Journal of Applied Econometrics

WILEY

Journal of APPLIED ECONOMETRICS

RESEARCH ARTICLE OPEN ACCESS

Labor Market Institutions, Fiscal Multipliers, and Macroeconomic Volatility

Maximilian Boeck[1,2] | Jesús Crespo Cuaresma[1,3,4,5] | Christian Glocker[4]

[1]Vienna University of Economics and Business, Vienna, Austria | [2]Friedrich-Alexander University Erlangen-Nuremberg, Nuremberg, Germany | [3]Wittgenstein Centre for Demography and Global Human Capital (IIASA, ÖAW, UniVie), Vienna, Austria | [4]Austrian Institute of Economic Research (WIFO), Vienna, Austria | [5]CESifo, Munich, Germany

Correspondence: Maximilian Boeck (maximilian.boeck@wu.ac.at)

Received: 19 January 2025 | **Revised:** 11 March 2026 | **Accepted:** 6 April 2026

Keywords: fiscal policy | interacted panel VAR | labor market institutions

ABSTRACT

How do labor market institutions shape the transmission of government spending shocks and macroeconomic volatility? We develop a theoretical model in which labor market institutions affect fiscal transmission through their effect on wage rigidity, job separation, and matching frictions. We estimate an interacted panel vector autoregressive model for 16 OECD economies and study how macroeconomic responses to government spending shocks vary with institutional labor market characteristics. In line with our theoretical predictions, we show that institutions that stabilize employment and wages tend to reduce output volatility and attenuate the response of output and employment to government spending shocks.

MSC2020 Classification: E62, C33, J21, J38

1 | Introduction

Government spending is a central policy tool during economic downturns, yet its macroeconomic effects vary substantially across countries and over time. A growing literature documents large differences in the response of output, employment, and wages to fiscal shocks, even among advanced economies. Understanding the sources of this heterogeneity is crucial for assessing the effectiveness of fiscal policy and its role in macroeconomic stabilization.[1]

This paper studies how labor market institutions (LMIs) shape the transmission of government spending shocks and the volatility of macroeconomic outcomes. Structural characteristics of labor markets help explain differences in the absorption of external shocks across economies (Gnocchi et al. 2015; Abbritti and Weber 2018). LMIs influence wage setting, job separation, and matching efficiency, all of which affect how fiscal expansions propagate through the economy. While existing work has emphasized the role of individual institutions (most prominently, employment protection), much less is known about how multiple LMIs jointly shape fiscal transmission and macroeconomic volatility.

We address this gap by combining a structural model of the labor market with cross-country empirical evidence for OECD economies. On the theoretical side, we develop a model in which LMIs affect fiscal transmission through three main channels: wage rigidity, job separation dynamics, and matching frictions. These channels generate testable implications for the responses of output, employment, and real wages following government spending shocks. On the empirical side, we estimate impulse responses to fiscal shocks for a panel of 16 OECD economies and examine how their magnitude and persistence vary systematically with labor market characteristics.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.
© 2026 The Author(s). *Journal of Applied Econometrics* published by John Wiley & Sons Ltd.

Our theoretical framework combines a standard New Keynesian model with search and matching frictions in the labor market (Thomas and Zanetti 2009; Christoffel et al. 2009). We focus on three measurable institutional dimensions. Union density (UD) determines workers' bargaining power in wage negotiations, the unemployment benefit replacement rate (BRR) enters as a subsidy to unemployed workers, and employment protection is captured by firing costs per displaced worker. In the model, higher unemployment benefits and greater UD increase real wages, which dampens the employment response to an expansionary fiscal shock. Higher employment protection reduces employment adjustment by lowering job separation rates.[2]

We validate the model's predictions using a semi-structural Bayesian interacted panel VAR estimated for 16 OECD countries (Towbin and Weber 2013; Sá et al. 2014). Identification relies on implementation lags of government spending (Blanchard and Perotti 2002; Ilzetzki et al. 2013) and exogeneity restrictions on the variables measuring LMIs. The empirical results broadly corroborate the qualitative predictions of the theoretical model. We find that higher UD and stronger employment protection are associated with smaller output and employment responses to fiscal shocks. At the same time, these institutions reduce output volatility, whereas higher unemployment BRRs increase volatility in output and employment.

To shed light on the transmission mechanisms underlying these findings, we perform an impulse-response matching exercise linking empirical responses to the theoretical channels implied by different LMIs. This analysis shows that employment protection primarily operates through job separation risk, while UD additionally affects matching frictions in the labor market.

Our contribution advances the literature in several respects. First, we contribute to the extensive literature on the macroeconomic effects of fiscal policy shocks, and in particular to studies analyzing labor market responses to government spending (Monacelli et al. 2010; Brückner and Pappa 2012). While a large body of work emphasizes state-dependent fiscal effects across business cycle regimes (Auerbach and Gorodnichenko 2012), our analysis highlights how structural labor market characteristics shape the effectiveness of fiscal policy.

Second, we contribute to the literature on the macroeconomic consequences of labor market regulation. A growing theoretical literature studies the interaction between fiscal policy and labor market frictions in New Keynesian environments with search and matching (Christoffel et al. 2009; Thomas and Zanetti 2009; Zanetti 2009, 2011; Campolmi et al. 2011). Complementing this work, empirical studies document that LMIs affect macroeconomic dynamics and shock absorption (Gnocchi et al. 2015; Abbritti and Weber 2018; Hantzsche et al. 2018). Our analysis extends this literature by examining how LMIs condition the transmission of exogenous fiscal policy shocks.

Our work is closely related to Cacciatore et al. (2021), who study the role of employment protection legislation (EPL) in shaping fiscal spending responses. While their focus is on a single labor market institution, we consider a broader set of institutional features and assess their joint effects. This allows us to examine whether the marginal effect of a given labor market institution depends on the level of other institutions, revealing complementarities or substitutabilities in fiscal transmission. Moreover, whereas existing work primarily focuses on fiscal responses, we explicitly analyze how LMIs affect macroeconomic volatility, highlighting trade-offs between stabilization and fiscal effectiveness that are not captured by multiplier estimates alone.

The remainder of the paper is structured as follows. Section 2 provides a descriptive overview of LMIs across selected OECD countries. Section 3 presents the theoretical model and its main predictions. Section 4 connects the theoretical framework to the empirical analysis and presents the econometric results. Section 5 concludes.

2 | Structural Labor Market Indicators in OECD Economies

We begin by describing the evolution of LMIs in OECD countries using available data for the period 1960–2020.[3] We focus on three variables that correspond to structural dimensions of the labor market playing a central role in our theoretical model: UD, η, the unemployment BRR, φ, and EPL, ς.[4] We provide a descriptive analysis of cross-country and within-country variation in these LMIs in Figure 1.[5]

In the theoretical model, the parameter η captures workers' bargaining power, which we proxy empirically using UD. This indicator is primarily derived from survey data or adjusted administrative records and represents the share of trade union members among wage and salary earners.[6] Higher values of UD indicate greater trade union influence in wage negotiations. UD displays substantial cross-country variation, ranging from around 15% in France to approximately 80% in Sweden. It also exhibits considerable within-country variation, amounting to changes of 10–20 percentage points over the period considered.

The unemployment BRR measures the proportion of income maintained during unemployment, defined as the ratio of net household income while unemployed to income prior to job loss. Higher values indicate more generous unemployment insurance systems. In the theoretical model, the parameter φ captures unemployment benefit payments relative to pre-dismissal wages and is measured empirically using the replacement rate. Similar to UD, the replacement rate shows substantial variation both across countries and over time.

We proxy the degree of employment protection (ς in the model) using the EPL index. This index measures the regulatory strictness of dismissals and temporary contracts based on regulations in force on January 1 of each year. In addition to severance payments, it incorporates one-time payments to the social security system related to the burden imposed on unemployment insurance by dismissals.[7] Higher index values indicate stricter employment protection. While the median level of EPL has remained broadly stable across countries, its dispersion has

1099125, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

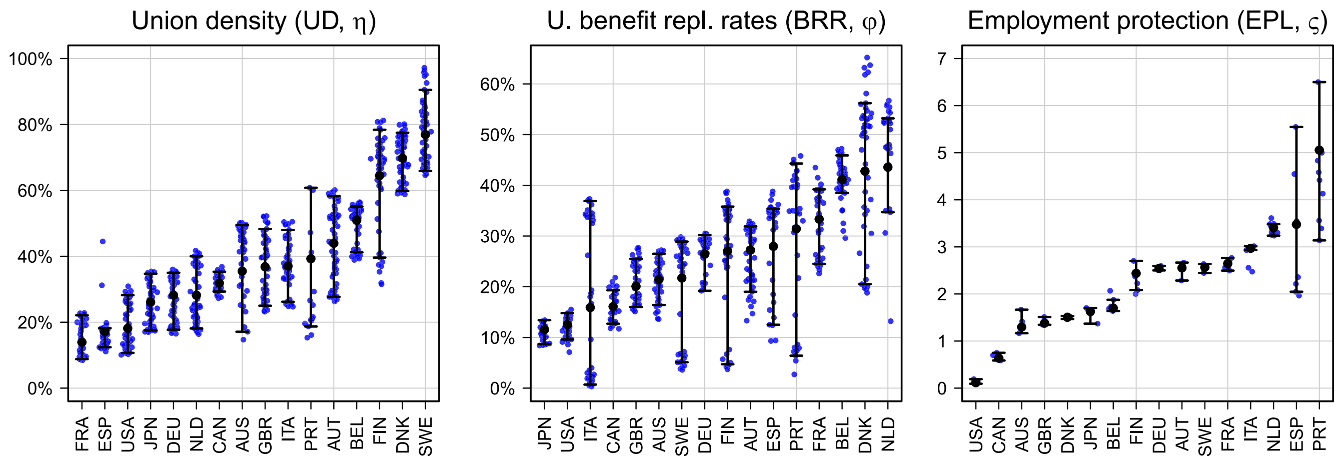

FIGURE 1 | Labor market institutions in OECD economies: Cross-country variation. *Note*: The figure reports labor market institution variables (union density, unemployment benefit replacement rate, and employment protection legislation) by country. The black dot represents the mean, while the whiskers correspond to the 10th and 90th percentiles of the distribution. Blue points denote observed country–year data. The y-axis is measured in percent for union density and the benefit replacement rate; the EPL index is unit-free.

declined markedly over time. This reflect convergence, particularly among European Union member states (see Supporting Information Figure D1).

3 | The Theoretical Model

For our theoretical model, we combine a Diamond–Mortensen–Pissarides search-and-matching labor market with an otherwise standard business-cycle framework, building on Merz (1995), Andolfatto (1996), Krause and Lubik (2007), and Monacelli et al. (2010). The model is deliberately parsimonious and is designed to isolate the role of LMIs as determinants of the fiscal multiplier. Supporting Information Appendix B discusses extensions that allow for richer interactions and that can be useful for other applications.

