

# Scar Effects of Unemployment: An Assessment of Institutional Complementarities

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*This article uses panel data from the Survey of Income and Program Participation (SIPP) and the European Community Household Panel (ECHP) for a comparative analysis of workers' post-unemployment earnings trajectories in the United States and 12 Western European countries. Across the study sample of industrialized countries, results of difference-in-difference propensity score matching show post-unemployment earnings losses to be largely permanent and particularly significant for high-wage and older workers as well as for women. The analyses also show that negative effects of unemployment on workers' subsequent earnings are mitigated through either generous unemployment benefit systems or strict labor market regulation. These effects stem partly from favorable behavioral responses that prevent downward occupational and industrial mobility and partly from changes in the overall structure of labor markets favoring the transferability of worker skills between jobs. These positive effects materialize despite the fact that labor market policies tend to successfully protect the core work force from experiencing a job loss in the first place.*

Significant socioeconomic inequality in modern societies naturally begs the question as to why it persists so stubbornly. Stratification research provides three classical answers. First, there is social reproduction in the sense that privileged members of society are able to pass on favorable resources to their offspring. Second, there is an intrinsic inequality of rewards attached to different positions in the labor market, with access to more privileged

positions governed by precisely those economic, cultural, and social resources that parents transfer to children. Third, and finally, family formation is characterized by strong homogamy within strata or classes, thus further increasing inequality of individual status.

More recently, however, stratification researchers have added the role of *trigger events* (DiPrete 2002) to the set of mechanisms that generate social stratification in modern soci-

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ties. Trigger events are typically understood as critical, potentially disruptive life course events such as childbirth (Budig and England 2001), divorce, or job loss (DiPrete and McManus 2000) that are fundamentally structural determinants of intragenerational mobility processes. Moreover, trigger events are potentially important also in explaining the dynamics of social stratification because broader processes of economic and social change become linked with individual life courses via the incidence of trigger events as well as the socioeconomic consequences they entail.

This is particularly evident for the case of an event such as unemployment that is deeply rooted in processes of structural change as well as worker and job reallocation (e.g., DiPrete 1993; DiPrete and Nonnemacher 1997; DiPrete et al. 1997). Given the disproportionate risks of job loss faced by low-skilled and minority workers (e.g., DiPrete 1981; Schervish 1983) as well as the fact that unemployment experiences imply significant risks of subsequent downward mobility (e.g., Kuhn 2002), unemployment is a clear example of a trigger event that has important inequality-enhancing impact. Taking this observation as its point of departure, this article emphasizes that, unlike what is presumed in much mainstream economic research, the relationship between structural change, unemployment experiences, and inequality is not exogenously determined by the rate of technological change, but fundamentally depends on the institutional arrangements in which labor market processes are embedded. More specifically, this article develops a theoretical argument to predict positive effects of particular labor market policies—notably a combination of flexible labor market regulation and generous unemployment insurance—on workers' post-unemployment career trajectories. In that sense, labor market policy should mitigate workers' long-term cost of unemployment experiences, thereby also weakening the link between economic change and social inequality.

This analysis empirically tests the validity of this institutional hypothesis using data from the Survey of Income and Program Participation (SIPP) and the European Community Household Panel (ECHP) for the United States and 12 European Union countries. With this database, we are able to track workers' job histories over the second half of the 1990s, and thus

to establish the extent to which unemployment experiences empirically cause workers' subsequent earnings prospects to deteriorate. Controlling for a range of individual and structural determinants of workers' career trajectories, the cross-nationally comparative nature of the data permits us to identify the institutional effects of interest from wide variation in labor market policy among the 13 advanced Western economies in our sample. Focusing on the prime age work force strongly attached to the labor market, we obtain robust empirical evidence that labor market policy may play a positive role for workers' post-unemployment career prospects.

Before we present our own analyses, the following section first summarizes the available empirical evidence on the impact of unemployment experiences on workers' careers. Integrating sociological and economic labor market theory, we then develop the core hypotheses of the article and discuss cross-national differences in labor market policy that permit an empirical test of the argument. Subsequently, we describe the data in more detail and discuss the statistical approach taken in this study before extensively documenting our empirical analyses in a separate section. In the final section we summarize the evidence and offer our conclusions on the relationship between labor market institutions and workers' economic recovery from unemployment.

## **JOB LOSS, UNEMPLOYMENT, AND CAREERS IN ADVANCED WESTERN ECONOMIES**

The existing empirical evidence leaves little doubt about the fact that experiences of job loss and unemployment indeed have persistent negative effects on workers' subsequent careers. Perhaps best known are the results reported by Ruhm (1991), who, using data from the Panel Study on Income Dynamics on workers displaced during the mid-1970s, describes evidence of persistent earnings losses after job loss. According to Ruhm's estimates, at the point of reemployment, earnings of displaced American workers have been as much as 16 to 18 percent below the earnings of observationally identical workers who were continuously employed. Ruhm also reports data for workers' earnings losses up to four years after the ini-

tial job loss and finds little evidence that workers were able to recoup much of these initial losses. In that sense, unemployment experiences were found to inflict persistent *scar effects* on workers' subsequent career prospects.

Over the years, Ruhm's results have been replicated a number of times using different data sets and for more recent data. For example, Jacobson, LaLonde, and Sullivan (1993) obtained evidence of significant earnings losses among a sample of "high-attachment" workers with at least six years of tenure using administrative data for Pennsylvania. Moreover, studies by Brand (2003), Farber (1993, 1997), and Stevens (1997) have confirmed these conclusions for more representative and national samples, using the Displaced Worker Survey, the Panel Study on Income Dynamics and the Wisconsin Longitudinal Study. In addition, Farber (1993, 1997) reports that earnings losses are partly related to the fact that former full-time workers often fail to return to full-time postdisplacement jobs, but fails to find much of an impact from macroeconomic conditions. Stevens (1997) also emphasizes a job quality explanation for unemployment scarring because she finds workers' earnings losses to be largely accounted for by a high risk of multiple job losses associated with the initial trigger event.

Whereas the American data thus clearly suggest significant and persistent penalties related to unemployment, evidence on the longer-term implications of unemployment in other countries is scant. However, recent evidence of unemployment scarring among British workers largely seems to coincide with the results obtained in the American literature. For example, Gregory and Jukes (2001) estimate average earnings losses of some 15 percent for British men in the late 1980s and early 1990s, and as with U.S. workers, these earnings losses are found to largely persist even years after the original spell of unemployment. Similar conclusions are reached in recent work by Arulampalam (2001) and Borland et al. (2002). Borland et al. (2002), in particular, also stress the importance of the source of unemployment and report significant scarring not only after dismissals and layoffs, but also after nonrenewal of temporary contracts and among workers from declining industries.

In sharp contrast to the results for Britain, however, there is good evidence that unemployment scarring is much less pronounced for

German workers. Despite the fact that their average unemployment duration is longer than for both U.S. and British workers, recent studies by Bender et al. (2002), Burda and Mertens (2001), Couch (2001), and Gangl (2004a) all report earnings losses for German workers to be as low as 1 to 6 percent. These studies also report a much lower incidence of large earnings losses than commonly found in the U.S. studies. These findings also fit well with the observation of DiPrete and McManus (2000) that German workers had fully recouped these small earnings losses three years after a job loss, whereas U.S. workers took more than seven years to recover.

Other evidence that unemployment scarring may be less pervasive in some European economies comes from a recent study by Albæk, Audenrode, and Browning (2002), who establish average post-unemployment earnings losses of merely about 3 percent in Belgium and 6 percent in Denmark. In a related analysis comparing job histories in Britain, Italy, the Netherlands, and Sweden, Layte et al. (2000) observe that although unemployment induced downward class mobility in all four countries, respective effects were relatively weak in the Netherlands and Italy.

## AN INSTITUTIONAL THEORY OF UNEMPLOYMENT SCARRING

### *JOB LOSS, UNEMPLOYMENT, AND SCARRING: SOME FUNDAMENTAL MECHANISMS*

Sociological and economic models of the labor market offer several potential explanations as to why job loss and subsequent unemployment may result in persistently diminished earnings prospects for workers, as observed in the empirical data. Key among these explanations are stigma effects of unemployment, loss of workers' firm-specific human capital, human capital depreciation through intensified economic restructuring, and constraints on worker search behavior. All these explanations may generate potentially important implications for workers' reemployment prospects, for attained earnings at reemployment, and for workers' prospects of post-unemployment earnings mobility.

Perhaps the most basic explanation points to signaling models of the labor market that explain unemployment scarring through the stigma effects generated by a spell of unemployment in

the eye of prospective employers (Berkovitch 1990; Gibbons and Katz 1991; Vishwanath 1989). If employers tend to view unemployment as a signal of inferior worker quality, job applicants with unemployment records are likely to receive fewer job offers or might be offered lower starting wages. For example, arguing that the type of job loss will be informative about individual worker quality from a signaling perspective, Gibbons and Katz (1991) are able to show that workers displaced in mass layoffs were receiving higher post-unemployment wages than workers individually dismissed for, presumably, their own fault. More importantly, these initial disadvantages might easily lead to persistent or even cumulative earnings disadvantages if workers' future career prospects with a given employer depend on their starting position in a company (e.g., DiPrete and Eirich 2006; Rosenfeld 1992).

Significant earnings losses after job loss are also implied by human capital models of the labor market. Drawing on Becker's (1993) seminal distinction between "general" human capital that is transferable across employers and "specific" human capital that is not, workers may be assumed to possess both general knowledge and more specific capabilities that are of use only at particular firms, in particular occupations, or in particular industries. To the extent that workers' productive capabilities are largely specific to their former company, considerable earnings losses will result in competitive markets because prospective future employers will not reward nonusable worker skills in making new job offers (Kletzer 1989; Topel 1991). Obviously, this explanation of unemployment scarring through loss of firm-specific human capital should be particularly relevant for earnings losses of high-tenure workers who will have accumulated a particularly large stock of firm-specific human capital (Farber 1993; Kletzer 1989).

