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Collective Agreements, Wages, and Firms' Cohorts: Evidence from Central Europe

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Abstract

Using a large, matched employer-employee data set, the authors investigate the impact of company and industry collective bargaining agreements on wages in the Czech Republic, Hungary, and Poland (CE3). They also examine the changing characteristics of the union wage premium in different cohorts of establishments. Their results challenge the common idea of weak unions in the CE3 by revealing a union wage premium whose characteristics depend on the level at which collective bargaining occurs. They find that industry agreements increase wages for low-skilled workers, while company agreements increase medium- and high-skilled wages. Their second finding is that the union wage premium is unevenly distributed between cohorts, with substantial cross-country variation. Wage premiums are concentrated in the transitional cohorts in the Czech Republic and Poland and, to a lesser extent, in the pre-transitional cohort in Hungary.

COLLECTIVE AGREEMENTS, WAGES, AND FIRMS' COHORTS: EVIDENCE FROM CENTRAL EUROPE

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Using a large, matched employer-employee data set, the authors investigate the impact of company and industry collective bargaining agreements on wages in the Czech Republic, Hungary, and Poland (CE3). They also examine the changing characteristics of the union wage premium in different cohorts of establishments. Their results challenge the common idea of weak unions in the CE3 by revealing a union wage premium whose characteristics depend on the level at which collective bargaining occurs. They find that industry agreements increase wages for low-skilled workers, while company agreements increase medium- and high-skilled wages. Their second finding is that the union wage premium is unevenly distributed between cohorts, with substantial cross-country variation. Wage premiums are concentrated in the transitional cohorts in the Czech Republic and Poland and, to a lesser extent, in the pre-transitional cohort in Hungary.

The transition to a market economy in the former socialist countries of Central Europe challenged the role of the old socialist unions as these proved unable to represent rank-and-file workers' interests (Blanchflower and Freeman 1997).[1] Such unions experienced new pressures, for which they were not initially prepared, from the growing need to protect low-income workers and to minimize employment losses, and from the challenges of new tripartite systems of social concertation (meaning a process of negotiation between the social partners and the government, aimed at reaching a consensus on social and economic policy). The resulting lack of union credibility among both employers and employees triggered loss of membership and influence, exposing unions to competition from new forms of company bargaining (EIRO 2002a, 2002b). A key role in this process of union and collective bargaining revitalization was played by newly established, de novo, private firms and by multinational enterprises seeking to adapt parent company industrial relations practices to the local socioeconomic environment of their subsidiaries (Aguilera and Dabu 2005; Meardi 2007b; Hancké and Kurekova 2008; Meardi et al. 2009).

The impact of the development of modern systems of collective bargaining on the structure of wages in the post-socialist economies of Central Europe remains largely unexplored. In this article we seek to fill this gap by analyzing the impact of collective agreements on wages in three cohorts of firms in the Czech Republic, Hungary, and Poland (the CE3). Among the former socialist countries, the CE3 are of particular interest because they constitute a group of early and radical reformers. During the 1990s, extensive reforms were introduced in response to two waves of market liberalization, notably, the launch of transition in 1990 to 1991 and the publication of the European Commission's positive *avis* (its opinion on EU accession) in 1997, which opened the negotiations for EU entry. The institutional and industrial changes triggered by these two events helped to shape the current system of collective bargaining in the CE3 countries, mostly through the steady process of new firm creation during the transition. In practice, a firm's bargaining status, such as the extent of union recognition and levels of bargaining, can be regarded as a once-and-for-all decision made early in its life cycle, and is thus influenced by the institutional, social, and economic conditions prevailing at that time (Disney, Gosling, and Machin 1995). As a result, firms in the CE3 today participate in an unusual collective bargaining system that combines elements of both the Anglo-Saxon and the continental European models. Bargaining is strongly decentralized, with the company level being dominant, some industry bargaining, and a large uncovered sector. The uncovered sector provides a common benchmark

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[1]Unions in socialist countries acted as "transmission belts" for the central planning authority. Their function was to ensure adherence to the National Labor Code, administer welfare, and sustain a labor market equilibrium with artificially full employment and compressed wage distributions (see Basu et al. 2004 for a description of the bargaining model of wage and employment determination in socialist countries).

against which to measure the respective effects of these two levels of collective agreements.

We use data from the European Structure of Earnings Survey (ESES), a unique cross sectional linked employer-employee data set. The high degree of cross-country comparability enables us to conduct a detailed comparative analysis of the union wage premium in establishments set up during the pre-transition, early-middle, and late-transition in the CE3, the periods being delimited by the two waves of liberalization described above. We contribute to two strands of the union literature. The first analyzes the role of union bargaining in firms whose start-up dates are characterized by contrasted institutional, market, and macroeconomic conditions. Previous studies have not dealt explicitly with wage outcomes. Disney et al. (1995) focused on union recognition in successive cohorts of UK firms. They found a progressive decline in union recognition between cohorts during the 1980s and early 1990s, alongside structural changes in the UK labor market and progressively tighter legal regulation of union activities by the state. Once established, changes of union status by de-recognition were comparatively rare, and in Britain the greater part of the overall contraction of collective bargaining during that period occurred as new firms opted for alternative methods of pay determination. Basu, Estrin, and Svejnar (2004) examined rent-sharing mechanisms in the Czech Republic and Slovakia in the 1990s. They showed these mechanisms were relatively more effective in firms set up after the launch of transition compared with pre-existing state-owned enterprises. Our own study emphasizes how changing conditions have imprinted different priorities for pay determination and skill differentials within each cohort.[2]

The second strand analyzes the impact of bargaining structure on wages. So far there has been no simultaneous evaluation of the impact on wages of both company and industry agreements relative to non-covered firms, in particular taking into account different cohorts of firms. In single-level systems, such as those prevailing in Anglo-Saxon countries, company agreements are found to compress the wage structure relative to the non-covered sector (Freeman and Medoff 1984; Blanchflower and Bryson 2004). In multilevel systems, such as those prevailing in many EU countries, company agreements increase wages at the top of the distribution relative to the wage floors provided by industry agreements (Dell'Aringa and Lucifora 1994; Card and de la Rica 2006; Dell'Aringa and Pagani 2007;). Because of the substantial non-covered sectors in the CE3 countries, the possibility exists to

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[2]The idea that organizations' employment practices are "imprinted" in the early years after their founding has been investigated notably in a series of influential studies of recently founded high technology firms by Hannan, Burton, and Baron (1996) and Baron, Hannan, and Burton (2001). Drawing on Stinchcombe's (1965) theory, these authors argue that employment systems, comprising key motivational, selection, and control policies, many of which we suggest would be influenced by union status, are established in the years immediately after foundation. Once in place, they are costly to change because of implicit contracts with employees and other stakeholders, reputational effects in the labor market, and fit with other business strategies.

extend these studies and resolve the apparent paradox by comparing the effects of both company- and industry-level agreements operating in the same economies.

