



Amortization requirements and household indebtedness: An application to Swedish-style mortgages



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ABSTRACT

Since the mid-1990s, many OECD countries have experienced a substantial increase in household indebtedness. Sweden, in particular, has seen indebtedness rise from 90% of disposable income in 1995 to 179% in 2015. The Swedish Financial Supervisory Authority (FSA) has identified mortgage amortization requirements as a potential instrument for reducing indebtedness; and has drafted guidelines that will intensify the rate and duration of amortization. In this paper, I characterize Swedish-style mortgage contracts, which differ substantially from U.S.-style contracts. I then evaluate the policy changes in an incomplete markets model with three types of debt and a novel mortgage contract specification that is calibrated to match Swedish micro and macro data. I find that intensifying the rate and duration of amortization is largely ineffective at reducing indebtedness in a realistically-calibrated model. In the absence of tight restrictions on the maximum debt-service-to-income ratio or implausibly large refinancing costs, the policy impact is small in aggregate, over the lifecycle, and across employment statuses.

1. Introduction

Since the mid-1990s, household indebtedness has risen in many OECD countries, driven primarily by mortgage debt growth. The United States, Ireland, Spain, Sweden, Norway, Canada, and Denmark experienced debt stock increases of between 50% and 300% over the 1995–2007 period (OECD, 2015). While some countries, such as the United States and Spain, experienced a housing crash and a financial crisis, accompanied by a reduction in the debt stock, other countries retained high house prices and high levels of household indebtedness. Sweden, in particular, has seen household indebtedness rise from 90% of disposable income in 1995 to 179% in 2015 (Sveriges Riksbank, 2016).

Not surprisingly, countries that have not experienced a drop in house prices and an accompanying drop in household leverage are attempting to identify viable indebtedness reduction policies to lower the probability of a financial crisis. In Sweden, the Financial Supervisory Authority (FSA) was recently given control over the formulation of macroprudential policy; and will play the chief role in addressing household indebtedness.

One potential problem the Swedish FSA has identified is the structure of Swedish mortgage contracts. In contrast to U.S.-style mortgages, for instance, Swedish-style mortgages do not require full amortization. Rather, households must partially amortize to a pre-specified loan-to-value (LTV) ratio threshold, but may voluntarily amortize thereafter. Combined with the option to refinance inexpensively, households may avoid amortizing entirely after the initial period; and may periodically extract equity up to that threshold without triggering required amortization.

It is important to note that something similar can be achieved with U.S.-style mortgages through perpetual refinance: that is, households may avoid gaining equity by refinancing periodically. One difference is that standard mortgage contracts in the U.S.

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require regular amortization, even if the equity gained through amortization is extracted. This means that a household must be liquid enough to cover both the amortization and interest components of a U.S.-style mortgage, even if they do not plan to stay on the intended amortization path. In contrast, with Swedish-style mortgages, borrowers must only be able to cover the interest payments once the LTV threshold has been reached. The current structure of Swedish-style contracts most closely resembles an interest only mortgage—but with temporary, front-loaded amortization.¹ There is still disagreement about whether interest-only contracts have been generally welfare-enhancing elsewhere, which leaves the implications of Sweden's choice to move away from them ambiguous.²

The Swedish Financial Supervisory Authority (FSA) has outlined a plan to change mortgage contract structure by increasing amortization requirements (Swedish FSA, 2014a, 2015). When it comes into effect, new originations will be amortized at an annual rate of 2% until the top loan³ is paid off. Thereafter, the bottom loan will be amortized at a 1% rate until the total outstanding mortgage balance is lowered to 50% of the property's value.

The purpose of this policy—as stated in FSA memoranda (Swedish FSA, 2014b)—is to reduce demand for housing and subsequently household indebtedness. A common worry revealed in both FSA documents and elsewhere is that the high level of indebtedness makes households vulnerable to shocks. If a household becomes unemployed, for instance, its consumption may drop more if a substantial part of its budget is committed to debt service payments.⁴

This policy is significant for at least two reasons. First, it constitutes a substantial difference in policy response from the United States and Spain, which did not have the opportunity to attempt macroprudential interventions before house prices dropped and deleveraging began. This is particularly relevant for countries such as Norway and Canada, which also remain highly indebted and have retained high house prices. And second, the outcome of the policy experiment could help to guide countries that are contemplating mortgage contract reform to avert future crises or reduce indebtedness.

