Industrial Democracy Today: An Examination of European Codetermination

Krister Rasmussen

2021

Abstract

This thesis examines the institution of codetermination, under which a private firm's workers as well as its shareholders elect representatives to the firm's governing board. The thesis surveys the history and present state of European codetermination, before presenting the first comprehensive estimates for private-sector codetermination coverage in the Nordic states (Denmark, Norway, & Sweden) as well as comparable estimates for Germany, and examining statistical relationships between codetermination presence and outcome variables at firm level that are theorized to relate to codetermination.

JEL Codes: J30, J53, J59, K31, L25

Acknowledgements

I thank Thomas Piketty for his support and supervision during the production of this thesis. Thanks are also due to Jérome Bourdieu for agreeing to serve as a referee for this thesis' defence. I am grateful also to my peers at PSE for their discussion and advice in the course of this project. Most of all, of course, I thank Lara, whose patience, care, and devotion make possible all I do.

Contents

1 Introduction

If capital is back, what news of labor?

Scholarship and commentary over the past two decades have called attention to the rise — or return — of a 'proprietarian' political economy, in which social patterns of power and production are dominated by private property.[1] We now know that the patterns of ownership of capital stocks are dramatically and increasingly uneven,[2] and that the control afforded by ownership is growing more absolute. Earning power in the dimensions of both labor and capital has been further concentrated into the hands of those whose endowment was already greatest.[3] Ever-greater control over productive processes is afforded to private stakeholders, a group that is growing in relative power and shrinking in relative size. Meanwhile, since the latter part of the last century, labor's share of aggregate earnings in developed countries has been in continuous decline.[4] This decline in earning power, and the attendant decline in class mobility[5] and slowing growth in standards of living[6] are in part symptoms of the withering of institutions designed to assure that even those who did not belong to the propertied classes might hold appropriate power over productive and allocative processes.[7] Class polarization and the disempowerment of those who do not own or control capital have corrosive implications for open and democratic societies, cheating them of their promise of self-rule by equals[8] and contributing to strife that can pull them apart.[9]

There is clear value, then, in a discussion of how our productive systems relate capital and labor, manager and employee — how the parties coordinate themselves in the productive sphere, and how they share the results of their productive cooperation. I aim to make some contribution to that discussion in this thesis' examination of codetermination, a power-sharing approach to industrial governance under which a firm's workers as well as its shareholders elect representatives to the board of the firm. Codetermination is a venerable but under-examined feature of the European industrial landscape. Its functional unobtrusiveness belies radical origins, born as it was from a hope of moving past the adversarial relationship between labor and management that has characterized Europe's capitalist order of production since its birth in the seventeenth century, and of establishing an 'industrial democracy' commensurate with the political democracy that has been the continent's hard-sought ideal since that same era.[10] This thesis examines European codetermination with a focus on Germany and the Nordic states, assessing what we might learn about the status & implications of workers' involvement in industrial governance.

[1] Piketty (2020)
[2] Piketty (2014); also Milanovic (2016)
[3] Atkinson & Lakner (2017)
[4] Elsby, Hobijin, & Sahin (2013); also Doan & Wan (2017)
[5] Chetty et al. (2016); also Davis & Mazumder (2017)
[6] Lazonick (2018); also Goldberg & Torras (2021)
[7] Pariboni & Tridico (2019); also Stansbury & Summers (2020)
[8] cf. Dewey (1888); also Anderson (1999); also Scanlon (2017)
[9] Polanyi (1944); also Karl (2000); cf. also Gethin, Martinez-Toledano, & Piketty (2021)
[10] cf. Naphtali (1966); see also Zielinski (2015); and Zwing (1925)

2 What is codetermination?

2.1 A little history

The basic premise of codetermination is the institutionalized sharing of directorial power between representatives of labor and representatives of capital. This is not a new idea. Historians of the subject have pointed to mid-nineteenth century British laws granting employees at the universities of Oxford and Cambridge voting rights in institutional governance as early examples of codetermination law. The first serious proposal to institutionalize worker representation at scale appears to have been made by the revolutionary parliament established at Frankfurt in 1848[11], and although the proposal (like the revolutionary state itself) did not immediately take hold, it inaugurated the special association that the codetermination model would have with Germany and her neighbors. In any case, though its roots certainly lie in the nineteenth century's piling-up of labor in industrial masses, codetermination would not take hold at the institutional level until after the wars of the early twentieth century.

One can think of codetermination as occupying a sort of middle ground between the total control of managerial decision-making by capital and the wholesale supercession of shareholder power by labor. It was therefore a natural fit for the postwar states of northern and central Europe, pulled between the Anglo-American and Soviet models of industrial organization abroad and unsettled at home by class conflict that came to a head in the industrial strife of the 1970s. Codetermination as it exists today emerged in this setting. Between the end of the Second World War and the mid-1970s, Germany[12], Austria [13], Denmark [14], Sweden[15], and Norway[16] all enacted laws providing for the elected representation of employees on the boards of private firms exceeding a certain size, and more limited measures establishing similar representation on a voluntary basis, or among only certain classes of enterprise, were instituted across Europe more broadly.

The postwar expansion of worker representation stalled in the 1980s. Few countries adopted codetermination laws in the final two decades of the twentieth century, and most of those that did were former members of the Eastern Bloc, where codetermination was the outcome of a very different bargaining arrangement than had obtained in the West; in these countries, codetermination law was often drafted so as to apply only to state-owned enterprises, whose share of overall output and employment has decreased markedly over time. Codetermination law has subsequently been rolled back in a number of countries, including Germany[17] and the Czech Re-

[11] Teuteberg 1960
[12] Coal and Steel Codetermination Act 1951; Codetermination Act 1976
[13] Labor Constitution Act 1975
[14] Companies Act 1973
[15] Act on Board Representation of Private Sector Employees 1972
[16] Limited Liability Companies Act 1973
[17] A reform to the *Aktiengesetz* of 1994

public[18], and has been abolished altogether in Spain.[19] Nonetheless, the recent history of codetermination is not one of generalized decline. In most countries where the system exists, it has not become a point of serious political contention, let alone an object of the sort of vigorous laissez-faire scrutiny that has gnawed away at other progressive institutions of the mid-twentieth century. Worker representation has even gained ground in some places,[20] and as concerns over the ramifications of a less powerful and more dislocated labor force have risen in the years since 2008, the question of board-level representation of workers has enjoyed a modest but notable return to scholarly[21] and political[22] attention.

2.2 What effects might codetermination have?

So much for where it came from; what might it actually do? Here I briefly lay out the mechanisms of effect that have been attributed to codetermination. They fall into three families: first, codetermination might shift the patterns of income in industry and society; second, codetermination might alter the relationship between management and labor; and third, codetermination might alter corporate governance or behavior.

Codetermination might shift the patterns of income.

Certainly, the idea that codetermination might affect the magnitude and distribution of rents in the labor market has been influential in scholarship of the subject. The expectation that their representation in firm governance would leave workers more able to extract rents has motivated critics and proponents of codetermination alike. Codetermination is sometimes — perhaps hastily — considered to be of a piece with other labor-oriented institutions like unions or co-operatives, in the sense that its primary effect will be to give labor a firmer hand on the wheel (and the wallet) of the enterprise.[23] At least one influential treatment of codetermination goes so far as to characterize the institution as an intermediate position between traditional shareholder-controlled firms and fully worker-owned, worker-operated cooperatives,[24] and while there is pretty good reason to think that that would be too simple a view of the institution, it is nonetheless true that to the extent that codetermination might shift rents from management to labor, it could reduce the firm's owners' incentives to invest. This is the idea of the 'hold-up problem', which has been

[18] A reform of 2014 removed all private-sector requirements for board representation

[19] Spain had introduced a law mandating board representation in larger firms and public-sector enterprises in 1962; it was repealed in 1980.

[20] In France, for instance, a reform of 2013 made worker representation on boards mandatory for very large firms.

[21] A partial list of major recent publications advocating for codetermination might include Autor, Mindell, and Reynolds (2019), Piketty (2020), or Fraser, Mouffe, Sassen, Müller, Rodrik, Piketty, Zucman, Chang, et al. (2020)

[22] Bernie Sanders and Elizabeth Warren, two prominent candidates for the American presidency in 2020, claimed that they would pursue robust codetermination policies if elected; meanwhile, since 2016, both major parties of the United Kingdom have at one point or another proposed worker representation, as has the Australian Labor Party.

[23] for example, see Lindbeck & Snower (1989)

[24] Jensen & Meckling (1979)

a chief theoretical concern for students of codetermination.[25] The primary implication of this problem, and what we would expect to see if the theory held true, is a tendency to lower levels of investment and less capital-intensive modes of production.[26]

Of course, if it is the case that rents are being shifted from management to labor, we would also expect to see workers taking home a higher share of income — hence a second main strand of the theory concerning codetermination's effects on firm rents, focussing on the suggestion that codetermination could mean higher incomes for workers or a reduction in intrafirm pay inequality.[27] To the extent that codetermination might raise pretax incomes for those at the lower end of the income distribution, it holds obvious interest for those concerned with accounting for or addressing income inequality in general.[28] Reducing intrafirm inequality and raising labor power could also serve as a useful counterweight to the growing market power enjoyed in particular by large firms: the idea that internal wage rebalancing can transfer wealth back to the many in a context of high and growing corporate market power, particularly in labor markets[29], is one that could be cited in defence of codetermination.[30] A role for labor in determining remuneration within the firm might also have effects at higher pay grades: employee representatives, likely more conscious of (and less comfortable with) immense disparities between employers' and employees' pay packages, might impose a constraining effect on executive pay.

Greater power for labor within the firm might also have the effect of cementing incumbent workers in their roles: if labor has influence over hiring procedures, it could face incentives to keep new employee intakes low, so as to strengthen incumbent workers' claims on existing income flows and to drive up capital-to-labor ratios (thereby raising labor's marginal product).[31]

Codetermination might alter the relationship between management and labor.

Conceived in an era of chronic industrial strife, codetermination was from the outset explicitly understood as a sort of institutional concession to labor by capital, made to secure a less adversarial mode of labor relations in which all involved in the productive process might make their voices heard.[32] For this reason, a primary expectation one might have is that codetermination could reduce shop-floor acrimony and the incidence of labor disputes. One would expect to see fewer strikes and work stoppages in industries with a greater prevalence of codetermination.[33]

[25] Benelli, Loderer, & Lys (1987); also Menezes-Filho & Van Reenen (1998)
[26] Grout (1984)
[27] Freeman & Lazear (1995); cf. Freeman & Medoff (1984)
[28] cf. Blanchet, Chancel, & Gethin (2020)
[29] Azar et al. (2017)
[30] cf. Khan & Vaheesan (2016)
[31] see Furubotn (1978); or Gallaway (1978); for a paper whose empirical observation contradicts this hypothesis, see Gurdon & Rai (1990)
[32] McGaughey (2016)
[33] Bradley & Gelb (1983)

Beyond its role in defusing what we might think of as 'hot' labor relations, codetermination could have coordinational effects on enterprises' everyday functioning. In particular, it might affect the contracting practices of management and labor.

Practically any real-world employment contract can be understood as incomplete — that is, insufficiently state-contingent due to the cost, asymmetry, or inaccessibility of relevant information — such that agents' behavior in various important states of the world may be underdetermined by the terms of the contract. This can produce imperfections in the coordinational relationship between employer and employee, which codetermination might address. Of particular interest is the situation where the asymmetry of information between management and labor could incentivize managers to misrepresent the firm's situation to its workers.[34] The incentive to misrepresent could eliminate the credibility of management's reports, precluding (potentially optimal) state-contingent contracts whose terms might vary in function of the firm's situation.[35] Were the firms able to resolve this credibility problem, they might be free to engage in employment relationships that would be preferable for employer and employee.

A second, related strand of the incomplete-contracts literature addresses the possibility that codetermination might actually resolve a hold-up problem associated with underinvestment (by workers) in firm-specific development of human capital[36] or (by management) in worker-specific development of fixed capital.[37] Workers' representation in corporate governance could lead them to commit themselves more fully to the success of their specific firm, raising their personal investments in both experience- and effort-based productivity.

The resolution-of-incomplete-contracts mechanism discussed above has to do with the potential of codetermination to strengthen a management-to-labor informational channel. Codetermination might also strengthen a reverse informational channel, making labor's knowledge and preferences heard at the level of corporate governance. While the first informational dynamic has to do with something like 'gaining the worker's trust' — productivity rises as workers get a clearer picture of what management is up to, and can as a result rationally commit to otherwise untenable sorts of action — this second dynamic runs the other way, the mainspring here being the workers' collective institutional capacity to speak, rather than to hear. One way this might raise productivity is by keeping management informed concerning the state of the employees. If a happy worker is a hard worker, and if it's easier for management to keep its workers happy when management hears from its workers, then it's pretty clear how a firm whose workers have greater voice could be a firm whose workers are more dedicated and more productive. (It bears noting that actual employee representatives frequently indicate precisely this sort of communicative role

[34] Tirole (1986); Freeman & Lazear (1995)

[35] Grossman & Hart (1981)

[36] For instance, firm-specific training (see Becker (1962); and Hashimoto (1981)), or back-loaded compensation rewarding earlier performance (see Lazear (1979); Gibbons & Murphy (1992)

[37] Compare this supposed mechanism with the role for unions in enforcing the productivity-enhancing implicit terms of contracts theorized in Hogan (2001)

as among their most important functions.[38])

The possibility that codetermination might enable more cooperative relationships between management and labor and thereby make for more 'nimble' firms has fuelled interest in the subject, particularly in light of the 'German employment miracle' during the post-2008 crises — numerous commentators have entertained the idea that it was thanks to codetermination that German firms were able to pull off innovative labor-contracting approaches (including flexible hours and 'wage moderation') that were key to minimizing job losses and the long-term trauma of the recession.[39]

Codetermination might alter corporate governance or behavior.