However, because many worker capabilities might be neither fully general nor fully firm-specific, workers may be able to contain unemployment scarring by finding reemployment in similar jobs within their pre-unemployment industry or occupation. In doing so, workers might be able to reap the economic returns to that part of their skills that could be considered occupation- or industry-specific. In line with this argument, studies such as those of

Carrington (1993), Jacobson et al. (1993), Neal (1995), and Stevens (1997) have found more pronounced earnings losses among workers changing industries or occupations relative to their predisplacement job. As other studies have demonstrated workers' reemployment chances to depend on both sectoral wage and sectoral vacancy levels (e.g., Fallick 1993; Gangl 2004b; Thomas 1996), workers' opportunities to retain economic returns to sector-specific skills may depend to a large extent on the larger macroeconomic situation. During recession or under intense economic restructuring, low vacancy rates in declining industries and occupations will push workers to accept reemployment in other sectors and occupations, and hence will induce significant scar effects through the loss and devaluation of occupation- or industry-specific components of worker skills.

Finally, scar effects of unemployment may result from constraints on workers' search behavior other than macroeconomic conditions. Evidently, constraints on geographical mobility (e.g., family ties, class, or local identity) might turn out to be a significant impediment to workers securing economic prospects after job loss (e.g., Halaby 1988). Lack of networks extending to other geographical areas or occupations may similarly hamper workers' opportunity for economic adaptation to job loss because the unemployed workers may be cut off from potentially relevant information (e.g., T. Korpi 2001; Mouw 2003). Economists also have stressed the importance of financial constraints, arguing that unemployed workers may use their own savings to fund the job search period required to locate adequate reemployment (e.g., Mortensen 1986). The same line of reasoning extends to the expectation that workers who are able to draw on financial support from family or state sources will experience more positive post-unemployment career prospects than nonsupported workers (e.g., Addison and Blackburn 2000; Gangl 2004a). In summary, whatever the precise weight of these different factors, any realistic model capable of explaining unemployment scarring would obviously need to draw on the interaction of workers' specific human capital, workers' economic and social resources that may be brought to bear on workers' job search success, local and sectoral labor market conditions, and employer hiring

behavior as affecting workers' reemployment and earnings prospects after job loss.

### **THE ROLE OF LABOR MARKET INSTITUTIONS: EMPLOYMENT PROTECTION AND INCOME SUPPORT**

Many of the aforementioned elements will be affected by the nature of institutional arrangements in which labor market action is embedded. Because they provide the basic regulatory framework for individual labor market action, institutional arrangements will shape key decision parameters of workers and employers, and hence will have a fundamental impact on how individual actors (are able to) respond to economic incentives, opportunities, and risk.

Among the many aspects of the institutional factors that may affect labor market behavior, the current analysis sees employment protection legislation (EPL) and unemployment insurance (UI) as those most directly relevant to unemployment processes. Essentially, EPL sets specific limits on freedom of contracting in the labor market, typically limiting employers' use of temporary or flexible work arrangements and constraining employers' rights to contract termination. In consequence, as discussed later in more detail, EPL strictness can be expected to have important impacts on who experiences job losses, which job vacancies are posted, and how employers go about in filling these. Unemployment insurance systems, in turn, provide conditional and typically time-limited income support to workers experiencing job loss, thus partly decommodifying workers from the market. In addition, modern UI systems are typically accompanied by further institutional resources such as employment services and a range of active labor market policies that seek to improve on workers' labor market prospects. Taken together, the embedding of labor market action in respective institutional arrangements may imply that economic processes relevant to unemployment scarring sharply diverge from those observed in largely unfettered markets.

To understand respective effects, we propose a conceptual framework that distinguishes three ways in which labor market institutions may affect workers' cost of unemployment. First, and most simply, institutions may affect the *composition* of workers experiencing unemployment, thus generating a pool of workers

with more or less advantageous job prospects. Second, labor market institutions may have *behavioral* implications in the sense that individual workers and employers behave differently than under a pure market system. Finally, the fact that the institutions in question are large-scale programs and hence affect a broad majority of workers and employers may lead to significant contextual effects on the overall *structure* of the labor market, affecting, for example, overall vacancy rates, the wage distribution, or the permeability of labor market segments and boundaries.

Considering potential effects of differences in EPL strictness in these respects (see Table 1 for a summary), EPL, to begin with, may be expected to have important compositional effects. Because EPL tends to protect high-tenure workers from no-fault dismissal, strict regulation should imply a concentration of job loss among the nonwhite, female, young periphery work force (Esping-Andersen 2000; Kletzer and Fairlie 2003). If unemployment generates comparatively smaller economic costs for these workers, EPL will have a positive impact on observed average wage or earnings losses after unemployment. Over and above this compositional effect, EPL also may be expected to generate significant behavioral and structural effects. In particular, because employment protection increases firing costs and, because employers will rationally consider expected future costs, and indirectly also hiring costs, already at the point of hiring, strict EPL should reduce overall labor market flows (Bertola 1999; Bertola and Rogerson 1997). As a consequence, unemployment duration will be prolonged, thus potentially exacerbating processes of human capital depreciation or stigma effects after unemployment experiences. Given that reemployment has been secured, more significant impediments to dismissals and layoffs may generate more positive effects, however, because of the lower risk for multiple spells of unemployment implied by strict EPL.

In fact, high firing costs themselves also may induce employers to follow more risk-averse hiring practices, thus increasing the stigma attached to (long-term) unemployment or mismatches between job skill requirements and workers' job histories as a form of statistical discrimination (e.g., Canziani and Petrungolo 2001; Gangl 2004c). If so, strict EPL might in fact

**Table 1.** Institutional Effects on Unemployment Scarring: a Theoretical Framework

Institution	Compositional	Mechanism		
		Unemployment spell	Behavioral	
			Post-unemployment trajectory	Structural
Employment protection legislation	+ Protection of core work force	- Increased spell duration	- Less occupational and/or industrial mobility ± Lower returns to mobility + Lower incidence rate of job loss	- Reduced vacancy rate - Increased segmentation - Higher wage dispersion
Unemployment insurance	- Easing of worker dismissal	- Increased spell duration (+ subsidized retraining)	+ Lower incidence of repeat unemployment + Less mobility into low-skill sector - Less occupational and/or industrial mobility	+ Increased vacancy rate ± Increased segmentation + Lower wage dispersion

reinforce skill boundaries in the labor market, thus contributing to an increase in overall labor market segmentation. To the individual unemployed worker, shutting off particular occupations and industries from outside competition may have positive effects as long as vacancies in that sector are plentiful. However, the effects become more negative once vacancies are more sparsely distributed and mobility into other sectors of the labor market is preferential. Moreover, limited competition across segments and firms may have the additional effect of preserving economic rents (i.e., considerable wage differentials across firms), which may decrease the likelihood that job seekers will be able to locate good jobs for reemployment.

Similarly important impacts may be expected for the effects of UI on labor market processes. Because benefit transfers constitute nonearned income, mainstream economic theory expects significant disincentive effects that should result in prolonged unemployment duration and hence in much the same consequences as discussed for the case of EPL earlier (e.g., Holmlund 1998; Meyer 2002). Also, Mortensen (1990) argues that UI eases firing and economic restructuring for employers, allowing generous systems to unfold positive effects through higher vacancy rates in the market, but this also may result in stronger scar effects for compositional reasons because high-wage, high-

tenured workers will find themselves at relatively higher risks of dismissal.

Alternatively, however, positive UI effects might be predicted from job search theory, which views unemployment benefits as a search subsidy to workers (Burdett 1979). On this account, transfers tend to raise workers' reservation wages, reducing outflow rates from unemployment on the one hand, but significantly improving the quality of post-unemployment job matches in terms of wages, occupation, industry, or job security because of a more selective worker search (e.g., Acemoglu 2001; Addison and Blackburn 2000; Estevez-Abe, Iversen, and Soskice 2001; Gangl 2004a).

As with EPL, the large-scale nature of UI programs is likely to imply significant equilibrium effects on the overall structure of the labor market from aggregation of such behavioral effects at the micro level. In particular, depending on how workers are using unemployment benefits and UI services, UI systems may reinforce patterns of labor market segmentation when workers primarily try to stay within their pre-unemployment occupation and industry, but also may weaken labor market boundaries once workers seek to compete proactively into more dynamic segments of the labor market. Because the extent to which workers will be willing to switch occupation and industry is likely to

depend on their perception of opportunities, the overall impact of UI on segmentation is hard to predict. If workers' proactive use of UI systems should prevail, however, the fact that workers' competitive position is strengthened by UI may contribute to erosion of wage differentials in the market, thus making it easier for workers to locate good jobs during their search.

Taken together, this complex variety of mechanisms suggests that the relationship between labor market institutions and workers' career cost of unemployment is highly contingent on the relative empirical strength of the various mechanisms involved, and hence defies straightforward theoretical predictions. As a bottom line, however, it might be argued that because structural change is an important factor behind job loss and unemployment, occupational and industrial mobility might be a predicament for workers in their attempts to secure favorable career prospects after unemployment experiences. If so, institutional effects working to decrease the permeability of labor market boundaries might have a critical negative impact. This applies particularly to demand-side effects expected for employment protection because presumed EPL effects on employer action will structurally deprive workers of labor market opportunities that arise outside their narrow occupational or industrial specialization. The fact that EPL might additionally reduce overall labor market dynamics makes it all the more likely that the overall effect of employment protection on unemployment scarring will be negative despite potentially counteracting effects working through the composition of unemployment inflow.

Along the same lines, the judgment on UI should be less negative, however. Unlike EPL, UI acts more as an institutional resource to improve workers' bargaining power in the labor market, while leaving the structure of the labor market (i.e., employers' hiring and job creation behavior) basically unaffected. In that sense, UI's more worrisome implications of prolonged unemployment spell duration and increased labor market segmentation are likely endogenous to workers' perceptions about the relative benefits of conducting selective versus broader job searches. Together with the fact that frictional worker reallocation over and above the requirements of structural adjustment is empirically common (Davis, Haltiwanger, and Schuh

1996), UI systems help protect workers' economic returns to occupation- or industry-specific skills, and may even contribute to building additional skills through appropriate retraining and further education systems, making the overall impact on workers' career prospects clearly positive. Evidently, however, this latter assessment implicitly presumes a sufficiently dynamic labor market that actually provides workers with alternative labor market opportunities from which to choose. In consequence, the hypothesis of positive UI effects on unemployment scarring is thus institutionally contingent on the presence of fairly flexible labor markets that generate high levels of turnover and worker mobility. As a result, one should expect to see evidence of a regime effect in the sense of a negative interaction between employment protection and UI: when both protective arrangements are present, workers may not benefit very much because the lack of labor market dynamics in highly regulated markets may undermine the necessary ingredients for positive effects of UI.