Transition, Firms' Cohorts, and the Evolution of Collective Bargaining in the CE3

Two major waves of liberalization played a key role in the transition to a market economy of the CE3 countries; namely, the launch of transition (1990 in Hungary and Poland, 1991 in the Czech Republic) and the publication of the European Commission's *avis* in 1997, which opened the negotiations for their accession to the European Union (see Grabbe 1999). These two events delimit a pre-transition, an early-middle, and a late-transition period, each associated with a specific political and macroeconomic context. During the pre-transition period, the CE3 countries, with the partial exception of Hungary, were dominated by the socialist model of administrative wage setting. The early-middle transition was a period of labor market adjustment, rapid inflation and first experiments with concertation, and political and economic transformation. Finally, late transition was a phase of stabilization that saw a dramatic increase of foreign direct investment (FDI) inflows from the EU (particularly toward the Czech Republic and Poland; see Meardi 2002) and growing demand for skilled labor. These factors had long-lasting effects on both industrial developments and the characteristics of collective bargaining institutions in the CE3 countries.

Pre-transition

The CE3 faced contrasting economic and political situations before the launch of transition. In the former Czechoslovakia and Poland, various attempts to introduce elements of the market economy had failed during the 1960s. Thus, at the start of transition, economic activities were controlled by the state, which fully appropriated enterprise profits, artificially maintained a compressed wage distribution, and ensured full employment in the economy (Basu et al. 2004, 2005).

The situation was different in Hungary, where from the late 1960s, market reforms had gradually freed firms from the rigid directives and surveillance of central authorities. Central plans transformed from instructions into guidelines. The state no longer fully appropriated profits as these became partially incorporated into the economic accounting of the individual enterprises, which were now accountable for their operations. A price formation process began to bring about a balance between supply and demand as firms gradually attuned to world market prices. During the 1980s, liberal rules for the establishment of small firms and cooperatives were introduced as well as regulations for foreign direct investment. The latter had favored waves of spontaneous privatizations, which made Hungary the leader for

FDI inflows and new firm creation among the CE3 countries during the pre-transition period (Zwass 1984).

"Embryo Bargaining" in Hungary and Mainstream Socialism
in Czechoslovakia and Poland

The development of collective bargaining institutions in the CE3 countries closely followed the progress of reform in each country. Former Czechoslovakia and Poland were much closer to the mainstream socialist model of enterprise management. Although there had been experimentation in work organization and incentives (Grootings, Gustavsen, and Héthy 1991; Gardawski 2009), both the Normalization after the Prague Spring of 1968 and the imposition of martial law after Poland's strike wave in 1981 reimposed bureaucratic controls and inhibited new developments in the workplace (Thirkell, Scase, and Vickersaff 1994; Pollert 1997). Thus, in the 1980s, national wage scales continued to be set centrally according to workers' job grades while unions remained subordinated to the Communist Party (Thirkell et al. 1994). Unions focused mainly on welfare administration at enterprise level, ensuring adherence to the Labor Code, and they lacked any formal representational role.

In contrast, Hungary experienced successful labor market reforms starting from 1968. Enterprise management underwent gradual and steady change as labor retention problems eroded central control causing wage drift (Kölló and Vincze 1999). Local agreements were allowed to modify regulations and to adapt bonus and benefit rules to the working of enterprise internal labor markets (Neumann 1997). A limited form of covert "embryo bargaining" emerged, such that core workers in the establishment had the opportunity to carry out a form of collective wage negotiations, bypassing the formal trade union channels. Such processes of informal bargaining mostly benefited the groups of workers on whom managers most depended for their production targets (Héthy and Makó 1989; see also a remarkable series of field studies of wage bargaining in Hungarian enterprises in the early 1980s by Révész et al. 1984 and Kölló et al. 1984).

Early and Middle Transition

The Czech Republic, Hungary, and Poland (together with the Slovak Republic) were the first countries in Central and Eastern Europe to embark on the transition, thus entering a period of great political unrest during the early 1990s. In 1993, former Czechoslovakia split into the Czech and the Slovak Republics with an ensuing period of political restructuring. In Poland as well, the launch of transition triggered a period of great political instability replacing the authoritarian socialist system with political democracy and a pluralist multiparty system. In the early transition, both countries experienced a severe economic depression from which they started to re-

cover in 1994 (Neuhaus 2006). In contrast, at the start of transition, Hungary had already carried out a number of democratic reforms and had relatively stable government institutions and a well-functioning constitution. This relative political and institutional stability helped to soften the effects of economic recession (Weidenfeld and Altmann 1995; Sharma 1997; Svejnar 2002).

The Czech Republic, Hungary, and Poland were also the first countries to embark on radical reforms with the help of Western expertise (through the Programme of Community aid to the countries of Central and Eastern Europe [PHARE]) concerning economic institutions, tax administration, legal systems, and competition policies.[3] Such reforms prepared the economies for the increased competitive pressures coming from Western economies and for the waves of privatizations, which led to the establishment of widespread private ownership during this period (Weidenfeld and Altmann 1995). Each country pursued a different strategy: the Czech Republic and Poland adopted "shock therapy" with rapid all-out programs directed mainly toward domestic investors, whereas Hungary opted for a gradualist approach with organic direct sales combined with inflows of foreign direct investment (OECD [Organization of Economic Cooperation and Development] 1993; Sharma 1997; Bennett et al. 2004).[4] Overall, large-scale privatizations precipitated the breakup of state-owned enterprises into small or very small units that arose from the "divestitures" (including asset sales, spin-offs, and break-ups). This led to an increased number of firms, thus higher competition and efficiency (Lizal, Singer, and Svejnar 2001; Svejnar 2002). By 1996, at the end of the waves of privatizations, respectively 75%, 70%, and 60% of firms in the Czech Republic, Hungary, and Poland were in private hands (Estrin et al. 2009).[5]

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[3]The Czech Republic and Hungary devoted a special effort to the early design of competition policies that liberalized prices, cut state subsidies, favored the scaling down of old SOEs, boosted foreign trade liberalization, and provided a legal framework for the regulation of FDI. Poland and Hungary pioneered the creation of a modern multibank system that replaced the Socialist *monobank* (Weidenfeld and Altmann 1995; Svejnar 2002).