Now, this could be for better or for worse. Probably the most influential extant theory of the firm would have us believe that it operates as a sort of 'machine for monitoring' — the firm exists to facilitate informational flows between contracting parties, and to obviate shirking or other behavior that would drag the firm away from optimality.[40] Traditionally, economists have tended to presume that the contracting party who is in want of monitoring is the employed party, that is, labor. Whether or not that is the case, every contract is a two-way agreement, and laborers — particularly those with long-term commitment to a firm — will have behavioral expectations all their own of management (maintaining a proper working environment, for example, or making prudent choices about firm strategy). Codetermination can be seen as both a diffusion of power in corporate governance and a reinforcement of labor's power to monitor management.[41]

Making authority more diffuse could do the same to accountability, potentially leading to firms that are led in a way that is less responsible, more short-termist, and (over time) less productive.[42] On the other hand, and especially if workers are actually more concerned with the long-term health of the firm than are shareholders and their representatives, worker representatives could tighten up standards of responsibility in corporate behavior and undo the logic behind what might be termed 'Gresham's Law in corporate governance'.[43] That workers have more interest in

[38] See, for instance, Gold, Kluge, & Conchon (2010); or Gold (2011)

[39] Herzog-Stein, Lindner, & Sturn (2018); Krugman (2009); Möller (2010)

[40] cf. Coase (1937); also Alchian & Demsetz (1972)

[41] cf. Smith (1991). Indeed, keeping an eye on the activity of the managers was an explicit goal of early advocates of codetermination. Hans Böckler, postwar Germany's most influential trade unionist, put it this way: "*Wir dürfen aber eigentlich die Unternehmer keinen Augenblick unter sich alleine lassen… Wir müssen in der Wirtschaft selber sein, also völlig gleichberechtigt vertreten sein… Also der Gedanke ist der: Vertretung in den Vorständen und Aufsichtsräten der Gesellschaften.*" ("We really cannot leave the employers alone together in a room by themselves for a moment… We must ourselves be directly in the economy, and so be fully endowed with equal rights… So the proposition is this: representation on the management and supervisory boards of industry.") see p.33 in *Protokoll der ersten Gewerkschaftskonferenz der britischen Zone vom 12.-14. März 1946*, Hannover, Entschliessung Nr. 6

[42] Tirole (2001); and Tirole (2010); and Jensen & Meckling (1979)

[43] Whereby, that is, the 'bad coinage' of short-termism drives out long-termism. Cf. Haldane (2011): given the very short horizons for shareholders and high-level managers alike in modern industry, it is not implausible that *workers* have the longer horizon.

the long-term success of their firm than do shareholders is more likely to be true in a context of activist shareholders who may hold their stakes only very briefly[44] or who hold stakes in a range of other firms that are differently incentivized or perhaps even competitors.[45]

On quite the other side of the debate, there is a hardy strain of critique rooted in the logic of property rights, whose exponents agree that the representation of workers will lead to a conformation of corporate decisionmaking to the preferences of labor, and for this very reason predict serious negative consequences for the firm. I have already mentioned the hypothesis that firms with workers in positions of decisionmaking power will exhibit capital-to-labor ratios that are above optimal, which is a frequent implication of the analyses made by researchers sceptical of codetermination.[46] More dire evaluations hold, for example, that codetermination could not be efficient, since it is only ever the product of of top-down legislation[47] (whereas, if it were efficient, codetermination would not require legislation to bring it about); or that it is a hamfisted and potentially costly intervention that, as far as firm-specific investments by workers go, addresses a problem that contractable job security rights would solve better[48]; or that including workers in corporate governance will lead to an inefficient 'divorce between decision-making and risk-bearing'[49]; or indeed, most dramatically, that workers will begin 'transforming the assets of the firm into consumption or personal assets… [and] the value of the stock will go to zero'.[50] The concern, in short, is that the codetermined public firm will be considered less valuable by investors – maybe because codetermination depresses the productivity or profitability of a firm, reducing the value of the future profits on which the prospective shareholder would be purchasing a claim; or perhaps because investors attach some intrinsic value to the control associated with owning a stake in a firm, and this control is diluted to the extent that workers take up corporate governance roles previously controlled exclusively by the shareholders. The implication is that codetermination is predicted to be inefficient and costly in ways that will show up in the firm's productivity, profitability, capital/labor ratio, or market value. The spirit of these property-rights based criticisms is that efficient utilisation of property directly entails the close holding of control of that property by the owner (that is, the claimant on the residual product of the property) and not by others, because it is only the owners of capital whose interests are rightly aligned with maximizing the present value of firm income. The property-rights school of thought is clear that codetermination represents an 'attenuation'[51] of the income rights and control rights whose snug unity underlies the traditional conception of ownership, and in this regard, these criticisms

[44] And so desire corporate governance that yields short-term rewards through rising share price, which may not – over the long run – be the sort of corporate governance that is efficient or otherwise desirable. Cf. Dallas (2011).

[45] Such shareholders or managers will not appropriately optimize their decision-making at the firm level: cf. Steinbaum (2021)

[46] see discussion in Gurdon & Rai (1990)

[47] Jensen& Meckling (1979), p469, 473; this is a strange claim not least because it is demonstrably false, as is shown later in this thesis; see also McGaughey (2016)

[48] for instance, Williamson (1985)

[49] Pejovich (1978)

[50] Jensen & Meckling (1979), p. 504

[51] Furubotn (1981)

actually evoke some of the same thoughts – about how codetermination might remake the relationship between ownership and control of capital – that are raised by its advocates.[52] Indeed, for all the bluster of their pessimism, the property-rights theorists actually agree with many of codetermination's defenders about what, in principle, it would do, namely condition industrial decision-making on the interests and judgements of the workforce.

The sharpest point of disagreement is somewhat more local, and concerns the content and implications of this conditioning. For detractors of codetermination, it is generally taken as obvious that workers' interests will diverge 'significantly' from the interests of the firm's owners (assumed to be nothing more or less than the maximization of the present value of the firm-as-income-stream).[53] To the extent that their judgments will track their interests,[54] the conditioning of corporate governance on those judgements will therefore be inefficient. Those who are for codetermination largely agree that a primary effect will be to condition firm governance on workers' judgments, but disagree that the effects will be negative. This could be because they believe that incorporating workers' judgments will actually increase the value of the firm-as-income-stream (perhaps for the sorts of reasons concerning informational effects sketched above); or because they believe that workers' interests and judgments will not in fact conflict with the maximization of the present value of the firm's income; or because they believe that heeding workers' interests, whatever they may be, will by necessity bring firm governance in line with the interests it should be serving (perhaps *just because* employees are coequal industrial partners – call this the 'moralized' argument, in keeping with the terminology of the property-rights school); or, finally, because they believe that workers' incorporation in industrial governnace will serve higher (perhaps social) interests better than will a system under which firms are governed without the input of their workforces.

A final note on corporate governance effects: though codetermination' material implications are of course of primary interest, its effects on corporate governance might not be of the sort that can be 'cashed out' in the terms of a firm's financials; codetermination might have further effects that are, at most, only indirectly connected with output or income. For instance, it has been suggested that representation in and of itself might mean workers are more satisfied with their jobs (independent of income).[55] Other research has suggested important connections between codetermination and representational equity — beyond the evident claim that workplace equity is intrinsically improved by giving workers a voice in the making of decisions that affect them, there is good reason to think that worker representation might improve the gender, educational, and socioeconomic diversity of corporate boards.[56]

[52] cf. Piketty (2020)
[53] cf. Furubotn (1981)
[54] (an extent that is assumed to be pretty near total)
[55] Grund & Schmitt (2011)
[56] Jager, Schoefer, & Heining (2020); Hagen, Huse, & Nielsen (2009)

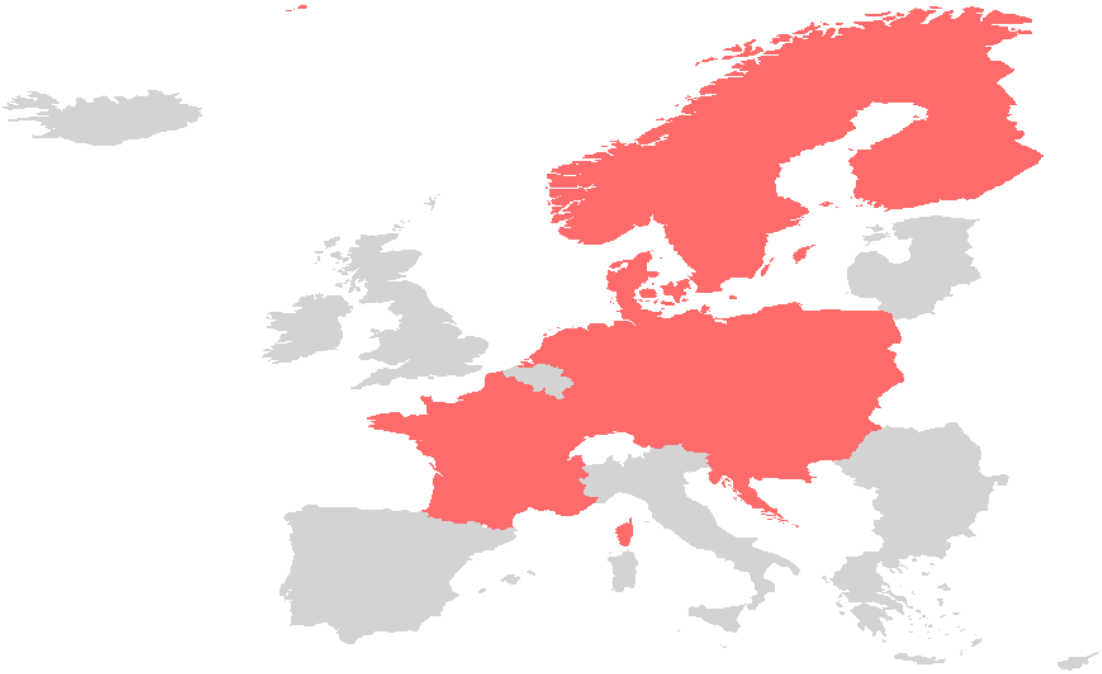
3 Codetermination on the continent: a survey

This first investigative section assembles summary statistics and relationships that can give us a working idea of the status of European codetermination and the context in which it exists.

3.1 Survey of presence and scale of codetermination regimes

Presence of codetermination regimes

This map shows in red the countries among the EU27 (plus the UK, Norway, and Iceland) that had, as of 2016[57], institutionalized some form of employee representation on the supervisory or executive boards of private enterprises.



As already discussed, codetermination is a phenomenon peculiar to continental Europe, and central Europe specifically. Nonetheless, the extent of its spread across the continent exceeds what the literature can often seem to indicate, with the typical focus placed overmuch on German codetermination without corresponding attention to the institution's prevalence across other parts of Europe. Codetermination in Eastern Europe, in particular, has received disappointingly little scholarly attention – as the institution there is a legacy of communist governance rather than (as in the west) a product of the trade-union movement, one imagines that there could be characteristic differences that might merit investigation.

[57] ETUI data (2015), Conchon, Kluge, & Stolt; also CBR Labour Regulation Index (2016), Adams, Bishop, & Deakin.

Scale of codetermination regimes

This map shows the breakdown of European codetermination regimes according to the following five-point scale[58]:

4. Substantial worker presence on boards is possible or mandatory for a substantial portion of private firms.

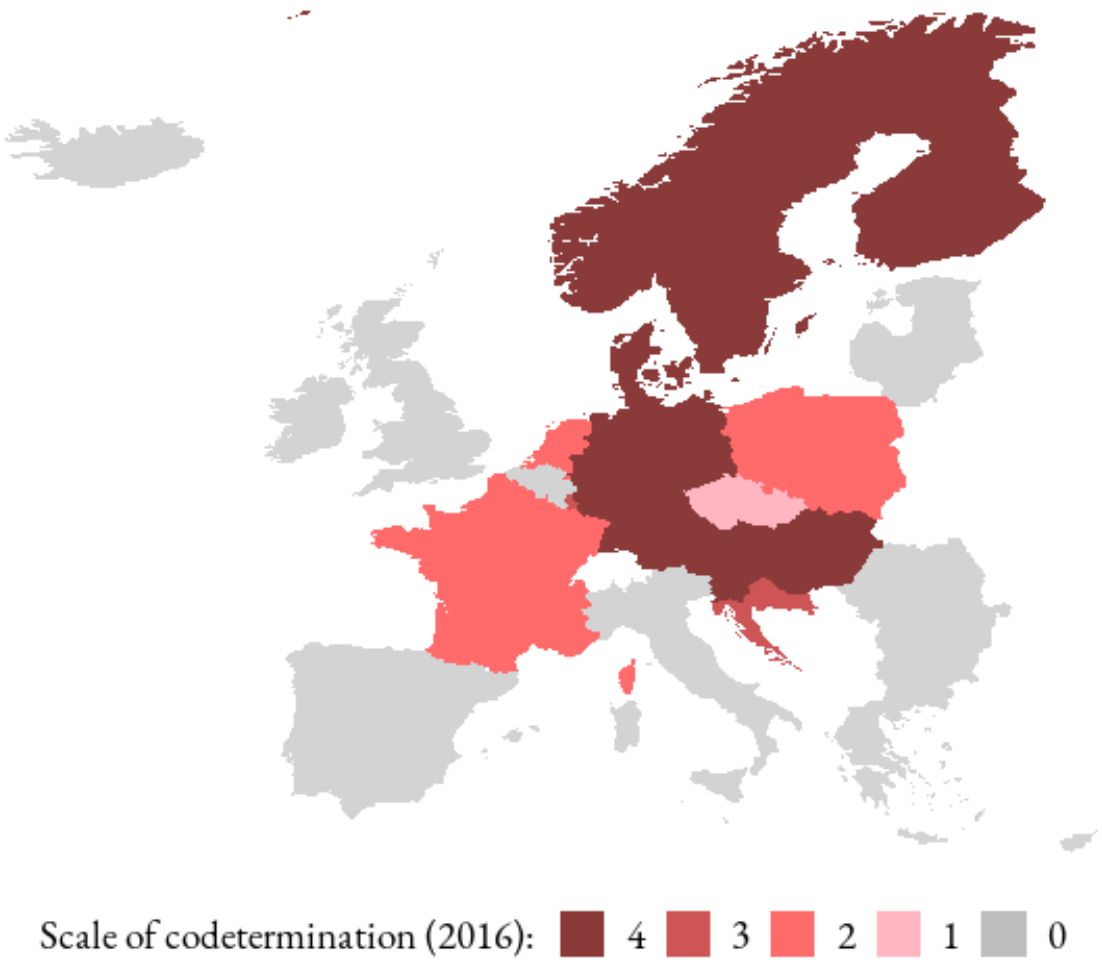
3. Limited worker presence on boards is possible and mandated for a considerable portion of private firms.

2. Limited worker participation in boards is possible and mandated for a relatively narrow segment of private firms.

1. Restricted worker participation is provided for but not mandatory.

0. No explicit provision for worker presence on boards.

[58] ETUI data (2015), Conchon, Kluge, & Stolt; also CBR Labour Regulation Index (2016), Adams, Bishop, & Deakin.



3.2 Country-level associations

As a prelude to more granular investigations, it is interesting to observe the correlations between the presence of codetermination and certain outcomes of interest at the national level.

Table 1 displays correlations between codetermination presence and the Gini coefficient of market income before taxes and transfers (this is the appropriate outcome measure since, if codetermination has any income effects, one would expect these to manifest predominantly within the firm, at the level of take-home pay, rather than after transfers). There is a significant though modest negative association between codetermination and the Gini (indicating that codetermination is associated with greater income equality).

This apparently strong macroeconomic relationship is puzzling in light of recent microeconomic evidence finding little effect of codetermination on income distributions within the firm[59], al-

[59] Jäger, Schoefer, & Heining (2020)

Table 1: Gini coefficient of pretax market income

	Dependent variable:	
	Gini coefficient	
	(1)	(2)
Codetermination presence	−0.035***	
	(0.006)	
Codetermination scale		−0.010***
		(0.001)
Collective bargaining coverage	−0.0002**	−0.0002**
	(0.0001)	(0.0001)
Total tax revenue as % of GDP	0.001	0.001*
	(0.001)	(0.001)
Unemployment rate	0.003***	0.003***
	(0.001)	(0.001)
Constant	0.401***	0.396***
	(0.021)	(0.021)
Observations	168	168
R^2	0.391	0.411
Note:	*p<0.1; **p<0.05; ***p<0.01	

though it is consistent with certain theoretical predictions about the institution[60]. One might suspect that this significant relationship is picking up on a background correlation between codetermination and some other relevant feature of these countries, such as (a) the strength of the employee class or (b) the presence of other structural features that would tend to promote income equality like a history of left-wing politics, and this is probably true to some extent, though such explanations are puzzling given the lack of any strong relationship between the Gini coefficient and collective bargaining coverage or tax revenues as a share of GDP (which one would expect to reliably correlate with (a) and (b) respectively).

