The Liquidity Trap and a Price Dispersion Puzzle

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Introduction

We report that in a nonlinear new-Keynesian model, the level of price dispersion rises by 100 times when the economy is in a liquidity trap, i.e., when the nominal interest rate reaches the "zero lower bound." This is sharply inconsistent with the data, which shows that price dispersion did not differ significantly before and after the Great Recession. We call this the "price dispersion puzzle."

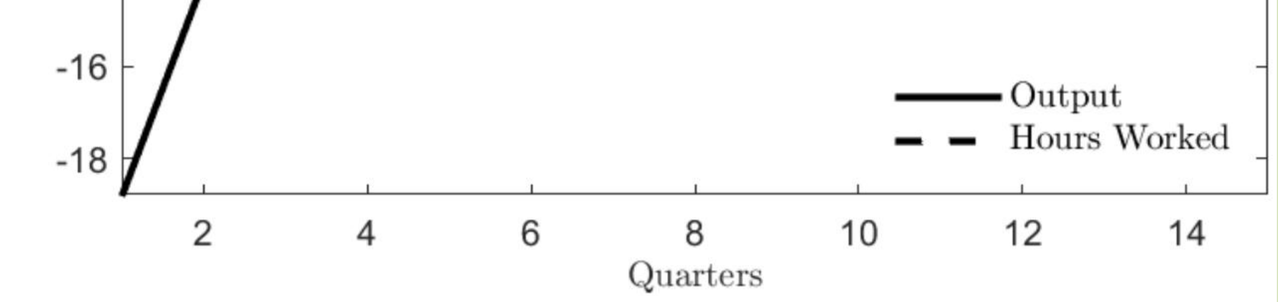
Method

Price dispersion is simplified away in a linearized model. We study a nonlinear new-Keynesian model. A negative discount-factor shock causes output, inflation and hours worked to fall sharply, which causes the nominal interest rate to hit the ZLB. We solve for the perfect-foresight solution.

Price Dispersion Puzzle

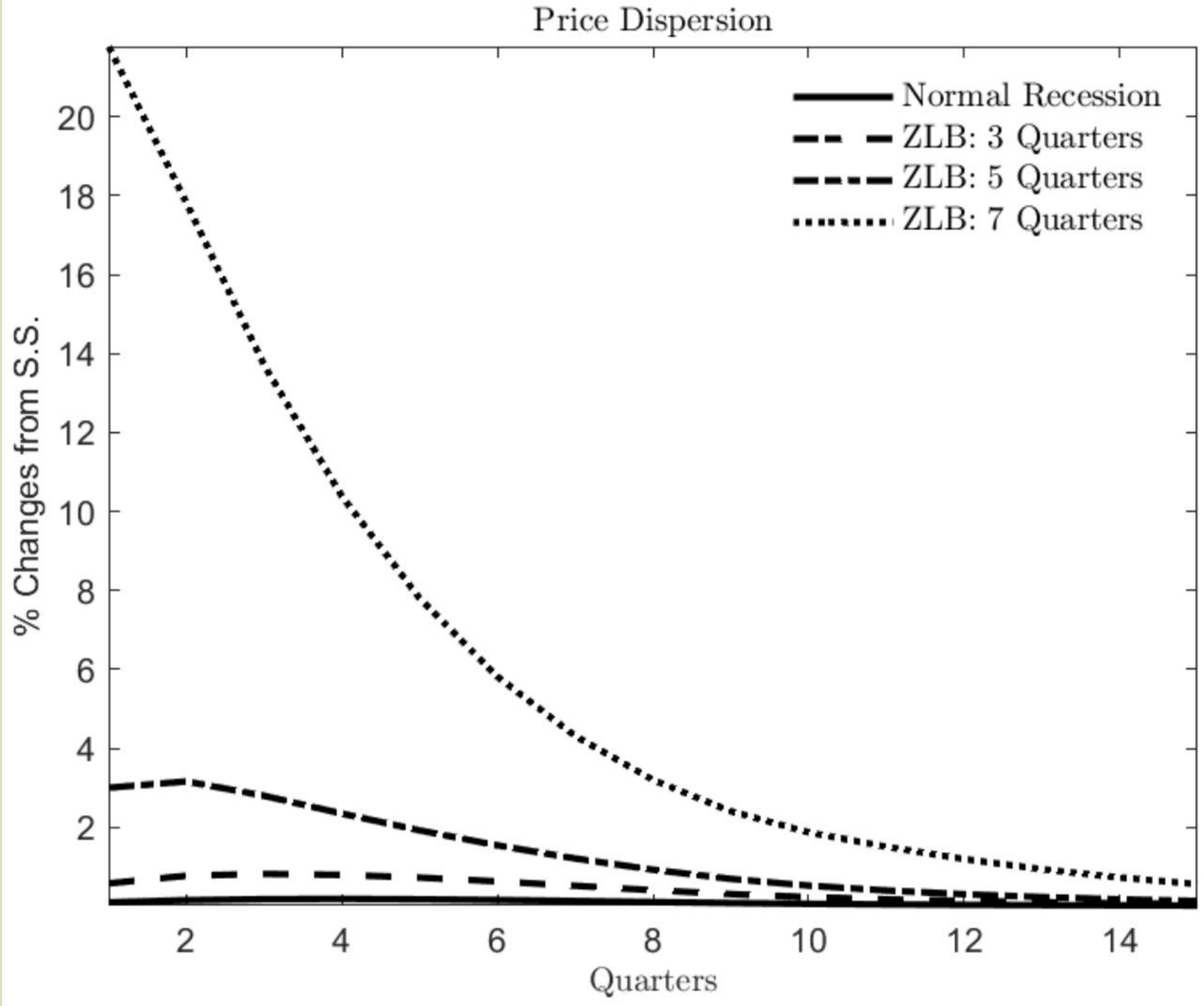
Price dispersion grows exponentially as the severity of the liquidity trap increases. Compared with a normal recession (solid line), price dispersion can easily grow to more than 100 times (dotted line), which is completely at odds with the empirical findings (Nakamura et al., 2018; Sheremirov, 2020).