#### *IDENTIFYING INSTITUTIONAL EFFECTS: POLICY VARIATION IN ADVANCED WESTERN ECONOMIES*

To test the preceding arguments, this analysis draws on variation in labor market policy among a sample of 13 advanced Western economies, including the United States and 12 Western European countries. In fact, national labor markets in these 13 countries exhibit quite distinct institutional underpinnings that provide rich exogenous variation in institutional context conditions for identifying the respective effects of interest. As a background to the subsequent analyses, Table 2 documents the range of policy differences between national labor markets in the sample and clearly shows evidence of four empirically highly distinct approaches to labor market policy that closely fall in line with Esping-Andersen's (1990, 1999) and others' (e.g., Gallie and Paugam 2000, Hall and Soskice 2001) typology of liberal (United States, United Kingdom, Ireland), social-democratic (Denmark, Finland), conservative (Germany, Austria, Belgium, France), and Mediterranean welfare regimes (Greece, Italy, Portugal, Spain).

As a matter of fact, the data on unionization levels, the strictness of EPL, and the generosity of UI clearly show the United States, the

**Table 2.** Labor Market Institutions in the United States and 12 Western European Countries, late 1990s

	Union Coverage Rate	Strictness of Employment Protection Legislation	Unemployment Benefit Coverage Rate	Unemployment Benefit Net Replacement Ratio	Active Labor Market Policy: Expenditure on Training (% of GDP)	Unemployment Insurance Decommodification Index
United States	16	.7	39.2	.577	.040	1.2
United Kingdom	35+ (45)	.9 1.1	43.2 65.9	.677 .575	.062 .145	1.6 2.5
Ireland						
Denmark	75+	1.5	78.4	.810	.734	4.4
Finland	90+	2.3	85.7	.800	.460	3.9
Germany	75+	2.6	81.7	.695	.376	3.5
Austria	95+	2.1	69.8	.673	.142	2.7
Belgium	90+	2.5	80.7	.702	.168	3.4
France	90+	2.8	80.2	.784	.300	3.6
Greece	(30)	3.5	35.5	.494	.100	1.0
Italy	80+	3.4	24.4	.447	.006	.6
Spain	75+	3.1	46.6	.751	.144	1.8
Portugal	75+	3.7	35.6	.822	.068	1.7

Source: (1) Organization for Economic Co-operation and Development (2004), Table 3.3, average of 1990 and 2000 data; (2) expert estimates for Greece and Ireland; (2) Organization for Economic Co-operation and Development (1999), Table 2.5, version 2; (3) Proportion of unemployed workers receiving unemployment compensation during an unemployment spell, late 1990s, Survey of Income and Program Participation, 1996 Panel (U.S.), and European Community Household Panel, UDB Waves 1–8 (European countries), own estimates; (4) OECD Benefit Systems and Work Incentives, 1997 data, benefit levels at the start of an unemployment spell, average ratio across four family types and two earnings levels; (5) OECD Employment Outlook, various years, annual average of 1995–2000 data; (6) multiplicative index of UI decommodification computed as (6) = (3) × (4) + (5) / 10 / 2, rounded to the first digit.

United Kingdom and, perhaps to a lesser extent, Ireland as fairly unique in terms of the limited role of trade unions, the near absence of EPL, and the relatively weak UI systems that combine limited access to benefits, relatively modest benefit levels, and comparatively little spending on active labor market policies. In contrast, continental European countries, broadly speaking, are similar to each other in terms of a very significant role of unions in the labor market, yet clearly differ in terms of both the strength of the UI system and the approach taken toward labor market regulation.

According to the data presented in Table 2, the Scandinavian model, exemplified by Denmark and Finland, quite obviously combines flexible labor markets with a strongly decommodifying UI system that provides near universal access to materially generous unemployment benefits plus, it may be added, significant investment in worker retraining. France, Germany, Belgium, and the Netherlands (i.e., the continental European countries narrowly defined) share a tradition of strong UI with Scandinavia (although perhaps less strong in active labor market policies), yet exhibit significantly stronger regulation of labor markets through EPL. In turn, employment protection is even stronger in southern Europe. However, as compared with both Scandinavian and continental European countries, UI in southern Europe is much less encompassing, much less generous (particularly in Greece and Italy), and weaker on retraining.

#### ***MACROECONOMIC AND STRUCTURAL FACTORS AS CONFOUNDERS***

With the frequency, quality, and distribution of job offers assuming a prominent role in our theoretical framework, it follows directly that broader macroeconomic and structural conditions will affect the earnings lost by workers after unemployment. Moreover, because macroeconomic factors may be observationally or structurally correlated with existing institutional variation in our country sample, it is of course essential to control for respective confounders in our attempt to estimate the causal impact of labor market policies. As potentially relevant structural features of national labor markets, the following analyses control for the effects of economic growth, unemployment incidence,

the importance of the manufacturing sector, and the overall rate of structural change in the labor market. We also consider the role of unionization as an alternative institutional determinant of the observed empirical patterns.

Although this list of confounding factors is far from theoretically exhaustive, we believe these confounders represent some of the key structural aspects of labor markets that need to be taken into account in our attempt to isolate the impact of EPL and UI.<sup>1</sup> Quite obviously, economic growth should generally improve workers' labor market prospects (e.g., DiPrete 1981, 1993) through increased vacancy rates, increased prospects for upward mobility, and generally rising wage levels. In contrast, the intensity of economic restructuring signals the level of economic adjustment and strain in the labor market that implies increasing risks of job losses for high-wage, high-tenure workers (e.g., DiPrete 1981; Kletzer 1998; Kuhn and Sweetman 1998, 1999), falling vacancy levels, increasing job competition from unemployed job seekers (e.g., Petrongolo and Pissarides 2001), structural shifts in the distribution and quality of job offers (e.g., DiPrete and Nonnemacher 1997; DiPrete et al. 1997; Neal 1995), and perhaps falling overall wages (e.g., Card and Riddell 2004). Similarly, union strength might be an important power resource for establishing specific labor market policies in the first place (Esping-Andersen 1990; W. Korpi 2001; Korpi and Palme 2003), as well as an important structural feature of labor markets in itself. Unionization in itself may reduce unemployment scarring through solidaristic wage policies that lower overall wage dispersion (e.g., Kuhn 2002; Kuhn and Sweetman 1998, 1999) through closed-shop policies by sup-

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<sup>1</sup> These particular factors also represent those empirically found to have the strongest and most consistent effects in a wide range of exploratory analyses we conducted. In conjunction with the fact that the small number of countries in our sample severely limits the effective degrees of freedom available to provide statistical controls for contextual confounders, we hold that by concentrating on a few selected measures, the analysis does provide a parsimonious, yet empirically viable way of accounting for the confounding impact of macroeconomic factors that may affect our inferences about the causal role of labor market institutions.

porting hiring systems based on formal certificates (e.g., Weeden 2002), or by enforcing last-in first-out rules in case of mass layoffs (e.g., Kuhn and Sweetman 1998, 1999).

That said, macroeconomic conditions, such as unionization and labor market policy, empirically in fact differed significantly over the late 1990s in our sample of industrial countries. As evident from the data presented in Table S1 in the Web site appendix, macroeconomic conditions in the United States were particularly favorable during that time, with gross domestic product (GDP) growth comfortably in the upper range of European Union economies, low levels of unemployment, a fairly small manufacturing sector, and, consequently, rather low levels of economic restructuring (the lowest in the sample).<sup>2</sup> In contrast, many European countries were facing considerable macroeconomic strain through low growth rates (e.g., Germany and France), high unemployment rates and high levels of restructuring (e.g., Spain and Portugal) or both low growth and intense restructuring (e.g., Italy and Belgium).

## DATA AND STATISTICAL MODELING

To obtain empirical evidence on the relationship between labor market institutions and unemployment scarring in industrial economies, the following analysis relies on a multilevel design that uses individual work history data available for 13 advanced Western economies for the second half of the 1990s. More specifically, the analysis combines data from the 1996 Panel of the Survey of Income and Program Participation (SIPP; U.S. Census Bureau 2001) and the 1994–2001 waves of the ECHP (Eurostat 2003) study. As a result, the subsequent analysis is based on work history data for the United States and 12 Western European countries, including Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, and the United Kingdom.<sup>3</sup>

<sup>2</sup> The same observation holds if restructuring is measured by reallocation across industries. Both measures correlate at  $r = 0.7$  cross-nationally.

<sup>3</sup> Because of data problems, the remaining EU-15 member states (the Netherlands, Luxembourg, and Sweden) had to be excluded from this study. Also, note that the ECHP sample deliberately includes additional years of data, primarily to boost available

To achieve cross-national data comparability, the SIPP data first were adjusted to reflect the ECHP design that, like the Panel Study on Income Dynamics, for example, has the annual panel interview as its building block. As a consequence, five equally spaced “interview” months were arbitrarily defined for the SIPP (months 4, 15, 26, 37, 48), and data on incomes, earnings, wages, employment status, and other variables were extracted as of these time points. Data for the nonselected months were discarded, except in the construction of monthly employment status information between interviews similar to the employment status calendar data available in the ECHP. As a result, the cross-national database used in the following analysis consists of up to eight consecutive observations (five in case of the SIPP) on individual wages, monthly earnings, and current employment status plus monthly information on individual employment status between survey interviews.

At each survey interview, respondents' International Labor Organization (ILO) employment status is recorded for those employed at the time of the interview, as well as their real hourly wages (deflated to 2000 national currency units), industry, occupation, usual hours of work, and tenure with current employer. Also, the data provide information on gender, race (SIPP), ethnicity (ECHP), level of education, and age, the latter being used to construct a measure of potential labor force experience.<sup>4</sup> In addition, an unemployment spell is recorded whenever

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sample sizes relative to those of the SIPP. Restricting the ECHP sample to the 1995–1999 period covered in the 1996 SIPP panel produces little change in the estimates of (cross-national differences in) unemployment scarring. Moreover, the statistical analyses rely on random coefficient models to control for potential unobserved heterogeneity between worker cohorts and countries.