In this paper, I evaluate Swedish-style mortgages—and the proposed changes to them—through the lens of a quantitative equilibrium model. I also perform additional policy simulations to show how the results can be applied more generally to contracts that attempt to intensify amortization. I calibrate the model to match Swedish micro and macro data; and attempt to reproduce the details of Swedish-style mortgage contracts, as well as the changes proposed in the new guidelines. I focus specifically on the long-run implications of these contracts by comparing stochastic steady states.

I find that intensifying the rate and duration of amortization is largely ineffective at reducing indebtedness in a realistically calibrated model. Depending on the specification used, the drop in the aggregate debt-to-income (DTI) ratio is between 4.79% and 4.99%, which is eclipsed by the increase in indebtedness in Sweden since 1995. More generally, in the absence of implausibly large refinancing costs or tight restrictions on the maximum debt-service-to-income ratio, the policy impact is small in aggregate, over the lifecycle, and across employment statuses. Furthermore, when contracts become fully amortizing, the incentive to lower indebtedness below a 50% LTV ratio is dampened. Consequently, the DTI reduction drops to 1.93%.

The small size of the policy effect arises from the empirically low barrier to refinance. In the limit, if refinancing were costless, then households could maintain their optimal amortization path by obtaining a new mortgage in each period to nullify the previous period's amortization. The only “forced” amortization would come from mortgage lock-in when income drops, tightening the borrowing constraint and preventing equity extraction via refinancing. We do not consider this extreme case, but instead calibrate the model to incorporate all known, measurable barriers to refinancing; and set conservatively high values for intangible barriers to refinance. In this environment, we find that households often refinance periodically to undo forced amortization that is individually suboptimal. Furthermore, even when we substantially increase the barriers to refinancing, we still find small effects from the policy, since households may simply reduce the frequency with which they refinance, but extract greater amounts of equity when they do.

The most closely related papers are Svensson (2016) and Chen and Columba (2016). Svensson (2016) demonstrates that increasing the rate of amortization may actually increase household indebtedness; and also provides an analysis of the transition path. Chen and Columba (2016) also examine an amortization rate intensification in Sweden and find that it reduces the debt stock by 10%.

The remainder of the paper proceeds as follows: In Section 2, I will describe the essential features of a Swedish-style mortgage contract. I will then construct a quantitative equilibrium model, which reproduces these features in Section 3. Finally, I will detail the model's calibration in Section 4, evaluate the benchmark model in Section 5, perform policy experiments in Section 6, and then conclude in Section 7.

¹ Front-loading amortization allows Swedish-style mortgages to avoid the selection problem that deferred amortization contracts create. Households who lack the liquidity to amortize can obtain a deferred amortization mortgage with the intention to refinance out of it to avoid liquidity issues. This is not the case with a Swedish-style mortgage, which begins amortizing at origination.

² For an empirical analysis of Alternative Mortgage Products (AMPs), see Cocco (2013), which finds that AMPs can be welfare-enhancing if they are used to smooth consumption over the lifecycle. For a contract-theoretical treatment of AMPs and deferred amortization, see Piskorski and Tchistyi (2010) and LaCour-Little and Yang (2008), which suggest that deferred amortization and interest only mortgages are optimal under certain circumstances, including the ones present during the 1995–2007 period. See Forlati and Lambertini (2014) for a macro analysis of deferred amortization that finds negative welfare effects for borrowers.

³ A Swedish-style mortgage contract consists of two components: a top loan and a bottom loan. The bottom loan accounts for the larger share of the mortgage and usually amounts to 70% of the property's value. The top loan covers the gap between the property's value, the bottom loan, any consumption loans related to the purchase, and the downpayment. Borrowers are given some period of time to fully amortize the top loan. They are also given a grace period on the bottom loan's amortization at the start of the contract. This structure permits households to defer amortization below 70% indefinitely by refinancing into a new grace period or negotiating directly with lenders to maintain voluntary amortization.

⁴ “Debt service” refers to the combined principal and interest component of a payment.

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