We assume representative firms and households. Each firm employs n_t workers and posts v_t vacancies. Posting a vacancy costs κ per vacancy, and endogenous job separations are associated with firing costs of b_t^s per separated worker. Unemployment is given by $u_t = 1 - n_t$.

New hires are determined by a standard matching function,

$$m_t = \overline{m} u_t^{\gamma} v_t^{1-\gamma}, \tag{1}$$

with $\overline{m} > 0$ and $\gamma \in (0, 1)$. Labor market tightness is $\theta_t = v_t / u_t$. The probability that a vacancy is filled is $q_t = m_t / v_t = \overline{m}\theta_t^{-\gamma}$, and the job-finding probability is $p_t = m_t / u_t = \overline{m}\theta_t^{1-\gamma}$.

Each period, a fraction $\varrho(\tilde{a}_t)$ of existing matches is destroyed. Separations have an exogenous component $\overline{\varrho}$ and an endogenous component. Following Krause and Lubik (2007), idiosyncratic job productivities a_t are drawn each period from a distribution with c.d.f. $F(a_t)$ and density $f(a_t)$. A match is endogenously destroyed if $a_t < \tilde{a}_t$, where $\tilde{a}_t$ is a threshold chosen endogenously. The overall separation rate is

$$\varrho(\tilde{a}_t) = \overline{\varrho} + (1 - \overline{\varrho}) F(\tilde{a}_t). \tag{2}$$

3.1 | Intermediate Goods-Producing Firms

A representative intermediate-goods producer uses labor to produce output

$$y_t = \bar{A} n_t A(\tilde{a}_t), \tag{3}$$

where $\bar{A} > 0$ is a common aggregate productivity factor and

$$A(\tilde{a}_t) = E[a | a \geq \tilde{a}_t] = \frac{1}{1 - F(\tilde{a}_t)} \int_{\tilde{a}_t}^{\infty} a \, dF(a) \tag{4}$$

is the conditional expectation of productivity larger than the endogenously determined threshold.

Employment evolves according to

$$n_t = (1 - \varrho(\tilde{a}_t))(n_{t-1} + m_{t-1}). \tag{5}$$

Per period profits are given by

$$\pi_t^F = \frac{y_t}{\mu_t} - w_t n_t - \kappa v_t - F(\tilde{a}_t)(1 - \overline{\varrho})(n_{t-1} + q_{t-1} v_{t-1}) b_t^s, \tag{6}$$

where the output price is normalized to one, μ_t is the price markup (so $mc_t = \mu_t^{-1}$), w_t is the average real wage across match productivities, and κ denotes the vacancy posting cost. The last term captures firing costs incurred for endogenously separated matches: cost per laid off worker, b_t^s, times the number of existing and new workers who were laid off due to endogenous job separation.[8] Firms maximize expected discounted profits, $\max_{n_t, v_t, \tilde{a}_t} \mathbb{E}_t \sum_{k \geq 0} \Lambda_{t,t+k} \pi_{t+k}^F$, where $\Lambda_{t,t+k}$ denotes the firm's stochastic discount factor. The optimization problem is subject to the production function and Equation (5).

The first-order conditions imply

$$\begin{aligned} F_t^n = {} & mc_t mpl_t - w_t + \mathbb{E}_t \Lambda_{t,t+1} \\ & \times \left[(1 - \varrho(\tilde{a}_{t+1})) F_{t+1}^n - b_{t+1}^s (1 - \overline{\varrho}) F(\tilde{a}_{t+1}) \right], \end{aligned} \tag{7}$$

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

$$\frac{\kappa}{q_t} = \mathbb{E}_t \Lambda_{t,t+1} \left[(1 - \varrho(\tilde{a}_{t+1})) F^n_{t+1} - b^s_{t+1}(1 - \overline{\varrho}) F(\tilde{a}_{t+1}) \right], \quad (8)$$

$$mc_t A(\tilde{a}_t) = \frac{1}{\bar{A}} \left(w_t - b^s_t - \frac{\kappa}{q_t} \right), \quad (9)$$

where mpl_t is the marginal product of labor and F^n_t is the multiplier on Equation (5).[9]

Equation (7) defines the (shadow) value of an additional worker to the firm, which is given by the current marginal revenue product net of the wage, plus the discounted continuation value, net of expected firing costs. Equation (8) is the free-entry condition, which equates the expected value of a vacancy to its posting cost. Equation (9) pins down the endogenous separation threshold: higher wages increase the productivity cutoff required for continuing a match, while higher firing costs and higher expected hiring costs (lower q_t) make firms more willing to retain lower-productivity matches.

3.2 | Final Goods-Producing Firms

Final-goods firms buy intermediate goods and sell differentiated varieties to households. There is a continuum of final-goods producers indexed by $i \in [0, 1]$. Firms are perfectly competitive in input markets and monopolistically competitive in output markets. Prices are subject to Calvo stickiness à la Calvo (1983). Following Christiano et al. (2005), firms that cannot re-optimize partially index prices to lagged CPI inflation, so that $P_t(j) = (1 + \pi_{t-1})^{\gamma_p} P_{t-1}(j)$ with $\gamma_p \in [0, 1]$. If $\gamma_p = 1$, non-re-optimizing firms fully index to lagged inflation; if $\gamma_p = 0$, they keep prices unchanged (see Uribe 2020).

Let ξ denote the probability of not being able to re-optimize in a given period. Standard profit maximization yields a New Keynesian Phillips curve that is given by

$$(1 + \gamma_p \xi \beta)\pi_t = \beta \mathbb{E}_t \pi_{t+1} + \gamma_p \pi_{t-1} + \frac{(1 - \xi\beta)(1 - \xi)}{\xi} \hat{mc}_t, \quad (10)$$

where $\hat{mc}_t$ denotes real marginal costs in log-deviations.

3.3 | Households

Households are modeled as in Merz (1995). A representative household consists of a continuum of members of unit mass who pool income and consumption. Income accrues from labor earnings for employed members and unemployment benefits for unemployed members.

The household budget constraint is

$$c_t + B_t = R_{t-1} B_{t-1} + (1 - \tau) w_t n_t + b^u_t (1 - n_t) + T^S_t + \pi^F_t, \quad (11)$$

where B_t denotes holdings of government bonds paying a gross return of R_t, τ is the wage tax rate, b^u_t represents unemployment benefits per unemployed member, and T^S_t refers to lump-sum subsidies.

Employment evolves according to

$$n_t = (1 - \varrho(\tilde{a}_t)) n_{t-1} + p_t (1 - n_{t-1}), \quad (12)$$

and the household maximizes expected lifetime utility $\mathbb{E}_t \sum_{k \geq 0} \beta^k u(c_{t+k}, n_{t+k})$ subject to both equations, where λ_t is the Lagrange multiplier attached to Equation (11) and $\lambda_t H^n_t$ the one attached to Equation (12). Optimality implies

$$1 = R_t \mathbb{E}_t \Lambda_{t,t+1}, \quad (13)$$

$$H^n_t = \tilde{w}^b_t - mrs_t + \mathbb{E}_t \left[1 - \varrho(\tilde{a}_{t+1}) - p_{t+1} \right] \Lambda_{t,t+1} H^n_{t+1}, \quad (14)$$

where $\tilde{w}^b_t = (1 - \tau) w_t - b^u_t$ and $mrs_t = -u_{n,t} / \lambda_t$. Hence, mrs_t captures both the marginal rate of substitution between consumption and work and the marginal value of non-work activities. The stochastic discount factor is given by $\Lambda_{t,t+1} = \beta \frac{\lambda_{t+1}}{\lambda_t}$.

Equation (14) defines the (shadow) value of having one additional employed member, which is given by the increase in utility due to higher income, net of the disutility from work, plus the discounted continuation value of being employed next period.

3.4 | Nash Wage Bargaining

Wages are set each period via Nash bargaining over the pre-tax average wage w_t between firms and workers, leading to

$$w_t = \arg\max_{w_t} (H^n_t)^\eta (F^n_t)^{1-\eta}, \quad (15)$$

where $0 < \eta \leq 1$ captures workers' bargaining power. The Nash solution implies

$$w_t = (1 - \eta) \frac{mrs_t + b^u_t}{1 - \tau} + \eta \left(mc_t mpl_t + \mathbb{E}_t \Lambda_{t,t+1} \left[\kappa \theta_{t+1} - b^s_{t+1} (1 - \overline{\varrho}) F(\tilde{a}_{t+1}) \right] \right). \quad (16)$$

The wage is a weighted average of the household's outside option (captured by mrs_t and unemployment benefits) and the firm's surplus from the match (captured by marginal revenue product net of expected hiring and firing costs).

3.5 | Policies, Aggregate Resource Constraint, and Government Budget Constraint

The government budget constraint is

$$\tau w_t n_t + B_t = R_{t-1} B_{t-1} + b^u_t u_t + T^S_t + g_t, \quad (17)$$

where g_t denotes government consumption.

Fiscal policy is specified as follows. Government consumption g_t follows an exogenous AR(1) process (in log-deviations). Unemployment benefits are given by

$$b^u_t = \overline{\varphi} + \varphi w_{t-1}, \quad (18)$$

where φ is the replacement rate relative to the last wage received. Firing costs are specified as

$$b^s_t = \overline{\varsigma} + \varsigma w_{t-1}. \quad (19)$$

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Finally, lump-sum subsidies satisfy

$$T_t^S = \overline{T}^S + \varphi_{T^S} B_t. \tag{20}$$

The constants $\overline{T}^S$ and $\overline{\varsigma}$ facilitate steady-state computations, while the feedback term $\varphi_{T^S} B_t$ ensures debt stationarity.

Monetary policy follows a Taylor rule,

$$i_t = \rho_i i_{t-1} + (1-\rho_i)\big(\phi_\pi \pi_t + \phi_y \hat{y}_t\big), \tag{21}$$

where $i_t = \ln(R_t)$ and a hat denotes the log-deviation from the steady state.

Finally, combining Equation (17), the household budget constraint in Equation (11), and firms' profits π_t^F yields the aggregate resource constraint,

$$y_t = c_t + g_t + \kappa v_t + F(\tilde{a}_t)(1-\overline{\varrho})(n_{t-1} + q_{t-1}v_{t-1})b_t^s. \tag{22}$$

This equation closes the model.

3.6 | Equilibrium, Model Solution, and Dynamic Simulations

We collect the LMI parameters of interest in the vector $\boldsymbol{\vartheta} = (\eta, \varphi, \varsigma)'$. To assess how LMIs shape fiscal transmission, we study how changes in $\boldsymbol{\vartheta}$ affect the impulse responses to a government spending shock.