[4]In the Czech Republic we observe two waves of voucher privatizations, in 1991 and 1994 (Bennett et al. 2004). In Poland, starting from 1990, there were direct sales and privatizations by liquidation of medium-sized and small SOE, which were mainly directed to the workforce, with the participation of foreign investors having the medium-run objective to gain control of the company (Weidenfeld and Altmann 1995; Sharma 1997). In Hungary, large-scale privatizations were launched in 1990; however, during 1990 to 1994 a gradualist approach was adopted, with partial and phased reforms: at the beginning of 1993 only 8.3% of state assets had been privatized. This gradualist approach was abandoned with the election of the former Communist party which undertook basic, small-scale privatizations, combined with inflows of foreign direct investments; by 1993 about 80% of Hungarian privatizations involved the presence of foreign capital (OECD 1993; Sharma 1997). In contrast to Czech Republic and Poland, in Hungary, FDI inflows also took the form of greenfield investments with foreign ownership. Svejnar (2002) attributes the Hungarian success in attracting foreign ownership in early-middle transition not only to the privatization strategy pursued but also to its more stable political setting and the better defined rules and regulations for foreign direct investment.

[5]Notice that during the period the fastest growth was experienced by the Czech Republic where the size of private sector increased by 60 percentage points and Hungary with an increase by 45 points. The

Table 1. Collective Bargaining Institutions in CE3

	Union density		Coverage		Corporatism
	1990	*2001*	*1990s*	*2002*	*1990–2000*
Czech Republic	78.8	27	55%	21–30%	1
Hungary	63.4[a]	19.9	>70%	31–40%	1
Poland	53.1[b]	14.7	>70%	41–50%	1

Sources: Data are drawn from CESiFO Institute and ILO databases; ILO World Labor Report; EIRO 2005; Riboud et al. 2002, Eurostat; OECD Labour Force Statistics.
[a]refers to 1995
[b]refers to 1989

Labor Market Adjustment and Social Protection:
The Development of a New Corporatist Model of Concertation

In the immediate aftermath of the fall of the communist governments, privatization and industrial restructuring induced job destruction, notably among unskilled workers and job-to-job reallocation flows, particularly among workers voluntarily quitting the state sector to enter private employment. Meanwhile, rapid inflation and high unemployment led the new governments in the CE3 to seek to combine economic liberalization with social concertation and to introduce modern schemes of unemployment compensation and social security benefits (Boeri and Terrell 2002). Few official unions at that time had experience in bargaining on behalf of their members. The new unions inherited a highly centralized wage determination system and were caught between national-level sociopolitical goals and the emerging needs of their members for workplace representation.

In such a context, unions started to lose legitimacy among employers and employees, which caused the steady fall of union density and coverage during the 1990s (Table 1). Meanwhile, institutions such as the International Monetary Fund, the World Bank, and the International Labour Organization pressed for the establishment of tripartite systems. National governments were thus encouraged to foster a dialogue between the social partners with the goal of containing wage increases and protecting workers on the lowest incomes (Thirkell et al. 1994; Aguilera and Dabu 2005).[6] EU-style industry agreements became the favored instrument for ensuring a compressed wage distribution and for coping with industry specific wage and labor movements (Flanagan 1998). The outcome of sectoral concertation in

process was slower in Poland ("just" 30 points), which started from a relatively higher private sector share in 1990 (Estrin et al. 2009).

[6]In 1990, Czechoslovakia set up a three-tier tripartite collective bargaining system that actively sought to protect low income workers (Pollert 1997). In the same year, Hungary broadened the scope of the tripartite model that it had first set up in 1988 (Neumann 1997) and unions gave special importance to negotiations over the minimum wage as multiemployer agreements set minimum rates of pay (Toth 1997). Poland also set up a tripartite social pact in 1993 (Pollert 2000) and Solidarity combined its support for the Balcerowicz austerity package with calls for wage restraint and establishment of a social minimum (Rainnie and Hardy 1995).

this period depended mostly on the effectiveness of employers' associations, and their recognition of unions as social partners. Lacking wide legitimacy among employers in the CE3 countries, employer associations were reluctant to reinforce industry bargaining by such means as extension clauses (EIRO 2004). Thus, new industry agreements remained multiemployer in form, being signed by employers' organizations, but generally the agreements covered only a fraction of the sector unless its firms had a dominant position in the market (Pollert 1999; EIRO 2002a). By the mid-1990s, the Czech Republic, and to a lesser extent Hungary, were the countries in which industry bargaining was most effective. In contrast, in Poland, the economy became dominated increasingly by small firms interested mostly in single-employer bargaining (Neumann 1997; Flanagan 1998; Gardawski et al. 1999).

Late Transition

The conclusion of the political reforms, which culminated with the European Commission's *avis,* opened the period of late transition for the CE3, a period of relative economic and political stability. Poland and Hungary experienced rapid economic growth, low inflation, and falling unemployment, interrupted in Poland by Russia's default in 1998.[7] The Czech Republic experienced a period of political crisis and economic recession in 1997 and 1998 but recovered thereafter (Svejnar 2002; Neuhaus 2006).

While all the most urgent reforms had been carried out in the early-middle period, the late transition saw the stabilization of an institutional framework able to attract foreign investors. This was particularly the case in Poland where the implementation of competition policies had been relatively sluggish in early and middle transition. We thus observe the sale of virtually all domestic banks to large Western banks, and the development of the stock market which, in the early-middle transition, had been characterized still by insufficient regulation and shareholder protection (Estrin et al. 2009). This was coupled with privatization and financial sector reforms, market-oriented reforms of the export sector, and internal liberalization of prices and markets (Fischer and Sahay 2000). The new legal and institutional reforms sought to conform to the standards set out by the European Commission (Estrin et al. 2009).