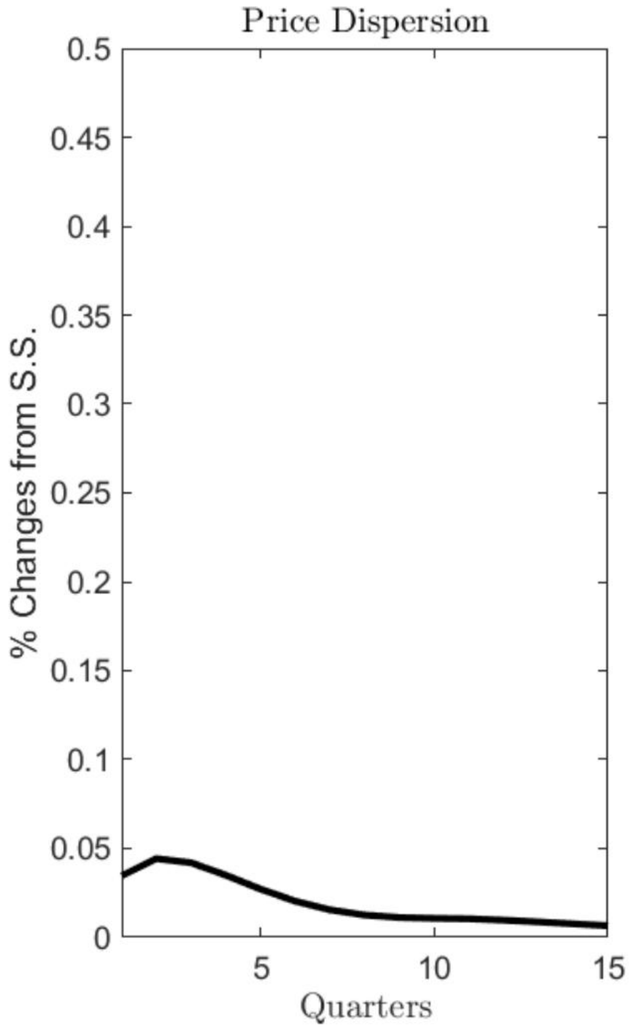
The price puzzle arises for the following reason. In a liquidity trap, both prices and nominal wages fall sharply. Because the fall in nominal wages is even larger, real wages fall. A fall in real wages lowers firms' marginal costs, prompting flexible-price firms to further lower their prices. Sticky price firms cannot change prices. This results in the large price dispersion.

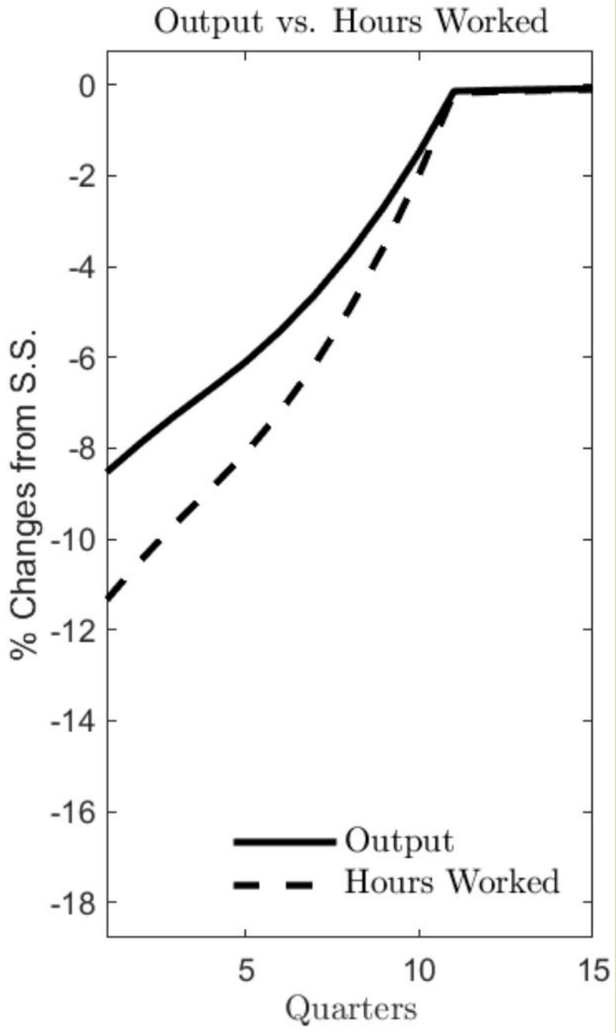


Resolution

We propose a simple approach to resolve or alleviate the puzzle: introduce downward wage rigidity by following Schmitt-Grohé and Uribe (2017) and Shen and Yang (2018). Empirical findings suggest that when the economy falls into a recession, nominal wages are extremely sluggish downward. When this feature is introduced into the model, it leads to a rise in real wages when prices fall, which raises firms' marginal costs, thereby easing deflation and resulting in lower price dispersion.







Consequences

The large price dispersion drives a large wedge between the transitional dynamics of output and hours worked. The output decline is more severe, but the hours worked is less severe when compared with a recession without a liquidity trap.

References

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