The model is solved by log-linearizing the system around its deterministic steady state. The equilibrium dynamics can be summarized by

$$\boldsymbol{\Psi}_0(\boldsymbol{\vartheta})\boldsymbol{z}_t = \boldsymbol{\Psi}_1(\boldsymbol{\vartheta})\boldsymbol{z}_{t-1} + \boldsymbol{\varepsilon}_t, \tag{23}$$

where $\boldsymbol{z}_t$ is the vector of endogenous variables and $\boldsymbol{\varepsilon}_t = \hat{g}_t$ denotes the vector of exogenous shocks, which in our case consists only of government spending shocks. The matrix $\boldsymbol{\Psi}_1(\boldsymbol{\vartheta})$ governs the endogenous dynamics, while $\boldsymbol{\Psi}_0(\boldsymbol{\vartheta})^{-1}$ determines the contemporaneous impact of fiscal shocks. The dependence of these matrices on $\boldsymbol{\vartheta}$ allows us to trace how LMIs affect the propagation of fiscal policy.

We compute impulse response functions (IRFs) based on a calibrated version of the model, as described in Supporting Information Appendix A.2. Since the IRFs are continuous functions of $\boldsymbol{\vartheta}$, we evaluate them over a range of institutional configurations.

Following Crespo Cuaresma and Glocker (2023), we summarize the dynamic response of a variable x using the cumulative elasticity with respect to government spending over the horizon $\mathcal{P}$,

$$\mu_x(\vartheta_l) = \frac{\sum_{i=1}^{\mathcal{P}} \mathrm{IRF}_i^x(\vartheta_l)}{\sum_{j=1}^{\mathcal{P}} \mathrm{IRF}_j^{\hat{g}}(\vartheta_l)}, \qquad l \in \{1,2,3\}. \tag{24}$$

To facilitate comparison with the fiscal multiplier literature, we report the corresponding spending multiplier in levels,

$$\mathcal{M}_x(\vartheta_l) = \frac{\mu_x(\vartheta_l)}{\overline{g}/\overline{y}}, \qquad l \in \{1,2,3\}, \tag{25}$$

where $\overline{g}/\overline{y}$ denotes the steady-state government spending share in output (Ramey and Zubairy 2018). In our sample, the average value of $\overline{g}/\overline{y}$ is approximately 0.20.

Figure 2 reports the multipliers for output ($\hat{y}_t$), employment ($\hat{n}_t$), and the real wage ($\hat{w}_t$) at different horizons. We distinguish between the contemporaneous response ($\mathcal{P} = 1$) and longer-horizon cumulative responses ($\mathcal{P} \geq 2$) to highlight dynamic adjustment. Each column shows how fiscal multipliers vary with the corresponding LMI parameter in $\boldsymbol{\vartheta}$.

3.7 | The Role of Differences in LMIs

We now examine how the three LMIs–the BRR (φ), workers' bargaining power (η), and firing costs (ς)–shape fiscal spending multipliers.

We begin with the unemployment BRR, φ. Lower replacement rates are associated with larger output and employment multipliers due to the mechanism that operates through wage bargaining. Since unemployment benefits raise workers' outside option, they increase the reservation wage of households and raise the equilibrium wage negotiated between firms and workers.

The reservation wages of firms and households are obtained by setting the marginal value of employment equal to zero, $F_t^n = 0$ and $H_t^n = 0$. Using Equations (7) and (14), and setting $\tau = 0$ for simplicity, the firm's and household's reservation wages are given by

$$\overline{w}_t^F = mc_t mpl_t + \mathbb{E}_t\Lambda_{t,t+1}\big[(1-\varrho(\tilde{a}_{t+1}))F_{t+1}^n - b_{t+1}^s(1-\overline{\varrho})F(\tilde{a}_{t+1})\big], \tag{26}$$

$$\underline{w}_t^H = mrs_t + b_t^u - (1-\varrho(\tilde{a}_{t+1}) - p_{t+1})\mathbb{E}_t\Lambda_{t,t+1}H_{t+1}^n. \tag{27}$$

The equilibrium wage is a weighted average of these reservation wages,

$$w_t = (1-\eta)\overline{w}_t^F + \eta\underline{w}_t^H. \tag{28}$$

An increase in unemployment benefits raises the household reservation wage $\underline{w}_t^H$ by improving workers' outside option. This increases the negotiated wage and reduces the surplus from employment for firms. As a result, vacancy creation declines, and firms raise the productivity threshold $\tilde{a}_t$, thus increasing endogenous job separations. Both channels reduce the employment response to a fiscal expansion. Since output is proportional to employment, higher replacement rates also reduce the output multiplier. Therefore, in the model, economies with more generous unemployment benefits exhibit weaker employment and output responses to government spending shocks.[10]

We next consider workers' bargaining power, η. Higher bargaining power increases the weight placed on the household reservation wage in Nash bargaining and therefore raises the equilibrium wage. This reduces the value of employment to firms and increases the endogenous job separation threshold $\tilde{a}_t$, leading to lower employment.

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

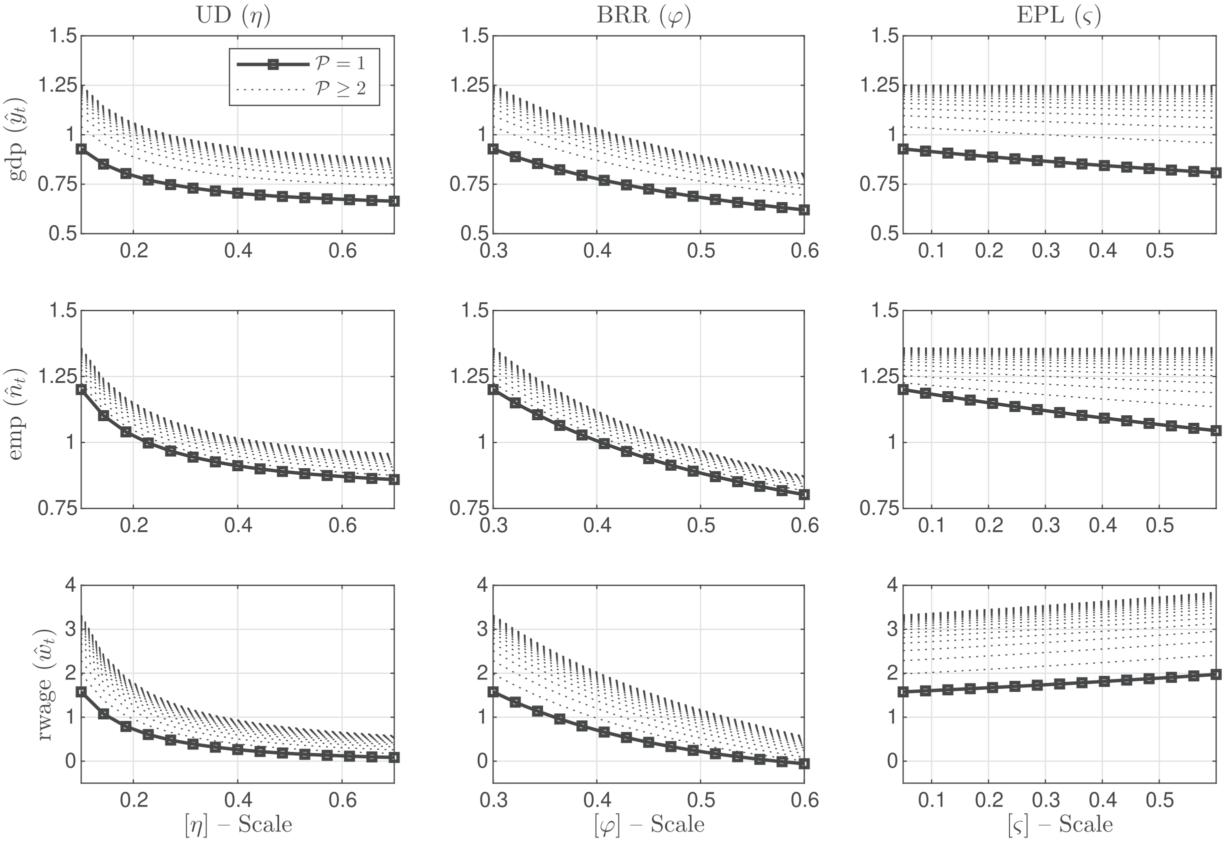

FIGURE 2 | Fiscal spending multipliers and the LMIs ($\mathcal{M}(\boldsymbol{\vartheta})$). *Note:* The figure illustrates the sensitivity of the fiscal spending multipliers to variations in the three LMI parameters (UD – union density, BRR – (unemployment) benefit replacement rate, and EPL – employment protection (legislation)). The multipliers are defined in Equation (25) are presented for different horizons, with the contemporaneous multiplier ($\mathcal{P}=1$) represented by a solid black square line, and the higher horizon multipliers ($\mathcal{P}\geq 2$) indicated by black dotted lines.

As a consequence, when government spending increases, employment and output rise by less in economies where workers have greater bargaining power. This mechanism is illustrated in the first column of Figure 2, which shows that fiscal multipliers decline as η increases.

Finally, we consider firing costs, ς, which capture employment protection. Unlike the previous institutions, firing costs do not directly affect wage bargaining. Instead, they influence firms' hiring and separation decisions.

Lower firing costs increase both job creation and job destruction by making employment adjustment less costly. This raises the responsiveness of employment to aggregate shocks. Consequently, employment reacts more strongly to fiscal spending shocks when firing costs are low, resulting in larger employment and output multipliers. Conversely, stricter employment protection dampens employment adjustment and reduces fiscal multipliers.[11]

4 | The Empirical Evidence

This section empirically evaluates the theoretical prediction concerning how LMIs shape the transmission of fiscal policy shocks. In particular, we examine how the responses of output, employment, and wages to government spending shocks vary systematically with the benefit replacement rate, workers' bargaining power, and firing costs.

To do so, we estimate an interacted panel vector autoregressive (IPVAR) model, following Towbin and Weber (2013) and Sá et al. (2014), for a panel of advanced economies. The IPVAR framework allows the dynamic responses to fiscal shocks to depend explicitly on LMIs. This provides an empirical counterpart to the theoretical model, in which the propagation matrices $\boldsymbol{\Psi}_0(\boldsymbol{\vartheta})$ and $\boldsymbol{\Psi}_1(\boldsymbol{\vartheta})$ depend on the institutional parameters $\boldsymbol{\vartheta}$.

In the following subsections, we present the econometric specification, describe the data and identification strategy, and discuss the empirical results.

4.1 | The Econometric Model

Let $\boldsymbol{y}_{it}$ denote the n-dimensional vector of endogenous variables for country $i = 1, \ldots, N$ at time $t = 1, ..., T$, and let $\boldsymbol{\vartheta}_{it}$ denote the d-dimensional vector of labor market institution indicators. The reduced-form IPVAR is given by

$$\boldsymbol{y}_{it} = \boldsymbol{c}_i(\boldsymbol{\vartheta}_{it}) + \sum_{j=1}^{p} \boldsymbol{\Phi}_{ij}(\boldsymbol{\vartheta}_{it})\boldsymbol{y}_{it-j} + \boldsymbol{u}_{it}, \quad \boldsymbol{u}_{it} \sim \mathcal{N}_n\big(\boldsymbol{0}, \boldsymbol{\Sigma}_i(\boldsymbol{\vartheta}_{it})\big), \tag{29}$$

1099125, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

where $\boldsymbol{c}_i(\boldsymbol{\vartheta}_{it})$ is the intercept, $\boldsymbol{\Phi}_{ij}(\boldsymbol{\vartheta}_{it})$ are the autoregressive coefficient matrices, and $\boldsymbol{\Sigma}_i(\boldsymbol{\vartheta}_{it})$ is the covariance matrix. All coefficients are allowed to vary with the institutional variables $\boldsymbol{\vartheta}_{it}$, so that the propagation of shocks depends on the labor market environment. Supporting Information Appendix C provides full details of the parameterization.

