vector autoregressions with panel data," *Econometrica*, 1988, pp. 1371–1395.

Im, Kyung So, M.Hashen Pesaram, and Yongcheol Shin, "Testing for unit roots in heterogeneous panels," *Jornal of Econometrics*, 2003, *115* (1), 53–74.

Kilic, Erdem and Serkan Cankaya, "Consumer confidence and economic activity: a factor augmented VAR approach," *Applied Economics*, 2016, *32* (48), 3062–3080.

Korinek, Anton and Alp Simsek, "Liquidity trap and excessive leverage," *American Economic Review*, 2016, *106* (3), 699–738.

Kukk, Merike, "How did household indebtedness hamper consumption during the recession? Evidence from micro data," *Journal of Comparative Economics*, 2016, *44* (3), 764–786.

Lee, Maw Lin, "An Analysis of Instalment Borrowing by Durable Goods Buyers," *Econometrica*, 1962, *30* (4), 770–787.

Louis, Rosmy Jean and Faruk Balli, "Low-inflation-targeting monetary policy and differential unemployment rate: Is monetary policy to be blamed for the financial crisis? — Evidence from major OECD countries," *Economic Modelling*, 2013, *30*, 546–564.

Maggio, Marco Di, Amir Kermani, and Christopher J Palmer, "How quantitative easing works: Evidence on the refinancing channel," *The Review of Economic Studies*, 2020, *87* (3), 1498–1528.

McCarthy, Jonathan, "Debt, delinquencies, and consumer spending," *Current Issues in Economics and Finance*, 1997, *3* (3).

Mian, Atif, Amir Sufi, and Emil Verner, "Household debt and business cycles worldwide," *The Quarterly Journal of Economics*, 2017, *132* (4), 1755–1817.

_ , _ , and _ , "How does credit supply expansion affect the real economy? the productive capacity and household demand channels," *The Journal of Finance*, 2020, *75* (2), 949–994.

_ and _ , "Household Leverage and the Recession of 2007–09," *IMF Economic Review*, 2010, *58* (1), 74–117.

_ and _ , "Finance and business cycles: The credit-driven household demand channel," *Journal of Economic Perspectives*, 2018, *32* (3), 31–58.

Ogaki, Masao and Carmen M Reinhart, "Intertemporal substitution and durable goods: long-run data," *Economics Letters*, 1998, *61* (1), 85–90.

_ and _ , "Measuring intertemporal substitution: The role of durable goods," *Journal of Political Economy*, 1998, *106* (5), 1078–1098.

Stiglitz, Joseph Eugene and Andrew Weiss, "Credit Rationing in Markets with Imperfect Information," *The American Economic Review*, 1981, *71* (3), 393–410.