Table 2: Income share by earnings bracket

	Dependent variable:			
	Income share (pre-taxes & transfers) of the (X) percentile group of earners			
	Bottom 50%	50-90%	Top 10%	Top 1%
Codetermination scale	0.726***	−0.078	−0.648***	−0.132
	(0.077)	(0.069)	(0.117)	(0.087)
Collective bargaining coverage	0.010*	0.030***	−0.040***	−0.037***
	(0.005)	(0.005)	(0.008)	(0.006)
Total tax revenue as % of GDP	0.093***	−0.083***	−0.010	0.076**
	(0.034)	(0.030)	(0.051)	(0.038)
Unemployment rate	−0.054*	0.076***	−0.022	−0.028
	(0.030)	(0.027)	(0.046)	(0.034)
Constant	16.951***	46.076***	36.973***	9.999***
	(1.107)	(1.000)	(1.691)	(1.254)
Observations	260	260	260	260
R^2	0.463	0.177	0.256	0.139
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 2 shows the association with the income shares of certain earnings brackets (again, before taxes and transfers). Interestingly, the estimates are quite consistent with what one would hypothesize are the most plausible relationship between codetermination and incomes. The bottom 50% of earners – the traditional working class, in other words – see their incomes rise, while there is

[60] Kraft (2017)

a significant association with a decline in the income share of the top 10% *apart* from the uppermost 1% – an earnings bracket dominated by the white-collar managerial class who occupy the upper echelons of firms. There seems to be little relationship with the income of the top 1%, who are distinguished from the masses by enjoying substantial non-labor income from capital holdings – again, if the main way one would expect codetermination to affect income patterns is through compressing intrafirm pay schedules, it is entirely unsurprising that codetermination status would have less co-movement with the income shares of those who enjoy substantial investment income.

Table 3: Frequency of labor disputes

	Dependent variable:
	Log. frequency of labor disputes
Codetermination presence	-2.663^{***}
	(0.819)
Collective bargaining coverage	0.010
	(0.013)
Total tax revenue as % of GDP	0.157^{*}
	(0.079)
Unemployment rate	0.048
	(0.106)
Constant	−1.216
	(2.533)
Observations	65
R^2	0.253

Table 3 shows the observed relationship between codetermination presence and the frequency of labor disputes; again, there is a substantially lower incidence of strikes, walkouts, and lockouts among countries with codetermination provisions.

Now, it seems by far most the most sensible conclusion to say that the associations observed here between the outcomes surveyed and codetermination status are not due to codetermination in any simple way – it is more reasonable an explanation to suggest that the sorts of countries that introduce codetermination laws may be those that already have a background of relatively coop-

erative labor relations and labor-market institutions that promote relatively egalitarian distributive results. No claim is made that these results reveal any sort of causal effect, much less one attributable to worker representation specifically. The more plausible claim is a more limited one – that codetermination is part of a family of (and thus correlated with) certain pro-cooperative labor institutions and positive outcomes for labor relations.

A fuller consideration of codetermination requires a more granular assessment, at a firm-by-firm level. That is what the subsequent sections of this thesis will be devoted to.

4 Codetermination in the Nordic states: a firm-level analysis

Here, I move to a more focussed study of codetermination in Denmark, Sweden, and Norway, three countries where the institution has sunk its roots deepest. This section presents what are the first comprehensive estimates of codetermination coverage in these countries, as well as a statistical analysis of the relationships between codetermination and certain outcome variables of interest. My aim in this section is to explore whatever empirical evidence there may be to be found for codetermination's various mechanisms of effect as laid out in Section 2.

4.1 Summary of codetermination regimes by country

All three countries have longstanding legislation providing that employees of firms exceeding a certain size be afforded the right to representation on the firm's supervisory board. However, the specifics vary from country to country.[61]

In **Denmark**, employees of a public and/or limited firm receive the right to representation on their firm's supervisory board once the firm employs more than 35 workers. To exercise this right, a majority of the firm's employees must vote in favor of representation on the board. If the vote for representation passes, the employees are entitled to elect representatives numbering half the seats on the board that are appointed by shareholders, rounding up — in other words, employees in firms with more than 35 workers may elect around one third of the board.[62]

In **Norway**, employees are accorded the right to representation in a three-tiered system subject to three thresholds. The exercise of this right is subject to a majority vote among the employees.

- In companies employing between 30 and 50 people, employees may elect one board representative and one (non-voting) observer member of the board from among themselves.
- In companies employing between 50 and 200 people, employees may elect representatives numbering *at least two* and *up to one third* of the board.
- In companies employing more than 200 people, employees are entitled to one further elected board member and two further observers in addition to those granted at the prior threshold.[63]

In **Sweden**, employees are afforded the right to representation subject to two thresholds.

- Employees of a firm employing more than 25 people may claim two representatives.

[61] For a more extensive treatment of these countries' codetermination structures, see Thomsen & Conyon (2012), Ch. 16; or Thomsen, Rose, & Kronborg (2013)
[62] Public Companies Act (1973)
[63] Norwegian Public Limited Liability Companies Act (1997)

- Employees of a firm employing more than 1000 people may claim three representatives.[64]

Sweden is peculiar in that the decision to exercise the right to representation and the implementation of elections are the exclusive responsibilities of a union bound by collective agreement with the firm in question, in keeping with the country's union-first approach to industrial relations.[65]

Note that these national schemes vary not only in terms of the numerical thresholds but in the terms of representation (proportional versus absolute). Note further that, unlike the stricter form of codetermination that was instituted in Germany, worker representation is not directly mandated for these countries' firms — instead, workers have the right to representation, but they must be proactive in some way in order to exercise that right. In Denmark and Norway, the majority of a firm's employees must vote in favor of claiming their representation on the board before they may elect representatives. In Sweden, worker representation on the board of a firm depends on the presence and affirmative decision of a recognized union or workers' organization bound in a collective bargaining agreement with the firm in question. The opt-in character of codetermination in the Nordic countries opens the questions of how many firms actually implement employee representation and whether there is anything that distinguishes that firms that exercise codetermination from those that do not. It also differentiates the observation I do here from previous empirical studies, which have tended to focus on the German context, where codetermination was historically mandatory, though restricted to firms over an employee count much higher than in Scandinavia.

4.2 Summary of data

The data I use is taken from Bureau Van Dijk's Orbis database, the world's largest collection of firm-level panel data, including details on balance sheets, employment statistics, and supervisory boards. My data, which is of yearly frequency from 2011 to 2019, includes all firms in the Orbis database satisfying the following criteria:

- public or private limited companies
- incorporated in Denmark, Sweden, or Norway and not known to have ceased operations
- counting 20 or more employees in at least one of the years on record.

A total of 62,041 firms are thus selected. Subsequent data cleaning reduces this set to 51,509. 9,282 of these firms are in Denmark, 17,707 are in Norway, and 24,520 are in Sweden. The table below breaks down the distribution of firms by country and by firm size, calculated as the firm's average employee count over all years the firm is recorded as being active.

[64] Act on Private-Sector Employee Representation on the Board (1987)
[65] cf. Victorin (1979)

Country/Size band	**0-24**	**25-49**	**50-99**	**100-199**	**200-499**	**500-999**	**1000+**
Denmark	2316	2966	1803	970	678	277	272
Norway	7621	5924	2292	1020	523	159	168
Sweden	10018	6550	3799	2020	1236	452	445
All	19955	15440	7894	4010	2437	888	885

4.3 Observing employee representation

Firm-level records in Orbis report the names and titles of the members of the firms' supervisory boards. There are 670 unique titles in my dataset, and I have manually classified these as either denoting that the titleholder is an employee representative (example titles include "Director, Board of Directors; Employee Representative", "Elected By Employees; Director / Member of the Board", "Employee Representative; Regular Member") or is not (example titles include "Executive Member (Board of Directors); Member of the Board", "Managing Director and Regular Member; Director (Board of Directors); Chief Executive Officer", "Deputy Managing Director and Regular Member").[66] In all, 225 distinct titles are found to represent employee representatives, and 445 are found to represent non-employee representatives. Codetermination at the firm level is observed by reference to these reported titles.

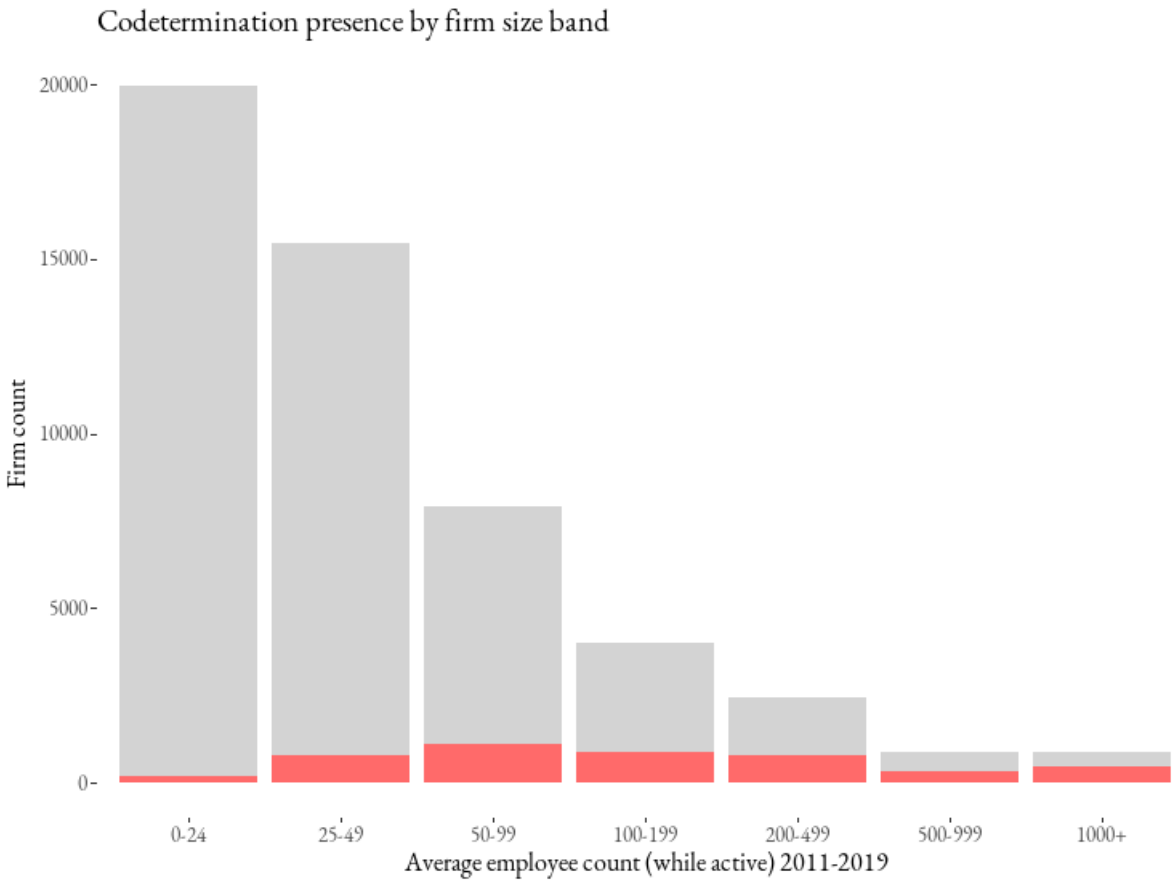
While the data allows us to identify worker representatives, a limitation of the data is that Orbis does not reliably report board members' dates of tenure; therefore, it is not possible to construct timelines of board member presence, and thus neither of codetermination presence. A company is therefore considered as either having or not having codetermination for all years where it is observed as eligible (based on employment numbers). This is a relatively minimal restriction, however, as I can find no precedent for a firm that is at one point codetermined removing worker representatives from its board, whether due to downsizing or otherwise.

Statistics on presence: in general

In all, 4506 firms are observed to have employee representatives on their board during the period of observation; that is, 8.7% of firms under consideration exhibit codetermination. Of these, 963 (21%) are Danish firms, 1964 (44%) are Norwegian firms, and 1579 (35%) are Swedish.

It should be immediately clear, then, that worker representation on boards is far from universal, even among firms whose employment numbers make their workers eligible for representation. This result confirms previous findings of a more limited study concerning the uptake of codetermination among Danish firms and reveals that more or less the same is true at a pan-Scandinavian level.[67] The figure below shows the distribution of firms identified as having worker representatives on their boards.

[66] A longer sample of titles and their corresponding classification is found in Appendix A.
[67] Neville, Gregoric, & Poulsen (2014)



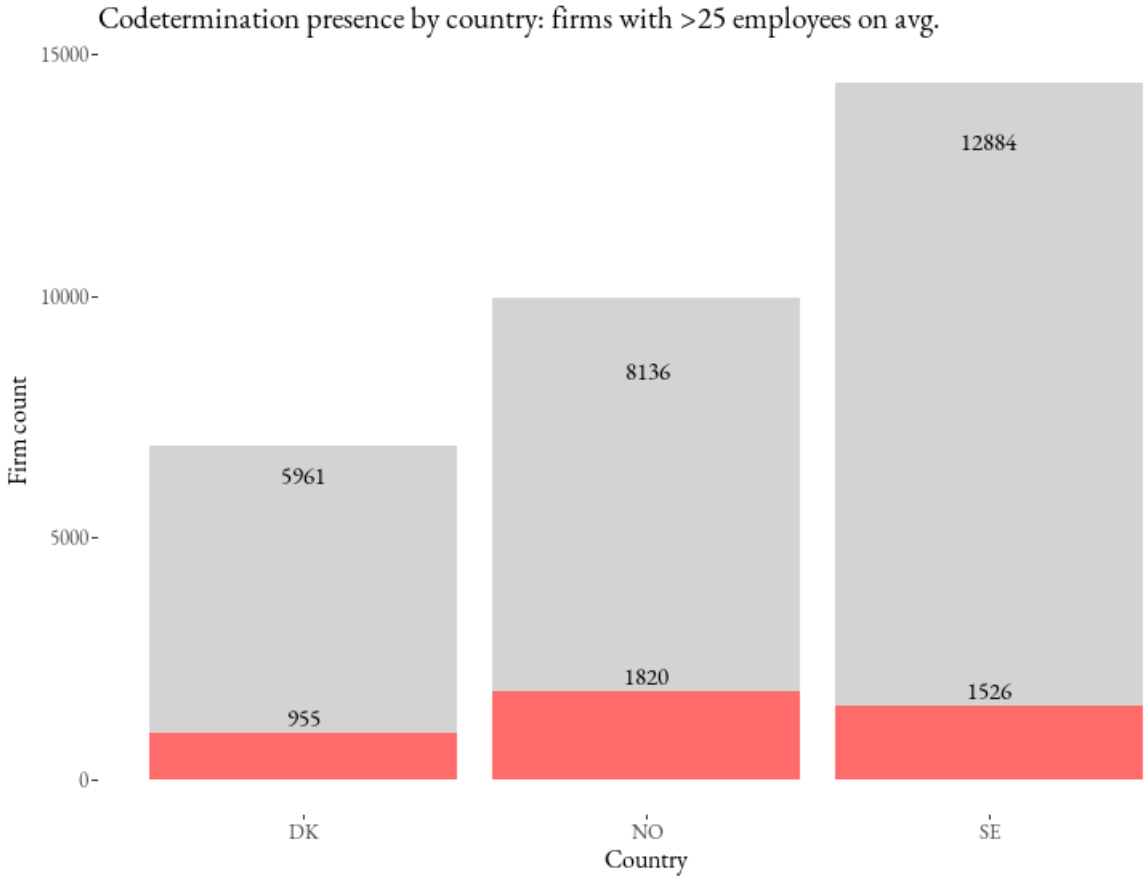
The proportion of firms with worker representation on their boards is higher among larger enterprises, but even among the largest, worker representation is not overwhelming. Of the firms in the 200-499 employee band, 1659 did not have worker representatives on their boards, while 778 did; for firms with an average of between 500 and 999 employees, 552 did not have worker representation, while 336 did. It is only among the very largest firms, those with an average employee count exceeding 1,000, that codetermination is the norm rather than the exception, and then only narrowly — among these firms, 441 had workers on the board, while 435 did not.[68] Charts of codetermination presence by firm size band and disaggregated by country, available in Appendix B, show that such patterns are pretty stable across the countries under consideration, although with notable international variation in the levels of codetermination presence.