<sup>4</sup> Both the SIPP and the ECHP lack full employment biographical data that would permit reliably constructed measures of actual labor force experience. In consequence, labor force experience is approximated by subtracting the (nationally specific) standard age of completing education at level 2, 3, and 5 + 6 of the International Standard Classification of Education (ISCED). Because the ECHP UDB data do not permit a more fine-grained classification of education, U.S. degrees were appropriately recoded.

respondents report to be without work and searching for a job at the time of the interview or, to detect unemployment spells completed between interviews, at any point in the monthly status calendar available for both the SIPP and the ECHP.

Finally, the sample has been restricted to workers 25 to 54 years of age throughout to focus the analysis on estimating the impact of unemployment experiences among more mid-career workers strongly attached to the labor market. Note also that this particular choice restricts the analysis to unemployment spells of previously employed workers (i.e., to the sample of workers who mostly will have experienced an involuntary job loss before unemployment incidence).<sup>5</sup> Consequently, the subsequent analysis defines the trigger event in question as the experience of unemployment after job loss, irrespective of its specific source. In total, this setup leaves us with about 400 to 2,000 observations of unemployed workers (in the sense just described) and about 6,500 to 20,000 control cases per country in the ECHP data. The larger SIPP panel results in a total sample of 2,450 workers experiencing a spell of unemployment and nearly 60,000 control cases of continuously employed workers.<sup>6</sup> Table S2 in the Web site appendix to this article provides full summary statistics for the estimation samples.

### ***ESTIMATING THE SCAR EFFECTS OF UNEMPLOYMENT***

To estimate the causal effect of unemployment on workers' subsequent careers, this analysis

<sup>5</sup> Unfortunately, information on the specific source of job loss (e.g., quitting, firing, layoff, termination of fixed-term contract) cannot be used in the analyses because SIPP and ECHP response categories do not consistently match. More importantly, the quality of the ECHP data does not approach SIPP standards, so for that particular question, the level of missing information is significantly larger than in the SIPP.

<sup>6</sup> This count potentially includes multiple (panel) observations of the same worker in either the treatment or the control group. In the estimation of the causal effect of interest, however, stratification by survey wave ensures that individuals do not appear simultaneously in the relevant treatment and control samples.

implements a stratified difference-in-differences kernel matching estimator for the (average) treatment effect on the treated ([A]TT), that is, the (average) impact of an unemployment spell on the subsequent earnings of those workers having actually experienced unemployment in a given country and year. The (A)TT effects at the center of this analyses thus constitute an attempt to ascertain the economic cost of unemployment experiences to those workers actually affected during the late 1990s. The estimates to be reported do not necessarily generalize to statements about the potential cost of unemployment to the average worker in different countries, nor do they necessarily generalize to other historical time points or countries.

In general, difference-in-differences (DiD) matching algorithms (Heckman, Ichimura, and Todd 1997, 1998; Imbens 2004; Rosenbaum 2002; Winship and Sobel 2004 for introductions) provide a nonparametric estimate of the causal effect of interest from

$$ATT = E(\delta|T = 1) =$$

$$\sum_{i \in E \cap S} w_i \left[ \Delta Y_{1i,T+t} - \sum_{i \in E \cap S} W_{i,j} \Delta Y_{0j,T+t} \right], \quad (1)$$

where

$$\Delta Y_{Di,T+t} = Y_{i,T+t} - Y_{i,T-1} \mid D = d,$$

*E* — treatment (experimental) sample (unemployed workers),

*C* — control sample (continuously employed workers),

*S* — area of common covariate support (see later),

*D* — causal factor of interest (treatment; unemployment experience)

*w<sub>i</sub>* — individual weight (set to one),

and *W<sub>i,j</sub>* — kernel weight (see Equation 2 later).

Equation 1 directly corresponds to the counterfactual model of causality because the (average) causal effect to be estimated is defined as the (average) difference between observed outcomes among treated observation units and the weighted average of observed outcomes among nontreated units, where respective weights *W<sub>i,j</sub>*

serve as a measure of similarity between a specific treated observation  $i$  and a specific control unit  $j$ .

In our particular case, the treatment of interest  $D$  is defined as job loss and subsequent unemployment between survey interviews at time point  $T$  and  $T + 1$ . The goal of the analysis then is to establish the causal effect of  $D$  on the outcome variable  $Y$ , corresponding to workers' log real monthly gross earnings at time points  $T + t$  years after job loss, with  $t = 1, 2, 3$  years. In this specific analysis,  $t$  defines a time scale for labor force experience (i.e., refers to years spent *in employment*). In disregarding (multiple) periods of nonemployment and zero earnings, this analysis thus in fact takes a fairly conservative approach to estimating workers' economic cost of unemployment.<sup>7</sup>

The current analysis then uses DiD matching to difference out any unobserved, but individually stable heterogeneity between workers in the treatment and control groups, where differencing is done to real earnings at time point  $T - 1$  (i.e., more than one year before actual job loss) to accommodate for potential predispacement earnings losses of workers losing jobs between focal years  $T$  and  $T + 1$  that are regularly reported in the empirical literature (e.g.,

Ashenfelter 1978; Ruhm 1991; Jacobson et al. 1993; Stevens 1997).<sup>8</sup> Moreover, stratification by country and survey year prevents bias in treatment effect estimates resulting from any country- or cohort-specific factors.

Further adjustment of any background differences between the treatment and control groups is done through kernel matching on the propensity score  $\hat{p}(X)$ , that is, the estimated likelihood of treatment (experiencing job loss and unemployment between survey interviews  $T$  and  $T + 1$ ) given the observed covariates  $X$ . The kernel matching uses the Epanechnikov Kernel

$$W_{i,j} = \frac{1}{nh} \sum_{k=1}^{n_c} K\left(\frac{z}{h}\right), \quad (2)$$

$$\text{where } z = \frac{\hat{p}_j - \hat{p}_i}{h}, \quad K(z) = \frac{3}{4}(1 - z^2) I(|z| \leq 1)$$

$$\text{and } \hat{p}(X) = \Phi(Z_{it}\gamma)$$

with a relatively narrow bandwidth  $h$  (equal to one half the standard deviation of the estimated propensity score to form kernel weights). The propensity score itself is estimated from a probit model that predicts the probability of experiencing a job loss and subsequent unemployment between focal interviews  $T$  and  $T + 1$  from workers' gender, race (SIPP), ethnicity (ECHP), education, potential labor force experience, log real wage, usual hours of work, major industry, and major occupation in jobs held at  $T$ . To make full use of the available pretest information, the probit assignment model additionally includes measures of occupational and industrial mobility (across major occupations and industry groups) between  $T - 1$  and  $T$ , employment status at  $T - 1$ , and the trend in workers' log wages between  $T - 1$  and  $T$ . To estimate the treatment effects empirically, we further assume independence of treatment status and earnings outcomes conditional on the assignment model, the fixed unobserved heterogeneity component, and stratification by country and survey year (see Winship and Sobel 2004 for a discussion of this assumption).

#### **DETERMINANTS OF UNEMPLOYMENT SCARRING**

In a second step, we draw on the estimates from the DiD propensity score matching algorithm to assess the determinants of unemployment scar-

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<sup>7</sup> As far as can be assessed, disregarding periods of nonemployment also does not give rise to any serious sample selection bias in the analyses reported later. Fitting selectivity-correction versions of the reported regression models provided hardly any significant indication of selection bias, and where bias occurred, sample selection correction generally produced slightly stronger parameter estimates for institutional effects. In substantive terms, this negative result on selection bias is related to the fact that the data actually show merely small variation in the proportion of unemployed workers never observed to return to work in the observation window.

<sup>8</sup> Because the available panel data are relatively sparse, the chosen observation window of two pretest ( $T - 1, T$ ) and (a maximum of) three posttest observations ( $T + 1, T + 2, T + 3$ ) seemed the best compromise between adequate covariate control and substantively interesting outcomes. With post-unemployment earnings available for up to three years, it is at least feasible to address unemployment scarring in the short and medium terms. Obviously, an analysis of long-term effects is unfortunately beyond the scope of this article.

ring through parametric methods. More specifically, we fit the regression model

$$\begin{aligned}\hat{\delta}_{tiwc} &= \beta_0 + T\alpha_{wc} + X_{tiwc}\beta_{wc} + V_{tiwc}\gamma_{wc} + \\ W_{wc}\lambda + v_{wc} + u_{ic} + e_{tiwc} \quad (3) \\ \alpha_{wc} &\sim N(\bar{\alpha}_{wc}, \sigma_a) \\ \beta_{wc} &\sim N(\bar{\beta}_{wc}, \sigma_b) \\ \gamma_{wc} &\sim N(\bar{\gamma}_{wc}, \sigma_c) \\ v_{wc} &\sim N(0, \sigma_v) \\ u_{ic} &\sim N(0, \sigma_{i,c}) \\ e_{tiwc} &\sim N(0, \sigma_{t,c})\end{aligned}$$

that relates the estimated treatment effects on the treated  $\hat{\delta}_{tiwc}$  obtained for the individual worker as a result of the DiD kernel matching to a series of predictors at the micro as well as at the macro level. In the full model specification described by Equation 3, workers' earnings losses after unemployment are predicted from time since job loss  $T$ , individual-level covariates  $X$  describing workers' pre-unemployment status, individual-level covariates  $V$  describing workers' post-unemployment career trajectory, and country-level covariates  $W$  that describe aspects of the macroeconomic and institutional context in which national labor markets are embedded. Focusing on the treatment effect on the treated, our sample is restricted to 6,260 workers actually having experienced unemployment whose earnings losses were estimated for a total of some 15,000 (annual) post-unemployment observations. Besides this repeated outcome measurement, the data exhibit an additional multilevel structure insofar as the sample of workers represents data drawn from 70 unemployment inflow cohorts (defined by year of event occurrence) in 13 advanced industrial economies.