For identification and interpretation, it is useful to consider the structural representation,

$$\tilde{\boldsymbol{\Psi}}_{i0}\boldsymbol{y}_{it} = \sum_{j=1}^{p}\tilde{\boldsymbol{\Psi}}_{ij}(\boldsymbol{\vartheta}_{it})\boldsymbol{y}_{it-j} + \boldsymbol{e}_{it}, \quad \boldsymbol{e}_{it} \sim \mathcal{N}_n(\boldsymbol{0}, \boldsymbol{I}), \tag{30}$$

where $\boldsymbol{e}_{it}$ denotes structural shocks. The structural coefficients $\tilde{\boldsymbol{\Psi}}_{ij}(\boldsymbol{\vartheta}_{it})$ capture how the transmission of shocks varies with LMIs.

The panel dimension allows us to estimate a common underlying economic structure while allowing for country-specific deviations. To this end, we employ a hierarchical prior which assumes that country-specific coefficients are drawn from a common Gaussian distribution, as in Jarocinski (2010). Such a prior implies that

$$\tilde{\boldsymbol{\Psi}}_{ij}(\boldsymbol{\vartheta}_{it}) \sim \mathcal{N}\left(\boldsymbol{\Psi}_j(\boldsymbol{\vartheta}_t), \boldsymbol{V}_j\right), \quad j = 1, \ldots, p, \tag{31}$$

where $\boldsymbol{\Psi}_j(\boldsymbol{\vartheta}_t)$ denotes the cross-country mean and $\boldsymbol{V}_j$ governs cross-country dispersion. We employ global–local shrinkage priors to regularize estimation and avoid overfitting (Griffin and Brown 2010; Huber and Feldkircher 2019). Details of the prior specification are provided in Supporting Information Appendix C.

To connect the empirical specification to the theoretical model, we assume that the structural coefficients vary smoothly with LMIs. Specifically, we approximate the coefficient matrices using a first-order Taylor expansion,

$$\boldsymbol{\Psi}_j(\boldsymbol{\vartheta}_t) = \overline{\boldsymbol{\Psi}}_j + \sum_{l=1}^{d}\frac{\partial\boldsymbol{\Psi}_j}{\partial\vartheta_{lt}}(\vartheta_{lt} - \overline{\vartheta}_l), \quad j = 0, \ldots, p. \tag{32}$$

In practice, we evaluate impulse responses by varying one institutional variable at a time while holding the others fixed at their median values. This approach isolates the contribution of each labor market institution to fiscal transmission.

Two potential limitations of this approach merit discussion. First, LMIs may be endogenous to macroeconomic conditions. However, their evolution appears to reflect long-run structural changes rather than cyclical dynamics (see Supporting Information Appendix D1). Consistent with this interpretation, impulse response analysis shows that LMIs do not respond significantly to cyclical shocks when estimating a standard panel VAR model that includes the institutional variables and examining their response to macroeconomic shocks.

Second, the specification assumes that coefficient variation with respect to institutions is linear. While more flexible specifications are possible, the available sample size limits the feasibility of estimating highly nonlinear models without overfitting.

4.2 | Data and Specification

We use quarterly data for 16 OECD countries over the period 1960Q1–2020Q4 to estimate our IPVAR model.[12] The empirical specification follows the theoretical framework and focuses on government spending, output, employment, and wages.

The vector of endogenous variables is given by $\boldsymbol{y}_{it} = (g_{it}, x_{it}, er_{it}, \omega_{it})'$, where g_{it} denotes the growth rate of real government consumption per capita, x_{it} denotes the growth rate of real GDP per capita, er_{it} denotes the first difference of the employment rate, and ω_{it} denotes the growth rate of real wages.[13] Detailed definitions and data sources are provided in Supporting Information Appendix D.

LMIs enter the model as interaction variables. Specifically, we define $\boldsymbol{\vartheta}_{it} = (\eta_{it}, \varphi_{it}, \varsigma_{it})'$, where η_{it} denotes UD, φ_{it} denotes the unemployment BRR, and ς_{it} denotes the employment protection index. These data are obtained from the CEP-OECD institutions database. Since institutional data are available annually, we construct quarterly series by assigning each annual observation to all quarters within the corresponding year, thus reflecting the slow evolution of LMIs over time.

Prior to estimation, all interaction variables are standardized to facilitate interpretation and comparability across countries. The IPVAR model includes all three institutional variables simultaneously. When evaluating impulse responses with respect to a particular institutional variable ϑ_l, we hold the remaining institutional variables fixed at their median values.

The lag length is set to $p = 1$ based on the Bayesian information criterion.[14] Estimation is based on 20,000 posterior draws, discarding the first 10,000 draws as burn-in.

4.3 | Shock Identification

We identify fiscal spending shocks by imposing a recursive identification scheme based on the Cholesky decomposition of the reduced-form IPVAR shocks. We follow Blanchard and Perotti (2002) and assume that fiscal spending does not react contemporaneously to shocks arising from GDP or labor market variables in the system. These three variables are assumed to respond within the same quarter to the fiscal spending shock. Such a recursive structure is the most conventional strategy used to identify fiscal spending shocks in the established structural VAR literature (see, for instance, the discussion in Čapek and Crespo Cuaresma 2020). We utilize this particular approach for two reasons. First, this approach is in line with recent studies that use panel VAR or country VAR methods to analyze the effects of fiscal policy (see, inter alia, Beetsma and Giuliodori 2011; Bénétrix and Lane 2013; Ilzetzki et al. 2013; Huidrom et al. 2020). Second, alternative identification approaches are infeasible in the context of a large cross-country analysis.[15]

One potential drawback in the context of a recursive approach to identification concerns the issue of fiscal foresight. Economic agents constantly receive information and update their expectations regarding news on fiscal policy issues. As econometricians, we may only observe a smaller information set. This

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

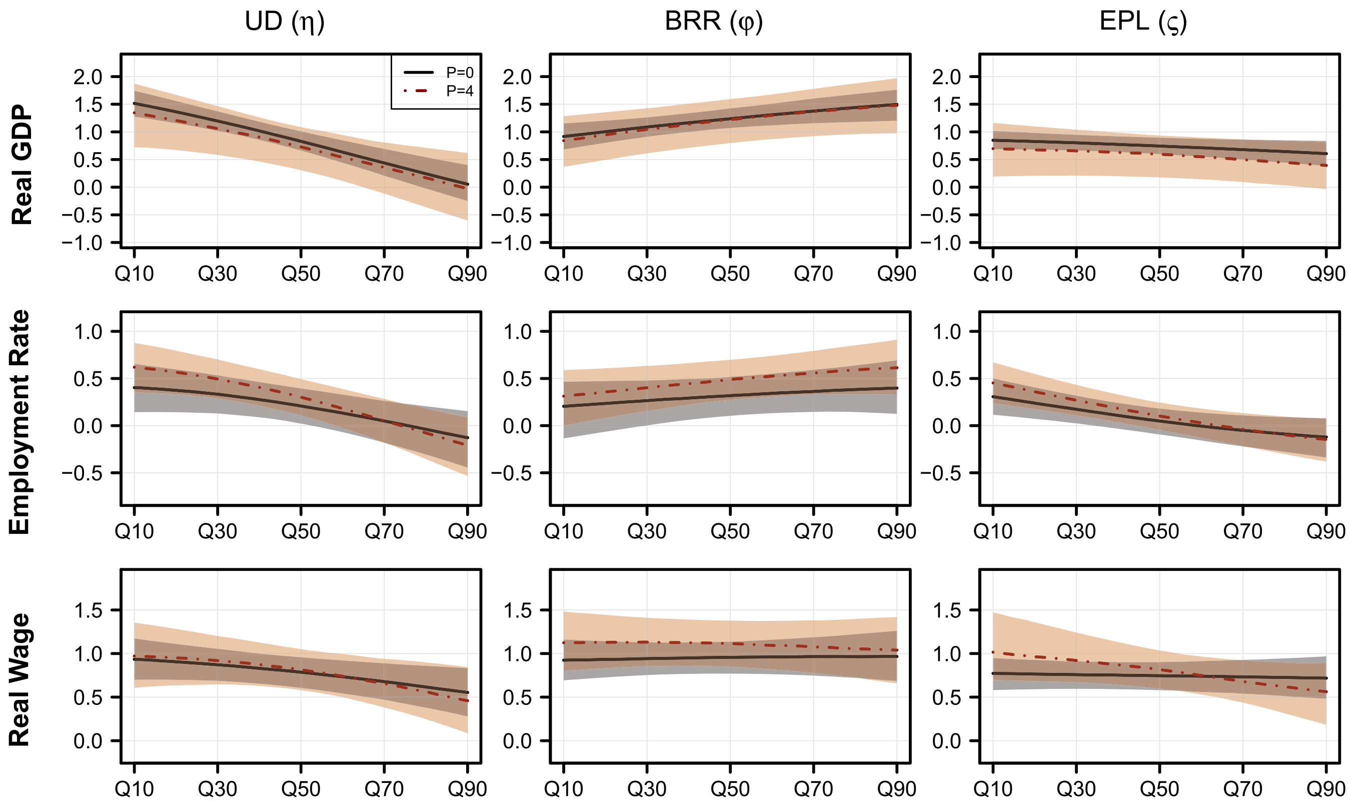

FIGURE 3 | Fiscal multipliers along LMIs. *Note*: The figure shows the sensitivity of the fiscal spending multipliers to changes in the structural parameters (η is union density, φ is the unemployment benefit replacement rate, and ς is employment protection legislation). The y-axis gives the size of the multiplier while the x-axis runs from the 10th to the 90th quantile in terms of the respective LMI. The multipliers are defined in Equation (25) and shown for different horizons: on impact ($\mathcal{P} = 0$, solid black line) and one-year ($\mathcal{P} = 4$, dashed-dotted red line) multiplier. The lines denote the median and the colored area refers to the 80% credible set.

misalignment between the information sets of the economic agents and the econometrician can generate equilibria with a non-fundamental moving average representation (Ramey 2011; Leeper et al. 2013; Ellahie and Ricco 2017). To resolve this issue, the information set in the VAR is enlarged to contain a variable proxying for agents' expectations. These expectations are not available for the full sample of countries and time span considered here. Therefore, we show that our results are robust to this concern in a smaller setting in Supporting Information Appendix E.3[16]

4.4 | The Effect on Fiscal Spending Effectiveness

This subsection examines empirically how LMIs affect fiscal spending multipliers. Following the theoretical analysis, we report both the impact multiplier ($\mathcal{P} = 0$) and the one-year cumulative multiplier ($\mathcal{P} = 4$). Figure 3 shows how these multipliers vary with UD (η), the BRR (φ), and EPL (ς). The solid black and dashed red lines denote the median impact and one-year multipliers, respectively, and shaded areas indicate 80% credible sets. The horizontal axis spans the 10th–90th percentiles of each institutional variable.