After the various waves of small- and large-scale privatizations during the early and middle transition, this period saw further consolidation of the private sector. By 1999, it accounted for 80% of GDP in the Czech Republic and Hungary. In Poland, the growth of the private sector continued until 2001 reaching 75% of GDP (Estrin et al. 2009). This period is characterized primarily by the surge of FDI into the Czech Republic and Poland,

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[7]In Hungary, Russia's default led primarily to an increase in the public debt but did not have a strong effect on GDP growth and labor market owing to the re-orientation of its trade flows toward the EU (Svejnar 2002). In Poland, the spill-over effects of the shock were stronger due, among other things, to the scale of cross-border trade with Russia (Bukowski, ed. 2010).

precipitated by low labor costs in labor intensive sectors as well as by the relative abundance of a highly skilled workforce favoring the development of high-tech industries (Svejnar 2002). The main partners were EU countries, which accounted for 80% of the total flows. Whereas FDI in these countries took the form of joint ventures with domestic investors in the early and middle transition, it now took the form of greenfield investments, which significantly increased the stock of foreign capital.[8]

Decentralization and Revitalization of Unions: The Role of Multinational Companies

Negotiations for accession to the EU triggered further labor market deregulation in the CE3 instead of favoring the introduction of the European Social Model. Despite the institutional pressures toward tripartism and the need to conform to European Union labor standards, lack of employee voice reinforced loss of legitimacy and recognition of existing unions, and hence intensified de-unionization (Meardi 2007a).[9]

Meanwhile, the rapid expansion of multinational companies (MNCs) started to play a key role in the revitalization of unions and collective bargaining. New MNCs further weakened corporatist tendencies by applying company-level industrial relations practices similar to those used in the parent companies to their subsidiaries, but adapted to the local socioeconomic environment (Meardi 2007b; Meardi et al. 2009).[10] Various union revitalization strategies were then combined within the MNCs in a way to cope with country-specific institutional factors (see Meardi 2007b and Frege and Kelly 2003 for detailed accounts of union revitalization strategies pursued in the EU). In the Czech Republic and Poland, the low membership thresholds required for union recognition generally favored a quick start and implementation of collective bargaining. This entailed more strategic use of innovative systems of variable pay, linked to performance and skills, that benefit more qualified and managerial workers (Ost and Weinstein 1999; Aguilera and Dabu 2005; Hancké and Kurekova 2008; EIRO 2009a, 2009b,

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[8]Western Europe was already the main source of FDI inflows into the CE3 by early and middle transition. In 1994, Germany alone accounted for the 30%, 28%, and 46% of FDI stocks in Hungary, Poland and Czech Republic, respectively. The figure exceeded 90% considering EU countries in general (mainly Austria, Netherlands, France, and Belgium (Lansbury, Pain, and Smidkova 1996; Altomonte and Guagliano 2001).

[9]Since the mid-1990s, the Czech government had been pressing ahead with wage deregulation (Pollert 1997). Similarly, in Poland the Social Pact agreed to in 1993 broke down, and by 1995/97 average pay increases were running 5 to 6% above the levels established by the Tripartite Commission with less than 30% of firms treating its target as a ceiling, and 40% ignoring it altogether (research by Bogusław Urbaniak, cited in EIROnline 2002a). In 1995, the Hungarian government implemented the Bokros austerity package, which included the suspension of tripartism (Köllő and Koltay, eds. 2002).

[10]Within these broad lines it should be recalled that existing studies indicate a great degree of heterogeneity in the attitude of multinational corporations (MNCs) toward trade unions and collective bargaining in the CE3, depending on, among other things, sector and country of origin (see Aro et al. 1997; Pollert 1999; Aguilera and Dabu 2005; EIRO 2009a, 2009b, 2009c).

2009c). The development of such new company agreements gave more flexibility to wage determination, which particularly benefited highly skilled workers. Data from the National Labor Inspectorate's report in Poland, for example, suggest that between 1997 and 1999 the share of employers signing such new company agreements increased at the expense of those that were simply a prolongation of existing ones. Indeed, pre-existing agreements rarely contained clauses that would offer the employees significantly more than the minimum stated by the Labor Code (Państwowa Inspekcja Pracy [National Labor Inspectorate] 1999, 2000) (Martin 1997; EIRO 2009a, 2009b, 2009c).

In contrast, in Hungary the steady FDI inflows since the early transition had not contributed significantly to trade union development owing to the prevailing hostility of MNC management toward unions (Toth 1997). Although they accepted the formal rights to union organization and collective bargaining, the latter institutions were not the main determinants of actual wages, hours, and terms of employment. Instead, the companies preferred to use Employee Share Ownership Programs, which enabled share-owning employees to gain higher incomes, greater job security, and preferential terms and conditions of employment (Neumann 1997; Flanagan 1998). High membership thresholds for union recognition required a big organizing effort for unions and slowed the spread of wage bargaining. Moreover, the provisions of the Labor Code, signed in 1992, had triggered a de facto dualism between the post-communist trade unions and new works councils within the establishment, which hindered the growth of the new union confederations (Toth 1997; Pollert 2000).

To summarize, we observe a reduced effectiveness of union representation in Hungary compared with the Czech Republic and Poland where new forms of collective bargaining had been introduced in the late-transition period. In a survey of union representatives, Aro et al. (1997) report that in 1997 only 60% had signed local pay agreements in Hungary as opposed to the 72% and 90% in the Czech Republic and Poland, respectively. The majority of representatives surveyed in Hungary also indicated a decline of union influence compared with those in the Czech Republic and Poland who mostly reported either increased influence or no significant change with respect to the previous three years (Aro et al. 1997).[11]

Characteristics of Collective Bargaining by Firms' Cohorts

Once-and-for-all choices made at the time, and in the conditions prevailing when an establishment is set up, are very likely to produce permanent effects on firms' activity, for example, restructuring and privatization strategies, FDI intensity, and the type of collective bargaining adopted. The evidence presented so far on the three stages of transition suggests that firms took

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[11]We acknowledge Pollert's (2000) remark about the ambiguity of the term *influence* used by Aro et al. (1997) and interpret it as an indicator of unions' effective presence in the establishment.

such strategic choices in radically different economic, political, and social contexts. Accordingly, important information about a firm can be obtained by simply looking at its cohort: the period in which it was established. This information is particularly relevant with respect to the role of collective bargaining in wage determination. Firms set up before the launch of transition are likely to be covered by old-style unions, together with an adapted form of the pre-transition system of industrial relations. Firms established in the early-middle transition, a period of great social unrest, labor market adjustment, and experiments in tripartism, are more likely to operate a system of collective bargaining that protects the low-skilled workers. Finally, firms set up in the late transition, a period characterized by a steady rise of FDI inflows, a closer relationship with the EU, and strong demand for skilled workers, are more likely to operate a decentralized form of collective bargaining, reflecting management concerns with market pressures and the growth of new, revitalized models of union activity.