In terms of concrete model specification, the vector of duration dependence  $T$  is modeled by simply incorporating dummy variables for  $T + 2$  and  $T + 3$  into the specification, and the vector of pretreatment worker characteristics  $X$  includes the same variables as used in the assignment model described earlier. The vector of posttreatment characteristics of workers' labor market trajectories  $V$  includes time-varying measures of cumulative unemployment

duration, hours of work, and major occupation and industry of workers' post-unemployment job. Of crucial interest to the current analysis, of course, are the effect estimates for the set of aggregate covariates  $W$ , which includes not only the core (time-constant) indicators for the strictness of employment protection, the level of decommmodification in the UI system (Table 2), and their interaction, but also the macroeconomic controls summarized in Table S1 (see Online Supplement on ASR Web site: [www2.asanet.org/journals/asr/2006/toc054.html](http://www2.asanet.org/journals/asr/2006/toc054.html)). To test for the presence of intervening effects via the structure of labor markets,  $W$  furthermore includes measures of hiring rates, labor market segmentation, and wage inequality described in more detail in the presentation of the empirical results later.

In estimation of the model, all covariate effects at the individual level (vectors  $T$ ,  $X$ , and  $V$ ) are considered random, whereas effects of aggregate covariates are seen as fixed parameters. Moreover, reflecting the multilevel nature of the data, the model specification of Equation 3 uses two (cross-classified) random error terms to control for unobserved heterogeneity at both the level of unemployment inflow cohorts (defined by country and year of the focal event, error term  $v_{wc}$ ) and individual workers (error term  $u_{ic}$ ).<sup>9</sup> In addition, both the random effect for the overall error term  $e_{tiwc}$  and the respective effect of the individual-level error term  $u_{ic}$  are estimated as country-specific heteroskedastic variance components. All random terms in the model are assumed to follow the standard normal distribution. The model is estimated by maximum likelihood using Gaussian quadrature to approximate the normal distributions of the random terms in the model.

In the following discussion, we report estimation results for different specifications of this model. In a first step, we actually estimate

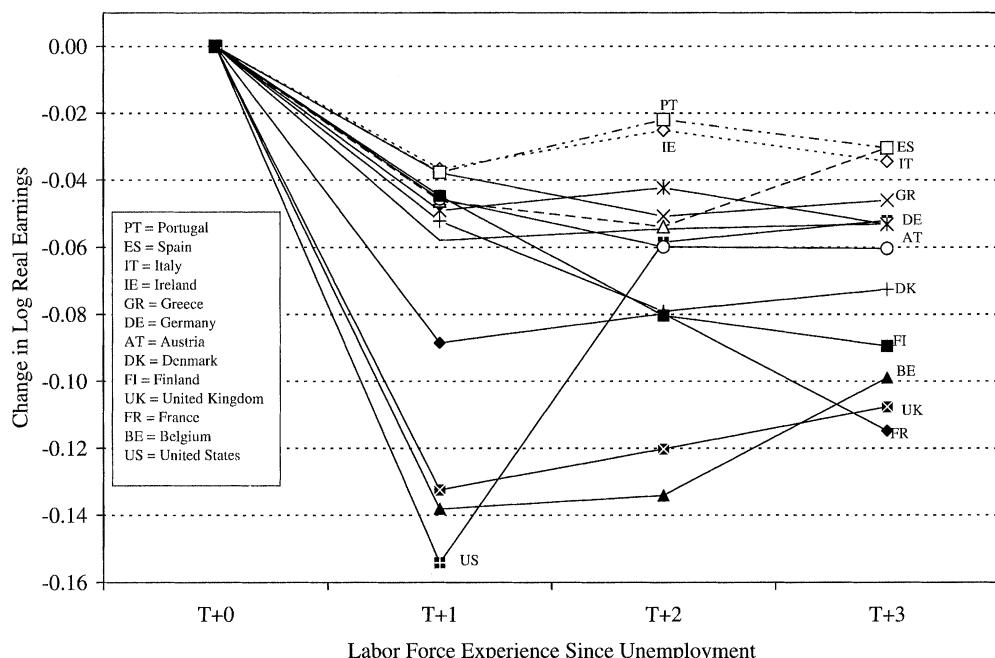
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<sup>9</sup> Obviously, the model should ideally have a four-level structure, with heterogeneity at the country level clearly separated from heterogeneity between worker cohorts within countries. However, with  $N = 13$  at the country level only, fitting the full four-level model resulted in severe convergence problems in more involved models, so a somewhat simpler specification was chosen here. As far as we are aware, the substantive results remain qualitatively unaffected by this simplification.

a descriptive version of Equation 3 that includes only country-specific time dummies  $T$  to provide the baseline estimates of ATTs in the 13 countries to be reported in the next section. As compared with reporting ATT estimates based on our kernel DiD matching directly, our use of a respectively restricted heteroskedastic variance component model implies a post-estimation adjustment for the impact of unbalanced country samples as well as selective panel attrition in calculating the overall estimates of the average treatment effect of an unemployment experience on workers' subsequent earnings trajectories in different advanced industrial economies.

From this starting point, the analysis proceeds to report estimation results for more elaborate model specifications that permit testing of our hypotheses in greater detail. The core specification of interest is of course the regression including our institutional and macroeconomic measures (vector  $W$ ) because this specification is to provide our estimates of the causal effect that institutional arrangements have on workers' post-unemployment career prospects,

controlling for macroeconomic and structural differences between the national labor markets in our sample. The analysis then proceeds to test for the relevance of specific compositional, behavioral, or structural mechanisms underlying the overall institutional effects established empirically in this first step. To that end, we present estimates from a series of model specifications that elaborate on the basic specification by successively including measures of workers' pre-unemployment characteristics (vector  $X$ ), measures of workers' post-unemployment career trajectories (vector  $V$ ) as well as measures of hiring rates, segmentation, and wage inequality in national labor markets (vector  $W$ ). Because these features of labor markets and individual careers are potentially endogenous to the overall institutional environment, the more elaborate model specifications describe the importance of specific mechanisms linking institutions and worker outcomes, and hence provide an empirical basis for decomposing observed institutional effects into their constituent parts.



**Figure 1.** Unemployment Scarring by Post-unemployment Labor Force Experience

*Note:* Workers ages 25 to 54 years; ATT estimates are based on difference-in-differences propensity score kernel matching and baseline regression model of Table S3 on the Web site appendix. Sources: Survey of Income and Program Participation, 1996 Panel; European Community Household Panel, Users' Database Waves 1–8.

## LABOR MARKET INSTITUTIONS AND EARNINGS LOSSES AFTER UNEMPLOYMENT

As a starting point of the analysis, Figure 1 presents our baseline estimates of cross-national differences in unemployment scarring in the 13 economies under study. More specifically, Figure 1 provides the estimates of the average treatment effect (ATT) of unemployment experiences on workers' subsequent monthly real earnings by country and time (i.e., labor force experience) since job loss. Full estimation results for the descriptive regression model underlying Figure 1 are provided in Table S3 on the Web site appendix.

The ATT estimates reported in Figure 1 provide the counterfactual estimate of the causal effect from job loss and subsequent unemployment, defined as the average difference in actual post-unemployment earnings of workers who experienced a job loss between interviews at T and T + 1 relative to the counterfactual estimate of workers' earnings prospects if no unemployment spell had occurred between T and T + 1. Thus, the implicit reference case in Figure 1 is the zero line signifying the case of no earnings losses attributable to job loss and unemployment. Evidently, there is no single point estimate for any country or post-unemployment period in which workers' post-unemployment earnings on the average were equal to, let alone above, the earnings level observed among observationally identical workers continuously employed between T and T + 1. Clearly, unemployment thus induces significant and—at least up to T + 3—persistent earnings losses for the average worker who experiences a job loss in all 13 industrialized countries in the sample.

Two aspects about the empirical evidence presented in Figure 1 are particularly remarkable. First, in practically all countries, workers' post-unemployment earnings losses largely occur at the point of first reemployment jobs at T + 1. Between T + 1 and later time points, workers' earnings again progress very much in line with, but do not exceed, earnings growth among comparable workers who did not experience an unemployment spell between T and T + 1. In fact, the U.S. labor market provides the single outlier case: whereas by T + 1, U.S. workers are bearing excessive earnings losses in the order of 15 percent, they are able to recoup some of these by T + 2, where the data indicate

average earnings losses of some 6 percent only. Closer examination of the data shows that U.S. workers are able to recoup part of their earnings losses largely because they can increase hours more flexibly than their European fellow workers.

Perhaps even more importantly, Figure 1 also provides evidence of significant cross-national differences in the level of persistent earnings costs of unemployment. Comparison of earnings losses across industrialized countries shows that the experiences of U.S. workers in fact occupy an intermediate position. In the short run, at time point T + 1, U.S. workers clearly have to face excessive losses. Similar scar effects are felt by British and Belgian workers only, whereas workers in many European countries, including Germany, Ireland, Austria, Denmark, Finland, and all four Southern European countries, experience more modest earnings losses on the order of 3 to 5 percent. Because of strong catch-up between T + 1 and T + 2, the earnings prospects of U.S. workers in the medium run (i.e., at time points T + 2 and T + 3) are found to be close to those of workers in southern and continental European countries. With ATT estimates of earnings losses at 7 to 8 percent, slightly stronger scarring is evident for the two Scandinavian countries, and even more so for Belgium, France, and the United Kingdom, where workers' average earnings losses amount to 10 percent even fully three years after job loss.

