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Strategic Interaction among EU Governments in Active Labor Market Policy-making

Subsidiarity and Policy Coordination under the European Employment Strategy

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ABSTRACT

The European Union (EU) recently committed to becoming 'the most competitive and dynamic knowledge-based economy in the world.' Active labor market (ALM) policies are a critical part of the European Employment Strategy (EES) – the plan designed to achieve this objective. ALM policies entail several possible externalities that, spilling across national boundaries, may create incentives for European governments to free ride off the efforts of their neighbors. We provide empirical evidence that the national best-response functions for ALM spending (worker-training programs in particular) are indeed downward sloping; an increase in expenditures in one country decreases equilibrium expenditures in its neighbors. Therefore, levels of ALM spending may well be too low, notwithstanding the mildly increasing coordination fostered through the EES framework. Stronger enforcement procedures may be necessary if the European Union is to achieve its EES objectives.

KEY WORDS

- active labor market policies
- European employment strategy
- spatial econometrics
- strategic policy interdependence

Five years ago at the Lisbon Summit the European Union committed to becoming 'the most competitive and dynamic knowledge-based economy in the world by 2010' (European Council, 2000: 1). Active labor market (ALM) policies are a critical part of the European Employment Strategy (EES) – the plan designed to achieve this objective. ALM programs are supposed to improve job seekers' prospects of finding employment and increase the productivity and earning potential of workers. They include spending on public employment, labor market training, and other policies intended to promote employment among the unemployed. Although ALM policies – particularly training and education programs – seem almost inherently necessary to create the kind of workforce and economy EU leaders envisage, coordinating these policies through an EES system that relies heavily on the principle of subsidiarity may be problematic. Subsidiarity in the EES implies that member states create their own programs and implement them on a mostly voluntary basis, yet individualistic voluntarism leaves policy susceptible to positive-externality-induced underinvestment. Has this theoretically possible negative interdependence of European ALM policies actually arisen empirically? If so, are these spillovers and the detrimental interdependence they induce sufficiently sizable to warrant concern and redress?

We argue and present evidence that ALM policies do indeed entail significant externalities that spill across national boundaries and that, apparently, these spillovers are sufficiently sizable to generate appreciable political and economic incentives for European governments to free ride off the efforts of their neighbors. That is, we provide empirical evidence that the national best-response functions for ALM spending (worker training programs in particular) are statistically significantly and substantively appreciably downward sloping: an increase in expenditures in one country decreases equilibrium expenditures in its neighbors. This leads us to conclude that current levels of ALM expenditures may indeed be too low and that, apparently, the limited (although increasing) coordination of the EES framework is insufficient to internalize positive ALM policy externalities noticeably. Stronger enforcement procedures would seem to be necessary if the European Union is to achieve its EES objectives.

The paper structures these explorations as follows. In the first section, we briefly review the history of the EES, starting with the Luxembourg Jobs Summit. We then cover the generic theory of strategic policy complementarity and substitutability (negative and positive externalities, respectively). The third section contains our empirical analysis, and sections four and five discuss the results and offer our conclusions, respectively.

Historical overview of the European Employment Strategy

The key elements of the European Employment Strategy (EES), adopted by EU governments in November 1997 at the Luxembourg Jobs Summit, are contained within the Amsterdam Treaty's Title on Employment (see Goetschy, 1999). This section of the treaty, among other things, makes unemployment a common European concern, places job creation alongside macroeconomic stability as one of the EU's primary objectives, and creates an EU-level institutional mechanism for the oversight and evaluation of member states' employment policies. Since the Luxembourg Summit, the objectives and coordination procedures of the EES have been refined at several European Councils.

For our interests in subsidiarity and policy coordination, some of the most important changes came at the Berlin Council in 1999, where EU member states decided to use Structural Funds to finance EES programs aimed at developing human resources.[1] Regulation (EC) No. 1260/1999, in addition to incorporating this change and setting new objectives, created a system of ex ante, mid-term, and ex post program evaluations combined with performance rewards and punishments (i.e. performance reserve allocations). As a result of this new regulation, the EU budget and employment promotion processes became entwined under 'Objective 3' (i.e. human resource development) funding. It also established a limited system of centralized enforcement with respect to employment policy coordination.

The (annual) coordination cycle of the EES follows four steps. Each year the European Council adopts a set of guidelines – developed by the European Commission – for EU member states' employment policies. These guidelines are intended to be instrumental in achieving full employment, improved quality and productivity at work, and labor market inclusiveness. National governments respond by writing action plans to describe how these guidelines are being (or will be) implemented domestically. The Commission and Council then review these plans and publish a joint economic report. If necessary, the Council makes country-specific recommendations.

In 2004, the most recently completed cycle, the Council promulgated the following guidelines for national employment policies: they should increase the adaptability of workers to changing conditions, attract more people into the labor market, and promote investment in human capital. Community-wide and country-specific recommendations that stressed the importance of labor market training programs were issued (European Commission Communication, 2004). In fact, the Council encouraged each of the original 15 members to increase participation in such programs.

Since 1988, the Council has set a multi-annual EU budget in its 'Fiscal Perspectives' report. The current budget agreement (the 'Agenda 2000' plan), which covers spending from 2000 to 2006, is the first governed by Regulation (EC) No. 1260/1999. Mid-term reviews, including reviews of programs financed under 'Objective 3', were conducted by member states in 2003 and submitted to the Commission by 31 December. On the basis of these reviews, the Commission allocated the performance reserves on 23 March 2004.

Despite the ostensible strengthening of the EES framework over time, employment policies (ALM programs in particular) remain primarily the prerogative of national governments. The Council sets guidelines, but member countries choose their own response and, with the minor exceptions of country performance reports and performance reserve allocations, no enforcement mechanism is in place should they fail to follow through. Thus, the situation post-Luxembourg is not fundamentally different from the one existing prior to the 1997 Council meeting.

How have EU member governments fared in the provision of ALM policies? Outside of Scandinavia perhaps, the consensus seems to be that EU member governments are behind in designing and implementing policies to upgrade the skills of their workers.[2] Strategic interdependence among European countries in the making of active labor market policies could explain this. Two kinds of interactions in particular, *race-to-the-bottom dynamics* and *policy free-riding*, would induce suboptimal expenditures on employment policies.