The distinction between different cohorts of firms can also serve the purpose of a cross-country comparison of union effects in the CE3. Pre-transitional unions are likely to be more effective in determining the pay of their members in Hungary, where successful labor market reforms had been in operation since the late 1960s, than in the Czech Republic and Poland, which had stayed much closer to the mainstream socialist model until the launch of the transition. Unions in firms set up in the early and middle transition are likely to be much more effective in Hungary, owing to the early appearance of FDI inflows, and in the Czech Republic, due to the relatively quick implementation of social concertation, than in Poland where both FDI and mechanisms of social concertation appeared later. Similarly, unions in the late-transition cohort are likely to be more effective in Czech Republic and Poland, owing to the surge of FDI inflows and a more union-friendly environment there, than in Hungary where FDI inflows had slowed by then and the lack of recognition by employers required an additional organizing effort.[12]

Data and Main Variables

We use data from the European Structure of Earnings Survey (ESES) for the Czech Republic, Hungary, and Poland. This is a matched employer-employee data set that is well suited to intercountry comparisons owing to the use of shared statistical definitions and agreed-upon norms for data collection and sampling that render data representative at the individual level.

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[12]Marginson and Meardi (2006), Meardi (2007b), and Meardi et al. (2009) notice more effectiveness and better negotiating capacities by Czech and Polish trade unions than by Hungarian ones. These differences also stem from the interaction between the revitalization strategies pursued by unions and the national institutional context. In the Czech Republic and Poland, partnerships with employers and coalition-building strategies generally allowed quick negotiations after the setup of the union. In Hungary, however, unions' organizing effort in an often hostile setting implied that negotiations normally started only 7 to 10 years later than the actual setup of the union.

The Czech, Hungarian, and Polish samples include, respectively, 1,030,982, 479,009, and 609,764 employee observations for establishments with 10 or more employees in the manufacturing, construction, and service sectors.[13]

We do not consider state-owned establishments, as these were only marginally affected by liberalizations in the transition, nor do we include establishments in the services and construction sectors as these developed primarily after the launch of the transition. We also exclude women, because during transition they tended to concentrate into the services sector (Pollert 1995, 2005) and are characterized by a specific labor supply function in CE3.[14] Finally, we exclude part-time workers, as they are unlikely to be unionized and are concentrated in establishments covered by "any other type of bargaining," such as agreements of individual professional groups that fall within a wide range of economic activities (Eurostat 2003). Our final samples for Czech Republic, Hungary, and Poland thus comprise 203,725, 26,086, and 94,706, respectively, male full-time employees in private establishments in the manufacturing sector.

Our wage measure relates to gross monthly earnings in the reference month, which include bonuses and exclude overtime pay.[15] ESES reports coverage at the lowest level for which collective agreements are signed by the representatives of employers and employees, namely the level of the company, by representatives of the industry, or not signed at all.

Cohort Definition Based on Firm's Longest Tenured Worker

ESES data do not contain direct information on the establishment's set-up date. Instead, we compute this using the tenure of individual workers within the establishment. In particular, we identify the longest tenured worker (LTW) within each establishment on the assumption that an establishment is set up when its first worker is hired. Next, we use this information to assign

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[13]Remote access to the Czech and Hungarian samples of the European Structure of Earnings Survey (ESES) was granted by Eurostat within the LEED project, while the Polish Structure of Earnings Survey was made available to us by the Polish Ministry of Labor and Social Policy. Czech and Hungarian data refer to 2002 while the Polish data refer to 2004. Data representativeness at the individual level is guaranteed by a two-stage sampling procedure, of both firms and workers within the firm carried on the Polish and Hungarian data and a single-stage sampling of establishments with full workers' coverage for the Czech data. As a result of different sampling procedures, the total number of observations is substantially higher in the Czech Republic compared with Poland and Hungary. We account for such differences by using the sampling weights in the analysis.

[14]Female labor supply was high under socialism but decreased sharply during the transition to a market economy due mainly to the structural changes that occurred in labor market conditions and welfare provisions in the CE3 countries (Scharle 2007). These developments differed across countries and over time, for example, Poland observed an initial surge in female participation rates, which fell back only in mid-1990s (Bukowski, ed. 2007, 2010). An analysis that adequately assesses the impact of unions on women's earnings should necessarily take account of these elements and tackle the issue of the gender wage gap in the CE3. This is beyond the scope of the present article and is left as an interesting direction for further research.

[15]We preferred a monthly wage to an hourly wage definition (which is the one most widely used in the union literature) because of a likely problem of under-reporting of actual working hours in the data.

each establishment to one of three cohorts depending on the transition period in which it was founded. In particular, following the classification by Sabirianova, Svejnar, and Terrell (2005), we assign an establishment to the *pre-transition* cohort of employers if the LTW was hired before the launch of transition (i.e., before 1990 in Hungary and Poland and before 1991 for Czech Republic); to the *early-middle transition* cohort if the LTW was hired between the launch of transition and 1997; and to the *late-transition* cohort if the LTW was hired after 1997.[16] We also construct an indicator of workforce reallocation, meaning the degree to which the workforce has changed, in pre-transition establishments. This uses the proportion of LTWs to compute the share of the current workforce hired since the launch of the transition.[17]

Relating our cohort definition to the various restructuring strategies pursued in the CE3 countries during the transition is useful. The LTW methodology assigns to the transitional cohorts the de novo establishments, such as those arising from greenfield investments and which started operating (thus hiring personnel) during the transition. This method treats the establishments of new firms arising from various forms of ownership restructuring, such as divestitures, mergers and acquisitions, spinoffs, and employee-management buyouts, as belonging to the pre-transitional cohort unless their restructuring entailed the full replacement of their pre-transitional workforce.

Distribution of Firms' Characteristics by Cohort

Table 2 shows the average tenure within the establishment of workers by type of bargaining coverage and occupational group. On average, workers in establishments covered by a collective agreement have longer tenures than those in establishments without a collective agreement, particularly in Hungary (roughly 8 to 10 years as compared with 5 years). Workers in establishments covered by industry agreements have short tenures only in the Czech Republic.

Table 3 shows the distribution of firms in the pre-transition, early-middle, and late-transition cohorts by employment size, sector, and type of coverage. In all countries, post-transition firms are smaller on average than their pre-transition counterparts, which is consistent with the widespread evidence that de novo firms are much smaller than the earlier state-owned enterprises (SOE) or the privatized ones (Hughes and Hare 1994; Brada, King, and Ma 1997; Svejnar 2002). The sectoral composition, based on an OECD classification of industries by technology regime (OECD 2001), indicates that the

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[16]Our cohort effects differ from those adopted by Sabirianova et al. (2005) who kept the early cohort distinct from the middle transition one and chose 1998 as a cutoff date for the start of late transition. We opted for one single early-middle transition cohort and for the 1997 cutoff date to ensure sufficient observations in some cells. Moreover, the choice of 1997 better accounts for investors' anticipation effects of the EU negotiations after the publication of the Commissions' *avis*.