### *LABOR MARKET INSTITUTIONS, MACROECONOMICS, AND UNEMPLOYMENT SCARRING*

To assess whether these cross-national differences in workers' earnings losses after unemployment may be systematically related to institutional features of national labor markets, Table 3 summarizes estimation results from six regression models that test for the impact of contextual effects. The six model specifications differ in the set of aggregate variables included as covariates. Model 1 reports estimation results for a model that controls for macroeconomic conditions only, whereas Models 2 to 6 report estimation results for specifications that include institutional controls using alternative measures and specifications. More specifically, Model 2 tests for the impact of unionization,

Model 3 tests for the role of welfare regimes, and Models 4 to 6 make use of the quantitative policy indicators discussed in Table 1 earlier. Among the latter, Model 4 reports results for a main effects specification, whereas Model 5

additionally tests for the interaction effect between labor market regulation and UI. To complete the picture, Model 6 has the estimates of the marginal relationship between institutions and workers' earnings losses (i.e., without

**Table 3.** Structural and Institutional Determinants of Unemployment Scarring, ML Estimates

	(1)	(2)	(3)
Constant	-.146 *** (.032)	-.163 *** (.035)	-.192 *** (.046)
Time			
T+2	-.001 (.005)	-.001 (.005)	-.001 (.005)
T+3	.006 (.005)	.006 (.005)	.006 (.005)
Macroeconomics			
GDP growth	.002 (.004)	.003 (.004)	.008 * (.005)
Skilled manufacturing	.003 * (.001)	.003 * (.001)	.004 ** (.002)
Structural change ( $D_{occ}$ )	.004 ** (.002)	.003 (.002)	.000 (.003)
Unemployment incidence rate	.001 (.002)	.001 (.002)	-.003 (.003)
Institutions			
Union coverage rate		.030 (.025)	
Welfare regime type (ref.: liberal)			
Social-democratic			.080 *** (.024)
Conservative			.047 ** (.022)
Southern Europe			.065 ** (.027)
EPL strictness index			
UI decommmodification index			
EPL strictness $\times$ UI decommmodification			
$\sigma_v$	.231 *** (.006)	.231 *** (.006)	.231 *** (.006)
$\sigma_{i,c}$	country-specific	country-specific	country-specific
$\sigma_{t,c}$	country-specific	country-specific	country-specific
Log likelihood	-6564.40	-6563.65	-6558.32
LR-Test $\chi^2(df)$ vs. (1)		1.5 (1)	12.2 (3) ***

Note: Workers aged 25–54. N = 15,081 post-unemployment earnings observations of 6,260 workers from 70 (country  $\times$  year) unemployment inflow cohorts. Microlevel treatment effects of unemployment estimated by stratified propensity score kernel matching. Asymptotic standard errors in parentheses. EPL = employment protection legislation; UI = unemployment insurance. Full results available from author on request. Source: Survey of Income and Program Participation, 1996 Panel; European Community Household Panel, UDB Waves 1–8.

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Estimated variances of random effects and country-specific error terms omitted.

(Continued on next page.)

Table 3. (Continued)

	(4)	(5)	(6)
Constant	-.166 *** (.042)	-.326 *** (.067)	-.173 *** (.034)
Time			
T+2	-.001 (.005)	-.001 (.005)	.000 (.005)
T+3	.006 (.005)	.006 (.005)	.006 (.005)
Macroeconomics			
GDP growth	.004 (.004)	.009 ** (.004)	
Skilled manufacturing	.001 (.002)	.004 ** (.002)	
Structural change ( $D_{occ}$ )	.002 (.002)	-.006 * (.003)	
Unemployment incidence rate	.000 (.002)	-.001 (.002)	
Institutions			
Union coverage rate			
Welfare regime type (ref.: liberal)			
Social-democratic			
Conservative			
Southern Europe			
EPL strictness index	.019 ** (.008)	.074 *** (.020)	.044 *** (.012)
UI decommmodification index	.005 (.005)	.073 *** (.023)	.032 ** (.015)
EPL strictness $\times$ UI decommmodification		-.029 *** (.010)	-.012 ** (.006)
$\sigma_v$	.231 *** (.006)	.231 *** (.006)	.231 *** (.006)
$\sigma_{i,c}$	country-specific	country-specific	country-specific
$\sigma_{t,c}$	country-specific	country-specific	country-specific
Log likelihood	-6561.30	-6556.72	-6560.57
LR-Test $\chi^2(df)$ vs. (1)	6.2 (2) **	14.4 (3) ***	

Note: Workers aged 25–54. N = 15,081 post-unemployment earnings observations of 6,260 workers from 70 (country  $\times$  year) unemployment inflow cohorts. Microlevel treatment effects of unemployment estimated by stratified propensity score kernel matching. Asymptotic standard errors in parentheses. EPL = employment protection legislation; UI = unemployment insurance. Source: Survey of Income and Program Participation, 1996 Panel; European Community Household Panel, UDB Waves 1–8.

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Estimated variances of random effects and country-specific error terms omitted. Full results available from author on request.

taking macroeconomic differences between countries into account).

Of the various models considered, specifications 3 and 5 clearly are those that describe the data most convincingly, with Model 5 being the preferred specification of this analysis for

both statistical and substantive reasons. This result holds a number of interesting implications. First, the data provide stringent evidence that workers' earnings prospects after unemployment respond to both macroeconomic and institutional factors or, equivalently, that labor

market policies exert an impact on workers' earnings trajectories over and above macroeconomic differences between countries.<sup>10</sup>

Second, the fact that the two institutional main effects models (Models 2 and 4) are empirically inferior to the slightly more complex Models 3 and 5 implies empirical evidence of important *regime effects* rather than simple additive effects of specific institutions.<sup>11</sup> To put it differently, this result states that the overall impact of labor market institutions on workers' careers depends on the specific *policy mix* existing in national labor markets. Also, this implies that the effect of differences (and changes) of single policies is strongly *contingent* on the specific approach to either labor market regulation or UI systems already manifested in national institutional environments. Third, the superiority of Model 5 over Model 3 indicates that specific institutional measures of employment protection and UI apparently underlie observed welfare regime differences on the one hand, and that smaller within-regime differences in policy terms generally work in directions similar to the between-regime differences addressed in Model 3.

In substantive terms, the empirical data provide only partial support for the institutional

hypotheses developed earlier, however. The results for Model 5, in particular, confirm the hypothesis that generous UI may mitigate workers' economic cost of unemployment, but also that UI is far more effective if embedded in a relatively flexible labor market that provides intermediate to low levels of employment protection. The positive main effect for employment protection itself is in stark contrast to our theoretical expectations, however. Whereas we theoretically argued that low vacancy rates, strong labor market segmentation, and risk-averse hiring by employers should put unemployed workers at a structural disadvantage, the empirical data speak to a clear positive effect of EPL that is similar in magnitude to, if not larger than, the effect of UI decommmodification.

As directly evident from Model 3, these findings imply that, consistent with our expectations, institutional arrangements in Scandinavian labor markets are most favorable to workers' longer-term earnings prospects, with expected monthly earnings about 8 percent above those of workers experiencing unemployment in the unfettered labor markets of the United States or the United Kingdom in otherwise comparable macroeconomic conditions. Consistent with the notion that employment protection hampers the positive impact of UI decommmodification by reducing labor market dynamics, the northwestern continental European countries classified under the conservative regime type clearly take an intermediate position. Theoretically quite unexpectedly, however, workers in Mediterranean labor markets that exhibit a combination of rigid labor market regulation and weakly developed welfare states fare almost as well as workers in the two Scandinavian countries, and still slightly better than workers in continental Europe.

Before delving more deeply into potential mechanisms underlying these institutional effects, we also note that macroeconomic factors do have important implications for workers' careers as well. According to our estimates, workers strongly benefit from both economic growth and industrial labor markets exhibiting a strong manufacturing basis, which, in conjunction with greater standardization of skills in those fordist markets, is consistent with our emphasis on the importance of mobility-enhancing structural conditions in coping with unemployment experiences. Periods of intense

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<sup>10</sup> Testing for a potential interaction effect between institutions and the macroeconomic context would be highly interesting, both theoretically and empirically. Given the short time-series component of the database for this article, no attempt to recover those effects was made in this analysis.

<sup>11</sup> Given the fact that institutional variation resides solely at the country level, and that unionization levels are empirically highly correlated with both EPL strictness and UI generosity, we do not present estimation results for models that jointly control for unionization and specific labor market institutions. Theoretically, our position is consistent with an interpretation that union power is a necessary cause in the establishment of either EPL or a generous UI system (e.g., Esping-Andersen 1990), although specific policies enacted are considered the direct cause of labor market action. Empirically, including unionization in the models presented in Tables 3 and 4 leaves the estimation results qualitatively unchanged, although the inference is less precise and sometimes less robust than in the presented models. For more detailed results, we refer the interested reader to Table S5 on the *ASR* website appendix to this article.

structural change amount to significant challenges to workers, however. Most likely, structural change is harmful to workers' earnings prospects because of the high rate at which specific skills are becoming obsolete and workers are losing respective economic returns. A look at Model 6 should finally also show that controlling for macroeconomic factors actually tends to bring out institutional effects more sharply because, empirically, many of the European countries exhibiting favorable institutional arrangements have faced economic strain and more significant structural change

over the late 1990s than, for example, Britain or the United States.

### **LABOR MARKET PROCESSES: INFLOW COMPOSITION, WORKER BEHAVIOR, AND LABOR MARKET STRUCTURE**

To understand the driving forces underlying the observed relation between labor market institutions and workers' earnings prospects, we theoretically distinguish between compositional, behavioral, and structural sources of institutional effects. The empirical analyses documented in Table 4 seek to address the rel-

**Table 4.** Determinants of Workers' Earnings Losses after Unemployment, ML Estimates

	(1) Baseline	(2) Composition	(3) Behavioral	(4) Contextual	(5) Contextual
<b>Institutions</b>					
EPL strictness index	.074 ***	.105 ***	.093 ***	.080 ***	.114 ***
UI decommmodification	.073 ***	.098 ***	.081 ***	.047 **	.068 ***
EPL strictness × UI decommmodification	-.029 ***	-.039 ***	-.035 ***	-.031 ***	-.040 ***
<b>Control variables (selected)</b>					
Unemployment duration			-.006 *** (.001)	-.006 *** (.001)	
Occupation relative wage				.064 *** (.022)	.123 *** (.014)
Industry relative wage				.085 ** (.040)	.053 ** (.025)
Residual wage inequality				-.105 *** (.034)	-.112 *** (.037)
Occupational permeability				.252 * (.139)	.483 *** (.152)
Hiring rate				-.054 (.131)	-.040 (.140)
<b>Controls</b>					
Time, macro-economic conditions	(1) + Worker covariates, job history	(2) + Spell duration, major occupation & industry, hours of work in post-unemployment	(3) + Occupation/industry relative wage, residual wage inequality, segmentation, hiring rate		As in (4), no spell + trajectory covariates
Log likelihood	-6556.72	5504.71	4542.11	4505.94	-5454.31
LR-Test $\chi^2$ (df) vs. preceding model 1)		2104.0 *** (70)	1925.2 *** (48)	72.3 *** (5)	100.8 *** (5)

*Note:* Ages 25–54 years. N = 15,081 post-unemployment earnings observations of 6,260 workers from 70 (country × year) unemployment inflow cohorts. Microlevel treatment effects of unemployment estimated by stratified propensity score kernel matching. Asymptotic standard errors in parentheses. EPL = employment protection legislation; UI = unemployment insurance. *Source:* Survey of Income and Program Participation, 1996 Panel; European Community Household Panel, UDB Waves 1–8.

