

Inequality and the Zero Lower Bound

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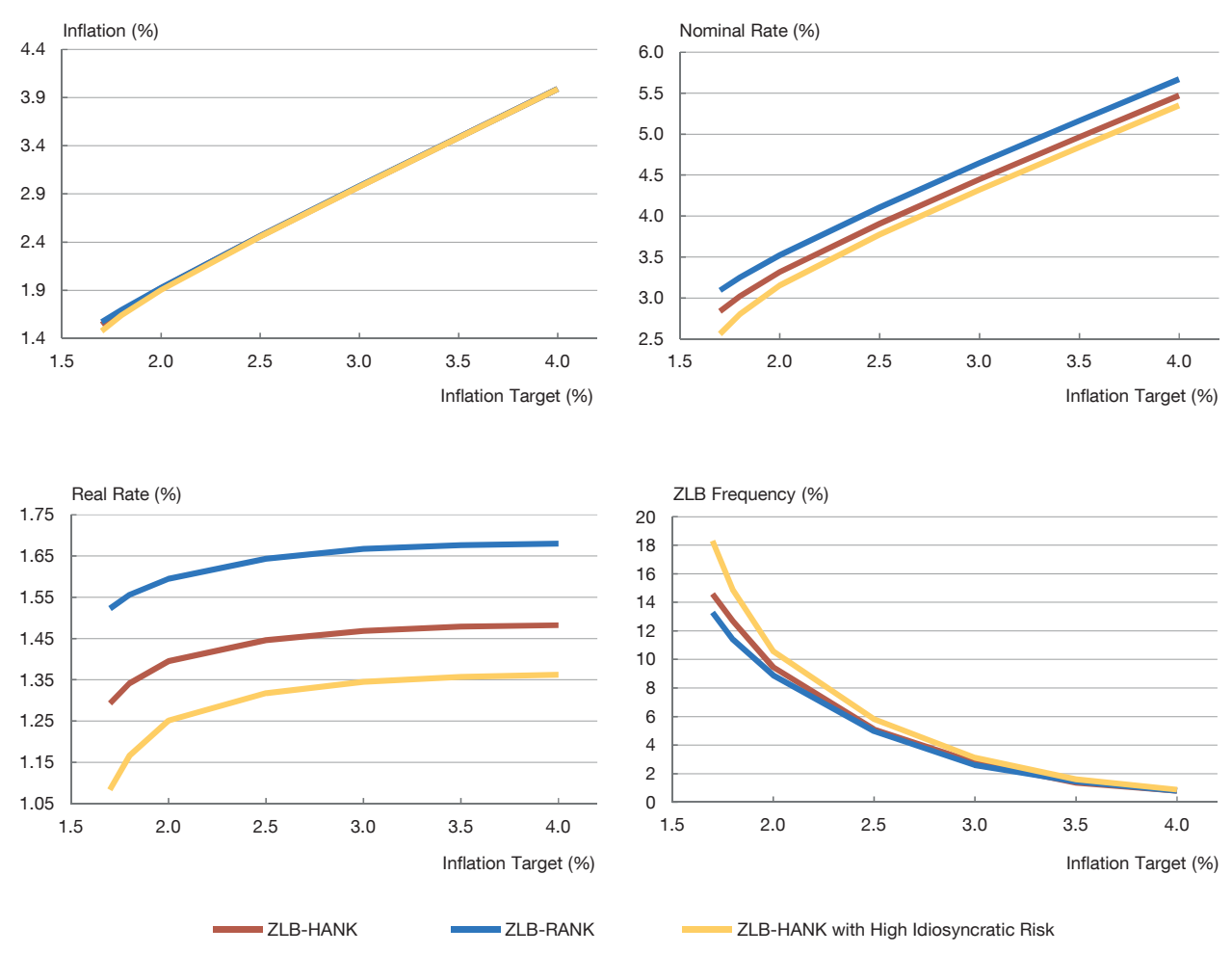
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The zero lower bound (ZLB) on nominal interest prevents central banks from effectively accommodating negative shocks to the economy. In Fernández-Villaverde et al. (2024), we study the interaction between household inequality and the ZLB on nominal interest rates through the lens of a fully nonlinear heterogeneous agent New Keynesian (HANK) model that is solved using a novel neural network algorithm. By explicitly accounting for the risk of hitting the ZLB, we

show that monetary policy exhibits long-run non-neutrality. This means that the central bank can affect long-run real rates (natural rates) through changes in its inflation target. Crucially, the extent of this monetary non-neutrality depends on the level of wealth inequality. A key channel for our results is how precautionary savings reduce the real and, in turn, the nominal interest rate, limiting the central bank's room to maneuver in the face of the ZLB and increasing the frequency of ZLB events. Therefore, higher income volatility, or any other factor that leads to higher precautionary savings, will affect real rates and the effectiveness of monetary policy in this environment.

Our model builds on recent heterogeneous agent models featuring households that face uninsurable idiosyncratic labor

Figure 1



income risk. While households can smooth consumption to some extent via borrowing, their capacity to do so is limited due to a borrowing constraint. Furthermore, our setup features sticky wages, a final-good firm producing using labor, and a central bank setting the nominal interest rate according to a Taylor rule subject to a ZLB constraint. We introduce aggregate uncertainty into this environment through demand shocks. Due to our non-linear solution approach, household expectations explicitly account for the risk of hitting the ZLB in the future, meaning that households have incentives to not only self-insure against labor income risk but also against the consequences of hitting the ZLB.

Using this model, we show five main results. First, the ZLB amplifies the effects of large negative demand shocks. This result is due to the central bank's inability to stabilize the economy once the ZLB becomes binding.

Second, ZLB recessions are more tilted towards wealth-poor households who are more reliant on labor income and have a lower capacity to smooth consumption through borrowing. As a result, these households experience larger drops in income and consumption when the economy hits the ZLB.

Third, as in Aiyagari (1994), household heterogeneity reduces real and nominal interest rates, reducing the central bank's room to maneuver. Hence, heterogeneity makes ZLB episodes more frequent than in an economy with a representative household. In other words, it increases the economy's vulnerability since smaller shocks are needed to push the economy down to the ZLB.

Fourth, monetary policy becomes non-neutral in the long run. Figure 1 shows that a reduction in the inflation target from 4% to 1.7% reduces the real interest rate in the stochastic steady state by 19 bps (red line in Figure 1). This is the result of households demanding more safe assets as inflation is lower and ZLB episodes are more frequent.

Finally, as shown in Figure 1, this non-neutrality of monetary policy is amplified when wealth inequality is high. For example, combining a drop in the inflation target from 4% to 1.7% with an increase in labor income risk (such that the corresponding Gini index of wealth increases by 3 pp as observed in the

U.S. in the early 2000s) leads to a reduction in the real interest rate by around 28 bps (yellow line in Figure 1). In a representative agent version of the model with the same parametrization (blue line in Figure 1), we would only observe a 16-bps drop. Again, this result is due to the precautionary savings that push down the nominal rate in our HANK economy and make the ZLB more likely to be binding for any given inflation target, thereby reinforcing the “deflationary bias” associated to the ZLB.

REFERENCES

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