



Real wages and aggregate demand shocks: contradictory evidence from VARs

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Abstract

This paper revisits two recent studies that estimate the dynamic response of real wages to aggregate demand shocks. Using identical empirical techniques—structural VARs with long-run identifying restrictions—and similar post-war data, [Gamber and Joutz 83 (1993) 1387] and [Spencer 36 (1998) 120] report contradictory findings. After careful examination, I conclude that the reason for this puzzling result is a lack of robustness of the estimated wage response functions to model specification, data transformation to induce stationarity, the choice of proxy for the aggregate real wage, and the choice of variables to include in the VAR. The implication is that the message from VARs with long-run restrictions regarding real wage dynamics is not clear, and that further work must be done to understand the role of relative stickiness of wages and prices in the transmission of aggregate demand shocks.

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1. Introduction

In a recent paper, [Gamber and Joutz \(1993\)](#) estimate that real wages respond *positively* to aggregate demand shocks in the short-run. This result is inconsistent with Keynesian “sticky-wage” theories of the business cycle, according to which the transmission of nominal shocks to real activity occurs through countercyclical changes in the real wage and movements along the labor demand curve, but is consistent with sticky-price models (e.g., [McCallum, 1986](#)) or

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real-business-cycle “limited participation” models of money (e.g., [Christiano, Eichenbaum, & Evans, 1997](#)). However, in a more recent study, [Spencer \(1998\)](#) directly contradicts these findings—his estimates suggest that the real wage response to such shocks is strongly and robustly *negative*, thus supporting the sticky-wage view.

Surprisingly, the empirical methods used by these studies are almost identical: each is a time-series study that estimates a three-variable vector autoregression (VAR) including a measure of the real wage, a measure of aggregate real economic activity, and the unemployment rate; each uses aggregate, quarterly, post-war US data; and each identifies the dynamic response of the aggregate real wage to aggregate demand shocks by imposing the plausible restriction that such shocks are neutral (have no effect on real variables) in the long-run. Readers are thus left to wonder both why the findings for real wages differ so dramatically across the studies, and which set of findings best characterizes the actual response of the real wage to aggregate demand shocks.¹

The aim of this analysis is to determine the extent to which model specification and choice of empirical proxy for the aggregate variables used in the VAR can explain the variation in such key results across these studies, holding the identification strategy and sample period constant. Clearly, this is an important task (a) theoretically, in light of the significance of real wage dynamics in distinguishing between alternative theories of the transmission mechanism, and (b) econometrically, in light of the critique of long-run restrictions by [Faust and Leeper \(1997\)](#). They point out that the use of long-run identifying restrictions in finite samples inherently lacks robustness; in particular, identified impulse response functions can be very sensitive to specification of the statistical model used. At issue, then, is what we can learn about the dynamic behavior of aggregate real wages from VARs that are identified by infinite-horizon restrictions.

My strategy is to vary model specification and empirical proxy along crucial dimensions and to compare the resulting dynamic response functions of real wages, real activity, and unemployment or nominal output, over a common sample period. I find a remarkable degree of robustness for real activity and unemployment/nominal output. However, I am also able to replicate the different results of [Gamber and Joutz \(1993\)](#) and [Spencer \(1998\)](#) for wages, and show that the dynamic response of the real wage is much less robust than as suggested by each of these studies. In particular, the estimated real wage responses are sensitive to lag length in the VAR, data transformation to induce stationarity, and choice of empirical proxies both for the real wage and for the nominal variables used to drive the identification of aggregate demand shocks. The upshot is that (a) aggregate demand shocks and dynamic responses *can* be confidently identified with long-run restrictions, given the robust findings for some variables in the system (so that the Faust and Leeper critique is not necessarily always a practical concern); but that (b) we learn little about the transmission mechanism of aggregate demand shocks through labor markets, in particular how real wages respond to such shocks, from long-run restrictions in trivariate VARs. This exercise cannot definitively answer the second question above (How do wages *really* respond to demand shocks?), but it suggests how to go about getting an answer.

2. Estimating and identifying aggregate demand shocks

Before discussing the results, it is necessary to briefly describe the approach to estimation and identification using long-run restrictions, as pioneered by [Blanchard and Quah \(1989\)](#) and

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