Fiscal multipliers for output decline markedly with UD. At low levels of UD, the impact elasticity is approximately 0.3, corresponding to a level multiplier of around 1.5 when scaled by the government spending share in output. As UD increases, the multiplier declines steadily and approaches zero at the upper end of the distribution. This decline is economically large and statistically significant.

In contrast, employment protection has a weaker effect on output multipliers. While there is some decline as employment protection increases, the effect is modest and not precisely estimated. For the BRR, we do not observe a decline in output multipliers. Instead, the estimates suggest a slight increase, although the differences are not statistically significant.[17]

The employment multiplier is consistently positive but declines with UD and employment protection. The impact employment multiplier decreases from approximately 0.60 at low levels of these institutional variables to values close to zero at high levels. These effects (which are statistically significant from a frequentist perspective) indicate that stricter LMIs dampen the employment response to fiscal spending shocks.

In contrast, the employment multiplier does not exhibit a systematic decline with the BRR. Although point estimates suggest a modest increase, the associated uncertainty is substantial. One-year multipliers are generally larger than impact multipliers, reflecting gradual adjustment in labor market outcomes following fiscal shocks.

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

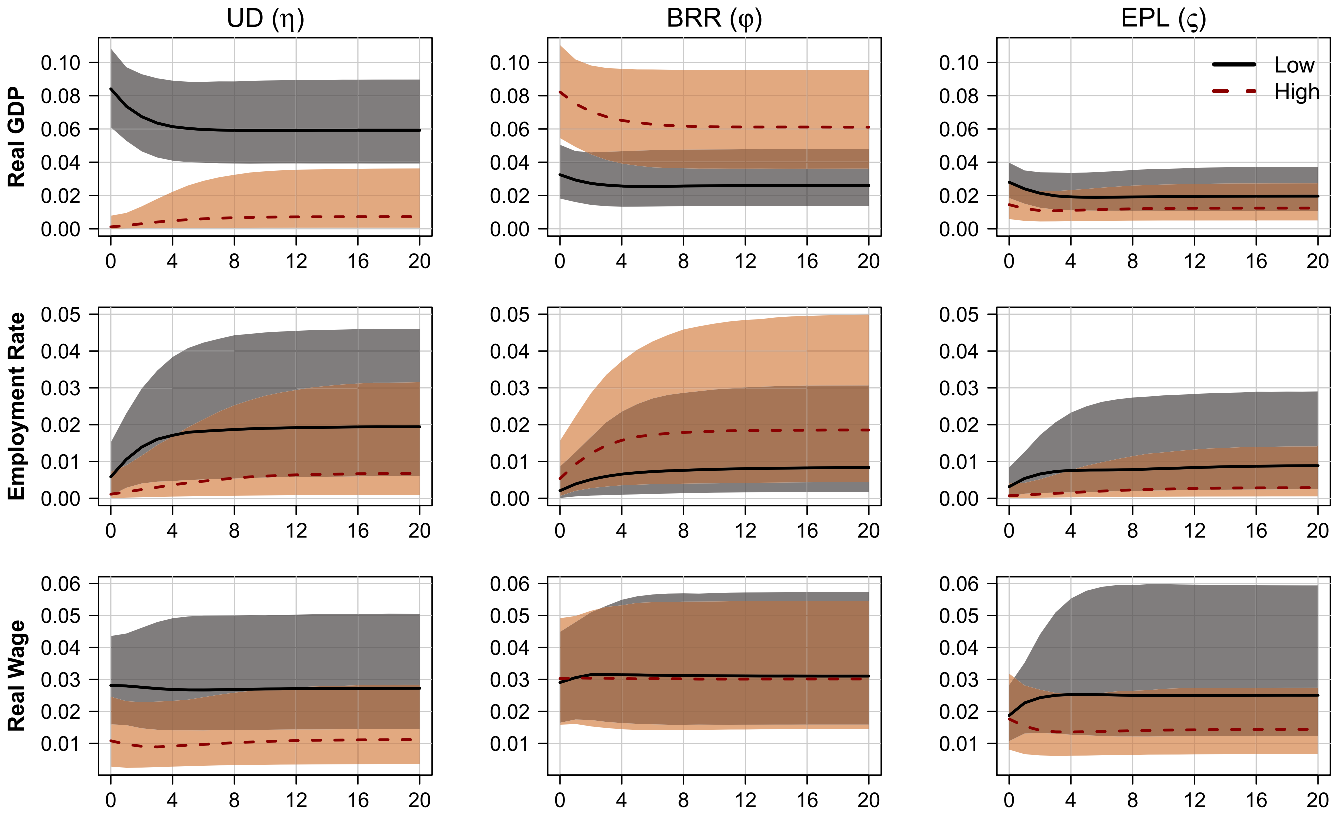

FIGURE 4 | Forecast error variance decomposition. *Note*: The figure shows the sensitivity of the forecast error variance to changes in the structural parameters (η is union density, φ is unemployment benefit replacement rate, and ς is employment protection). The y-axis gives the share of explained forecast error variance while the x-axis is the forecast horizon and runs up to 5 years (= 20 quarters). The forecast error variance decomposition is shown for the respective LMI at the 10th quantile (low, black dashed line) and 90th quantile (high, dashed red line). Confidence bounds refer to the 10/90 quantile of the posterior distribution.

Fiscal multipliers for real wages are smaller and estimated less precisely. There is some evidence of declining multipliers with UD and employment protection at longer horizons, but credible intervals are wide. In contrast, real wage multipliers show little systematic variation with the BRR.

Overall, the empirical results support the theoretical prediction that LMIs shape fiscal transmission. In particular, UD and employment protection significantly attenuate output and employment multipliers. These findings closely mirror the predictions of the DSGE model shown in Figure 2.

One difference between the empirical and theoretical results concerns the BRR. While the theoretical model predicts weaker multipliers with more generous unemployment benefits, the empirical estimates do not show such a decline. One possible explanation is that unemployment insurance reduces precautionary savings and strengthens aggregate demand (Challe 2020; McKay and Reis 2021; Kekre 2023; Gorn and Trigari 2024). This demand channel is not fully captured in the baseline theoretical framework. Another difference concerns the dynamic adjustment of employment, which appears less persistent in the empirical estimates than in the theoretical model.

Figure 4 reports the forecast error variance decomposition. Fiscal spending shocks explain a larger share of output fluctuations in economies with more flexible labor markets. For example, fiscal shocks account for up to 8% of output variance at longer horizons when UD is low, but substantially less when UD is high. Similar but weaker patterns are observed for employment protection. In contrast, the BRR does not reduce the contribution of fiscal shocks to output variability. Consistent with the impulse response analysis, differences across institutional regimes are small for employment and real wages.

Our results are consistent with existing estimates of fiscal multipliers (Ramey 2019; Ilzetzki et al. 2013) and confirm that employment responds less strongly than output to fiscal shocks (Monacelli et al. 2010). Our main contribution is to show that fiscal multipliers depend systematically on LMIs. Additional results and robustness checks are reported in Supporting Information Appendix E. These include results based on controlling for fiscal foresight, the use of alternative labor market indicators, and an assessment of cross-country heterogeneity.

4.5 | The Effect on Macroeconomic Volatility

While stricter LMIs may reduce the effectiveness of discretionary fiscal policy, they may also dampen macroeconomic volatility. The LMIs we consider capture structural features of the labor market and can, to some extent, act as automatic stabilizers. This is particularly evident for the BRR: more generous unemployment insurance smooths household income and provides

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

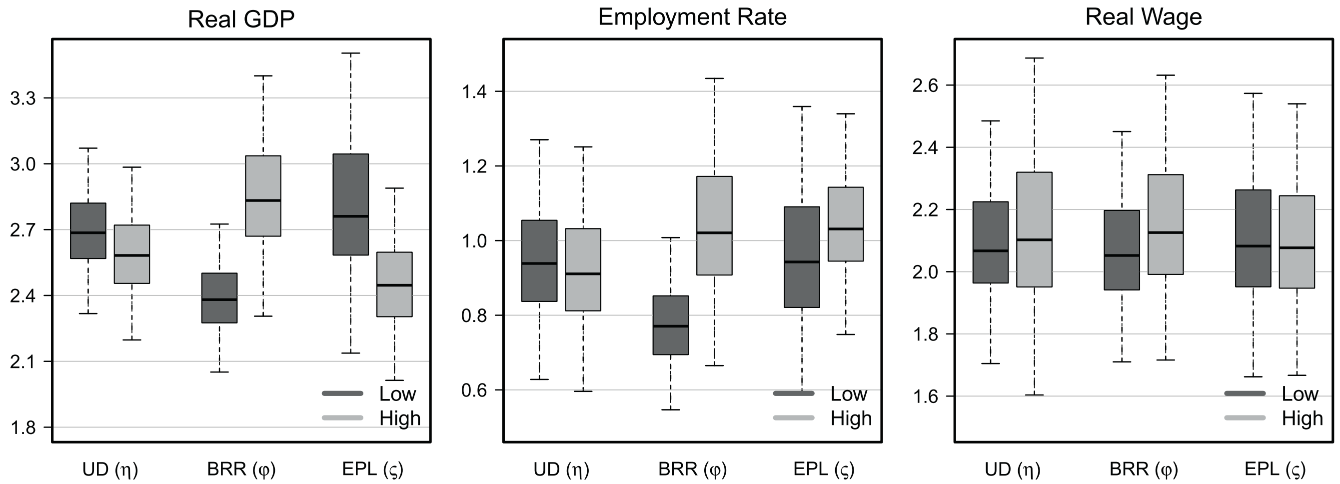

FIGURE 5 | Macroeconomic volatilities along LMIs. *Note*: Each sub-figure reports the implied unconditional standard deviation of the respective macroeconomic variable under a low (10th percentile, dark gray) and a high (90th percentile, light gray) value of the relevant labor market institution, holding the remaining LMIs fixed at their median values. The institutions are union density (UD, η), the unemployment benefit replacement rate (BRR, φ), and employment protection legislation (EPL, ς).

insurance against unemployment risk. Employment protection and unionization can also affect cyclical adjustment by altering job separation, hiring, and wage dynamics. This raises the question of whether LMIs and discretionary fiscal policy act as substitutes in stabilizing macroeconomic outcomes.