Race-to-the-bottom dynamics and policy free-riding

In theory, race-to-the-bottom (RTB) dynamics occur when policies are strategic complements across jurisdictions – that is, when policy changes adopted in one jurisdiction create incentives for other jurisdictions to adopt similar changes. The RTB argument has been applied, inter alia, to capital taxation, environment regulations, and labor standards. Cuts in taxes and the elimination of regulations and standards in one jurisdiction increase the costs to others of maintaining high taxes, regulations, and standards, causing the affected jurisdictions to follow suit in their own policies. By contrast, free-riding occurs when policies are strategic substitutes – that is, when policy changes in one jurisdiction create incentives for governments in others to adopt change in the opposite direction. For example, an increase in defense expenditures in one country might lower the marginal security benefit from defense spending in its military allies, creating an incentive for them to free ride (see Redoano, 2003).

More formally, consider a two-country world (i, j), each with homogeneous populations and domestic welfare that, owing to externalities, are a function of government policy in both countries:

$$W^i \equiv W^i(p_i, p_j);\ W^j \equiv W^j(p_j, p_i). \tag{1}$$

When the government in country i chooses its policy, p_i, to maximize its own social welfare, this affects the optimal policy choice in country j, and vice versa. We can express such *strategic interdependence* between countries i and j with a pair of *best-response functions*, giving optimal policies of i, p_i^*, as a function of the policy chosen in j, and vice versa:

$$p_i^* \equiv \text{Argmax}_{p_i} W^i(p_i, p_j) \equiv R(p_j);\ p_j^* \equiv \text{Argmax}_{p_j} W^j(p_j, p_i) \equiv R(p_j). \tag{2}$$

Explicitly, country i's optimum policy is obtained by maximizing $W^i(p_i, p_j)$ with respect to p_i, taking p_j as given (fixed); i.e. setting the first derivative of the welfare function with respect to p_i equal to zero and solving for p_i^* as a function of p_j (and then verifying that the second derivative is negative). Equation (2) expresses the result as the best-response function $p_i^* = R(p_j)$. The slopes of these best-response functions, the signs of which determine whether RTB or free-riding dynamics will occur, depend on the following ratios of second cross-partial derivatives:

$$\frac{\partial p_i^*}{\partial p_j} = -W^i_{p_i p_j} / W^i_{p_i p_i};\ \frac{\partial p_j^*}{\partial p_i} = -W^j_{p_j p_i} / W^j_{p_j p_j}. \tag{3}$$

If the government is welfare maximizing, the second-order condition guarantees that the denominator in (3) is negative. Therefore, the slopes will depend directly on the signs of the second cross-partial derivatives (i.e. the numerator). If $W^{i,j}_{p_i p_j} > 0$, i.e. if policies are strategic complements, we see from (3) that policy reaction functions will slope upward. If $W^{i,j}_{p_i p_j} < 0$, policies are strategic substitutes and the reaction functions slope downward. If the second cross-partial derivative is zero, strategic interdependence does not materialize and the best-response functions are flat (Brueckner, 2003).

Notice that *positive* externalities induce strategic-*substitute* policy interdependence and *negative* externalities induce strategic-*complement* policy interdependence (and a lack of externalities yields policy independence). In the national defense example discussed above, spending in one country induces free-riding in others owing to the positive security externalities (among allies) and diminishing returns of military expenditures. If ALM expenditures create positive employment externalities and exhibit diminishing returns, the same problem could arise in this context. In other words, if reducing unemployment requires increasing amounts of spending – €1000 per worker to reduce unemployment from 6% to 5%, €2000 to reduce from 5% to

4%, €4000 to reduce from 4% to 3%, etc. – and ALM spending in one country, *i*, helps reduce unemployment in another, *j*, an increase in expenditures in country *i* will reduce the marginal benefit to *j* of its (marginal increment of) spending, inducing lower equilibrium spending in *j*. Figure 1 illustrates this situation graphically. This strategic context also creates a first-mover disadvantage – the country that spends first will bear a larger portion of the cost of reducing unemployment – creating a potential for war-of-attrition dynamics that would push the equilibrium ALM spending of both countries is even lower.

Do cross-border positive employment externalities of ALM policies exist among European countries; if so, are they sufficient to induce this kind of fiscal free-riding in ALM policy? Evidence from a number of recent studies, at both the micro and macro levels, shows that ALM policies have increased employment in Europe and other OECD countries (see, e.g., Martin, 2000; Estevao, 2003; European Commission, 2005). That ALM spending would exhibit diminishing returns also seems reasonable. For instance, if labor market training programs increase employment by raising workers' marginal productivity, then, under any given macroeconomic conditions, some workers will just miss being employed because their marginal productivity was just

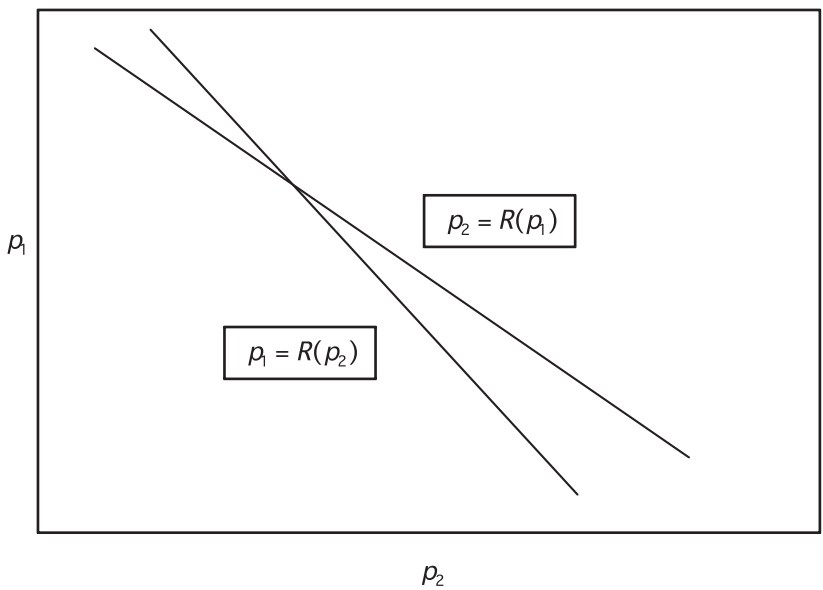

Figure 1 Best-response functions: Strategic substitutes.

below a threshold beyond which firms find hiring them profitable, whereas the productivity of some other workers will be far below this threshold. In this case, a little spending might get the first group of workers hired, but much more spending per worker would be required to get members of the less productive second group employed. If unemployed low- and high-productivity workers are spatially concentrated in regions that span national boundaries, this could create incentives for fiscal free-riding. Below, we describe several other mechanisms by which such cross-border spillovers may arise.