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . Selected parameter estimates only. Full results available from author on request. 1) LR-Test versus Model 2 in the final specification (model 5).

ative impact of these various mechanisms by successively incorporating additional control variables that are potentially endogenous to institutional context conditions and hence act as controls for potential intervening mechanisms in the relationship between institutions and labor market outcomes. To assess the degree to which institutional effects are related to compositional, behavioral, and structural effects, Table 4 presents selected parameter estimates from four additional model specifications that are compared with the baseline model (Model 5 in Table 3).

To begin with, Model 2 tests for the impact of compositional effects that work through institutional effects on unemployment incidence. Earlier, we argued that EPL in particular should be successful in protecting the core work force at risk for high earnings losses, thus implying comparatively smaller observed earnings losses among those workers who actually experience a job loss. However, when the parameter estimates for the institutional effects between Models 1 and 2 are compared, the empirical data do not at all bear out that expectation. Conditional on observed worker characteristics and job history, our estimates of institutional effects on workers' subsequent earnings paths in fact grow by a significant margin relative to the baseline specification. Thus, the data clearly indicate that, on the average, the labor market prospects of workers losing jobs in more institutionalized labor markets tend to be poorer than those of workers losing jobs in labor markets featuring weaker institutional intervention. Apparently, at least for the core work force considered in this particular analysis, a first impact of institutions is to render dismissal and layoffs a principle of last resort to which employers are turning during times of severe restructuring only.

To understand this effect in practice, Table 5 presents parameter estimates for the impact of worker characteristics and job histories on post-unemployment earnings trajectories. Consistent with the established literature, the analysis points to particularly significant earnings losses not only among the less educated and among experienced and full-time workers, but also among women (see Kuhn 2002 for similar results). Also, closer examination of the data reveals the expected negative correlation between institutions and average labor market experience in the pool of unemployed workers (results not shown),

thus confirming the notion that labor market institutions, and EPL in particular, tend to disproportionately shift the burden of job loss onto younger workers, for whom unemployment poses smaller earnings threats. Despite this effect, the overall relation between labor market institutions and unemployment composition is negative, however, because of the positive empirical correlation between institutions and workers' wages combined with the fact that workers' wage level is such an important predictor of post-unemployment earnings risk.

In fact, the finding that average pre-unemployment wages (relative to the national median) are higher in institutionally regulated markets seems hard to reconcile with any notion that labor market institutions would tend to protect jobs of the core work force. Given that the model controls for a number of important determinants of earnings, including occupation and industry, one might be tempted to argue that this result speaks only to the fact that the more institutionalized labor markets are typically also heavily unionized markets that feature compressed wage distributions to begin with. However, the positive correlation between institutions and workers' wages remains absolutely robust to the inclusion of our measure for union strength or direct measures of wage inequality (see later). A more realistic interpretation thus might be that economic rents may be an important component of (some) workers' wages (Sørensen 2000; Weeden 2002), that institutional features such as EPL that reduce competitive pressures in the labor market may in fact bolster those rents, yet that unemployment events exactly pinpoint the point at which monopoly rents become economically untenable and are swept away by processes of structural change. This latter interpretation would in fact also be consistent with our earlier reading that institutions may render dismissals and layoffs more of an employer's means of last resort.

In any event, the fact that the overall effect of institutions is clearly positive implies that significant behavioral and contextual effects of labor market policies must apparently far outweigh the nontrivial compositional effects just described. Returning to the evidence presented in Table 4 earlier, specification 3 includes information to describe workers' employment history subsequent to the focal job loss. More specifically, by incorporating information on cumula-

**Table 5.** Worker Characteristics and Earnings Losses after Unemployment, ML Estimates

	Coefficient	Standard Error
Time		
T+2	.011 **	(.005)
T+3	.019 ***	(.006)
Worker characteristics		
Women	-.067 ***	(.010)
Non-white (U.S.) / ethnic minority (EU)	.014	(.015)
Level of education (ref.: ISCED 0–2)		
ISCED 3	.031 ***	(.010)
ISCED 5–6	.103 ***	(.015)
Labor force experience	-.002 ***	(4.9e <sup>-4</sup> )
Job history		
Tenure with last employer (years)	-.001	(.001)
Occupation of last job (major groups)	Yes	
Industry of last job (major groups)	Yes	
Usual weekly hours of work (ref.: 45+)		
35–44	.030 ***	(.009)
25–34	.106 ***	(.018)
<25	.234 ***	(.020)
Relative log wage rate	-.362 ***	(.015)
Employed at T-1	-.038 ***	(.009)
Trend in log wage rate (T-1 vs. T)	.181 ***	(.017)
Occupational mobility (T-1 vs. T)	.002	(.010)
Industrial mobility (T-1 vs. T)	.001	(.012)
Random coefficients	Yes	
Log likelihood	-5504.71	

Note: Workers aged 25–54. N = 15,081 post-unemployment earnings observations of 6,260 workers from 70 (country × year) unemployment inflow cohorts. Microlevel treatment effects of unemployment estimated by stratified propensity score kernel matching. Asymptotic standard errors in parentheses. U.S. = United States; EU = European Union. Source: Survey of Income and Program Participation, 1996 Panel; European Community Household Panel, UDB Waves 1–8.

\* p < .10, \*\* p < .05, \*\*\* p < .01. Selected parameter estimates from model specification (3) in Table 4 only. Full results available from author on request.

tive unemployment duration, workers' post-unemployment occupation, industry, and hours of work (all measured at the time of the interview), this specification accounts for the impact of key aspects of workers' post-unemployment career trajectories that may naturally be expected to have an impact on earnings, and may indirectly identify that part of institutional effects that can be accounted for by purely behavioral effects (i.e., by the fact that [some] workers exhibit more favorable post-unemployment mobility patterns).<sup>12</sup>

As indicated by the improvement in model fit statistics between specifications 2 and 3, workers' post-unemployment job history is indeed a major determinant of workers' earnings paths. Unemployment duration shows the expected negative effect on workers' earnings, and earnings also respond in predictable ways to changes in occupation, industry, or hours worked per week (detailed results are not shown in Table 4). More important to this analysis, however, is the fact that these behavioral processes show surprisingly modest relationships with institutional contexts. Taken together, the full set of trajectory covariates *V* incorporated in Model 3 reduces coefficient estimates of institutional effects by some 20 percent (2 percentage points) in case of the UI main effect, and a mere 10 percent in case of both the employment protection

<sup>12</sup> Given the short observation window up to T + 3 years that prevents us from identifying the effect reliably, we exclude post-unemployment tenure from this specification.

main effect (1 percentage point) and the interaction term for the joint effect of UI and EPL (0.3 percentage points). As measured in this particular analysis, behavioral differences between national labor markets are thus clearly not the dominant cause behind the positive relationship between labor market institutions and workers' earnings trajectories after a job loss.

It is nevertheless instructive to examine the results somewhat more closely to assess the precise sources of those behavioral effects that are in fact apparent in the data. When the change in institutional effects is compared across more detailed specifications that incorporate blocks of covariates separately (see the supplementary results in Table S4 on the *ASR* Web site appendix), it turns out that changes in hours worked actually prove to be the most important factor among this set of behavioral covariates. Cross-national differences in changes in hours alone in fact already explain almost one percentage point of the positive main effect of both UI and EPL. This clearly suggests that the more highly standardized distribution of work hours in a regulated labor market generates a positive effect for workers, which works through a smaller likelihood of a worker picking jobs with shorter hours after an unemployment spell (see also Farber 1993, 1997 on the importance of hours changes in the U.S. case).

Whereas hours effects did not feature prominently in our theoretical arguments, our overall reasoning is in fact more clearly supported by the finding that cross-national differences in unemployment duration account for another 0.7 percentage points of the positive effect that UI has on earnings. Together with a clearly negative coefficient for unemployment duration, this suggests that UI is effective because unemployment duration is *lower* in national labor markets that exhibit generous UI. The apparent conflict with mainstream economic reasoning is easily resolved once it is recognized that unemployment duration as measured in this analysis is the total number of months spent in unemployment since the focal job loss at time T. In contrast to standard spell duration, our measure thus incorporates the effect of multiple unemployment spells that potentially follow the initial job loss (cf. Stevens 1997), and thus provides indirect evidence that generous UI systems empirically tend to improve on post-

unemployment job quality. Similarly, UI also generates favorable effects on occupational and industrial mobility, although the overall effect is surprisingly small in magnitude and accounts for a mere 0.2 percentage points of the overall UI effect.

Because neither compositional nor behavioral effects seem to provide a convincing explanation as to why workers experience a more favorable recovery from job loss in either Scandinavian or southern European labor markets, we finally turn to examine the impact of more structural (i.e., genuinely contextual) features of national labor markets. In Models 4 and 5, we specifically test for the impact of cross-national differences in the structure of wages, in the strength of labor market segmentation, and in overall vacancy rates in the labor market.<sup>13</sup> According to our analysis, it in fact turns out that workers' careers respond strongly to both the structure of wages and the permeability of labor markets.

It is perhaps surprising to see no evidence for an effect of vacancy levels in the labor market at this point. In fact, the coefficient is even negatively signed in both models. On the other hand, macroeconomic covariates such as GDP growth, the level of structural change, and unemployment incidence may already partial out much of the structural variation in vacancy rates, so that inclusion of an explicit measure may merely index either short-run and potentially time-lagged cyclical responses or, perhaps more plausibly, cross-national differences in job churning rates at otherwise identical levels of structural change in the economy (cf. Davis, Haltiwanger, and Schuh 1996). If so, a negative sign is to be expected for our vacancy rate measure because individual job security would suffer in consequence.