To address this question, we use the IPVAR to quantify changes in unconditional macroeconomic volatility as a function of LMIs. Specifically, we compute the unconditional covariance matrix of the endogenous variables implied by the estimated IPVAR, conditional on different levels of our institutional variables.[18]

Let $\boldsymbol{\Omega}(\boldsymbol{\vartheta}_t)$ denote the unconditional covariance matrix of the IPVAR state vector in companion form. Using standard results for stable VARs (see, e.g., Hamilton (1994)), the unconditional covariance satisfies

$$\operatorname{vec}\big(\boldsymbol{\Omega}(\boldsymbol{\vartheta}_t)\big) = \big(\boldsymbol{I} - \boldsymbol{F}(\boldsymbol{\vartheta}_t) \otimes \boldsymbol{F}(\boldsymbol{\vartheta}_t)\big)^{-1} \operatorname{vec}\big(\boldsymbol{Q}(\boldsymbol{\vartheta}_t)\big), \tag{33}$$

where $\boldsymbol{I}$ is the identity matrix of dimension $K^2 = (np)^2$, $\boldsymbol{F}(\boldsymbol{\vartheta}_t)$ is the $K \times K$ companion matrix implied by the VAR coefficient matrices, and $\boldsymbol{Q}(\boldsymbol{\vartheta}_t)$ is the $K \times K$ covariance matrix of the VAR innovations in companion form. We do not impose a pooling prior on the country-specific covariance matrices. For the variance calculations, we therefore work with a common-mean covariance matrix obtained by averaging the country-specific estimates, $\overline{\boldsymbol{\Sigma}}(\boldsymbol{\vartheta}) = N^{-1}\sum_{i=1}^{N} \boldsymbol{\Sigma}_i(\boldsymbol{\vartheta}_{it})$. Equation (33) makes explicit that unconditional volatilities depend on institutional characteristics through both the propagation matrix $\boldsymbol{F}(\boldsymbol{\vartheta}_t)$ and the innovation covariance $\boldsymbol{Q}(\boldsymbol{\vartheta}_t)$.

Figure 5 summarizes the implied volatilities by comparing low (10th percentile) and high (90th percentile) values of each LMI. Two patterns stand out. First, higher UD and stronger employment protection tend to reduce output volatility, although the effect is more pronounced for employment protection. Second, a higher BRR is associated with higher output volatility and also increases the volatility of the employment rate. Real wage volatility exhibits comparatively small differences across institutional regimes. These results refer to unconditional volatilities and are consistent with the general message in Zanetti (2011). At the same time, the effect of LMIs on volatility depends on the source of shocks, as discussed in Supporting Information Appendix A.4.

4.6 | How Do LMIs Affect Macroeconomic Volatility?

We next investigate through which channels LMIs affect (unconditional) macroeconomic volatility. Equation (33) shows that institutional variables can influence volatility (i) by changing the propagation of shocks through the VAR dynamics, or (ii) by changing the size and covariance structure of reduced-form innovations. We refer to these components as the shock transmission effect (STE) and the shock size effect (SSE), respectively.

Let $\omega_{kk}(\boldsymbol{\vartheta}_t)$ denote the kth diagonal element of $\boldsymbol{\Omega}(\boldsymbol{\vartheta}_t)$, that is, the unconditional variance of the kth variable. Define

$$\tilde{\boldsymbol{F}}(\boldsymbol{\vartheta}_t) \equiv \big(\boldsymbol{I} - \boldsymbol{F}(\boldsymbol{\vartheta}_t) \otimes \boldsymbol{F}(\boldsymbol{\vartheta}_t)\big)^{-1}, \qquad \tilde{\boldsymbol{Q}}(\boldsymbol{\vartheta}_t) \equiv \operatorname{vec}\big(\boldsymbol{Q}(\boldsymbol{\vartheta}_t)\big). \tag{34}$$

Using $\operatorname{vec}(\boldsymbol{\Omega}(\boldsymbol{\vartheta}_t)) = \tilde{\boldsymbol{F}}(\boldsymbol{\vartheta}_t)\tilde{\boldsymbol{Q}}(\boldsymbol{\vartheta}_t)$, the partial effect of an institutional variable ϑ_{lt} on ω_{kk} can be written as

$$\frac{\partial \omega_{kk}(\boldsymbol{\vartheta}_t)}{\partial \vartheta_{lt}} = \sum_j \left(\underbrace{\tilde{q}_j(\boldsymbol{\vartheta}_t)\frac{\partial \tilde{f}_{kj}(\boldsymbol{\vartheta}_t)}{\partial \vartheta_{lt}}}_{\text{STE}} + \underbrace{\tilde{f}_{kj}(\boldsymbol{\vartheta}_t)\frac{\partial \tilde{q}_j(\boldsymbol{\vartheta}_t)}{\partial \vartheta_{lt}}}_{\text{SSE}} \right), \tag{35}$$

where $\tilde{f}_{kj}(\boldsymbol{\vartheta}_t)$ denotes element (k, j) of $\tilde{\boldsymbol{F}}(\boldsymbol{\vartheta}_t)$ and $\tilde{q}_j(\boldsymbol{\vartheta}_t)$ denotes element j of $\tilde{\boldsymbol{Q}}(\boldsymbol{\vartheta}_t)$. This decomposition separates changes in volatility due to propagation (STE) from changes due to shock variances and covariances (SSE).

Figure 6 reports the change in volatility when moving from low to high values of each institutional variable and decomposes this change into STE and SSE. For UD, the STE tends to increase

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

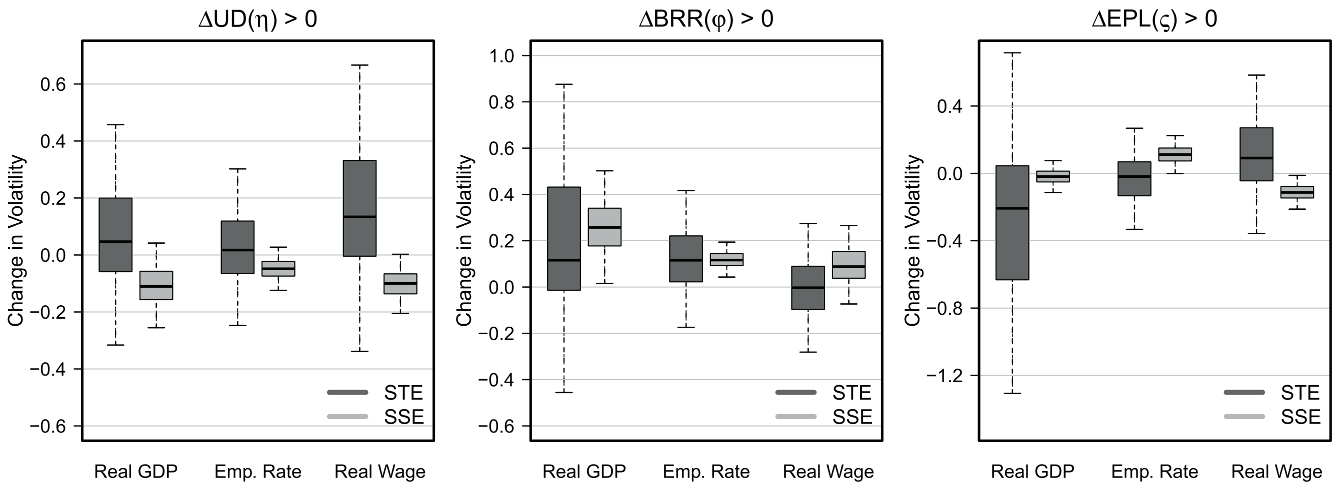

FIGURE 6 | Change in macroeconomic volatilities along LMIs. *Note*: Each sub-figure shows the change in the unconditional standard deviation of the respective macroeconomic variable when moving from the low (10th percentile) to the high (90th percentile) regime of the respective labor market institution, holding the remaining LMIs fixed at their median values. Dark gray bars represent the shock transmission effect (STE) and light gray bars represent the shock size effect (SSE), as defined in Equation (35). The institutions are union density (UD, η), the unemployment benefit replacement rate (BRR, φ), and employment protection legislation (EPL, ς).

volatility, whereas the SSE tends to reduce it. These effects partially offset each other, implying a small net effect on unconditional volatility, particularly for real wages. For the BRR, both STE and SSE increase volatility, most clearly for output and, to a lesser extent, employment. For employment protection, the reduction in output volatility is primarily driven by the STE, while the SSE contribution is close to zero; effects on employment and wages are comparatively small.

Overall, both channels matter for how institutions shape volatility. The decomposition also shows that STE and SSE can operate in opposite directions, which helps explain why net effects are sometimes small despite sizable underlying components.[19]

4.7 | Accounting for the Evidence

We next explore which structural features of the theoretical model account for the empirical differences across institutional regimes. To this end, we estimate a subset of structural parameters by matching IRFs from the DSGE model to those estimated from the IPVAR.

Let $\widehat{\text{IRF}}$ denote the empirical IRFs obtained from the IPVAR (for the common-mean dynamics).[20] Let $\text{IRF}(\boldsymbol{\theta})$ denote the model-implied IRFs from the DSGE model. We fix all structural parameters at their baseline calibration (Supporting Information Table A1), except for the persistence of the government spending shock (ϱ_g), price stickiness (ξ), the degree of inflation indexation (γ_p), the matching elasticity with respect to unemployment (γ), and the first two moments of the idiosyncratic productivity distribution (μ_a, σ_a). Idiosyncratic productivity is i.i.d. log-normally distributed with c.d.f. $F(\cdot)$. We estimate the moments of $\ln(\tilde{a})$, that is, $\mu_a = E[\ln(\tilde{a})]$ and $\sigma_a = \sqrt{\text{Var}[\ln(\tilde{a})]}$. These parameters are collected in $\boldsymbol{\theta}$ and are selected because they play a central role in shaping fiscal multipliers and labor market adjustment (Galí et al. 2007; Dupaigne and Fève 2016).

We match the first 25 periods of the responses of government spending ($\hat{g}_t$), output ($\hat{y}_t$), employment ($\hat{n}_t$), and real wages ($\hat{w}_t$). The parameter vector is obtained by minimizing the distance between empirical and theoretical IRFs

$$\hat{\boldsymbol{\theta}} = \arg\min_{\boldsymbol{\theta}} \left\| \widehat{\text{IRF}} - \text{IRF}(\boldsymbol{\theta}) \right\|. \tag{36}$$

We restrict attention to parameter values that imply equilibrium determinacy. We perform this exercise separately for each institutional dimension and for low and high values of the corresponding LMIs (10th and 90th percentiles), holding the remaining LMIs fixed at their median values.

The resulting estimates are reported in Table 1. The persistence of the government spending shock (ϱ_g) is moderate and varies little across institutional regimes, and we find similarly limited variation in the dispersion of idiosyncratic productivity (σ_a). In contrast, several parameters show economically meaningful changes across regimes. For UD, the estimates point to substantial changes in the matching elasticity γ and the mean of the idiosyncratic productivity distribution μ_a, both of which shape job creation and separation dynamics. For the BRR, the matching results primarily indicate stronger nominal rigidities, reflected in changes in price stickiness and inflation indexation. Finally, employment protection mainly affects the mean of idiosyncratic job destruction, consistent with the interpretation that stricter EPL lowers the propensity for separations. These structural differences help rationalize the cross-regime variation in empirical fiscal responses.