A large literature examines the regional patterns of unemployment in Europe (see, e.g., Elhorst, 2003; Puga, 2002; and Overman and Puga, 2002). This research shows that, in many cases, differences in employment between bordering regions are much smaller, even if the regions lie in different countries, than the differences between more distant regions within countries. In other words, geographic proximity is more important than nationality in understanding spatial patterns of unemployment in Europe. Labor market performance in Languedoc-Roussillon in southern France on the Mediterranean, for example, is likely to resemble much more closely that in Cataluña in north-eastern Spain than that in Paris. Similarly, employment outcomes in Nord–Pas-de-Calais on the French border with Belgium correlate more strongly with those in the region of Wallonne across the border than with employment patterns in the center of France.[3]

Consider the implications of (effective) French ALM spending for Belgium, for example. Effective French ALM policies enhance Belgian workers' abilities to obtain training in France and then to return, more employable, to work in Belgium. Effective French ALM policies also enhance Belgian workers' abilities to find work in France. Effective French ALM policies also enhance the pool of workers (quantity, quality, and diversity) available to employers along the Belgian border, thereby luring employers to both sides of the border. These and other agglomeration effects all yield positive externalities of (effective) French ALM policies to Belgian workers (and citizens more generally). Of course, Belgians cannot provide political support to French policy-makers in response to these spillover effects, so French policy-makers ignore these spillover benefits in determining French ALM spending. Accordingly, ALM spending by national policy-makers will exhibit negative interdependence, reflecting the positive externalities.

Given what we know about spatial patterns of unemployment in Europe and the employment effects of ALM policies, fiscal free-riding seems plausible. In the next section, we examine the empirical record to gauge the evidence of its existence and magnitude.

Empirical analysis

To evaluate strategic interaction in national ALM expenditures empirically, we estimate a dynamic spatial-lag model. This approach has been used by Case et al. (1993), Brueckner and Saavedra (2001), Fredriksson and Millimet (2002), Redoano (2003) and Allers and Elhorst (2005), among others. Our sample includes annual data from 1987–98 for 15 European countries: Austria, Belgium, Denmark, Germany, Greece, Finland, France, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK.[4,5] ALM programs include spending on public employment, labor market training, and other directly active policies intended to promote employment among the unemployed. In this analysis we focus exclusively on labor market training (LMT) programs. Our dependent variables are LMT expenditures per unemployed worker (€2000, PPP) and the ratio of LMT expenditures to GDP.[6] The key independent variable, which allows us to evaluate the hypothesis of strategic interdependence, is the *spatial lag* of LMT spending. We also include a number of control variables in the analysis. These are discussed below.

More precisely, the model we estimate is

$$\mathbf{Y_t} = \phi\mathbf{Y_{t-1}} + \rho\mathbf{WY_t} + \mathbf{X_t}\boldsymbol{\beta} + \boldsymbol{\varepsilon_t}. \quad (4)$$

$\mathbf{Y_t}$ is an $N \times 1$ vector of LMT observations in the $N = 15$ countries for each year, t. ρ is the spatial autoregressive coefficient (explained below). $\mathbf{W}$ is an $N \times N$ (15×15) *spatial weighting matrix*, with elements w_{ij} reflecting the relative degree of connection from unit j to i (elaborated below). $\mathbf{WY_t}$ is thus the *spatial lag*; i.e. for each LMT observation in each country i, y_{it}, $\mathbf{WY_t}$ gives the weighted sum of the other countries' LMT y_{jt}, with the weights given by the relative connectivity from j to i. Note that each element of $\mathbf{W}$'s diagonal, which would be the w_{ii} multiplying y_{it} itself in the weighted-sum spatial lag, is zero. Thus, ρ gives the impact of the LMT outcomes in the other ($j \neq i$) countries, as weighted by w_{ij}, on LMT in county i; i.e. ρ gauges the overall strength of interdependence, whereas the w_{ij} describe the relative magnitudes of the specific interdependence relations from one country to another. $\mathbf{X_t}$ is an $N \times K$ matrix of observations on K independent variables, including fixed country and period effects (i.e. country and year dummies). $\boldsymbol{\beta}$ is a $K \times 1$ vector of coefficients on those $\mathbf{X}$, and $\boldsymbol{\varepsilon}$ is an $N \times 1$ vector of residuals.

We calculated $\mathbf{WY_t}$ using two alternative spatial weights matrices. The first is a standardized *binary contiguity weights matrix*, which begins by coding $w_{ij} = 1$ for countries i and j that share a border and $w_{ij} = 0$ for countries that do not. As exceptions, we code France, Belgium, and the Netherlands as contiguous with the UK, and Denmark as contiguous with Sweden. Then, we *row-standardize* (as commonly done in spatial econometrics research) the

resulting matrix by dividing each cell in a row by that row's sum. So, e.g., standardized $w_{1,6}$ = ½; = 0.5 and $w_{15,2}$ = ¼ = 0.25.

$$\mathbf{W} = \begin{array}{c|cccccccccccccc} & AUT & BEL & DEN & FIN & FRA & DEU & GRE & IRE & NTH & NOR & PRT & ESP & SWE & CHE & UK \\ AUT & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ BEL & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 \\ DEN & \mathbf{0} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ FIN & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ FRA & 0 & 1 & 0 & 0 & 0 & 1 & \mathbf{0} & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ DEU & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ GRE & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \mathbf{0} & 0 & 0 \\ IRE & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ NTH & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ NOR & \mathbf{0} & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ PRT & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ ESP & 0 & 0 & 0 & 0 & 1 & 0 & \mathbf{0} & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ SWE & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ CHE & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & \mathbf{0} & 0 & 0 \\ UK & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \end{array} \quad (5)$$

The second **W** we consider uses shared border length for the spatial weights; that is, we substituted actual border length for each 1 in (5) and then standardized the rows. Austria, for example, shares a 784 km border with Germany and a 164 km border with Switzerland. After standardization, the non-zero cells in Austria's row of **W** are 0.83 and 0.17, respectively.