[68] The apparently surprising result that codetermination is observed at a handful of firms in the 0-24 band — which falls below the threshold for codetermination eligibility in all countries — may be explained by two possibilities. One: these could be firms that grew rapidly during the period of observation, and so were affected by codetermination law during the observation period even as their average employee count during their period of activity falls below 25. Two: it may be that small firms can also include worker representatives on their boards if they so wish — there's no law against it, but neither is it explicitly provided for in law as is the case for larger firms.

Statistics on presence: by country

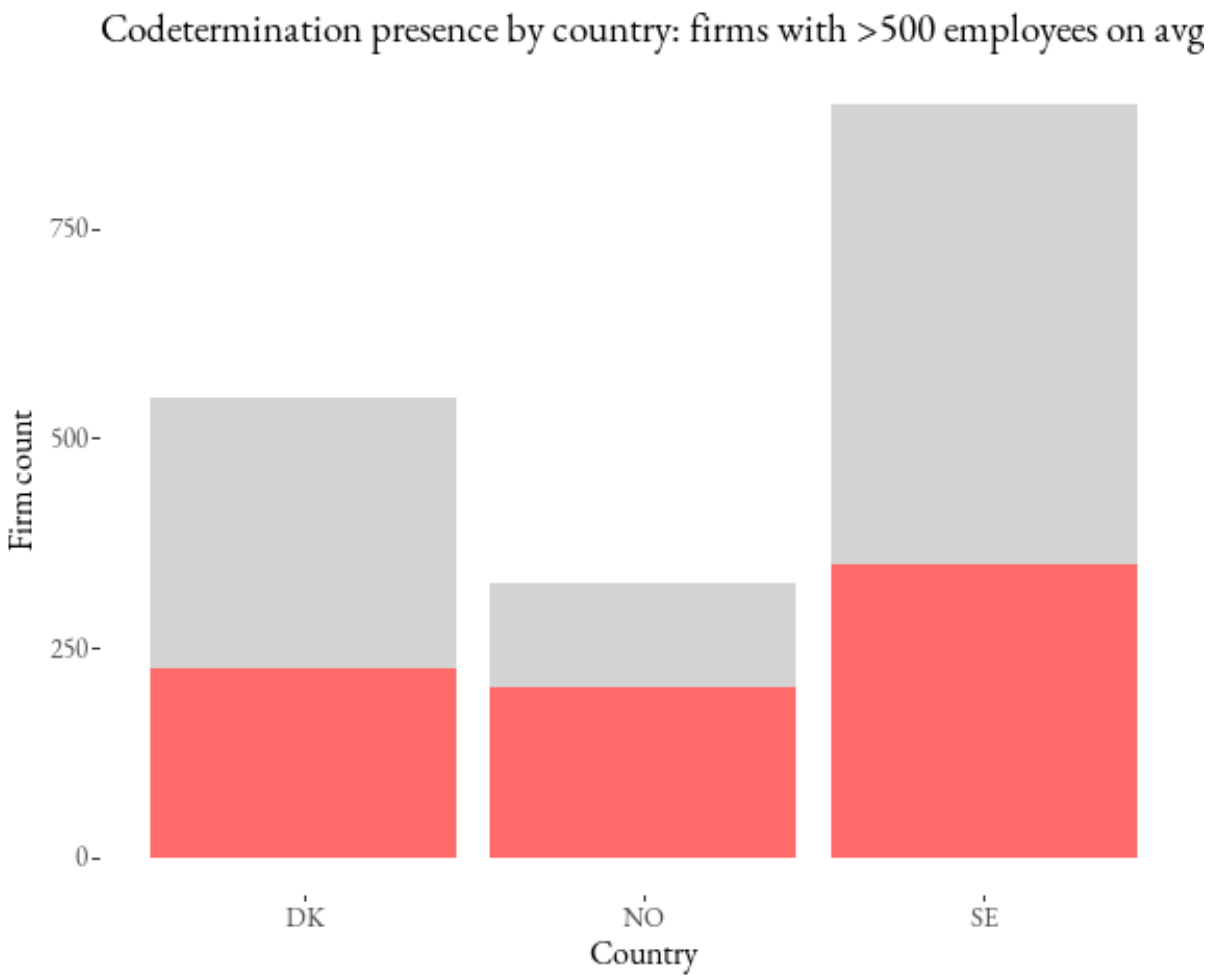
Though populous Sweden accounts for the most firms overall, Norway is the country with the highest count and proportion of codetermined firms. I suggest this higher prevalence may be in part due to Norway's somewhat lower union density[69] – workers who do not enjoy the influence or bargaining power afforded by a union might be more likely to exercise their rights to board-level representation. (With that said, the union might also seem a natural apparatus for overcoming the coordinational challenges involved in exercising codetermination rights, so the mechanism here could be mixed).

This pattern of prevalence is observed even when we restrict our attention to very large firms (500 or more employees). Though uptake of codetermination is higher for this subsample in all three countries, Norwegian firms remain most inclined to codetermination, with 62% of very large firms codetermined, as opposed to 41% in Denmark and 39% in Sweden.



[69] 49% of Norwegian workers belonged to a union in 2018, next to Denmark's 67% and Sweden's 65% (source: OECD)

16% of Denmark's firms with an average employee count over 25 are identified as codetermined as are 22.3% of corresponding Norwegian firms and 11.8% of Swedish.



Why we observe this sort of incomplete uptake is a substantial question in itself. I suspect that in Denmark and Norway, where codetermination is dependent on a majority of a firm's employees taking action to exercise their rights to representation, there may be a collective-agency barrier involved in coordinating this. In Sweden, where codetermination density is lowest, a barrier that seems likely to be even more substantial exists, since codetermination must be handled through negotiations between management and the firm's designated union; the requirement to implicate a union adds another layer of complexity and will inevitably reduce codetermination's prevalence as union density declines.[70]

[70] see, for instance, International Labor Organization statistics showing that Swedish union density has fallen from 92.6% in 1998 to 65.6% in 2018.

It is worth noting that codetermination is more and more common the larger are the firms considered, even comparing only firms that are all past the thresholds for eligibility. The pressure towards codetermination is likely higher in the context of larger workforces, both because there may be more to be gained by having a seat at the table in a large firm than in a small one, and because with so many more workers to represent and such distance between top management and rank and file labor, there is a greater need for formal representation of worker voice.

Statistics on presence: by sector

The table below shows, by sector, the proportions of firms that are observed to have employee representation on their boards, as well as the absolute count of firms with and without employee representation, and the average number of employees at the average firm of each sector during the observation period. Sectoral variation in the incidence of codetermination is evidently substantial: in some sectors, the share of firms exhibiting codetermination approaches 30 or 40 percent, while in others, the share is close to zero.

Sector	Firms w/o codet.	Firms w/ codet.	Codetermined share of firms in sector (descending order)	Average employee count per firm
Printing & Publishing	331	204	0.38	107
Utilities	282	158	0.36	178
Mining & Extraction	184	65	0.26	509
Transport Manufacturing	310	109	0.26	668
Leather, Stone, Clay & Glass products	211	74	0.26	212
Chemicals, Petroleum, Rubber & Plastic	551	187	0.25	217
Information Services	10	3	0.23	75
Wood, Furniture & Paper Manufacturing	672	199	0.23	158
Industrial, Electric & Electronic Machinery	1392	349	0.20	263
Communications	224	54	0.19	835
Biotechnology and Life Sciences	172	36	0.17	90
Waste Management & Treatment	199	40	0.17	105
Textiles & Clothing Manufacturing	145	29	0.17	118

Metals & Metal Products	1414	267	0.16	215
Banking, Insurance & Financial Services	763	136	0.15	453
Food & Tobacco Manufacturing	971	140	0.13	163
Public Administration, Education, Health Social Services	2370	305	0.11	108
Computer Hardware	26	3	0.10	62
Transport, Freight & Storage	2823	256	0.08	164
Media & Broadcasting	279	25	0.08	103
Business Services	9087	703	0.07	322
Wholesale	5128	393	0.07	104
Miscellaneous Manufacturing	80	6	0.07	271
Computer Software	1940	140	0.07	81
Property Services	1164	73	0.06	92
Agriculture, Horticulture & Livestock	593	28	0.05	100
Construction	6808	271	0.04	67
Travel, Personal & Leisure	4743	139	0.03	58
Retail	3373	82	0.02	133

What might account for this variation? One possibility is that it is the brute result of variation in the size of the firms concerned. As we have seen, firms that employ more workers are more likely to have worker representation on their boards, so if Sector X has a far greater incidence of codetermination than does Sector Y, it may be simply because the average firm in Sector X has far more employees than does the average firm in Sector Y. Perhaps that effect is part of what is going on, but it is certainly not the whole story, as should be pretty clear from looking at the average employee counts per firm for the sectors — the codetermination share of firms is not clearly increasing in firm size, and, what's more, very similar patterns of sectoral codetermination prevalence are observed even when considering only subsets of the data containing larger firms (see Appendix C for further versions of the table taking into account only firms with an average of $\geq$25 and $\geq$100 employees respectively). Very similar patterns are also observed even when considering the three countries independently of each other (see Appendix C).

It seems, instead, that codetermination has a higher incidence in sectors that exhibit both a) high employee-to-firm ratios and b) a high degree of job-specific skill or education. This is precisely the sort of context in which we might expect better coordination between management and labor

(of the sort that might facilitate greater job specific investment) to prove especially efficient.[71]

Statistics on presence: employee coverage

Counting firms where workers enjoy representation is only one way to measure the extent of codetermination, of course. Another way is to examine how many workers are covered by codetermination, that is, how many workers are employed at firms where they have board-level representation. Under this metric, we see that codetermination's presence is more extensive than it appears when only considering firm count. This is logical: board-level representation is more common at larger firms, that is, firms with more workers. Even if there are fewer firms with board-level representation than there are without it, each of the former sort will, on average, account for more employees.

Country	Codetermination presence category	Number of employees in presence category (2019)	Percentage of employees (by country) in presence category
DK	0	1900713	61
DK	1	1216813	39
NO	0	742877	55.7
NO	1	590868	44.3
SE	0	2153997	50.9
SE	1	2074405	49.1

The table above shows that in each of the three countries, close to half of all workers observed in the data are employed at firms with employee representation at board level; given the extent of the data's coverage, we can say with confidence that close to half of private-sector workers in the three countries under consideration benefit from board-level representation at their workplace. Codetermination's extent is therefore more substantial than it might appear from a pure firm-count metric.

Nonetheless, as with the firm-count approach, we observe substantial sectoral variation in codetermination coverage. The same patterns of codetermination presence that we observed when counting firms obtain with an even greater range when we consider employee coverage, as the table below shows.

[71] A similar argument has been made in Gregoric & Poulsen (2017)

Sector	Employees not covered by codetermination (2019)	Employees covered by codetermination (2019)	% covered
Transport Manufacturing	37283	257355	87.3
Metals & Metal Products	99430	267456	72.9
Information Services	234	612	72.3
Communications	57559	148133	72
Printing & Publishing	17144	38652	69.3
Utilities	26429	53911	67.1
Industrial, Electric & Electronic Machinery	161723	302047	65.1
Mining & Extraction	45114	75329	62.5
Food & Tobacco Manufacturing	66232	106110	61.6
Retail	216458	239248	52.5
Leather, Stone, Clay & Glass products	28514	31356	52.4
Wood, Furniture & Paper Manufacturing	58197	62489	51.8
Biotechnology & Life Sciences	8970	9277	50.8
Chemicals, Petroleum, Rubber & Plastic	89941	72902	44.8
Public Administration, Education, Health Social Services	165822	123437	42.7
Business Services	1744844	1295554	42.6
Wholesale	341256	236055	40.9
Construction	275222	188529	40.7
Textiles & Clothing Manufacturing	14226	8090	36.3
Computer Hardware	1240	598	32.5
Waste Management & Treatment	16962	7528	30.7
Media & Broadcasting	19839	8762	30.6
Transport, Freight & Storage	364979	156681	30
Agriculture, Horticulture & Livestock	53509	21038	28.2
Computer Software	121494	28905	19.2
Travel, Personal & Leisure	217055	49393	18.5

Banking, Insurance & Financial Services	324784	68400	17.4
Miscellaneous Manufacturing	28067	4449	13.7
Property Services	70238	10068	12.5

Determinants of codetermination uptake

Table 5 shows the results of a logistic regression of codetermination status on certain firm characteristics, for firms in my database with an average employee count of 25 or more (that is, only firms that are in the size range that is plausibly eligible for codetermination).

Employees appear to be more likely to exercise their right to board-level representation in high-skilled sectors (defined as industries requiring greater firm- or occupation-specific investment or training[72]). This further supports the suspicion indicated above, that codetermination may be more useful in sectors where the success of production is more contingent on the skills of the labor force. It is unsurprising that one would more frequently observe codetermination taking root where the potential gains to greater firm- or job-specific investment are higher, if it is true that (as discussed in Section 2) codetermination might facilitate this sort of investment on the part of the labor force.

[72] Examples of high-skilled sectors under this classification include Chemicals, Petroleum, Rubber Plastic; Utilities; Public Administration, Education, Health Social Services; Computer Hardware; examples of non-high-skilled sectors include Agriculture, Horticulture Livestock; Food Tobacco Manufacturing; Wholesale

Table 7: Logistic regression of employee representation on predictors

Company age (years)	0.029***
	(0.001)
Avg. rev. per emp. (th.)	0.00005**
	(0.00002)
High-skilled sector	0.292***
	(0.039)
CEO on board	0.273
	(0.213)
Avg. emp. count	0.0001***
	(0.00001)
Board size	0.142***
	(0.004)
Norway	−0.381***
(country fixed effect)	(0.059)
Sweden	−1.049***
(country fixed effect)	(0.057)
Constant	−2.801***
	(0.067)
Observations	26,595
Note:	*p<0.1; **p<0.05; ***p<0.01

If codetermination were correctly understood as a means by which labor might strengthen its hand in contesting the distribution of firm income, one might expect that employees at firms with higher revenues per employee would be more likely to exercise their right to board-level representation, as at these firms there would be greater incentive to exert control over the disbursal of these revenues. This, however, is not what we observe – there is a significant relationship between average revenue per employee and codetermination, but the relation is practically null, suggesting either that the division is not such a concern in the establishment of employee representation or that (perhaps more plausibly) board-level representation alone is not seen by employees as a reliable means of contesting the division of firm income.

The presence of the CEO on the board – which has been interpreted as an indicator of how closely ownership holds control of the firm – does not have a significant relationship with a firm's codetermination status.[73]

The age of the firm appears to be importantly related to its codetermination status: older firms are more likely to have worker representation, all else being equal. Perhaps this is because it takes time to establish the formal and informal institutions required at firm level to organize employee representation; it could also be that the pressures that motivated workers to exercise their right to representation were stronger in years past.

4.4 Regression analysis: codetermination and outcomes

In the following section, I use linear regression analysis to estimate the relationships between codetermination and certain outcome measures of interest selected in line with the mechanisms of effect ascribed to codetermination as discussed in section 2. (Selected regression tables are available in Appendix D). As part of the estimation process, I evaluate the relationships at three levels of granularity. My primary estimations are made at the level of the population of all firms, but I supplement these with estimations made at the level of sectors and at the level of peer-groups. These latter two terms bear description.

Sectors, in my dataset, are large groupings of firms covering whole industries. There are 29 of them in my data, and they have been enumerated above in assessing the distribution of codetermination presence. Two sectors, however, are not included in the regression analysis due to containing too few firms to constitute a suitably large sample (see discussion below).