[17]Details available from the authors on request.

Table 2. Average Workers' Tenure (in years) by Occupation and
Type of Collective Bargaining Coverage

	Czech Republic			Hungary			Poland		
Type of coverage	Industry	Firm	None	Industry	Firm	None	Industry	Firm	None
Managers and Technicians	7.8	13.6	7.1	11.9	11.2	6.8	9.7	11.6	6.2
Clerical workers	3.9	10.2	5.2	11.1	8.9	5.5	8.3	9.4	5.2
Service workers	5.0	9.6	3.6	9.3	6.4	3.6	2.1	7.7	3.9
Skilled manuals	7.1	12.1	6.0	9.8	8.9	4.9	9.2	10.3	5.5
Elementary workers	5.7	9.1	5.7	4.2	6.4	3.7	6.9	8.0	4.5
All workers	**5.9**	**10.9**	**5.5**	**9.2**	**8.4**	**4.9**	**8.9**	**10.3**	**5.6**

Sources: Authors' calculations on ESES 2002 data. Occupational categories based on the International Standard Classification of Occupations.

Czech Republic has a relatively large percentage of firms in medium-high and high-tech sectors in all cohorts. In Hungary and Poland, the great majority of firms belong to low- and low-medium tech industries, particularly in the transition cohorts. In all countries, the great majority of pre-transition firms are covered by a collective agreement although cross-country differences exist in coverage between the transition cohorts. In the Czech Republic, a large percentage of new firms are covered by collective agreements, particularly in the late-transition cohort. In Hungary, the share of covered firms in the early-middle and particularly late-transition cohorts is much lower than in the pre-transition cohort. In Poland, the percentages of covered firms in the early-middle transition and late-transition cohorts are very similar, and somewhat lower than in the pre-transition cohort. In all countries, the company is the dominant bargaining level. Industry agreements cover a relatively large share of firms in the Czech Republic, particularly in

Table 3. Distribution of Firms (%) by Sector, Size, and Type of Coverage
in the Pre-, Early-middle, and Late-Transition Cohorts

	Czech Republic			Hungary			Poland		
Transition cohort	Pre	EM	Late	Pre	EM	Late	Pre	EM	Late
Industry agreement	7.85	15.15	8.05	8.15	2.10	2.59	1.51	0.91	1.58
Firm agreement	80.71	27.33	55.48	55.81	27.53	14.83	75.29	37.82	37.44
No agreement	11.44	57.52	36.47	36.04	70.37	82.58	23.2	61.27	60.98
Size 10–49	4.67	30.46	20.85	10.19	30.50	44.09	5.61	31.08	31.80
Size 50–249	34.17	47.19	54.15	22.17	29.48	34.60	26.08	41.70	46.31
Size 250–499	15.03	6.55	10.35	20.03	10.57	10.72	21.59	11.23	10.05
Size 500–999	23.21	6.90	5.63	22.34	13.29	7.75	20.4	7.32	5.66
Size 1000	22.92	8.89	9.02	25.27	16.16	2.84	26.31	8.67	6.18
Low, low-medium tech	55.36	55.46	54.53	65.23	53.15	69.04	65.82	77.11	70.88
Medium-high, high tech	44.64	44.54	45.47	34.77	46.5	30.96	34.18	22.88	29.13
Observations	*173,037*	*24,835*	*5,853*	*11,488*	*9,694*	*4,904*	*43,078*	*33,758*	*17,870*

Source: Authors' calculations on ESES 2002 data.
Notes: Percentages are calculated with respect to the workforce of the establishments; the technological intensity classification in low-, low-medium, medium-high, and high-tech industries is based on OECD (OECD 2001), *Pre, EM,* and *Late* denote pre-transition, early-middle transition, and late transition, respectively.

the early-middle transition cohort, and in Hungary in the pre-transition cohort.

These figures confirm that some correspondence exists between a firm's cohort and its type of coverage. Generally speaking, firms that started operation (i.e., hiring personnel) during the transition are less exposed to collective bargaining than are firms that had started operating before transition; however, Hungary experienced a more marked decline of bargaining coverage along the transition cohorts than did the Czech Republic and Poland. In the latter two, after coverage had declined in the early-middle cohort, it recovered in the late-transition cohort. These descriptive data are consistent with the institutional evidence presented above. They point to a constant and steady decline of union bargaining in Hungary during the transition, as opposed to the Czech Republic and Poland where it experienced a stabilization and recovery boosted by the diffusion of MNCs during the late transition.

Empirical Analysis

Empirical Framework

We estimate by Ordinary Least Squares (OLS) the following model of individual earnings for worker i at establishment j:

$$(1) \qquad w_{ij} = \alpha \mathbf{COHO}_j + \beta \mathbf{COHO}_j * \mathbf{AGREE'}_j + \mathbf{X'}_{ij}\gamma + \mathbf{Y'}_j\delta + \mathbf{Z'}_j\lambda + \upsilon_{ij}$$

in which w_{ij} is the log monthly wage of individual i in establishment j. $COHO_j$ is a vector of dummies for establishment j belonging to the pre-transition cohort (*Pre*), early-middle transition cohort (*EM*), or the late-transition cohort (*Late*). $AGREE_j$ is a vector of dummies for establishment j being covered by a collective agreement at the level of the company (*Fagree*) or the industry (*Iagree*). Vector X includes individual worker and job characteristics. Vector Y includes the average characteristics of coworkers, namely, workers in the same establishment and the same skill group. These capture the unobserved ability of individual workers on the assumption that workers with higher unobserved skills tend to have coworkers with higher average skill levels (see also Card and de la Rica 2006).[18] Finally, vector Z includes more than 120 dummies obtained by interacting the observed information on sector and size of the establishment with the information about the cohort and the extent of workforce reallocation in the pre-transition establishments. The extensive number of controls better accounts for otherwise unobserved establishment characteristics. However, the cross-sectional data and the lack of appropriate instruments do not allow us to tackle the endogeneity issues that typically impede a causal interpretation for the OLS

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[18]We define the low, medium, and high skilled as workers belonging to the ISCO occupational groups 9, 4–8, and 1–3, respectively. This classification is preferred to one based on workers' educational levels, because union wage claims are more likely to be formulated in relation to workers' occupations than their educational attainments.

estimates of the union wage premium (see Bryson [2007] for a review). We add simultaneously in Equation (1) the three cohort dummies and their interactions with *AGREE* while we omit the constant term. In this way, *the estimated* β*s measure the wage premium of collective agreements in each cohort*, and their comparison shows how the latter changes between firms belonging to different cohorts.