5 | Concluding Remarks

This paper studies how LMIs shape the transmission of fiscal spending shocks and macroeconomic volatility. We combine a structural New Keynesian model with search and matching frictions and an IPVAR model estimated for 16 OECD economies.

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 1 | Estimated model parameters.

	UD (η)		BRR (φ)		EPL (ς)	
	Low ($\eta = 0.1$)	High ($\eta = 0.7$)	Low ($\varphi = 0.3$)	High ($\varphi = 0.6$)	Low ($\varsigma = 0.1$)	High ($\varsigma = 0.6$)
ϱ_g	0.42	0.45	0.41	0.44	0.41	0.43
ξ	0.56	0.58	0.56	0.91	0.56	0.55
γ_p	0.02	0.03	0.00	0.52	0.04	0.03
γ	0.56	0.88	0.58	0.69	0.71	0.76
μ_a	−0.97	0.66	1.78	1.83	1.30	−1.48
σ_a	2.88	3.03	2.32	3.08	2.39	2.99

Note: Structural parameters: ϱ_g is the autoregressive coefficient of the AR(1)-government consumption spending shock, ξ captures the degree of price stickiness, γ_p denotes the share of inflation indexed prices, μ_a and σ_a are the first and second moments of the distribution of the idiosyncratic job productivity ($\tilde{a}_t$). The values in parentheses in the rows for the Low and High LMIs represent the specific LMI values used in the matching process. All other parameters are fixed at their baseline calibration.

This integrated theoretical and empirical framework allows us to quantify how institutional differences affect fiscal multipliers and the volatility of macroeconomic outcomes.

Our first main finding is that LMIs significantly affect the transmission of fiscal policy shocks. Higher UD and stronger employment protection reduce the output and employment responses to government spending shocks, thereby attenuating fiscal multipliers. The BRR exhibits weaker and less precisely estimated effects on multipliers. These empirical patterns closely align with the predictions of the theoretical model and can be traced to institutional effects on wage bargaining, job separation, and matching dynamics.

Our second main finding is that LMIs also shape macroeconomic volatility. Higher UD and stronger employment protection are associated with lower output volatility, while the BRR is associated with higher volatility in output and employment. Using a decomposition of unconditional variances, we show that these effects arise through both changes in shock transmission and changes in the size and covariance structure of reduced-form innovations.

Taken together, these results highlight a systematic relationship between LMIs, fiscal transmission, and macroeconomic stability. Labor market rigidities weaken the short-run effectiveness of discretionary fiscal policy but can also reduce output volatility. This implies that structural labor market characteristics influence both the need for and the effectiveness of countercyclical fiscal policy.

More broadly, our findings underscore the importance of accounting for institutional heterogeneity when evaluating fiscal policy effectiveness across countries. Differences in LMIs help explain cross-country variation in fiscal multipliers and macroeconomic volatility, and therefore constitute a key structural determinant of fiscal transmission.

Acknowledgments

We thank Astrid Czaloun for excellent research assistance. Furthermore, Maximilian Boeck and Christian Glocker gratefully acknowledge financial support by funds of the Österreichische Nationalbank (Austrian National Bank, Anniversary Fund, project number: 18466). The authors are grateful to the editor Marco Del Negro and four anonymous reviewers for very helpful suggestions that have helped improve the paper significantly. We also thank Pia Heckl, Brigitte Hochmuth, Christian Merkl, Lorenzo Mori, Thomas Url, Thomas O. Zörner, and participants of the ECON Theory and Policy Seminar at TU Vienna and the Annual International Conference on Macroeconomic Analysis and International Finance for valuable comments and helpful discussions. Open Access funding provided by Wirtschaftsuniversitat Wien. [Correction added on 02 July 2026, after first online publication: KEMO funding statement has been added.]

Funding

This work was supported by Österreichische Nationalbank (Austrian National Bank, Anniversary Fund, project number: 18466).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in the Journal Data Archive at https://doi.org/10.15456/jae.2026150.1702260498.

Endnotes

[1] Labor market outcomes are often a primary target of macroeconomic stabilization policies. In the wake of the financial crisis of 2007–2009, the American Recovery and Reinvestment Act (ARRA) explicitly aimed to raise employment (Romer 2009). During the COVID-19 pandemic, the coronavirus aid, relief, and economic security (CARES) act expanded unemployment insurance to support displaced workers (Ganong et al. 2020; Ganong et al. 2024). In Europe, the Next Generation EU program allowed member states greater fiscal flexibility and supported national relief measures.

[2] Ghassibe and Zanetti (2022) study goods market frictions and show that tighter product markets are associated with smaller fiscal responses.

[3] Our sample consists of 16 countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, and the United States. Further details on the data sources are provided in Supporting Information Appendix D.

[4] Other structural labor market characteristics may also affect the transmission of fiscal shocks. Examples include openness to foreign labor (see, for instance Amuedo-Dorantes and Rica 2013; Godøy 2017; Schiman 2021), long-run trends in labor productivity (see, for instance Policardo et al. 2019; Li et al. 2021), and the demographic structure of the

1099125, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

workforce (see, for instance Docquier et al. 2019). We limit our analysis to the dimensions listed above due to data availability and their suitability for the theoretical framework.

[5]Additional evidence on the time variation of these LMIs is presented in Supporting Information Figure D1.

[6]An alternative indicator of wage bargaining power is collective bargaining coverage. This measure is considerably more persistent than UD and does not necessarily reflect changes in effective bargaining power at the firm or worker level.

[7]The EPL index is qualitative in nature. Quantitative cross-country data on firing costs are not readily available, and monetary measures alone would omit non-pecuniary elements of employment protection, such as administrative and judicial procedures.

[8]Supporting Information Appendix B considers the case where firing costs accrue to the government.

[9]Details for the condition determining $\tilde{a}_t$ are given in the Supporting Information Appendix; the resulting expression implies Equation (9).

[10]Albertini and Poirier (2015) emphasize that these effects may differ at the zero lower bound, where higher unemployment benefits can stimulate activity by lowering real interest rates through inflation expectations.

[11]Supporting Information Appendix A.3 evaluates these mechanisms under alternative calibrations, and Supporting Information Appendix B considers several model extensions, including the absence of price indexation, real wage rigidities, limited asset market participation, firing costs accruing to the government, productivity-enhancing government spending, and complementarity between consumption and leisure. With the exception of the fiscal treatment of firing costs, these extensions do not alter the qualitative effects of LMIs on fiscal multipliers.

[12]The sample includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, and the United States.

[13]Following Brückner and Pappa (2012), all variables are expressed in per capita terms. As a robustness check, we also apply the transformation proposed by Gordon and Krenn (2010) and divide each variable by its trend estimated using the filter of Hamilton (2018). Consistent with Ramey (2016), this transformation produces impulse responses similar to those obtained using log-level specifications. Results are reported in Supporting Information Appendix E.2.

[14]Supporting Information Appendix E.2 shows that the results are robust to alternative lag lengths, including two and four lags.

[15]Alternative approaches can be summarized in three distinct groups: (i) event-study approaches based on defense spending changes (Ramey and Shapiro 1998; Ramey 2011), (ii) sign-restrictions (Mountford and Uhlig 2009), or (iii) narrative approaches (Romer and Romer 2010; Guajardo et al. 2014). These approaches are not feasible because they rely on additional data that are not available (e.g., detailed institutional information on fiscal spending plans) or are not practical for a large panel of countries. An interesting alternative is provided by the approach in Miyamoto et al. (2019), which uses military spending data in a large panel of countries but only on a yearly frequency.

[16]We follow the suggestions in Born et al. (2013), Born et al. (2020), or Ilori et al. (2022) and use two different sets of government spending forecasts. To control for fiscal foresight, we rely on data from professional forecasters at Oxford Economics and the OECD. We restrict our sample to the G7 countries in the cross-section, starting only in the mid 1980s (OECD) or late 1990s (Oxford Economics). See Supporting Information Appendix E.3 for further details.

[17]Supporting Information Appendix E.1 reports impulse responses evaluated at different points in the institutional distribution and examines the posterior distribution of their differences.

[18]For an analogous analysis in the theoretical model; see Supporting Information Appendix A.4. In the DSGE model, we consider volatilities conditional on specific shocks (government spending and technology shocks), whereas the IPVAR-based volatilities are unconditional.

[19]These results are robust to replacing the employment rate with the unemployment rate; see Supporting Information Appendix E.4.

[20]Throughout, we focus on impulse responses of the common mean in the hierarchical IPVAR, which pools information across countries while allowing for idiosyncratic deviations. The corresponding IRFs are reported in Supporting Information Appendix E.1.

References

Abbritti, M., and S. Weber. 2018. "Reassessing the Role of Labor Market Institutions for the Business Cycle." *International Journal of Central Banking* 14, no. 1: 1–34.

Albertini, J., and A. Poirier. 2015. "Unemployment Benefit Extension at the Zero Lower Bound." *Review of Economic Dynamics* 18, no. 4: 733–751.

Amuedo-Dorantes, C., and S. Rica. 2013. "The Immigration Surplus and the Substitutability of Immigrant and Native Labor: Evidence From Spain." *Empirical Economics* 44, no. 2: 945–958.

Andolfatto, D. 1996. "Business Cycles and Labor-Market Search." *American Economic Review* 86, no. 1: 112–132.

Auerbach, A. J., and Y. Gorodnichenko. 2012. "Measuring the Output Responses to Fiscal Policy." *American Economic Journal: Economic Policy* 4, no. 2: 1–27.

Beetsma, R., and M. Giuliodori. 2011. "The Effects of Government Purchases Shocks: Review and Estimates for the EU." *Economic Journal* 121, no. 550: 4–32.

Bénétrix, A., and P. Lane. 2013. "Fiscal Shocks and the Real Exchange Rate." *International Journal of Central Banking* 9, no. 3: 6–37.

Blanchard, O., and R. Perotti. 2002. "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output." *Quarterly Journal of Economics* 117, no. 4: 1329–1368.

Born, B., F. Juessen, and G. J. Müller. 2013. "Exchange Rate Regimes and Fiscal Multipliers." *Journal of Economic Dynamics and Control* 37, no. 2: 446–465.

Born, B., G. J. Müller, and J. Pfeifer. 2020. "Does Austerity Pay Off?" *Review of Economics and Statistics* 102, no. 2: 323–338.

Brückner, M., and E. Pappa. 2012. "Fiscal Expansions, Unemployment, and Labor Force Participation: Theory and Evidence." *International Economic Review* 53, no. 4: 1205–1228.

Cacciatore, M., R. Duval, D. Furceri, and A. Zdzienicka. 2021. "Fiscal Multipliers and Job-Protection Regulation." *European Economic Review* 132: 103616.