Also, the evidence on the effects of cross-national differences in the structure of wages is mixed. In Table 4, we in fact address two different aspects of the wage distribution. To address cross-national differences in occupa-

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<sup>13</sup> All contextual measures naturally vary over countries and historical time. Because institutions are measured for time constant only, the variance component relevant to our elaboration strategy is of course the part of stable cross-national differences between labor markets.

tional or industry pay, we use two measures of occupation and industry wages relative to the national median wage. Because these reflect workers' current (i.e., post-unemployment) occupation and industry, the parameter estimates effectively express the advantage associated with cross-national differences in the relative status of specific occupations and industries within national markets. Clearly, the coefficients are positive, indicating that workers' benefit from above average pay (relative to the situation elsewhere) for a given occupation or industry, and experience more significant earnings cuts from ending up in sectors with below average pay. Interestingly, however, cross-national differences in occupation or industry pay differentials play absolutely no role in explaining why institutions benefit workers (again see Table S4 for supplementary evidence). Apparently there is simply no relation between labor market policies and this specific aspect of wage structures.

The reverse applies, however, to our second measure for the structure of wage distribution, namely residual wage inequality. Defined as the ratio of the first and ninth decile (i.e., P90/P10) of the distribution of residualized wages net of occupation and industry main effects, this measure intends to capture cross-national differences in the level of wage differentials *within* identical occupations or industries (i.e., across firms). Most interestingly, it is this aspect of the wage structure that has a strikingly strong negative effect on workers' earnings, and that also is capable of accounting for a significant fraction of the overall positive effect of institutions—in fact, more than three percentage points of the effects from both EPL and UI and nearly a full percentage point of the interaction term. That is, workers apparently face significant difficulties securing adequate reemployment in markets where, for given occupations and industries, wages—and skill requirements and other job demands, for that matter—vary greatly across firms. This is an important result because it indicates that workers' earnings risks, in a sense, depend on the probability of their soliciting a "good" job offer, which is much reduced in a labor market wherein the dispersion of job quality is large. In that sense, much of the value of labor market institutions may lie precisely in the fact that regu-

lated markets tend to reduce heterogeneity of wages and jobs in the latter sense.

Reporting positive evidence for the role of labor market segmentation, Table 4 yields a final important insight. Our measure of segmentation is defined as the proportion of hires in any given year and national labor market that involved occupational mobility (across major occupation groups) on the part of the recruited worker. The measure therefore indicates the extent to which (skill) boundaries in the labor market are permeable. According to our estimates, this permeability of the labor market shows quite positive effects for workers' earnings trajectories, interestingly in both specification 4 that controls for individual mobility and specification 5 that omits those individual-level trajectory covariates. Labor market segmentation in the sense defined here has thus an important contextual component over and above the effect of individual mobility patterns, and it is specifically this macro feature of the labor market that is helpful in understanding the role of institutions. That is, labor market policy benefits unemployed workers if it contributes to relatively open labor markets that permit mobility across occupational boundaries, and they do so because the positive effect applies to both workers who are mobile (and thus successfully competing into new fields) and those who remain in their field of occupational or industrial specialization (who probably face less intense competition than otherwise).

Most importantly, and as expected theoretically, the more detailed results of Table S4 indicate that UI systems actually promote such permeability of labor market boundaries, whereas employment protection tends to increase segmentation and hence to depress post-unemployment earnings growth to about a similar degree. In focusing on the gross impact of the macro covariates just discussed, our final Model 5 consequently emphasizes that changes in structural features of the labor market alone are in fact able to account for about a third of the total positive effect of UI, but imply negative effects of EPL. The coefficient for EPL clearly increases in Model 5 relative to Model 2, which indicates that EPL effects on the structure of labor markets, particularly increasing labor market segmentation, tend to have the theoretically expected effect of putting job seekers at a disadvantage.

## SUMMARY AND CONCLUSIONS

By its cross-nationally comparative analysis of job loss and unemployment consequences for individual careers, this analysis adds to a growing literature that addresses the role of institutional arrangements in shaping individual life courses and social stratification more generally. Focusing on the specific trigger event of unemployment, the empirical results obtained in this analysis in fact side well with those of previous studies that have demonstrated important links between institutions and income inequality (Gottschalk and Smeeding 1997), poverty dynamics (Goodin et al. 1999), income trajectories (DiPrete and McManus 1996, 2000; Gangl 2005), patterns of labor market mobility (e.g., DiPrete et al. 1997), and life courses (e.g., DiPrete 2002; DiPrete and McManus 2000). Although our results clearly indicate that job loss and unemployment are veritable trigger events that entail significant and largely permanent earnings costs in all 13 economies in our sample, we also obtained robust evidence that labor market institutions, particularly EPL and UI, are able to mitigate these costs to a considerable extent.

At one level, our result that Scandinavian-type labor market institutions work best in that regard (as in many others) is simply consistent with long-standing views in the social stratification and welfare state literature. At otherwise comparable macroeconomic conditions, post-unemployment earnings of the average unemployed worker in Denmark or Finland are found a full 8 percentage points above those of the average unemployed worker in the UK, Ireland or the United States. Also, the Continental European mix of generous welfare states and moderate to high levels of employment protection has its merits as workers in Germany, France, Austria and Belgium are found to enjoy a 5 percentage point earnings advantage over unemployed workers in the group of liberal economies. As these differences are found to persist over time, it seems entirely appropriate to conclude that labor market institutions are in fact capable of mitigating the economic consequences of job loss and unemployment, in particular if modeled according to Scandinavian fashion.

In addition to offering further evidence on the consensus view in the established literature, however, this study has sought to provide more

specific answers as to which institutional features of Scandinavian labor markets are responsible for workers' favorable labor market outcomes and how these positive effects come about. Drawing on insights from sociological and economic models of labor market action, our key theoretical argument was that the overall impact of labor market institutions would depend on the interaction of labor market regulation and unemployment insurance systems, i.e. we expected important complementarities between employment protection and unemployment insurance because we argued that positive effects of UI systems will be enhanced by relatively dynamic labor markets that provide ample job opportunities and permeable labor market boundaries.

Our empirical results in many respects confirm these hypotheses, and moreover provide important clues as to how these positive institutional effects come about. First, our data are crystal clear on the fact that positive effects of labor market policies on workers' earnings trajectories are robust to controls for macroeconomic context. Also, institutional effects are not reducible to cross-national differences in the composition of unemployment. Quite contrary to any such expectation, we find that the pool of unemployed workers in more regulated economies consists of workers with poorer labor market prospects on average, so that positive institutional effects materialize despite a stronger selectivity of job loss in those labor markets. This in turn suggests that behavioral and structural effects of institutional arrangements must be fairly pervasive.

According to our estimates, part of the story behind positive institutional effects is indeed related to more favorable post-unemployment career trajectories as captured by a lower incidence of multiple unemployment spells, more favorable patterns of occupational and industrial mobility, and fewer changes in hours of work. Even more important, however, are institutional effects on the structure of labor markets (i.e., genuinely contextual effects that affect all workers in a national labor market). We find that institutional effects on wage structures and labor market segmentation are of prime importance in understanding why institutions matter so positively. In particular, UI partly works through enhancing the permeability of occupational and industrial (i.e., skill) boundaries in the labor

market, thus improving overall labor market matching. Moreover, and even more important, EPL and UI have positive effects because they partly reduce between-firm wage dispersion in identical occupations and industries, which also reduces the likelihood that workers end up accepting relatively bad jobs for reemployment.

By emphasizing the fundamental role of cross-national differences in aggregate features of the labor market, these empirical results thus pose a significant challenge to labor market theory in both sociology and economics. Although both disciplines abound with models of individual labor market action, we so far lack convincing theoretical models that describe macro processes of labor market change and equilibrium formation across heterogeneous submarkets defined by skill, occupation, or industry. The empirical results of this analysis have important implications in that respect because they advance our understanding of what makes unemployment such a critical trigger event in individual labor market careers, thus implicitly shedding new light on what makes for successful labor market careers.

Considering especially our results on the role of between-firm wage inequality, the truly critical aspect of unemployment (and the role of institutions) is that workers experiencing unemployment are typically losing rather good jobs, not necessarily in an absolute sense, but relative to what jobs they can get on the external labor market given their qualifications, experience, and background. The notion that unemployed workers are losing good jobs on the average is in fact perfectly consistent with a view that if, from the employer perspective, job destruction is mainly economic adjustment to competitive pressures in product markets, the rational response is to eliminate precisely those positions that are rewarded above the going market wage. To the individual worker, this poses the problem that the external labor market is unlikely to yield similarly advantageous reemployment, so that unemployment experiences lead to sustained earnings losses. Labor market institutions may help in that respect whenever they improve access to good jobs, and just what makes institutions work that way clearly needs more refined theoretical input than provided in this analysis or in current labor market models. This seems all the more important because it appears that, over and above behavioral effects,

changes in the *aggregate* structure of labor markets are the factor critical to a proper understanding in this case.

At the same time, the lack of proper theoretical foundations is but one of the challenges raised by this analysis. Another challenge is in fact theoretical as much as empirical and relates to the positive results for the southern European labor markets that point to a positive role of labor market regulation if regulation is embedded in a weakly developed welfare state. Theoretically, this is challenging because EPL effects on the structure of labor markets, vacancy dynamics, and labor market segmentation in particular would suggest a more negative role for workers' earnings prospects. In fact, our theoretical expectations were borne out in our data because EPL was found to increase labor market segmentation and thus to contribute to restrict worker mobility across labor market boundaries. Nevertheless, this clearly leaves us with the puzzle of how to account for the unequivocally positive overall effect of EPL. To be sure, our data show that EPL, like UI, strongly benefits workers because of reduced between-firm wage dispersion, which might be a consequence of more limited and less effective job competition across sectors and firms. Clearly, there must be other important confounders omitted from this analysis. For example, it might be the case that EPL has positive effects because the overall rate of technological change is reduced in regulated economies so that the technological spread between highly innovative and more traditional firms may not be as wide as in other labor markets. Speculative at this point, these and many other questions spurred by this analysis naturally beg further theoretical and empirical study.

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