Peer-groups, substantially more granular groupings than sectors, are a useful feature of the Orbis dataset: as part of Bureau van Dijk's observation, firms are classified into 3,362 groups of firms that are similar in nature and size, typically representing specific subsectors or groups of competitors.[74] For example, there is a peer-group comprising specialist producers of stainless steel (2529-LA); there is a peer-group comprising large fish farms (0321-VL); there is a peer-group comprising small video game developers (5821-SM); there is even a peer-group comprising chains of bingo parlors and gambling houses (9200-LA). In the regression analysis that follows, I exploit this peer-group differentiation as a sort of ex ante 'matching' that identifies broadly comparable firms and screens out the rest. This allows me to estimate relationships of interest at the peer-group level before examining the patterns in these many relationships when they are aggregated at the level of the firm population. Such an approach is in certain ways preferable to simply estimating the relationships at the population or sectoral level, since by estimating the relationships

[73] This undermines suggestions made elsewhere, on the basis of more limited samples, that codetermination is less successful – whether because opposed or unneeded – in contexts where firm insiders like the CEO have direct board presence. Cf., for example, Gregoric & Poulsen (2019).

[74] See Bureau van Dijk (2011), *User's Guide to Orbis*

between codetermination and certain outcomes of interest within these peer-groups, it is possible to come closer to the inferential ideal of observing counterfactual outcomes. I am still not able to see how Firm X would have ended up if it didn't have worker representation, but I can still learn something by examining how its close counterpart Y – alike in many ways but with no worker representation on its board – does in fact end up, since these are firms that inhabit similar market contexts and will therefore be comparably exposed to many of the factors and forces that would act as confounders when comparing broader and more diverse pools of firms. The idea is that even in the absence of an ideal experiment, one nonetheless gets closer to an idea of the true effects of codetermination by comparing like for like. It also allows us to see if the relationships between codetermination and the outcomes of interest are different in different industries.

One key drawback to note is that many peer-groups do not include an especially large number of firms. It is nonetheless informative to consider the share of peer-groups where we detect a significant relationship between codetermination and a variable of interest, and the nature of the relationship we detect. However, to assure that the enterprise is at all worthwhile, only peer groups that present a sufficiently large sample size may be considered.[75] I retain the same sample size criterion for sectors in the cases where it applies (two sectors are excluded on this basis).

Model specification

For regressions estimated at the population level, I use four specifications to estimate the relationships between codetermination and the outcome variables of interest. First, a simple linear estimator with a codetermination dummy only:

$$Y = \alpha + \beta_1 C + \epsilon \tag{1}$$

where Y is the outcome of interest and β_1 captures the relationship of interest with the dummy for codetermination presence C; then,

$$Y = \alpha + \beta_1 C + \beta_2 E + \epsilon \tag{2}$$

where E controls for firm size (employee count); then,

$$Y = \alpha + \beta_1 C + \beta_2 E + \beta_N N + \epsilon \tag{3}$$

where N is a vector of national fixed effect terms; then, finally,

$$Y = \alpha + \beta_1 C + \beta_2 E + \beta_N N + \beta_S S + \epsilon \tag{4}$$

where S is a vector of sectoral fixed effect terms. Regression tables reporting the results of all four specifications are available in Appendix D.

[75] My threshold for sample size here is 64 firms, which I derive using the tabulation provided in Kenny (1987), conservatively assuming an target test power of 0.8 and a small-to-moderate effect of interest (Cohen's *d* of 0.5).

For regression analyses conducted at the sectoral level, I use specification (3), since sectoral fixed effects are obviously not applicable; for regression analyses conducted at the peer-group level, I use specification (2), since national fixed effects are likewise inapplicable at such a level of granularity.

Output

I measure firm output by the natural logarithm of the firm's average gross revenue per employee per year during the period of observation.[76] At the level of the population there is a large and significant[77] positive association between output thus construed and the presence of codetermination, even when controlling for the size of the firm (as measured by its average employee count) and country of observation.
The finding of a positive relationship persists at higher levels of granularity. Sector-level regressions return significant relationships in 81 % of sectors examined. All of these are positive relationships with output. Likewise, when regressions are run at the peer-group level, 23% of peer-groups return significant relationships, and again, these relationships are overwhelmingly positive.
Value added (defined as the value of firm outputs less the value of firm inputs) per worker gives us another way of examining the productive output of a firm. Again, I find a significant and strongly positive relationship at the population level, which is likewise found at the sectoral level (again in 81% of sectors) and in 18% of peer-groups.

Costs per employee

Orbis does not directly report firms' wage bills or employee spending. Costs per employee is the best proxy available in my data to indicate the relationship between codetermination and financial transfers from management to labor. Of course, given that costs per employee can be affected by a wide range of factors, interpreting my findings here must be done quite carefully; though I find that codetermination is associated with higher costs per employee, this is not necessarily evidence that codetermination is associated with higher wage spend per employee, for instance. I take the natural logarithm of average costs per employee per year as my independent variable in this case.
At the population level, I find a substantial and significant positive relationship between costs per employee and codetermination. This relationship is robust to — indeed, only grows with - the addition of fixed effect terms.

At the sectoral level, a positive and significant relationship is observed in 22 of 27 sectors considered (81%); all these observed significant relationships are positive. The average magnitude of the relationship observed at the sectoral level is similar to that observed at the population level.

At the peer-group level, a positive and significant relationship is observed in 21.4% of peer-groups

[76] cf. Gal (2013)
[77] Throughout this section, "significant" indicates significance at the 5% level.

considered. The magnitude of this relationship is, on average, notably smaller than when it is evaluated at the sectoral and population levels, but non-negligible nevertheless. What is interesting is that the peer-groups where significant relationships are observed are overwhelmingly composed of firms from industries with among the lowest rates of codetermination presence, such as Wholesale, Retail, Construction, and Business Services. Perhaps the low prevalence of codetermination here might be partly explained by an employee-cost effect; it may be that these are industries where codetermination has particularly unhelpful or inefficient effects on employee costs such that firms where it is adopted are less competitive; however, if it were reasonable to interpret costs per employee as linked to wages, it would be strange to see codetermination go unadopted in contexts where employees stood to gain, since the adoption of codetermination is at the employees' discretion. Without clearer data on the nature of employee costs, it is hard to draw conclusions from this evidence.

Profitability

I measure firm profitability by the firm's average annual reported profit margin during the period of observation. As with output, the relationship observed at the population level is positive and significant at the 1% level. At the population level, codetermination is associated with profit margins that are higher by 1.5 percentage points.
This relationship, when estimated at the sectoral level, is significant in only 30% of sectors, although among these cases where a significant relationship is detected, the magnitude of the relationship is higher (codetermination being associated with 3 percentage points higher profit margins).
Such results are obviously inconsistent with pessimistic theoretical predictions that worker involvement in firm governance would kneecap the efficient, profit-seeking functioning of the privately-controlled firm.

Capital stock

I noted in Section 2 that one effect consistently imputed to codetermination by more pessimistic commentators is the idea that it might 'hold up' capital formation by reducing the incentives of management or shareholders to invest. Another, converse possible effect is that codetermination, by giving greater control of capital stocks to workers, will incentivize them to raise their marginal product by driving up capital-to-labor ratios. I consider these possibilities by estimating the relationship between capital-to-labor ratios and codetermination. Specifically, I regress the natural logarithm of firms' average working capital (in thousands of euros) per employee per year of firms on codetermination status. The results here are convincingly against the idea of a hold-up effect. At the population level, a significant and strongly positive relationship is found between the capital-to-labor ratio and codetermination. This result is persistent when evaluated at the sectoral level (where a significant relationship is found in 60% of sectors, all but one positive); likewise, the significant relationships identified among peer-groups (in 12.2% of peer-groups) are overwhelmingly positive relationships. There does not appear to be a clear pattern in the sectors where significant relationships are found – they are a mixture of white-collar and blue-collar

industries.

Market capitalization

In Section 2, it was noted that relationships have been theorized between codetermination and the market valuation of firms. A suspicion that such a relationship might exist has historically been particularly strong among sceptics of codetermination rooted in a property-rights school of analysis, who fear that by diluting the directorial power associated with ownership of productive capital or by reducing the firm's profitability, workers' representation in the governance of a firm will make that firm less attractive to prospective shareholders. To put this proposition to the test, I examine both the absolute level of firms' market capitalization and the average growth rate of their market cap over the period of observation. I find a positive and significant relationship between absolute level of firm's market capitalization and codetermination.[78] There is also a positive relationship found between codetermination and the average growth rate of a firm's market capitalization, although this relationship is not statistically significant.

Women's representation on supervisory boards

I noted earlier that research has suggested an association between codetermination and the socioeconomic representativity of corporate government. This is intuitive: the managerial class is, on the whole, less diverse than the working class,[79] so the inclusion of the latter in spaces otherwise occupied entirely by the former should tend to broaden those spaces' demographic composition.

This is borne out to some extent in my observations. At the population level, there is a small but statistically significant relationship between codetermination and women's representation on company boards. This shows up in the difference between codetermined and non-codetermined firms: women make up 23.7% of the board of the average codetermined firm, while they account for 22% of the board of the average non-codetermined firm. This gap is largest in Norway, where codetermined firms exceed non-codetermined firms in female representation by 5 percentage points, and smallest in Sweden, where there is negligible difference.

Regressing the female share of board members on a firm's codetermination status at the sectoral and peer-group level gives mixed results. Significant relationships are found in only 37% of sectors examined and in 13.7% of peer-groups, but where one is found, it can be substantial — among the (12 of 29 sectors where a significant relationship between codetermination and female representation is found, codetermination is associated with a 13% increase in the share of corporate boards made up by women, and among peer-groups of firms with a significant relationship between codetermination and female representation, codetermination is associated with a 27.3% increase in women's share of boards.

[78] This is contrary to earlier research that suggested a negative association between workers' representation on boards and firm value – see Gorton& Schmid (2004)

[79] cf. Edling, Hobdari, Randøy, Stafsudd, Thomsen (2012)

Something intriguing is that the sectors where the relationship between codetermination and female representation seems strongest tend to be sectors where there may be more substantial disparity between the gender makeup of labor and that of higher management: retail, wholesale, public administration, business services, and banking, for example, all sectors where we might expect that women make up substantially more of the employee population than they do of the managerial population.[80] Codetermination may offer a way for these female rank-and-file workers to improve the gender representativity of their supervisory board. In every sector — barring one — where a significant relationship between codetermination and women's share of the board is found, this relationship is positive (i.e. codetermination increases the representation of women), usually strongly so. The only two sectors where a negative and significant relationship is observed is construction, an industry where we might expect rank-and-file workers to be overwhelmingly male, such that the dynamic just described could actually tend to depress women's share of board seats.

Robustness check: firm size

One concern is that, by estimating these relationships at the level of the whole population of firms, large and small, there might be distortions introduced by the fact that codetermination is so strongly correlated with firm size. I have already tried to defuse this possibility by controlling for a firm's average employee count, but by way of testing the robustness of my findings against such distortions, I re-estimate all the relationships examined above using three subsamples of the population containing (respectively) only firms with an average of over 35 employees; only firms with an average of over 100 employees; and only firms with an average of over 500 employees. All relationships identified above as statistically significant at the population level remain so in these subsamples and maintain the same sign.

[80] for evidence from Sweden, for example, see Gonas, Wikman & Vaez (2019)

5 A comparison with the German case

The Nordic countries' provisions for employee representation in the workplace are among the most substantial in the world, but Germany, birthplace of the institution, remains an essential point of comparison in any consideration of the subject.

In this section I examine codetermination in Germany using similar metrics to those that I applied to the Nordic states. By examining the German case specifically, we also gain the ability to compare between the Nordic approaches (which are relatively similar to each other) and the German – specifically, how the presence and effects of codetermination might vary with a different set of institutional constraints.

5.1 The German codetermination regime

Codetermination in Germany differs from codetermination in Scandinavia in two main respects. Firstly, the threshold at which German firms are eligible for board-level employee representation is much higher; however, and secondly, employee representation is *mandated* for firms above that threshold, rather than being contingent on the collective decision of employees or their trade union representatives. Both of these differences might be expected to have material effects on codetermination's presence and coverage, and indeed they do, as will be made clear in section 5.3.

I have previously described that codetermination laws were first introduced in Germany in the first years of the 1950s. Initially applying only to very large firms, codetermination requirements were subsequently expanded with reforms in the 1970s. Various adjustments have taken place since, with notable legislative updates in 1994 and 2004, but the basic structure of German codetermination law has remained intact.

German private enterprises are subject to a three-tiered codetermination regime:

- Firms employing fewer than 500 workers are subject to no requirements for board-level representation.[81]
- Firms employing between 500 and 2000 workers are obliged to set aside one third of the seats on their supervisory board for worker-elected representatives.
- Firms employing more than 2000 workers are obliged give workers 'parity representation' – that is, one half of the seats – on the supervisory board. (The Chairman, who is shareholder-elected, retains a tie-breaking vote.)

[81] Indeed, these firms *cannot* introduce board-level representation barring some quite unexpected quirk of the firm's structure, since German corporate law makes no provision for board-level representation at such firms – see Raiser, Veil, & Jacobs (2015).

A wrinkle in this story is that, until 1994, *joint stock* companies[82] were obliged to give workers one third of the board *regardless* of their size. Joint stock companies incorporated before 1994 still face this requirement, while those incorporated thereafter face the same requirements as other sorts of firms (that is, no board-level representation with fewer than 500 employees).

5.2 Summary of data

As was the case for my examination of the Nordic states, my primary data is drawn from Bureau van Dijk's Orbis database: I obtain yearly-frequency data from 2011 to 2019 covering all firms that satisfy the following conditions:

1. public or private limited companies
2. incorporated in Germany and not known to have ceased operations
3. counting 20 or more employees in at least one of the years on record.

A total of 193,989 firms are thus selected. Subsequent data cleaning reduces this set to 190,464 firms.[83] The table below breaks down their distribution by size band (in terms of average employee count over the period of observation).

Size band	**0-24**	**25-49**	**50-99**	**100-199**	**200-499**	**500-999**	**1000+**
Firm count	55293	63844	34732	17752	11091	3899	3830

5.3 Observing employee representation

Differences in the data available for German firms lead me to supplement the firm-classification methodology employed for the Nordic countries with two additional steps. In my German sample, a firm is identified as codetermined where at least one of its board members is identified as an employee representative in the Orbis database; a firm is also identified as codetermined if it is identified as such in the Hoppenstedt Aktienführer database[84], with which I supplement my main dataset; or, since the threshold is legally binding, if the firm's average employee count over the period of observation surpasses the relevant threshold.