We estimated the models by maximum likelihood using MATLAB code written by James P. LeSage and J. Paul Elhorst. The likelihood function for the spatial-lag model involves only one complicating modification of the likelihood for the standard linear additive model. To see this, start by expressing the simple spatial-lag model with the stochastic component on the left-hand side:

$$\mathbf{y} = \rho\mathbf{WY} + \mathbf{XB} + \boldsymbol{\varepsilon} \Rightarrow \boldsymbol{\varepsilon} = (\mathbf{I} - \rho\mathbf{W})\mathbf{Y} - \mathbf{XB} \equiv \mathbf{AY} - \mathbf{XB}. \quad (6)$$

The likelihood function for the stochastic component, $\boldsymbol{\varepsilon}$, is then the usual linear normal likelihood:

$$L(\boldsymbol{\varepsilon}) = \left(\frac{1}{\sigma^2 2\pi}\right)^{\frac{NT}{2}} \exp\left(-\frac{\boldsymbol{\varepsilon}'\boldsymbol{\varepsilon}}{2\sigma^2}\right), \quad (7)$$

which, in this case, will produce a likelihood in terms of **y** as follows:

$$L(\mathbf{y}) = |\mathbf{A}| \left(\frac{1}{\sigma^2 2\pi}\right)^{\frac{NT}{2}} \exp\left(-\frac{1}{2\sigma^2}(\mathbf{AY} - \mathbf{XB})'(\mathbf{AY} - \mathbf{XB})\right). \quad (8)$$

This resembles the typical linear normal likelihood, although the transformation from $\boldsymbol{\varepsilon}$ to **y** is not by the usual factor, 1, but by $|\mathbf{A}| = |\mathbf{I} - \rho\mathbf{W}|$. The maximum likelihood is found numerically.[7]

Table 1 presents our estimation results. The first column of results provides estimates for our base model, which includes a time-lag of the dependent variable plus country and year dummies to account for temporal dependence and unit and period heterogeneity. The period dummies provide a flexible way to model common trends and/or common (random) shocks in LMT expenditures. As we show elsewhere (Franzese and Hays, 2005), by far the most important issue methodologically in obtaining good estimates of the strength of interdependence, i.e. of ρ, is to model well any alternative mechanisms by which the outcomes might correlate spatially, such as common exogenous shocks (e.g. global economic conditions) or correlated domestic factors. From that perspective, the country and year dummies serve as a powerfully conservative way to account for almost any sort of outside shock or spatially correlated domestic factor. Failure to account for such alternative mechanisms will bias spatial-lag coefficient estimates, usually in a positive direction (Franzese and Hays, 2004). The first column reports results using the standardized binary contiguity matrix for our spatial weights. Again, the estimated coefficient on the spatial lag gives an estimate of the strength of strategic interdependence in ALM policy-making, assuming border contiguity as the source of the employment spillovers.

Our estimate of the spatial-lag coefficient in the base model is statistically significantly negative. This coefficient gives some indication of short-run effect on country *i*'s LMT expenditures of a one-unit positive shock to all of its neighbors' spending. Insofar as we can credit that indication at this point, these results imply that a one-unit increase in neighbor spending leads to an immediate 0.258 decrease in domestic spending, suggesting some degree of fiscal free-riding among European countries in LMT spending. Because of spatial feedback – this effect then itself affects LMT in those neighbors, which feeds back into *i*'s LMT, and so on, recursively – this indication will be reasonably accurate regarding the magnitude of these effects only when ρ, the strength of the feedback, is fairly small, and, intuitively, it will become increasingly misleading about the ultimate magnitude of feedback effects as ρ increases. The sign of ρ remains directly informative about the sign of the feedback and interdependence, however. We will provide the exact calculations below when we discuss the substantive magnitudes of our preferred estimates and their implications.

In the next model (column 2), we control for a country's macroeconomic performance by adding real GDP per capita and the unemployment rate to the regression. As their economies grow, governments might provide more public goods and services (Wagner's Law of Increasing State Activity). If so, we would expect a positive coefficient estimate for the GDP per capita variable. Some alternative theories, such as Baumol's Disease, which refers to

Table 1 Labor market training expenditures in Europe, 1987–98

	LMT/ Unemp.	*LMT/ Unemp.*	*LMT/ Unemp.*	*LMT/ Unemp.*	*LMT/ GDP*	*LMT/ Unemp.*
Temporal lag	0.657***	0.553***	0.514***	0.490***	0.691***	0.547***
	(.055)	(.064)	(.068)	(.068)	(.054)	(.069)
Spatial lag	–0.258***	–0.277***	–0.286***	–0.284***	–0.109*	–0.130**
	(.068)	(.066)	(.067)	(.068)	(.065)	(.064)
Real GDP per capita		–0.964	–1.203*	–0.863	–0.477**	–0.588
		(.645)	(.655)	(.798)	(.199)	(.833)
Unemployment rate		–0.054***	–0.092***	–0.092***	–0.015**	–0.094***
		(.019)	(.026)	(.028)	(.006)	(.029)
Union density			0.000	0.000	0.003	0.000
			(.001)	(.001)	(.002)	(.001)
Deindustrialization			0.008	0.011	0.004	0.019**
			(.008)	(.009)	(.007)	(.009)
Trade openness			0.051*	0.048*	0.001	0.056*
			(.028)	(.029)	(.002)	(.030)
Foreign direct investment			0.071	0.027	0.001	0.012
			(.043)	(.050)	(.005)	(.052)
Old age				0.000	0.008	–0.000
				(.007)	(.012)	(.008)
Left cabinet seats				–0.030	0.000	–0.025
				(.021)	(.000)	(.022)
Christian Dem. cabinet seats				–0.002	0.000	–0.012
				(.013)	(.001)	(.013)
Left libertarian vote				–0.003	–0.008**	–0.002
				(.003)	(.003)	(.003)
Government consumption				0.026	0.024***	0.035
				(.032)	(.008)	(.033)
Spatial weights matrix	Binary contiguity	Binary contiguity	Binary contiguity	Binary contiguity	Binary contiguity	Border length
Log-likelihood	–27.256	–22.818	–19.626	–17.600	234.573	–23.292
σ^2	0.077	0.074	0.071	0.069	0.004	0.075