We proceed as follows: first, we check for any impact of collective agreements on wages without considering the cohort effects. Then we include the cohort effects by estimating Equation (1) on average wages. Finally, we re-estimate Equation (1) separately for low-, medium-, and high-skill workers. In this way, we check whether collective agreements favor specific groups of workers and whether the wage premium by skill group presents different characteristics in the three cohorts.

Estimates

Table 4 reports the estimates for the impact of company and industry agreements on average wages without the cohort effects. We present two sets of estimates for each country. In the first set (Table 4, col. 1, 3, 5), we include only controls for individual and job characteristics (age, tenure, ISCED-education, ISCO-occupation, having a short-term contract) and establishment characteristics (size and NACE2-sector); in the second set (col. 2, 4, 6), we add the characteristics of coworkers and their interactions. The coefficients of the collective agreement dummies in Table 4 are never significant, which suggests the absence of any impact of collective bargaining on wages in CE3. This is at odds with the main findings from the union bargaining literature, which typically point to the existence of a wage premium for collective agreements in continental European and Anglo-Saxon countries (see Bryson [2007] for a review). Indeed, the lack of significance for the coefficients on the collective agreement dummies may also reflect a differential impact of collective agreements on wages in different cohorts or skill groups. We address these issues, first by estimating Equation (1), which allows for a different impact of collective agreements on average wages in

Table 4. The Impact of Collective Agreements on Average Wages

	Czech Republic		Hungary		Poland	
	(1)	(2)	(3)	(4)	(5)	(6)
Firm agreement *(Fagree)*	−0.050†	−0.030	0.022	0.024	−0.007	0.005
	(0.026)	(0.025)	(0.024)	(0.023)	(0.014)	(0.014)
Industry agreement *(Iagree)*	0.027	0.015	0.009	0.004	−0.023	−0.0016
	(0.036)	(0.033)	(0.034)	(0.032)	(0.050)	(0.051)
Coworkers' characteristics	No	Yes	No	Yes	No	Yes
Observations	203,725	203,725	26,086	26,086	94,706	94,706
Rsq	0.47	0.50	0.50	0.51	0.49	0.51

Notes: All estimates include workers' characteristics, NACE 2-digit sectoral dummies, and size dummies. All coefficients for workers' and coworkers' characteristics are available from the authors on request. Standard errors clustered at the establishment level in parentheses: † 10%, * 5%, ** 1%.

each of the three cohorts, then re-estimating it separately for the low-, medium-, and high-skill workers.

Table 5 presents three sets of estimates for average wages. In the first set (Table 5, col. 1, 4, 7), we add only cohort effects. In the second set (col. 2, 5, 8), we add dummies for workforce reallocation in pre-transition establishments. In the third set (col. 3, 6, 9), we also consider interactions between the dummies for workforce reallocation and establishment size. Each set includes cohort-specific size and sectoral dummies and controls for individual and coworker characteristics. The coefficients in Table 5 show a wage premium for collective agreements, which had not been revealed by the estimates without the cohort effects. The magnitude and significance of the union wage premium critically depends on the cohort of the establishment. In the Czech Republic and Poland, a significant wage premium for company agreements occurs in the late-transition cohort (*Fagree*Late*), of magnitude 18% and 8%, respectively, whereas no evidence of a wage premium appears in the pre-transition (*Fagree*Pre*) and early-middle transition cohorts (*Fagree*EM*). In Hungary we observe only a weakly significant wage premium of company agreements (of magnitude 5% to 7%) in the pre-transition and early-middle transition cohorts. The wage premium for industry agreements in the pre-transition cohort disappears once we add the interactions between workforce reallocation and size. Notice also that the rise in the explained variance of individual wages as measured by the R^2 with respect to estimates in Table 4 indicates that the more extensive number of establishment controls accounts for a greater deal of firms' heterogeneity.

Table 5. The Impact of Collective Agreements on Average Wages
by Establishments' Cohort

	CZ (1)	CZ (2)	CZ (3)	HU (4)	HU (5)	HU (6)	PL (7)	PL (8)	PL (9)
Fagree*Pre	−0.031	−0.029	−0.030	0.052	0.054†	0.051†	0.005	0.015	0.017
	(0.028)	(0.027)	(0.026)	(0.032)	(0.031)	(0.028)	(0.025)	(0.024)	(0.025)
Fagree*EM	−0.099*	−0.100∗	−0.099∗	0.071	0.067†	0.067†	−0.018	−0.018	−0.017
	(0.041)	(0.041)	(0.041)	(0.038)	(0.038)	(0.038)	(0.021)	(0.021)	(0.021)
Fagree*Late	0.177*	0.185*	0.181*	−0.045	−0.046	−0.046	0.085**	0.084**	0.084**
	(0.085)	(0.088)	(0.088)	(0.039)	(0.039)	(0.039)	(0.027)	(0.027)	(0.027)
Iagree*Pre	−0.017	−0.020	−0.023	0.071	0.086*	0.070	0.062	0.083	0.093
	(0.038)	(0.038)	(0.037)	(0.044)	(0.044)	(0.043)	(0.076)	(0.074)	(0.068)
Iagree*EM	0.065	0.066	0.067	−0.083	−0.082	−0.082	−0.127	−0.129	−0.130†
	(0.056)	(0.056)	(0.056)	(0.054)	(0.053)	(0.053)	(0.079)	(0.080)	(0.079)
Iagree*Late	−0.028	−0.010	−0.016	−0.089	−0.090	−0.090	−0.013	−0.012	−0.012
	(0.164)	(0.168)	(0.167)	(0.066)	(0.066)	(0.066)	(0.075)	(0.075)	(0.075)
Workforce reallocation	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Size*reallocation	No	No	Yes	No	No	Yes	No	No	Yes
Observations	203,725	203,725	203,725	26,086	26,086	26,086	94,706	94,706	94,706
Rsq	0.52	0.52	0.53	0.53	0.53	0.54	0.52	0.52	0.53

Notes: OLS estimates without the constant; all estimates include workers' and coworkers' characteristics, cohort dummies, interactions between cohort and NACE 2-digit sectoral dummies, and interactions between cohort and size dummies. Standard errors clustered at the establishment level in parentheses: † 10%, * 5%, ** 1%. Rsq refers to the same estimates with the constant (ref. pre-transition firms).