[82] A category encompassing German firms of the legal forms *Aktiengesellschaft (AG)* and *Kommanditgesellschaft auf Aktien (KGaA)*, but not, notably, limited liability companies of the legal form *GmbH*

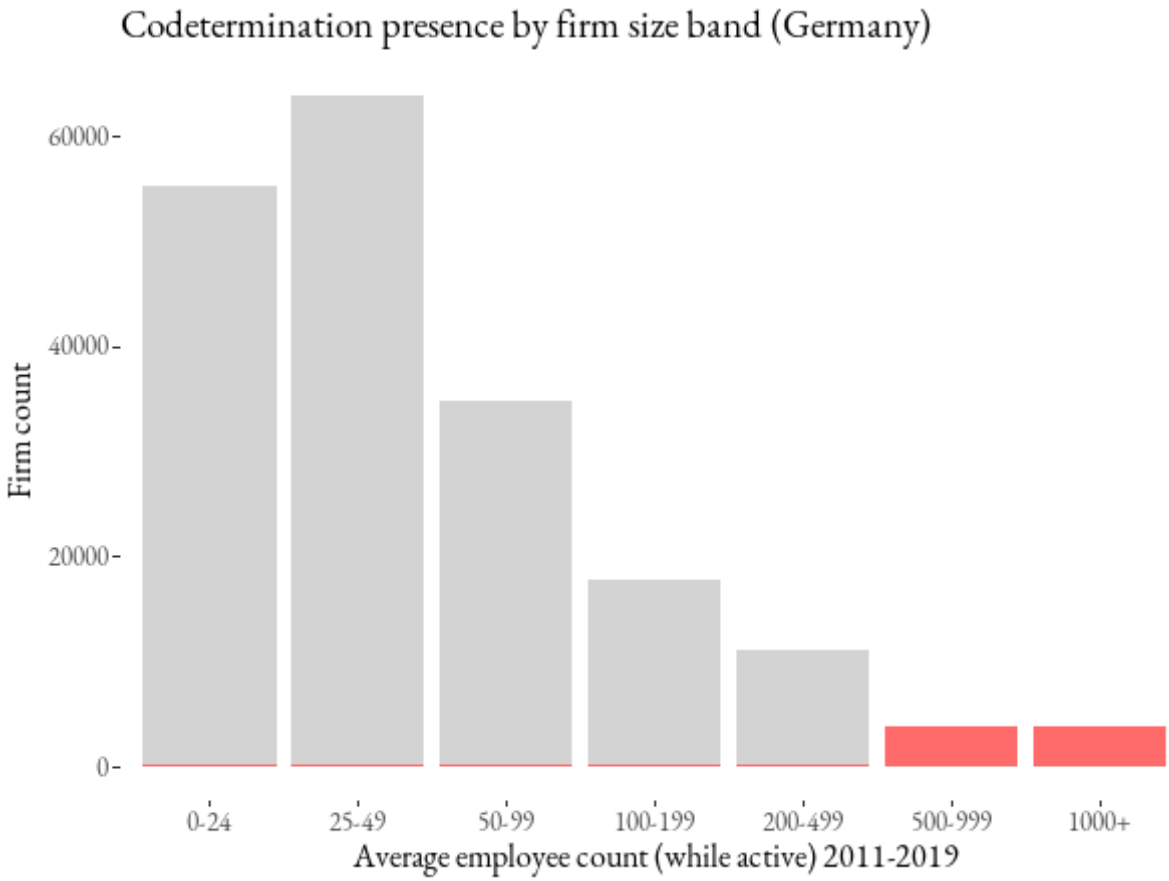
[83] Unfortunately, patchier data coverage, apparently due to less stringent reporting standards in Germany, mean that it is common for firms in the Orbis dataset to be missing values in certain fields of interest, particularly outcome variables. This does not obviate the analysis, but it does mean that the number of useable firms for a given regression analysis, for instance, may be substantially lower than the population total.

[84] See www.digi.bib.uni-mannheim.de/aktienführer/data/index.php

Statistics on presence: in general

In all, I identify a total of 8,808 firms as subject to codetermination; that is, 4.6% of firms under consideration. This is a markedly lower share than in the Nordic countries, indicating clearly the effect of the higher German threshold for codetermination eligibility.

The effect of that threshold is even clearer when considering the breakdown of codetermination presence by firm size band.



Perhaps unsurprisingly, given the nature of the German codetermination regime (legally binding over a high threshold, no provisions below that threshold), practically no firms that averaged fewer than 500 employees over the period of observation exhibit employee representation on their boards, while practically all those that averaged more than 500 employees have representation.

Two questions that might be raised are, first, why any firms above the threshold would *not* have representation, and, second, why any firms below it *would* have representation. The answer to the first question is that certain firms are incorporated with or adopt peculiar legal forms that are not covered by codetermination law, allowing them to evade the law (this is the case, for instance, for retail giants Aldi Nord & Aldi Süd, which are technically family foundations); some

may simply flout the regulations altogether.[85] (Indeed, since this is the sort of conduct that such firms want to make difficult to observe, it is entirely possible that there is some 'missing codetermination' among large firms that my data overlooks). The answer to the second question is that such firms are overwhelmingly joint-stock companies incorporated before 1994, which therefore remain covered by codetermination provisions despite their relatively small size.

Statistics on presence: by sector

The table below shows the breakdown of firms by sector (where indicated in the data) and codetermination status. As in the Nordic case, there is substantial variation in the codetermined share of firms across sectors; what is different here is that this variation is more clearly driven by the average size of firms in each sector.

Sector	Firms w/o codet.	Firms w/ codet.	% share of codet. firms (desc. order)	Avg. emp. count in sector
Banking, Insurance & Financial Services	1416	338	19.3	685
Transport Manufacturing	827	161	16.3	2419
Utilities	1408	142	9.2	321
Communications	519	50	8.8	592
Computer Hardware	198	18	8.3	107
Business Services	32929	2804	7.8	270
Chemicals, Petroleum, Rubber & Plastic	4464	320	6.7	340
Public Administration, Education, Health Social Services	15126	1063	6.6	176
Industrial, Electric & Electronic Machinery	11467	728	6	273
Property Services	2988	182	5.7	169
Textiles & Clothing Manufacturing	1195	65	5.2	190
Food & Tobacco Manufacturing	4166	226	5.1	146
Leather, Stone, Clay & Glass products	1588	79	4.7	168
Biotechnology and Life Sciences	492	23	4.5	135

[85] cf. Kluge et al. (2020)

Miscellaneous Manufacturing	709	31	4.2	133
Mining & Extraction	564	22	3.8	121
Printing & Publishing	2246	87	3.7	135
Wood, Furniture & Paper Manufacturing	2834	105	3.6	100
Information Services	111	4	3.5	185
Metals & Metal Products	10149	342	3.3	158
Transport, Freight & Storage	10768	362	3.3	198
Media & Broadcasting	1004	32	3.1	199
Computer Software	5022	159	3.1	70
Retail	9381	289	3	174
Agriculture, Horticulture & Livestock	1245	37	2.9	56
Wholesale	19942	569	2.8	107
Waste Management & Treatment	1519	37	2.4	77
Travel, Personal & Leisure	15244	285	1.8	105
Construction	20061	153	0.8	59

Statistics on presence: employee coverage

As in the Nordic countries, a consideration only of the count of firms at which employees are represented at board level may yield a skewed vision of the reality. This is especially true in Germany: **71.1%** of workers employed at German firms are covered by board-level representation, a figure that may be surprising next to the much less imposing share of German firms that are actually codetermined. This pattern is nonetheless borne out across German industry – the table below shows that in almost all sectors, a majority (often a large majority) of employees of German firms work at firms subject to codetermination requirements.

Sector	Employees at firms without board-level representation	Employees at firms with board-level representation	% of employees covered by codet.
Transport Manufacturing	75431	2512425	97.1
Banking, Insurance & Financial Services	93164	1034754	91.7
Communications	28481	278867	90.7
Media & Broadcasting	39629	173785	81.4
Business Services	1916288	7297294	79.2
Industrial, Electric & Electronic Machinery	755032	2629100	77.7
Chemicals, Petroleum, Rubber & Plastic	350121	1212634	77.6
Utilities	122839	388884	76
Transport, Freight & Storage	594401	1652047	73.5
Property Services	138476	378287	73.2
Information Services	5193	13167	71.7
Retail	425443	1000453	70.2
Textiles & Clothing Manufacturing	80230	141671	63.8
Metals & Metal Products	600520	1031061	63.2
Leather, Stone, Clay & Glass products	99513	166550	62.6
Public Administration, Education, Health Social Services	1131695	1701602	60.1
Miscellaneous Manufacturing	41643	53579	56.3
Printing & Publishing	119538	152562	56.1
Mining & Extraction	28866	34823	54.7
Travel, Personal & Leisure	685000	748137	52.2
Computer Hardware	10851	11826	52.1
Biotechnology & Life Sciences	29768	28377	48.8

Wholesale	1028030	951838	48.1
Food & Tobacco Manufacturing	303417	268844	47
Wood, Furniture & Paper Manufacturing	177398	95282	34.9
Agriculture, Horticulture & Livestock	42502	19489	31.4
Computer Software	249240	100137	28.7
Construction	719219	279212	28
Waste Management & Treatment	83596	30502	26.7

Why might this be? A major reason for the disparity between coverage in terms of firms and coverage in terms of employees is that the German industrial landscape is dominated by a relatively small number of extremely large firms: in my dataset, 3,813 firms employed over 1,000 workers on average over the period, 345 employed over 10,000 on average, and 26 employed over 100,000. Now, it must be noted that not all of these workers are based in Germany – many of the largest firms employ substantial workforces elsewhere in Europe and around the world. It is not possible in my data to distinguish firms' employment within and outside of Germany, and it does not at any rate matter for considering those firms as exhibiting elective board-level worker representation. However, it does raise interesting questions for future research over the status of foreign employees of large, codetermined firms: German law does not provide to these workers the rights to vote or stand in the elections for board seats, although the lack of such a provision has faced recent legal scrutiny.[86] For the purposes of the present work, it is sufficient to bear in mind that the units of observation are firms incorporated in Germany and their employees, not German firms as operating within German borders. With this in mind, one recognizes that the pattern of German codetermination coverage (compared to its Nordic counterpart) is 'fewer firms, but more workers'.

5.4 Regression analysis

As in the corresponding portion of the section on the Nordic countries, in this portion I use regression analysis to estimate the associations between the codetermination status of German firms and certain outcomes of interest. I follow the same methodology of estimating regressions at population, sectoral, and peer-group level, and impose the same minimum sample-size requirements.

[86] *Erzberger v TUI AG* (2017), C-566/15; case argued before the Court of Justice of the European Union

Model specification

For regressions estimated at the population level, I again use four specifications to estimate the relationships between codetermination and the outcome variables of interest. First, a simple linear estimator with a codetermination dummy only:

$$Y = \alpha + \beta_1 C + \epsilon \tag{1}$$

where Y is the outcome of interest and β_1 captures the relationship of interest with the dummy for codetermination presence C; then,

$$Y = \alpha + \beta_1 C + \beta_2 E + \epsilon \tag{2}$$

where E controls for firm size (employee count); then,

$$Y = \alpha + \beta_1 C + \beta_2 E + \beta_L L + \epsilon \tag{3}$$

where L is a vector of regional fixed effect terms capturing the German state in which the firm is incorporated; then, finally,

$$Y = \alpha + \beta_1 C + \beta_2 E + \beta_L L + \beta_S S + \epsilon \tag{4}$$

where S is a vector of sectoral fixed effect terms. Regression tables reporting the results of all four specifications are available in Appendix E.

For regression analyses conducted at the sectoral level, I use specification (3), since sectoral fixed effects are obviously not applicable; for regression analyses conducted at the peer-group level, I use specification (2).

Output

Output, as measured by the natural logarithm of average revenue per employee, is positively associated with codetermination presence when estimated at the population level, just as it was in the Nordic case. This positive relationship persists at more granular levels of analysis – a significant relationship between output and codetermination presence is found in 53% of sectors (every one of these relationships is positive) and in 22% of peer-groups.

Costs per employee

Estimated at the population level, I find a significant and negative relationship between codetermination presence and firm average costs per employee. This result is perhaps surprising given that a positive relationship was found in the Nordic countries. The results are more mixed when estimated at a sectoral level; a significant result is found in only 8 sectors, and the average relationship in these sectors is positive (6 of the 8 exhibit positive relationships). Estimates at the peer-group level are similarly mixed, and the average significant relationship found in peer-groups

is more strongly positive than among sectors.

As I have already warned, it is hard to say how much one should make of results on costs per employee as, although they are the best measure available in my data to indicate financial transfers away from management and towards labor, they are at best a very noisy sort of measure.

Profitability

Estimated at the population level, I find a positive but statistically insignificant relationship between profitability (as measured by firm average profit margin) and codetermination presence. A significant relationship between profitability and codetermination and codetermination presence is found in 26% of sectors, and these relationships are, on average, (barely) positive. Significant relationships are found in only 6% of peer-groups.

Capital stock

Just as was found in the Nordic states, a positive and significant relationship between working capital per employee and codetermination presence is observed at the population level, further undermining the idea that worker participation in corporate governance might be associated with a hold-up effect. A significant and positive relationship is also observed in 57% of sectors, and in 20% of peer-groups.

Women's representation

As was the case in the Nordic states, estimates at the population level find a positive and strongly significant relationship between codetermination and women's representation at board level among German firms: codetermination is associated with an increase, on average, of 4.7% in women's share of board seats. However, by and large, I do not find the same sectoral patterns as were observed in the Nordic states, perhaps problematizing the mechanisms suggested previously.

5.5 Regression analysis: restricted sample

As already noted, the development of the German codetermination regime has a peculiar twist in the 1994 reform to the *Aktiengesetz* (Corporation Law). This reform has already been investigated in other research[87] with greater thoroughness than I can devote to it here; however, I can make use of this quasi-experiment as a robustness check on my own results. To reiterate the nature of the reform: joint stock companies incorporated before 1994 were subject to codetermination requirements at *any* size, a requirement that persisted for those companies even after the reform; meanwhile, companies of the same legal form incorporated after 1994 were subject to codetermination requirements only at 500 employees or more, and so workers at such firms employing fewer than 500 employees were ineligible for board-level representation. Thus, an exogenous break was imposed on the joint-stock companies in the sub-500-employees cohort. Under the assumption

[87] see Jäger, Schoefer, & Heining (2020)

(substantiated in the cited literature) that affected firms incorporated in the periods just before and just after the reform are functionally comparable, by restricting my sample to just those firms, I can come closer to a like-for-like comparison such that the results of my estimations are nearer to the true effects of codetermination. I thus restrict the sample to firms in my full population fulfilling the following conditions:

1. joint-stock companies (legal forms *AG*, *KGaA*, or *GmbH & Co. KGaA*)
2. incorporated during the three years before and after the 1994 reform
3. with an average employee count not in excess of 500.

A total of 452 firms are thus selected (253 non-codetermined, 199 codetermined), a population which is sufficiently large to license the estimation of regressions at the full-population level only. Results tables for these regressions are reported in Appendix F.

Output

The relationship between codetermination presence and output per employee remains positive but is no longer significant when estimated in this sample.

Costs per employee

The previously significant and negative relationship between codetermination presence and average costs per employee becomes insignificant, positive, and closer to the moderate positive effects detected in the Nordic population.

Profitability

The positive association between codetermination and firm profitability remains in this restricted sample, though the relationships estimated are not always significant.

Capital stock

Likewise, in all but one specification, a significant and positive association with working capital per employee persists when estimated in this restricted sample.

Women's representation

Women's share of supervisory board seats are also positively associated with codetermination presence in this restricted sample, although the relationship is significant in only some specifications.

6 Remarks on findings and concluding discussion

What emerges from the investigations of this thesis?

For want of good experimental or quasi-experimental primary material, I have been constrained to descriptive work. Nonetheless, what I set out to do *ab initio* was to observe codetermination 'in the wild' to see whether the patterns that emerged – if any did – resembled the predictions that its architects and theorists made for codetermination. My main findings may be reported under two headlines. First, I have observed that codetermination, even in the countries that have implemented it with greatest vigor, is not uniformly adopted, and we may have lessons to learn from observing where it is and is not taken up. Second, I have observed (with surprising consistency across various distinct settings and codetermination regimes) associations between codetermination's presence and a number of 'positive' outcome measures for firms, notably profitability, investment in capital stock, and board diversity (as measured by women's representation).

I'll discuss the latter set of findings first. The main point that I am inclined to make on this matter is that, among all the data I have observed, there is no empirical evidence to be found for the pessimistic predictions about codetermination that I sketched earlier in my review of the literature. The reader will recall that certain scholars have predicted that, by weakening the connection between ownership and control of capital, codetermination and other mechanisms for worker inclusion would render firms less profitable, depress their investments, and reduce their market valuation. Nothing I have observed corroborates such predictions. On the contrary, the descriptive evidence that I have at my disposal is more consistent with worker representation playing a role that is at worst innocuous, and possibly salutary, at the firms where it has been adopted. Given that I have observed data on a comprehensive set of firms based in arguably the most thoroughly codetermined economies in the world, this seems to cut against 'codetermination pessimism'. It is far from the remit of this thesis to issue a verdict on what codetermination does and whether it is good policy, but the results I have found give no indication that worker representation is negative for enterprises, and could encourage those who wish to see greater worker participation in corporate governance. Of course, my results do not cover all subjects of relevance for such discussions – in particular, I was unfortunately unable to procure data on the intrafirm patterns of wages (since this information is closely held by national tax authorities), information which would have permitted an assessment of the relationship between codetermination presence and worker incomes (both with respect to the absolute levels of income and the relative incomes of top and bottom earners at firms).