Calvo, G. 1983. "Staggered Prices in a Utility-Maximizing Framework." *Journal of Monetary Economics* 12, no. 3: 383–398.

Campolmi, A., E. Faia, and R. Winkler. 2011. "Fiscal Calculus and the Labor Market." *BE Journal of Macroeconomics* 11, no. 1: 38.

Čapek, J., and J. Crespo Cuaresma. 2020. "We Just Estimated Twenty Million Fiscal Multipliers." *Oxford Bulletin of Economics and Statistics* 82, no. 3: 483–502.

Challe, E. 2020. "Uninsured Unemployment Risk and Optimal Monetary Policy in a Zero-Liquidity Economy." *American Economic Journal: Macroeconomics* 12, no. 2: 241–283.

Christiano, L. J., M. Eichenbaum, and C. L. Evans. 2005. "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy." *Journal of Political Economy* 113, no. 1: 1–45.

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Christoffel, K., K. Kuester, and T. Linzert. 2009. "The Role of Labor Markets for Euro Area Monetary Policy." *European Economic Review* 53, no. 8: 908–936.

Crespo Cuaresma, J., and C. Glocker. 2023. "Production Structure, Tradability and Fiscal Spending Multipliers." *Journal of International Money and Finance* 138: 102921.

Docquier, F., Z. L. Kone, A. Mattoo, and C. Ozden. 2019. "Labor Market Effects of Demographic Shifts and Migration in OECD Countries." *European Economic Review* 113: 297–324.

Dupaigne, M., and P. Fève. 2016. "Persistent Government Spending and Fiscal Multipliers: The Investment- Channel." *European Economic Review* 89: 425–453.

Ellahie, A., and G. Ricco. 2017. "Government Purchases Reloaded: Informational Insufficiency and Heterogeneity in Fiscal VARs." *Journal of Monetary Economics* 90: 13–27.

Galí, J., D. López-Salido, and J. Valles. 2007. "Understanding the Effects of Government Spending on Consumption." *Journal of the European Economic Association* 5, no. 1: 227–270.

Ganong, P., F. Greig, P. Noel, D. M. Sullivan, and J. Vavra. 2024. "Spending and Job-Finding Impacts of Expanded Unemployment Benefits: Evidence From Administrative Micro Data." *American Economic Review* 114, no. 9: 2898–2939.

Ganong, P., P. Noel, and J. Vavra. 2020. "US Unemployment Insurance Replacement Rates During the Pandemic." *Journal of Public Economics* 191: 104273.

Ghassibe, M., and F. Zanetti. 2022. "State Dependence of Fiscal Multipliers: The Source of Fluctuations Matters." *Journal of Monetary Economics* 132: 1–23.

Gnocchi, S., A. Lagerborg, and E. Pappa. 2015. "Do Labor Market Institutions Matter for Business Cycles?" *Journal of Economic Dynamics and Control* 51: 299–317.

Godøy, A. 2017. "Local Labor Markets and Earnings of Refugee Immigrants." *Empirical Economics* 52, no. 1: 31–58.

Gordon, R. J., and R. Krenn. 2010. "The End of the Great Depression 1939–41: Policy Contributions and Fiscal Multipliers". NBER Working Paper No. 16380.

Gorn, A., and A. Trigari. 2024. "Assessing the Stabilizing Effects of Unemployment Benefit Extensions." *American Economic Journal: Macroeconomics* 16, no. 1: 387–440.

Griffin, J. E., and P. J. Brown. 2010. "Inference With Normal-Gamma Prior Distributions in Regression Problems." *Bayesian Analysis* 5, no. 1: 171–188.

Guajardo, J., D. Leigh, and A. Pescatori. 2014. "Expansionary Austerity? International Evidence." *Journal of the European Economic Association* 12, no. 4: 949–968.

Hamilton, J. D. 1994. *Time Series Analysis*. Princeton University Press.

Hamilton, J. D. 2018. "Why You Should Never Use the Hodrick–Prescott Filter." *Review of Economics and Statistics* 100, no. 5: 831–843.

Hantzsche, A., S. Savsek, and S. Weber. 2018. "Labour Market Adjustments to Financing Conditions Under Sectoral Rigidities in the Euro Area." *Open Economies Review* 29, no. 4: 769–794.

Huber, F., and M. Feldkircher. 2019. "Adaptive Shrinkage in Bayesian Vector Autoregressive Models." *Journal of Business & Economic Statistics* 37, no. 1: 27–39.

Huidrom, R., M. A. Kose, J. J. Lim, and F. L. Ohnsorge. 2020. "Why Do Fiscal Multipliers Depend on Fiscal Positions?" *Journal of Monetary Economics* 114: 109–125.

Ilori, A. E., J. Paez-Farrell, and C. Thoenissen. 2022. "Fiscal Policy Shocks and International Spillovers." *European Economic Review* 141: 103969.

Ilzetzki, E., E. G. Mendoza, and C. A. Végh. 2013. "How Big (Small?) Are Fiscal Multipliers?" *Journal of Monetary Economics* 60, no. 2: 239–254.

Jarocinski, M. 2010. "Responses to Monetary Policy Shocks in the East and the West of Europe: A Comparison." *Journal of Applied Econometrics* 25, no. 5: 833–868.

Kekre, R. 2023. "Unemployment Insurance in Macroeconomic Stabilization." *Review of Economic Studies* 90, no. 5: 2439–2480.

Krause, M. U., and T. A. Lubik. 2007. "The (Ir)relevance of RealWage Rigidity in the New Keynesian Model With Search Frictions." *Journal of Monetary Economics* 54, no. 3: 706–727.

Leeper, E. M., T. B. Walker, and S.-C. S. Yang. 2013. "Fiscal Foresight and Information Flows." *Econometrica* 81, no. 3: 1115–1145.

Li, L.-B., C.-C. Zhang, J.-L. Hu, and C.-R. Chiu. 2021. "Disaggregate Productivity Growth Sources of Regional Industries in China." *Empirical Economics* 60, no. 3: 1531–1557.

McKay, A., and R. Reis. 2021. "Optimal Automatic Stabilizers." *Review of Economic Studies* 88, no. 5: 2375–2406.

Merz, M. 1995. "Search in the Labor Market and the Real Business Cycle." *Journal of Monetary Economics* 36, no. 2: 269–300.

Miyamoto, W., T. L. Nguyen, and V. Sheremirov. 2019. "The Effects of Government Spending on Real Exchange Rates: Evidence From Military Spending Panel Data." *Journal of International Economics* 116: 144–157.

Monacelli, T., R. Perotti, and A. Trigari. 2010. "Unemployment Fiscal Multipliers." *Journal of Monetary Economics* 57, no. 5: 531–553.

Mountford, A., and H. Uhlig. 2009. "What Are the Effects of Fiscal Policy Shocks?" *Journal of Applied Econometrics* 24, no. 6: 960–992.

Policardo, L., L. F. Punzo, and E. Sánchez Carrera. 2019. "On the Wage-Productivity Causal Relationship." *Empirical Economics* 57, no. 1: 329–343.

Ramey, V. A. 2011. "Identifying Government Spending Shocks: It's All in the Timing." *Quarterly Journal of Economics* 126, no. 1: 1–50.

Ramey, V. A. 2016. "Macroeconomic Shocks and Their Propagation." In *Handbook of Macroeconomics*, edited by J. B. Taylor and H. Uhlig, vol. 2, 71–162. Elsevier.

Ramey, V. A. 2019. "Ten Years After the Financial Crisis: What Have we Learned From the Renaissance in Fiscal Research?" *Journal of Economic Perspectives* 33, no. 2: 89–114.

Ramey, V. A., and M. D. Shapiro. 1998. "Costly Capital Reallocation and the Effects of Government Spending." *Carnegie-Rochester Conference Series on Public Policy* 48, no. 1: 145–194.

Ramey, V. A., and S. Zubairy. 2018. "Government Spending Multipliers in Good Times and in Bad: Evidence From US Historical Data." *Journal of Political Economy* 126, no. 2: 850–901.

Romer, C. 2009. "The Case for Fiscal Stimulus: The Likely Effects of the American Recovery and Reinvestment Act". Speech at the Chicago Booth Forum. University of Chicago.

Romer, C. D., and D. H. Romer. 2010. "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks." *American Economic Review* 100, no. 3: 763–801.

Sá, F., P. Towbin, and T. Wieladek. 2014. "Capital Inflows, Financial Structure and Housing Booms." *Journal of the European Economic Association* 12, no. 2: 522–546.

Schiman, S. 2021. "Labor Supply Shocks and the Beveridge Curve: Empirical Evidence From EU Enlargement." *Review of Economic Dynamics* 40: 108–127.

Thomas, C., and F. Zanetti. 2009. "Labor Market Reform and Price Stability: An Application to the Euro Area." *Journal of Monetary Economics* 56, no. 6: 885–899.

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Towbin, P., and S. Weber. 2013. “Limits of Floating Exchange Rates: The Role of Foreign Currency Debt and Import Structure.” *Journal of Development Economics* 101: 179–194.

Uribe, M. 2020. “Staggered Price Indexation”. NBER Working Papers 27657.

Zanetti, F. 2009. “Effects of Product and Labor Market Regulation on Macroeconomic Outcomes.” *Journal of Macroeconomics* 31, no. 2: 320–332.

Zanetti, F. 2011. “Labor Market Institutions and Aggregate Fluctuations in a Search and Matching Model.” *European Economic Review* 55, no. 5: 644–658.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Table A1:** Calibration of the model. **Figure A1:** Fiscal spending shocks and the LMIs. **Table A2:** Volatility of output, employment, and the real wage. **Figure B1**: Fiscal spending elasticities and the LMIs ($\mu(\vartheta)$)—no inflation indexation of prices. **Figure B2:** Fiscal spending elasticities and the LMIs ($\mu(\vartheta)$)—real wage rigidity. **Figure B3:** Fiscal spending elasticities and the LMIs ($\mu(\vartheta)$)—limited asset market participation. **Figure B4:** Fiscal spending elasticities and the LMIs ($\mu(\vartheta)$)—firing costs accrue to the government. **Figure B5:** Fiscal spending elasticities and the LMIs ($\mu(\vartheta)$)—productivity enhancing government spending. **Figure B6:** Fiscal spending elasticities and the LMIs ($\mu(\vartheta)$)—consumption/leisure complementarity. **Table D1:** Variable definitions. **Table D2:** Sample coverage in different models. **Figure D1:** Labor market institutions in OECD economies: Time variation. **Figure E1:** Dynamic effects of government spending shocks. **Figure E2:** Robustness: Model specification and sample. **Figure E3:** Controlling for fiscal foresight. **Figure E4:** Fiscal multipliers using other labor market indicators. **Figure E5:** Volatility outcomes using other labor market indicators: Unemployment rate. **Figure E6:** Classification of countries. **Figure E7:** Cross-country heterogeneity analysis.

10991255, 0, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jae.70078 by Readcube (Labtiva Inc.), Wiley Online Library on [08/07/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License