Note: All regressions include fixed period and unit effects; those coefficient estimates are suppressed to conserve space. The first five spatial lags are generated with a binary contiguity weighting matrix using shared territorial borders as the criterion, except that France, Belgium, and the Netherlands are coded as contiguous with the UK, and Denmark as contiguous with Sweden. The last spatial lag is generated using shared border length for the spatial weights (see text for details). All the spatial weights matrices are row standardized.
*** Significant at the .01 level; ** at the .05 level; * at the .10 level.

an argued decreasing relative productivity in service sectors rendering financing of public services increasingly difficult as economies develop and shift toward heavier service-sector employment, would suggest a negative relationship between GDP per capita and LMT expenditures. We might also argue expect a negative coefficient on the unemployment rate. As the unemployment rate rises, financing *per worker* LMT expenditures at existing levels

clearly becomes more costly and might therefore suggest declining LMT. Here too, however, one could offer an alternative that rising unemployment might increase political demand for LMT expenditures. In any event, the spatial-lag coefficient estimate remains negative and statistically significant in this model. The unemployment rate coefficient, meanwhile, is negatively signed and statistically significant, supporting the cost-constraint more than the demand-spurring argument. The GDP coefficient is negative but statistically insignificant, favoring neither Baumol nor Wagner particularly strongly.

Next we control for a number of structural features of a country's economy related to its labor markets and exposure to external shocks. The labor market variables are union density and Iversen and Cusack's (2000) measure of deindustrialization. Because higher union density increases the influence of organized labor, we would expect it to go hand in hand with greater LMT spending. With respect to deindustrialization, Iversen and Cusack (2000) argued that workers cross significant skill barriers when they move out of manufacturing and agriculture and into services. Thus, we would expect deindustrialization to induce higher levels of LMT expenditures also. Many scholars have argued that exposure to the international economy leads to increased government spending, especially on programs that help workers adjust to external shocks (e.g. Cameron, 1978; Ruggie, 1982; Katzenstein, 1985; Rodrik, 1997; Hays et al., 2005). We use trade openness and foreign direct investment flows as our measures of exposure. In this case, all of the coefficient estimates on the structural variables are positively signed, but only the trade openness coefficient achieves statistical significance (Table 1, column 3). The GDP coefficient is still negatively signed and now marginally significant. Most centrally, the spatial-lag coefficient remains negative and statistically significant.

We also consider several political variables (column 4): the retired population as a percentage of the total population, the percentage of cabinet seats held by left and Christian Democratic parties, the percentage of general election votes won by left-libertarian parties, and government consumption as a percentage of GDP. Working-age voters are the natural constituency for LMT programs. For retired voters, the benefits are indirect at best. Therefore, the political pressure for LMT programs should be lower when the percentage of retired individuals is high. Social democratic, Christian democratic, and left-libertarian parties have all been identified as key supporters of active social policies, albeit of different precise natures (see, e.g., Kitschelt, 1994; Garrett, 1998; and Swank, 2002). Government consumption is a direct measure of government size and intervention in the economy. We would expect, ceteris paribus, governments with high consumption to GDP ratios to spend more on LMT programs.[8] Interestingly, none of the coefficient estimates on the

political variables is statistically significant. The coefficients on the spatial lag, the unemployment rate, and trade openness, however, remain correctly signed and statistically significant.

Finally, we explore alternative plausible operationalizations of the dependent variable and spatial lag. First, we substitute LMT spending as a percentage of GDP for spending per unemployed worker as the dependent variable. We would argue that LMT spending per unemployed worker is more directly connected to a government's actual policy decision than is LMT spending as a percentage of GDP; i.e. governments set the amount of LMT spending per recipient more than they set such LMT spending proportionally to GDP. Even using the percentage-of-GDP measure, however, the estimated strategic interdependence (column 5) remains significantly negative ($p < .10$), albeit not as strongly so. Next, we consider an alternative spatial weight matrix based on the length of shared borders. The combination of binary indicators for borders and row standardization in our contiguity weights matrix implies that the effect of country j on country i is equal for all j, and declines for each j proportionally to how many neighbors country i has. If a country has five neighbors, the individual weights are .2 for each bordering country, whereas the w_{ij} for a country i with two neighbors are both .5. Substantively, one might argue that the employment spillovers between two countries that create their ALM policy interdependence depend more on how much those countries border each other than on how many neighbors each country has. Austria, e.g., shares borders with both Switzerland and Germany, but the lengths of those borders differ radically (784 km vs. 164 km). However, the political-economic significance of borders may not correlate any more strongly with their geographic length than with their number. For example, the UK shares no land border with France, Belgium, or the Netherlands, and Denmark shares none with Sweden (and sea border lengths are difficult to gauge comparably). Furthermore, some countries share long borders with lesser population and/or economic activity on either side, whereas other borders are shorter with more economic activity; e.g., the northern Finlandian–Norwegian border is 727 km whereas the Finlandian–Swedish border is only 614 km. Ideally, therefore, we would weight border length (or, even better, the ratio of border length to land area of country i) by some measure of the population and economic significance of the border regions. Unfortunately, such finely tuned weighting measures proved impossible to obtain and construct. Using the length of countries' shared territorial borders (standardized) as an alternative spatial weight matrix (despite its possible faults), the estimated negative LMT spending interdependence nonetheless remains significant (column 6).