On the question of codetermination presence, my results hold much of interest for further investigation. In the course of this thesis, I have produced surveys of codetermination presence and coverage for the Nordic countries that are far more comprehensive than anything hitherto available in the literature, which typically relied on samples of a few hundred firms; I have been able to survey codetermination presence across the great majority of the publicly registered Nordic private sector. My results for these countries, where codetermination is applied to firms on an

opt-in basis, are intriguing, as they show much variance between sectors in the extent of codetermination uptake. The primary question this raises is why, if it were the case that codetermination is good for firms, do we see such relatively limited adoption of codetermination in contexts where its adoption is voluntary? I cannot say with certainty on the basis of my work here, but I have three related suggestions for what could explain this. Firstly, it is possible that codetermination is good for firms but in a way (such as higher profitability, consistent with my observations) that might be only indirectly felt by its workers, such that they are not sufficiently incentivized to take the requisite action to exercise their rights to representation in corporate governance. Secondly, it could be that that requisite action – organizing a majority of firm employees in favor of codetermination – is difficult, costly, or time-consuming (this would also be consistent with my observations that older Nordic firms more reliably exhibited codetermination). Thirdly, there could be (non-monetary) incentives for management and shareholders to resist the exercise of codetermination rights by the workforce, such that it is further costly for workers to exercise their rights. At any rate, more work is worthwhile to understand the extent and determinants of codetermination uptake in the countries I have examined and beyond.

7 References

ADAMS, Z., BISHOP, L., & DEAKIN, S., 2016. *CBR Labour Regulation Index (Dataset of 117 Countries)*, Center for Business Research, Cambridge University

ALCHIAN, A.A., & DEMSETZ, H., 1972. *Production, Information Costs, and Economic Organization*, in *The American Economic Review* 62 (5)

ANDERSON, E., 1999. *What is the point of Equality?* in *Ethics* 109 (2)

ATKINSON, A.B., & LAKNER, C., 2017. *Capital and Labor: The Factor Income Composition of Top Incomes in the United States, 1962-2006*, World Bank Policy Research Working Paper

AUTOR, D., MINDELL, D., & REYNOLDS, E., *The Work of the Future: Shaping Technology and Instititutions*

AZAR, J., MARINESCU, I., & STEINBAUM, M., 2017. *Labor Market Concentration*, NBER Working Paper 24147

BECKER, G., 1962. *Investment in human capital: A theoretical analysis*, in *Journal of Political Economy* 70 (5-2)

BENELLI, G., LODERER, C., & LYS, T., 1987. *Labor Participation in Corporate Policy-Making Decisions: West Germany's Experience with Codetermination*, in *The Journal of Business*, 60 (4)

BLANCHET, T., CHANCEL, L., & GETHIN, A., 2020. *Why is Europe more equal than the United States?*, WID Working Paper No. 2020-19

BRADLEY, K., & GELB, A., 1983. *Worker capitalism: the new industrial relations*, Heinemann, London

CHETTY, R., GRUSKY, D., HELL, M., HENDREN, N., MANDUCA, R., & NARANG, J., 2016. *The Fading American Dream: Trends in Absolute Income Mobility since 1940*, NBER Working Paper 22910

COASE, R.H., 1937. *The Nature of the Firm*, in *Economica* 4 (16)

CONCHON, A., GOLD, M., & KLUGE, N., *In the union and on the board: experiences of board-level employee representatives across Europe*, ETUI, Brussels

DALLAS, L., 2011. *Short-termism, the Financial Crisis, and Corporate Governance* in *Journal of Corporation Law* 37

DAVIS, J., & MAZUMDER, B., 2017. *The Decline in Intergenerational Mobility after 1980*, Federal Reserve Bank of Chicago Working Paper No. 2017-05

DEWEY, J., 1888. *The Ethics of Democracy*, Andrews & Company, Kansas City

DOAN, H.,& WAN, G., 2017. *Globalization and the Labor Share in National Income*, ADBI Working Paper 639

EDLING, C., HOBDARI, B., RANDOY, T., STAFSUDD, A., & THOMSEN, S., 2012. *Testing the "Old Boys' Network": Diversity and Board Interlocks in Scandinavia*, in *The Small Worlds of Corporate Governance*, ed. KOGUT, B., MIT Press, Cambridge

ELSBY, M.W.L., HOBJIN, B., & SAHIN, A., 2013. *The Decline of the U.S. Labor Share* in *Brookings Papers on Economic Activity* (Fall 2013)

FRASER, N., MOUFFE, C., SASSEN, S., MÜLLER, J., RODRIK, D., PIKETTY, T., ZUCMAN, G., CHANG, H., et al., 2020. *Humans are not resources: Coronavirus Shows Why We Must Democratize Work*

FREEMAN, R., & LAZEAR, E., 1995. *An Economic Analysis of Works Councils*, in *Works Councils: Consultation, Representation, Cooperation in Industrial Relations*, ed. ROGERS, J., & STREECK, W., University of Chicago Press, Chicago

FREEMAN, R. & MEDOFF, J., 1984. *What Do Unions Do*, in *Industrial and Labor Relations Review* 38:244

FURUBOTN, E., 1978. *The Economic Consequences of Codetermination on the Rate and Sources of Private Investment*, in *The Codetermination Movement in the West*, ed. PEJOVICH, S., Lexington

FURUBOTN, E., 1981. *Codetermination and the Efficient Partitioning of Ownership Rights in the Firm*, in *Journal of Institutional and Theoretical Economics* 137 (4)

GAL, P., 2013. *Measuring Total Factor Productivity at the Firm Level Using OECD-ORBIS*, available at OECD iLibrary

GALLAWAY, L., 1978. *The economic consequences of codetermination on employment and income distribution*, in *The Codetermination Movement in the West*, ed. PEJOVICH, S., Lexington

GETHIN, A., MARTINEZ-TOLEDANO, C., & PIKETTY, T., 2021 (forthcoming). *Political Cleavages & Social Inequalities*, Harvard University Press, Cambridge

GIBBONS, R., & MURPHY, K., 1992. *Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence*, in *Journal of Political Economy* 100 (3)

GOLD, M., 2011. *Taken on board: An evaluation of the influence of employee board level representatives on company decision-making across Europe*, in *European Journal of Industrial Relations* 17 (1)

GOLDBERG, R., & TORRAS, M., 2021. *Explaining Stagnant Living Standards in a Generalized Asset Growth Context* in *Journal of Economic Issues* 55

GORTON, G., & SCHMID, F., 2004. *Capital, Labor, and the Firm: A Study of German Codetermination* in Journal of the European Economic Association 2 (5)

GONAS, L., WIKMAN, A., & VAEZ, M., 2019. *Changes in the gender segregation of occupations in Sweden between 2003 & 2011*, in *Scandinavian Journal of Public Health* 47 (3)

GREGORIC, A., & POULSEN, T., 2017. *The Power of Non-Controlling Stake: Below-Parity Representation of Employees on Corporate Boards*, available at SSRN

GREGORIC, A., & POULSEN, T., 2019. *When Do Employees Choose to Be Represented on the Board of Directors? Empirical Analysis of Board-Level Employee Representation in Denmark*, in *British Journal of Industrial Relations* 58 (2)

GROSSMAN, S.J., & HART, O., 1981. *Implicit Contracts, Moral Hazard, and Unemployment*, in *The American Economic Review* 71 (2)

GROUT, P., 1984. *Investment and Wages in the Absence of Binding Contracts: A Nash Bargaining Approach*

GRUND, C., & SCHMITT, A., 2011. *Works Councils, Wages, and Job Satisfaction*, IZA Discussion Paper No. 5464

GURDON, M., RAI, A., 1990. *Codetermination and Enterprise Performance: Empirical Evidence from West Germany*, in *Journal of Economics and Business* 42 (4)

HAGEN, I., HUSE, M., & NIELSEN, S., 2009. *Women and Employee-Elected Board Members, and their Contributions to Board Control Tasks*, in *Journal of Business Ethics* 89 (4)

HALDANE, A., 2011. *Get Shorty: The Thomas Gresham Docklands Lecture*, available online at https://www.gresham.ac.uk/lectures-and-events/the-sir-thomas-gresham-docklands-lecture-get-shorty

HASHIMOTO, M., 1981. *Firm-Specific Human Capital as a Shared Investment*, in *The American Economic Review* 71 (3)

HERZOG-STEIN, A., LINDNER, F., & STURN, S., 2018. *The German employment miracle in the Great Recession: the significance and institutional foundations of temporary working-time reductions*, in *Oxford Economic Papers* 70 (1)

HOGAN, C., 2001. *Enforcement of Implicit Employment Contracts Through Unionization*, in *Journal of Labor Economics* 19 (1)

The Labour Share in G20 Economies, report prepared by INTERNATIONAL LABOR ORGANIZATION & ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2015.

JAGER, S., SCHOEFER, B., & HEINING, J., 2020. *Labor in the Boardroom*, NBER Working Paper No. 26519

JENSEN, M., & MECKLING, W.H., 1979. *Rights and Production Functions: An Application to Labor-Managed Firms & Codetermination*, in *Journal of Business*

KARL, T.L., 2000. *Economic Inequality and Democratic Instability* in *Journal of Democracy* 11 (1)

KENNY, D., 1987. *Statistics for the social and behavioral sciences*, Little, Brown, Boston

KHAN, L., & VAHEESAN, S., 2016. *Market Power & Inequality: The Antitrust Counterrevolution and its Discontents*, in *Harvard Law & Policy Review* 235

KLUGE, N., et al., 2020. *Mitbestimmungsreport Nr. 58*, published by Institut für Mitbestimmung und Unternehmensführung, Hans-Böckler-Stiftung

KRAFT, K., 2017. *Productivity and distribution effects of codetermination in an efficient bargaining model*, ZEW Discussion Papers, No. 17-039, Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim

KRUGMAN, P., 2009. *Free to Lose*, in *The New York Times*, Opinion section of Nov. 12, 2009 issue

LAZEAR, E., 1979, *Why is the There Mandatory Retirement?*, in *Journal of Political Economy* 81 (5)

LAZONICK, W., 2018. *The New Normal is "Maximizing Shareholder Value": Predatory Value Extraction, Slowing Productivity, and the Vanishing American Middle Class* in *International Journal of Political Economy* 46 (4)

LINDBECK, A., & SNOWER, D., 1989. *The Insider-Outsider Theory of Employment and Unemployment*, MIT Press, Cambridge

MCGAUGHEY, E., 2016. *The Codetermination Bargains: The History of German Corporate and Labor Law*, in *Columbia Journal of European Law* 135

MENEZES-FILHO, N, & VAN REENEN, J., 1998. *R&D and Unionism: Comparative Evidence from British Companies and Establishments*, in *ILR Review* 52 (1)

MILANOVIC, B., 2016. *Global Inequality: A New Approach for the Age of Globalization*, Harvard University Press, Cambridge

MÖLLER, J., 2010. *The German labor market response in the world recession: de-mystifying a miracle*, in *Journal for Labour Market Research* 42 (4)

NAPHTALI, F., 1966. *Wirtschaftsdemokratie, Ihr Wesen, Weg und Ziel* (Economic Democracy: Its Logic, Path, and Goal), Europäische Verlagsanstalt, Frankfurt

NEVILLE, M., GREGORIC, A., & POULSEN, T., 2014. *Kontrol og ledelse i danske SMV'er – med fokus på bestyrelsens sammensætning: Rapport til Erhvervsstyrelsen*, Erhvervs- og Selskabsstyrelsen, Copenhagen

PEJOVICH, S., 1978. *Codetermination: A new perspective for the West*, in *The Codetermination Movement in the West: Labor Participation in the Management of Business Firms*, ed. PEJOVICH, S., Lexington

POLANYI, K., 1944. *The Great Transformation*, Farrar& Rinehart, New York

PIKETTY, T., 2014. *Capital in the Twenty-First Century*, Harvard University Press, Cambridge

PIKETTY, T., 2020. *Capital and Ideology*, Harvard University Press, Cambridge

RAISER, T., VEIL, R., & JACOBS, M., *Codetermination Act and Third Participation Act: Edition 6*, Walter de Gruyter GmbH Co KG, Berlin

SCANLON, T., 2017. *Why does inequality matter?*, Oxford University Press, Oxford

SMITH, S., 1991. *On the economic rationale for codetermination law*, in *Journal of Economic Behaviour and Organization* 16 (3)

STEINBAUM, M., 2021. *Common Ownership and the Corporate Governance Channel for Employer Power in Labor Markets*, in *The Antitrust Bulletin*

TEUTEBERG, H., 1960. *Zur Entstehungsgeschichte der ersten betrieblichen Arbeitervertretungen in Deutschland* ("On the origin of the first workers' representatives in Germany") in *Soziale Welt* 11 H. 1/2

THOMSEN, S., & CONYON, M., 2012. *Corporate Governance: Mechanisms & Systems*, McGraw-Hill, Berkshire

THOMSEN, S., ROSE, C., & KRONBORG, D., 2013. *Employee Representation and Board Size in the Nordic Countries*, DBJ Discussion Paper No. 1301

TIROLE, J., 1986. *Hierarchies and Bureaucracies: On the Role of Collusion in Organizations*, in *Journal of Law, Economics, and Organization* 2:181

TIROLE, J., 2001. *Corporate Governance*, in *Econometrica* 69 (1)

TIROLE, J., 2010. *The Theory of Corporate Finance*, Princeton University Press, Princeton

VICTORIN, A., 1979. *Co-Determination in Sweden: The Union Way*, in *University of Pennsylvania Journal of International Law*, 2 (2)

WILLIAMSON, O., 1985. *The Economic Institutions of Capitalism*, Simon & Schuster, New York

ZIELINSKI, B., 2015. *Historical and Theoretical Origins of Codetermination in German Companies*, in *Le Mouvement Social* 250 (1)