Table 6. The Impact of Collective Agreements on Average Wages of Low-, Medium-, and
High-Skilled Workers, by Establishment Cohort

	Czech Republic			Hungary			Poland		
	LS (1)	MS (2)	HS (3)	LS (4)	MS (5)	HS (6)	LS (7)	MS (8)	HS (9)
Fagree*Pre	0.071†	-0.022	−0.063	0.079*	0.042	0.079*	−0.048	0.011	0.044
	(0.041)	(0.027)	(0.043)	(0.036)	(0.030)	(0.039)	(0.046)	(0.025)	(0.036)
Fagree*EM	−0.085	−0.084*	−0.170**	−0.087	0.090*	0.019	−0.028	−0.004	−0.066*
	(0.057)	(0.041)	(0.057)	(0.062)	(0.043)	(0.049)	(0.041)	(0.023)	(0.033)
Fagree*Late	0.080†	0.195*	0.215*	0.019	−0.036	−0.066	0.049	0.078**	0.117**
	(0.043)	(0.080)	(0.109)	(0.067)	(0.043)	(0.075)	(0.040)	(0.029)	(0.040)
Iagree*Pre	0.049	0.014	−0.126*	0.043	0.079†	0.070	0.112	0.097	−0.080
	(0.046)	(0.041)	(0.050)	(0.062)	(0.047)	(0.072)	(0.147)	(0.078)	(0.059)
Iagree*EM	0.154**	0.070	0.024	0.173*	−0.004	−0.340**	−0.392**	0.083	−0.180**
	(0.054)	(0.057)	(0.076)	(0.076)	(0.050)	(0.089)	(0.073)	(0.079)	(0.060)
Iagree*Late	0.260**	−0.012	0.074	−0.076	−0.051	−0.255†	0.018	−0.044	0.126
	(0.100)	(0.152)	(0.243)	(0.152)	(0.060)	(0.145)	(0.087)	(0.061)	(0.156)
Observations	7,857	142,523	53,345	1,735	18,179	6,172	5,778	69,920	19,008
Rsq	0.31	0.27	0.45	0.38	0.38	0.43	0.32	0.37	0.42

Notes: LS, MS, HS denote low-skilled, medium-skilled, and high-skilled workers, respectively. OLS estimates
without the constant for each skill group. All estimates include workers' and coworkers' characteristics, cohort
dummies, interactions between cohort and NACE 2-digit sectoral dummies, interactions between cohort and
size dummies, dummies for workforce reallocation, and their interactions with size dummies. Standard errors
clustered at the establishment level in parentheses: † 10%, * 5%, ** 1%. Rsq refers to the same estimates with
the constant (ref. pre-transition firms).

Estimates in Table 5 do not provide information on whether company
and industry agreements favor specific types of workers within a given co-
hort. We deal with this issue in Table 6 in which we report the separate esti-
mates of Equation (1) for low skilled (Table 6, col. 1, 4, 7), medium skilled
(col. 2, 5, 8), and high skilled (col. 3, 6, 9) denoted by LS, MS, and HS,
respectively. The results show that the wage premium of company agree-
ments in late-transition establishments in the Czech Republic and Poland is
concentrated among the medium skilled and the high skilled. Czech esti-
mates also reveal a wage premium of industry agreements for the low skilled
both in early-middle and late-transition establishments that was not evident
from the estimates on average wages. In Hungary, company agreements
have a roughly uniform impact on wages along the skill distribution in pre-
transition establishments while industry agreements increase low-skilled
wages in early-middle transition ones. Conversely, we find no evidence of an
impact of collective agreements on wages in late-transition establishments
in Hungary.

Discussion and Conclusions

Our findings contrast with the common view that unions are weak in the
CE3 countries as they show the existence of a wage premium for collective
agreements. We looked at the changing characteristics of the union wage
premium in establishments set up at different points in time. We discovered

that the union wage premium varies according to cohort, and that cross-country differences are substantial. In the Czech Republic and Poland, wage premiums are in fact concentrated in the transitional cohorts, particularly the late one, whereas in Hungary weakly significant firm-level wage premiums exist in the pre-transition and early-middle transition cohort. The particularities of the CE3 systems of collective bargaining also allowed us to evaluate separately the impact of company and industry agreements relative to non-covered establishments. We found that the characteristics of the union wage premium critically depend on the type of coverage. Industry agreements increase wages for low-skilled workers whereas company agreements increase wages for medium- and high-skilled workers, reflecting in industry agreements the persistent influence of wage solidarity and concertation, and in company agreements the greater scope for skilled workers' demands as well as employer concerns about incentives and retention.

Econometric results and institutional evidence suggest that unions in the CE3 countries experienced different paths of development in the transition process. Union characteristics such as the recognition status and objectives can be regarded as once-and-for-all decisions made early in the lifetime of the establishment and influenced by the prevailing conditions at that time (Disney et al. 1995). With the partial exception of Hungary, where elements of modern systems of company bargaining had already developed before the transition, unions in pre-transition establishments continued to reflect the lack of workplace representation inherited from the socialist system. In establishments set up in early-middle transition, corporatist unions that protect low-skilled workers through industry bargaining reflect channels of social concertation activated in that period. The latter were more effective in the Czech Republic and Hungary as compared with Poland where they played only a small role. Finally, in establishments set up in the late 1990s, union revitalization and new flexible systems of company bargaining, particularly advantageous for medium- and high-skilled workers, occurred in response to the expansion of MNCs in the Czech Republic and Poland. In Hungary, institutional and industrial developments, which weakened social concertation, and the widespread lack of recognition by the employers, reduced the effectiveness of collective bargaining in the late transition. A similar pattern is documented for some EU countries, such as the UK during the 1980s (Disney et al. 1995, 1996).

Possible caveats for our conclusions relate to the LTW methodology used to identify the establishment cohorts. As already mentioned, this method may erroneously assign some pre-transition firms to the early-middle cohort if they had completely restructured their workforce during the transition. It may also misleadingly assign some firms to the pre-transition cohort if they underwent a major takeover during transition, for example by a multinational, but retained a small percentage of their former workforce. Under the realistic assumption that older establishments are less productive than more recently founded ones (Estrin et al. 2009), and more likely to be covered by collective agreements, if the other regressors are linearly

independent, both types of measurement error would lead to an underesti-
mate of the impact of unions on wages in the transition cohorts.[19]

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[19]Of course, identifying the direction of the potential bias in a multivariate context becomes impossi-
ble in the presence of some degree of linear dependence between the regressors; however, the negative
signs of some coefficients in Table 6 (particularly for the high-skilled workers) are consistent with a pro-
ductivity gap of firms covered mainly by industry agreements in the early-middle transition cohort.

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