We are satisfied, then, that EU members' ALM policy-making exhibits

statistically significant negative interdependence, but what do these statistically significant results tell us of the estimated substantive magnitude of this interdependence, i.e. of the effects individual EU countries' ALM policies have on their neighbors' policy-makers? To answer this question we need to calculate the so-called spatial multiplier, which is given in the following reduced form of equation (4):

$$\begin{aligned} &\mathbf{Y_t} = \rho\mathbf{W}\mathbf{Y_t} + \phi\mathbf{Y_{t-1}} + \mathbf{X_t}\boldsymbol{\beta} + \boldsymbol{\varepsilon_t} \Rightarrow \\ &\mathbf{Y_t}(\mathbf{I} - \rho\mathbf{W}) = \phi\mathbf{Y_{t-1}} + \mathbf{X_t}\boldsymbol{\beta} + \boldsymbol{\varepsilon_t} \Rightarrow \\ &\mathbf{Y_t} = (\mathbf{I} - \rho\mathbf{W})^{-1}(\phi\mathbf{Y_{t-1}} + \mathbf{X_t}\boldsymbol{\beta} + \boldsymbol{\varepsilon_t}) \end{aligned} \tag{9}$$

The spatial multiplier, $(\mathbf{I} - \rho\mathbf{W})^{-1}$, captures the feedback from, say, Belgium on France and other countries, and back from France and those others on Belgium, and so on recursively. The immediate time-*t* effect on the vector of policy outcomes in the 15 countries, $\mathbf{Y_t}$, including that recursive feedback, can now be calculated with this spatial multiplier by considering certain counterfactual shocks to the rest of the right-hand side of (9). Specifically, multiplying $(\mathbf{I} - \rho\mathbf{W})^{-1}$ by an $N \times 1$ column vector, with 1 in row *i* and 0 elsewhere, gives the immediate effect of a unit shock to country *i* on policies in the other $(N - 1)$ countries *j*. For example, multiplying $(\mathbf{I} - \rho\mathbf{W})^{-1}$ by a 15×1 column vector with 0 in all rows except that corresponding to Austria, which gets a 1, will give a 15×1 column vector containing the estimated effects of a unit shock in Austria on the other 14 countries in their respective rows.[9] Another informative counterfactual to consider is the 'post-feedback' effect of unit shocks to all of the other 14 countries on Austria. One obtains this estimate by multiplying $(\mathbf{I} - \rho\mathbf{W})^{-1}$ and a 15×1 column vector with 1 in all rows except Austria's row, which gets a 0. Table 2 reports estimates of these two different counterfactuals: the effect of each country on each of the others; and the effect of all of the others on each country. Specifically, the off-diagonal elements of Table 2 report the effect of a one-unit positive shock in the column country's LMT expenditures on the other countries in the sample. So, for example, a €1 positive shock to British LMT spending reduces spending in Ireland by €0.29. The diagonal elements of Table 2 report the effect of a one-unit positive spending shock in all the column country's counterparts on its own LMT spending.[10]

In addition to these spatial dynamics, our model of LMT spending includes a time-lag of the dependent variable and corresponding temporal dynamics. We could, therefore, plot the evolution of the one-period effects from Table 2 over time to illustrate the spatio-temporal dynamics of responses to various counterfactuals. More compactly and perhaps more comprehensibly, we can calculate the long-run steady-state effect, including the feedback

effects, of *permanent* hypothetical shocks to one country or to the set of other countries such as those considered above. To find these long-run steady-state effects, we set $\mathbf{Y}_{t-1}$ in (9) equal to $\mathbf{Y}_t$, which gives:

$$\mathbf{Y}_t = \left[\mathbf{I} - (\mathbf{I} - \rho\mathbf{W})^{-1}\phi\right]^{-1}\left[\mathbf{I} - \rho\mathbf{W}\right]^{-1}(\mathbf{X}_t\boldsymbol{\beta} + \boldsymbol{\varepsilon}_t)\cdot \tag{10}$$

Table 3 reports these calculations, the column entries corresponding to the same hypotheticals as those in Table 2. Not surprisingly, long-run steady-state effects are much larger. In the long run, a €1 positive shock to British LMT spending reduces spending in Ireland by €1.26. Again, this effect assumes a *permanent* increase in British spending and would take many years to materialize. In this sense, the calculation likely represents an upper bound for our spatial effects. One would probably not expect the UK to maintain the spending increase permanently, perhaps especially noting the cumulative Irish response over the equally long run, so we would probably never directly observe this full long-run-equilibrium degree of fiscal free-riding empirically.

Discussion

Much of the research into policy interdependence explores contexts in which either or both complement and substitute relations might be expected. In environmental policy, for example, the positive externality of cleaner domestic skies when others tighten environmental regulations may induce policy free-riding by relaxing domestic regulation (strategic substitutes); on the other hand, if others tighten environmental regulations and this entails some economic-distortionary costs, the domestic costs of following suit to tighten environmental regulations are reduced (strategic complements). In other frequently studied contexts, such as tax competition, strategic-complement relations are widely expected to dominate, although, theoretically, either are possible. Previous empirical studies in these and other policy contexts have found evidence of RTB dynamics or little or mixed evidence more often than free-riding. In other words, most studies have reported positive spatial-lag coefficient estimates, including those in the recent literature on policy and institutional diffusion as well (see, e.g., Simmons and Elkins, 2004). Exceptionally, several of the results in Case et al. (1993) and those given in Redoano (2003) do find evidence for fiscal free-riding (i.e. negative spatial-lag coefficient estimates). The former study examines spatial interdependence in public expenditures among American states. Though the authors stress a different set of results, they find a negative and statistically significant estimate for the coefficient on the spatially lagged dependent

Table 2 Short-run spatial effects of labor market training expenditures (binary contiguity weights matrix)

	AUT	*BEL*	*DEN*	*FIN*	*FRA*	*DEU*	*IRE*	*NTH*	*NOR*	*PRT*	*ESP*	*SWE*	*CHE*	*UK*
AUT	–0.241	0.005	0.006	0.000	0.020	–0.135	0.000	0.006	0.000	0.000	–0.001	–0.001	–0.140	–0.002
BEL	0.002	–0.239	0.003	0.000	–0.066	–0.064	0.005	–0.065	0.000	–0.001	0.004	0.000	0.006	–0.064
DEN	0.006	0.006	–0.242	0.012	0.006	–0.148	0.000	0.007	0.012	0.000	0.000	–0.148	0.006	–0.001
FIN	0.000	0.000	0.012	–0.252	0.000	–0.002	0.000	0.000	–0.134	0.000	0.000	–0.129	0.000	0.000
FRA	0.008	–0.053	0.002	0.000	–0.245	–0.051	0.004	0.010	0.000	0.009	–0.061	0.000	–0.057	–0.057
DEU	–0.045	–0.043	–0.049	–0.001	–0.043	–0.248	–0.001	–0.046	–0.001	0.000	0.003	0.007	–0.040	0.010
IRE	0.000	0.018	0.000	0.000	0.020	–0.004	–0.242	0.020	0.000	0.000	–0.001	0.000	–0.001	–0.294
NTH	0.004	–0.086	0.004	0.000	0.017	–0.093	0.007	–0.238	0.000	0.000	–0.001	–0.001	0.003	–0.093
NOR	0.000	0.000	0.012	–0.134	0.000	–0.002	0.000	0.000	–0.252	0.000	0.000	–0.129	0.000	0.000
PRT	0.000	–0.002	0.000	0.000	0.043	–0.002	0.000	0.000	0.000	–0.264	–0.298	0.000	–0.002	–0.002
ESP	–0.001	0.008	0.000	0.000	–0.152	0.008	–0.001	–0.002	0.000	–0.149	–0.272	0.000	0.008	0.008
SWE	–0.001	–0.001	–0.099	–0.086	–0.001	0.014	0.000	–0.001	–0.086	0.000	0.000	–0.260	–0.001	0.000
CHE	–0.093	0.009	0.004	0.000	–0.095	–0.080	0.000	0.003	0.000	–0.001	0.006	–0.001	–0.244	0.005
UK	–0.001	–0.064	–0.001	0.000	–0.071	0.015	–0.074	–0.070	0.000	–0.001	0.004	0.000	0.003	–0.257

Note: The off-diagonal elements of the table report the effect of a one-unit increase in the column country's labor market training expenditures on its European counterparts. The diagonal elements report the effect of a one-unit increase in all of the other countries' labor market training expenditures on the column country's own spending. These numbers are calculated using the spatial multiplier matrix $(\mathbf{I} - \rho\mathbf{W})^{-1}$ and thus reflect all feedback effects.

Table 3 Steady-state spatial effects of labor market training expenditures (binary contiguity weights matrix)

	AUT	*BEL*	*DEN*	*FIN*	*FRA*	*DEU*	*IRE*	*NTH*	*NOR*	*PRT*	*ESP*	*SWE*	*CHE*	*UK*
AUT	–0.854	0.027	0.052	0.002	0.159	–0.530	0.005	0.050	0.002	0.006	–0.021	–0.016	–0.557	–0.033
BEL	0.013	–0.828	0.023	0.001	–0.254	–0.238	0.033	–0.236	0.001	–0.009	0.033	–0.007	0.047	–0.237
DEN	0.052	0.047	–0.881	0.094	0.051	–0.640	0.003	0.056	0.094	0.002	–0.007	–0.648	0.039	–0.025
FIN	0.002	0.002	0.094	–0.938	0.002	–0.028	0.000	0.002	–0.520	0.000	0.000	–0.493	0.002	–0.001
FRA	0.064	–0.203	0.020	0.001	–0.907	–0.207	0.034	0.082	0.001	0.080	–0.286	–0.006	–0.240	–0.247
DEU	–0.177	–0.158	–0.213	–0.009	–0.173	–0.911	–0.012	–0.191	–0.009	–0.006	0.023	0.065	–0.133	0.083
IRE	0.009	0.132	0.007	0.000	0.172	–0.069	–0.876	0.163	0.000	0.006	–0.023	–0.002	–0.015	–1.257
NTH	0.033	–0.314	0.038	0.002	0.137	–0.382	0.054	–0.835	0.002	0.005	–0.018	–0.011	0.011	–0.390
NOR	0.002	0.002	0.094	–0.520	0.002	–0.028	0.000	0.002	–0.938	0.000	0.000	–0.493	0.002	–0.001
PRT	0.012	–0.037	0.004	0.000	0.398	–0.038	0.006	0.015	0.000	–1.076	–1.345	–0.001	–0.044	–0.045
ESP	–0.021	0.067	–0.007	0.000	–0.714	0.068	–0.011	–0.027	0.000	–0.672	–1.155	0.002	0.079	0.082
SWE	–0.011	–0.009	–0.432	–0.329	–0.010	0.129	–0.001	–0.011	–0.329	0.000	0.001	–1.005	–0.008	0.005
CHE	–0.371	0.062	0.026	0.001	–0.400	–0.266	–0.005	0.011	0.001	–0.015	0.053	–0.008	–0.874	0.037
UK	–0.017	–0.237	–0.012	–0.001	–0.309	0.125	–0.314	–0.293	–0.001	–0.011	0.041	0.004	0.028	–0.998

Note: The off-diagonal elements of the table report the effect of a one-unit increase in the column country's labor market training expenditures on its European counterparts. The diagonal elements report the effect of a one-unit increase in all of the other countries' labor market training expenditures on the column country's own spending. These numbers are calculated using the long-run spatio-temporal multiplier matrix $[\mathbf{I} - (\mathbf{I} - \rho\mathbf{W})^{-1}\phi]^{-1}[\mathbf{I} - \rho\mathbf{W}]^{-1}$.

variable when they operationalize the mechanism of interdependence by geography, specifically in a row-standardized binary contiguity matrix like ours. Redoano explores fiscal interdependence among European countries in a number of different policy areas: tax rates, expenditures on education, public health, social security and defense. She uses geographical distance between capitals for her spatial weights, which result in negative coefficient estimates for her spatial lags of social security and defense expenditures.

Why do these studies and ours here find evidence of free-riding whereas others do not? One methodological similarity between both of these studies and ours is that the empirical models include time-period dummies as a way to account for common trends and shocks. The failure to account for common shocks will bias spatial-lag coefficient estimates, usually in a positive direction (Franzese and Hays, 2004). So, in the case of ALM policies for example, two countries may experience a common shock that reduces expenditures in both countries (something like the convergence requirements of the Maastricht Treaty), and, if this common external stimulus is not or is insufficiently recognized in the empirical model, their policy behavior will be confounded with the RTB dynamics induced by the strategic interdependence that it resembles.

Another similarity is that all three of these studies use geographically defined spatial weights as opposed to other notions of space or distance – e.g. economic space/distance (Case et al., 1993). As we suggested above, many policy areas might have different aspects that induce strategic-complement and strategic-substitute relations. The latter, we conjecture, might be more likely to materialize along lines of geographic proximity. To give an example, for a country to be a competitor to another for mobile capital, requires not that the countries be geographically proximate but rather that they be economic competitors. Similarly, *learning* mechanisms for interdependence – i.e. that countries learn about policies and their effects – do not necessarily require geographic proximity and might more readily transmit along cultural or demographic or other non-geographic proximity bases. Conversely, for a country to experience the spillovers that tend to induce strategic-substitute relations and policy free-riding, geographic proximity seems more critical in many aspects, such as environmental quality or, in our case, labor market connectivity.

Our empirical results suggest that the EU may have to play a stronger role enforcing the coordination of its member states' employment policies if it is to achieve its EES objectives. Offering precise and definitive recommendations about what should be done is beyond this paper's scope, but the results here do demand that one option receive serious consideration: strengthening the performance review system. What most clearly distinguishes EU efforts to

coordinate over policies affecting macroeconomic stability (the Stability and Growth Pact) from those affecting employment (the European Employment Strategy) is that the latter efforts lack an effective enforcement mechanism to encourage governments to implement the policies they commit to in their National Action Plans. We suspect this contributes to the under-provision of ALM policies.

Under the Performance Reserve System adopted in Regulation (EC) No. 1260/1999, 4% of the Structural Funds allocated to member states are kept in reserve. The Commission monitors program implementation and performance and then disperses the reserves after a successful mid-term review. Although the enforcement mechanism design seems reasonable, its magnitude (the proportion of funds) is far too small to alter the behavior of member states significantly. One obvious reform to strengthen the system would be to increase both the percentages held in reserve and the number of installments paid to recipient countries. This would make the mechanism more similar to the IMF system of credit tranches based on conditionality and phasing.

Additionally, the allocation of performance reserves, which is currently project specific, could be linked to general compliance with EES commitments. In other words, the Commission could withhold reserve funds from successful EES/Structural Fund projects for the failure of other EES programs or commitments that are not financed with EU Structural Funds. These changes might be politically unpopular and would undoubtedly make Commission evaluations and decisions much more controversial than they are today, but they would increase the countries' incentives to follow through on their action plans.

Conclusion

A large and growing literature on regional patterns of unemployment in Europe suggests labor market outcomes are spatially clustered across the continent without tremendous regard for national borders. The unemployment rate in one region affects unemployment rates in its (regional) neighbors, and whether these regions are separated by national boundaries does not matter much for the degree to which these labor market experiences are shared. Moreover, the available evidence shows that ALM programs are effective at reducing unemployment. In theory, these conditions create strategic incentives for national governments to free ride on the ALM policies of neighboring states. We provide evidence via estimation of dynamic spatial models that such strategic interaction among European governments in ALM policy-making

does in fact exist, that these national best-response functions are indeed generally downward sloping, and that these effects are of substantively appreciable magnitude. Thus, we conclude that the EU should play a more active role in enforcing the policy commitments governments make throughout the EES process.

Notes

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1 The management of EU Structural Funds is guided by the principle of 'concentration', which holds that assistance should be focused on achieving a few core objectives. At Berlin the number of objectives was cut from seven to three: (1) support for the poorest regions, (2) conversion of regions facing structural difficulties, and (3) human resource development (European Commission, 1999).

2 The 2004 Joint Economic Report asked 6 of the original 15 members to strengthen their ALM policies. Five of the six later received a C grade for their response (partial and limited). One received a B (in progress). The Council asked every member country to improve its investment in human capital in one or more ways. The modal response of member governments to these recommendations was 'partial and limited' (European Commission Communication, 2005). See Murray and Wanlin (2005) for another disappointing report card.

3 Overman and Puga (2002) attribute the growing importance of spatial proximity to changes in the demand for labor. They identify, test, and find empirical support for three sources of demand change over the period 1986–96: the regional concentration of skilled and unskilled labor, the spatial clustering of industries, and what they call agglomeration effects (all of which are illustrated in the examples given next in the text).

4 Our paper is motivated by EU employment policy coordination, but limiting our sample to EU countries makes little sense. Empirically, we are evaluating the implications of strategic interaction among European neighbors in EU member national policy-making. If such strategic interdependence exists, it should be evidenced in all neighboring country pairs regardless of whether one, both, or neither are members of the EU. Therefore, we include Norway and Switzerland, as well as Austria, Sweden, and Finland, which were not EU members for most of the sample period.

5 Data availability limits our sample to the period before the Amsterdam Treaty entered into force. This should not affect our theoretical conclusions qualitatively since the lack of EES enforcement leaves the pre-Amsterdam strategic incentives largely unchanged. Empirically, the post-Amsterdam behavior of EU member states with respect to employment policy seems to have changed little.

6 The labor market training expenditures data are from the OECD Labor Market Statistics Database. We chose the time period to maximize the number of countries (because the spatial interdependence structure renders appropriate treatment of non-rectangular time-series cross-sections complicated). This database covers the period 1985–2002, but the data start for Denmark in 1986 and end for Greece in 1998, leaving 15 countries in 1986–98 preserving rectangularity. Qualitatively, our results are robust to using total ALM spending instead of LMT spending.

7 Some (surmountable) technical issues do arise in that search (see Franzese and Hays, 2004), but those issues do not affect the present substance and so need not detain us here.

8 We recognize that LMT spending is one component of total government consumption. Our concerns here, however, are to be as thorough and cautious as possible in controlling for domestic factors that might explain LMT spending and especially those explanators that might themselves be spatially correlated, because the latter are easily confused empirically with interdependence (Galton's Problem; see Franzese and Hays, 2005).

9 In Austria's row will be the estimated effect after feedback of a unit shock to the rest of Austria's right-hand side on Austria itself, which, in this case, will be somewhat more than the original unit because an increase in Austria's LMT spending induces other EU members to cut theirs, which induces Austria to raise further its spending and so on, recursively.

10 These latter calculations are not precisely equal to the estimate for ρ because they include spatial feedback; they are close, however, because ρ is small.

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