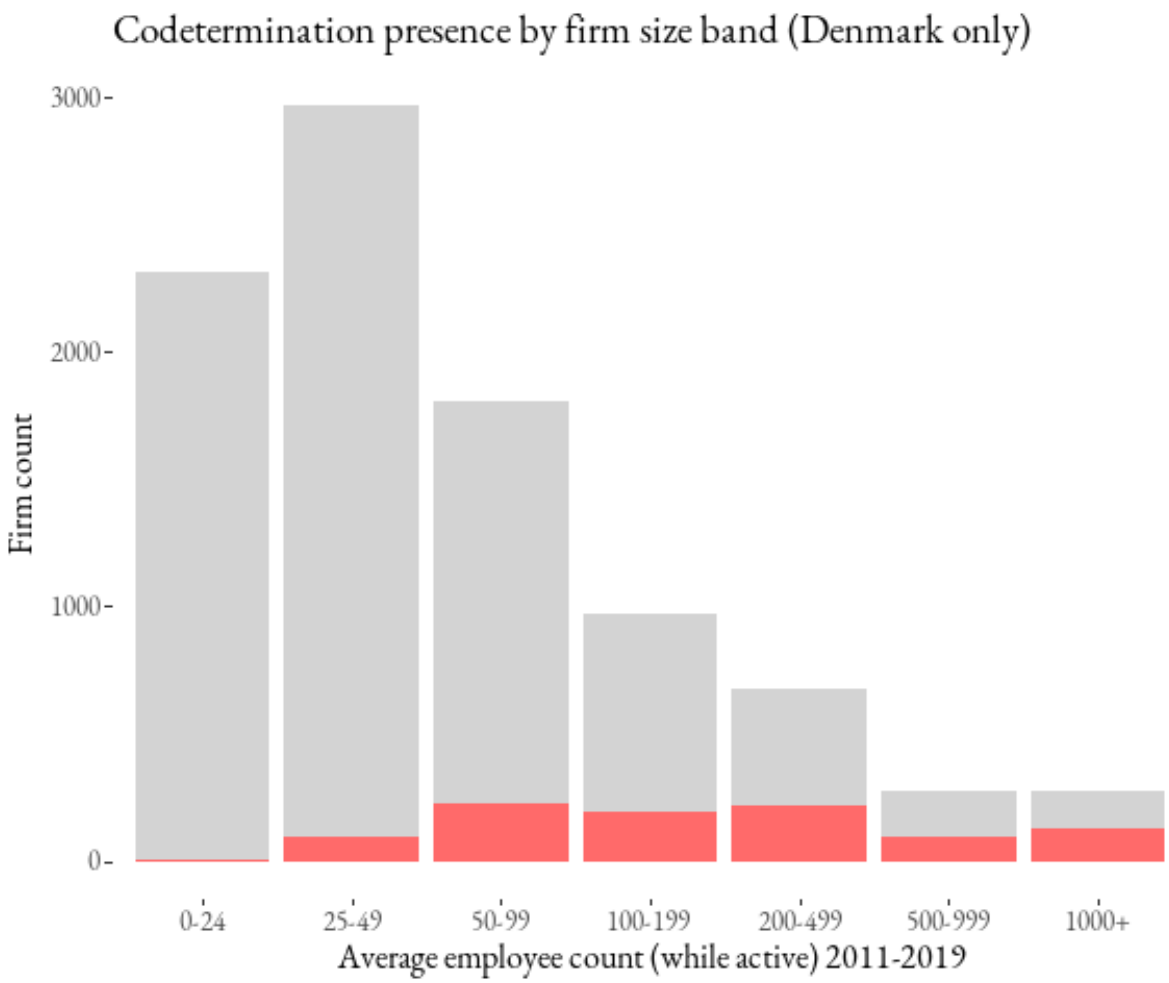
ZWING, K., 1925. *Soziologie der Gewerkschaftsbewegung* ("Sociology of the Trade Union Movement"), Verlag Gewerkschaftsarchiv, Jena

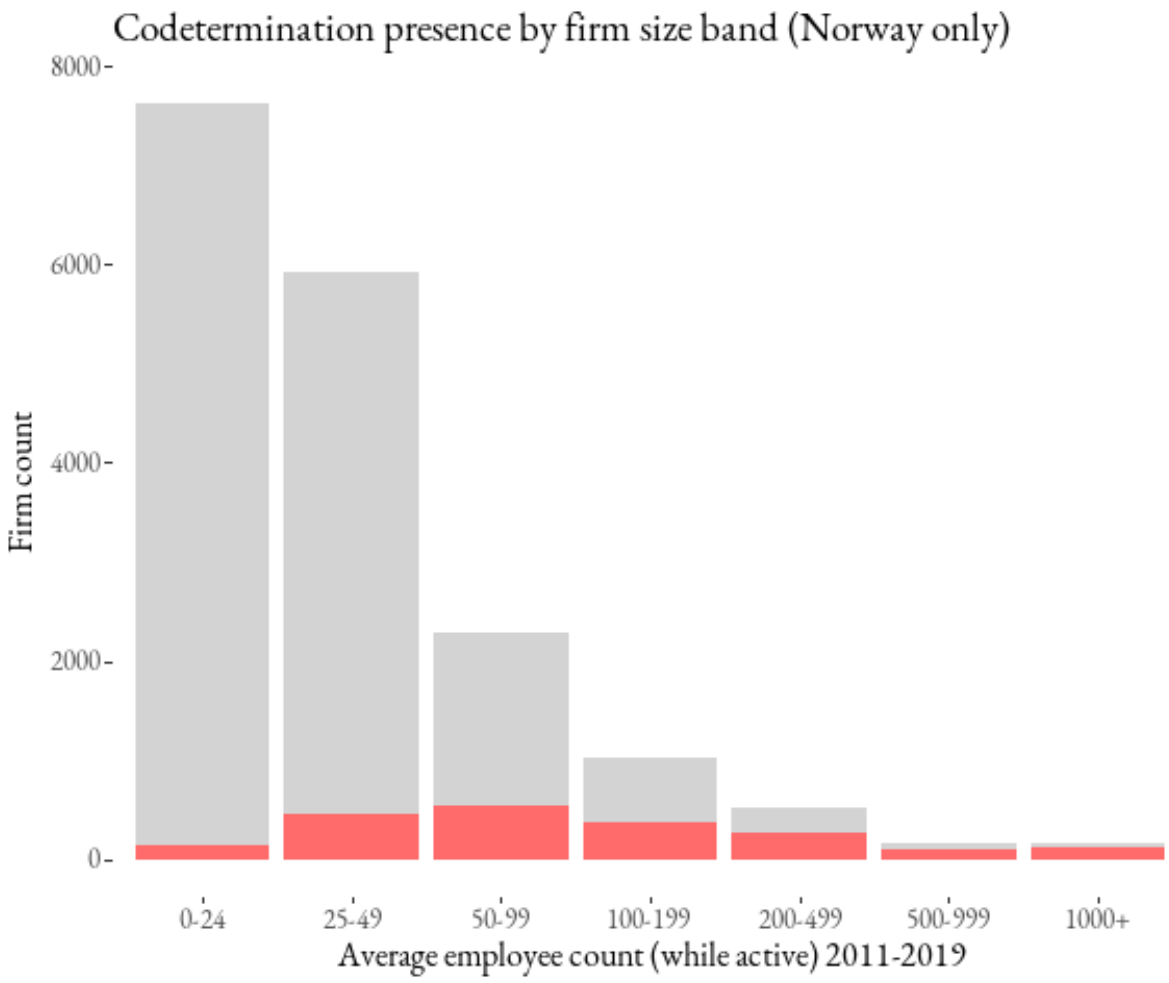
8 Appendix A: Board member titles and classifications

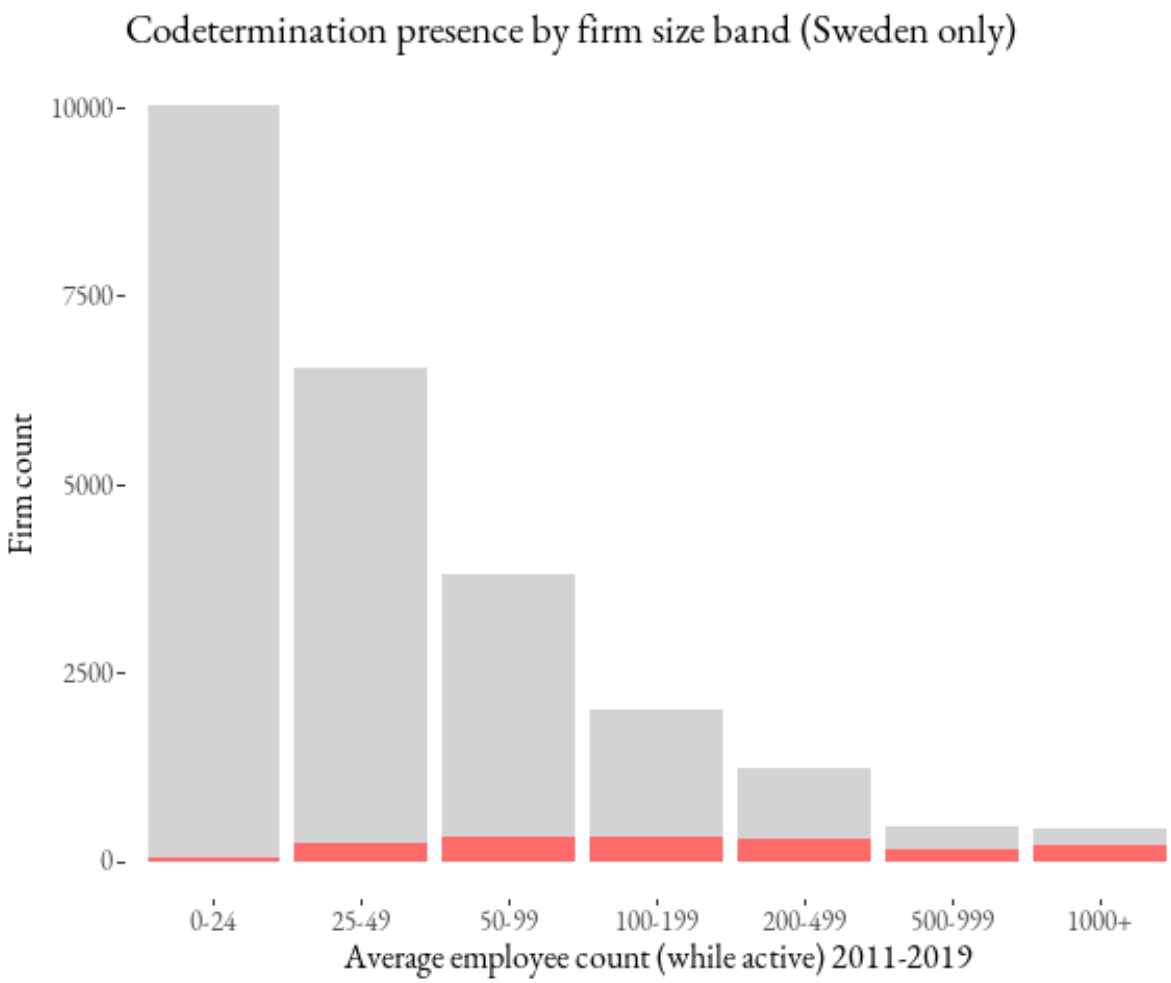
Employee-representative titles (top 30 by frequency)
Employees Representative
Regular Member and Employees Representative
Elected By Employees
Regular Member and Employees Representative; Board Member (Board of Directors)
Employee Representative
Board Member (Board of Directors); Regular Member and Employees Representative
Director (Board of Directors); Elected By Employees
Employees Representative; Board Member (Board of Directors)
Employee Representative Director (Board of Directors)
Employees Representative; Director (Board of Directors)
Regular Member and Employees Representative; Director (Board of Directors)
Director (Board of Directors); Regular Member and Employees Representative
Employee Representative; Board Member (Board of Directors)
Regular Member and Employees Representative; Member (Board of Directors)
Employees Representative; Member (Board of Directors)
Elected By Employees; Director / Member of the Board
Board Member (Board of Directors); Employee Representative
Director (Board of Directors); Employee Representative
Director / Member of the Board; Elected By Employees
Elected By Employees; Employee Representative
Employee Representative Member (Board of Directors)
Employee Representative; Director (Board of Directors)
Employee Representative; Elected By Employees
Employees Representative; Director / Member of the Board
Member (Board of Directors); Elected By Employees
Elected By Employees; Director (Board of Directors)
Employee Representative Board Member (Board of Directors)
Member (Board of Directors); Employee Representative
Board Member (Board of Directors); Elected By Employees
Elected By Employees; Employee Representative (Board of Directors)—Member (Supervisory Board)

Non-employee-representative titles (top 30 by frequency)
Regular Member
Board Member
Member of the Board
Chairman
Deputy Member
Managing Director and Regular Member
Deputy Chairman
Board Member (Board of Directors)
Director (Board of Directors)
Deputy Managing Director and Regular Member
Member (Board of Directors)
Managing Director and Deputy Member
Chairman (Board of Directors)
Director / Member of the Board
Deputy Managing Director and Deputy Member
Chairman (Board of Directors)—Regular Member
Director, Board of Directors
Deputy Chairman (Board of Directors)
Chairman—Regular Member
Non-Executive Director (Board of Directors)
Board Chairman (Board of Directors)
Vice President
Member of Supervisory Board
Vice Chairman (Board of Directors)
Member (Supervisory Board)
Independent Director (Board of Directors)
Managing Director and Regular Member; Chief Executive Officer
Chairman (Board of Directors)—Member of the Board
Director
Chairman—Member of the Board

9 Appendix B: Graphs of codetermination presence




Codetermination presence by firm size band (Norway only)
8000
6000
4000
2000
0
Firm count
0-24
25-49
50-99
100-199
200-499
500-999
1000+
Average employee count (while active) 2011-2019


Codetermination presence by firm size band (Sweden only)
Firm count
10000
7500
5000
2500
0
0-24
25-49
50-99
100-199
200-499
500-999
1000+
Average employee count (while active) 2011-2019

10 Appendix C: Sectoral presence of codetermination in sub-samples

Only Nordic firms with $\geq$ 25 employees on average

Sector	Firms w/o codet.	Firms w/ codet.	Codetermined share of firms	Avg. employee count per firm
Printing & Publishing	184	168	0.48	107
Utilities	194	148	0.43	178
Mining & Extraction	121	65	0.35	509
Leather, Stone, Clay & Glass products	139	72	0.34	212
Chemicals, Petroleum, Rubber & Plastic	382	185	0.33	217
Transport Manufacturing	229	109	0.32	668
Wood, Furniture & Paper Manufacturing	426	196	0.32	158
Information Services	7	3	0.3	75
Communications	134	53	0.28	835
Industrial, Electric & Electronic Machinery	934	341	0.27	263
Biotechnology and Life Sciences	105	36	0.26	90
Waste Management & Treatment	117	39	0.25	105
Metals & Metal Products	843	259	0.24	215
Textiles & Clothing Manufacturing	102	29	0.22	118
Banking, Insurance & Financial Services	522	132	0.2	454
Food & Tobacco Manufacturing	611	139	0.19	163
Computer Hardware	15	3	0.17	62

Public Administration, Education, Health Social Services	1335	268	0.17	108
Media & Broadcasting	147	24	0.14	103
Transport, Freight & Storage	1596	251	0.14	164
Miscellaneous Manufacturing	40	6	0.13	271
Computer Software	1076	127	0.11	81
Wholesale	3131	386	0.11	104
Business Services	5810	669	0.1	322
Property Services	665	66	0.09	92
Agriculture, Horticulture & Livestock	293	24	0.08	100
Construction	3405	265	0.07	67
Retail	1607	78	0.05	133
Travel, Personal & Leisure	2414	133	0.05	58

Only Nordic firms with $\geq$ 100 employees on average

Sector	**Firms w/o codet.**	**Firms w/ codet.**	**Codetermined share of firms**	**Avg. employee count per firm**
Computer Hardware	1	2	0.67	62
Printing & Publishing	38	65	0.63	107
Metals & Metal Products	90	144	0.62	215
Chemicals, Petroleum, Rubber & Plastic	80	126	0.61	217
Transport Manufacturing	47	75	0.61	668
Leather, Stone, Clay & Glass products	35	48	0.58	212
Wood, Furniture & Paper Manufacturing	90	113	0.56	158
Industrial, Electric & Electronic Machinery	195	207	0.51	263
Mining & Extraction	49	50	0.51	509

Biotechnology & Life Sciences	21	21	0.5	90
Utilities	56	53	0.49	178
Food & Tobacco Manufacturing	122	111	0.48	163
Communications	42	32	0.43	835
Waste Management & Treatment	31	19	0.38	105
Transport, Freight & Storage	330	176	0.35	164
Construction	311	139	0.31	67
Textiles & Clothing Manufacturing	22	10	0.31	118
Miscellaneous Manufacturing	7	3	0.3	271
Wholesale	533	217	0.29	104
Banking, Insurance & Financial Services	209	83	0.28	454
Public Administration, Education, Health Social Services	250	95	0.28	108
Media & Broadcasting	30	10	0.25	103
Agriculture, Horticulture & Livestock	41	13	0.24	100
Computer Software	210	65	0.24	81
Property Services	155	33	0.18	92
Retail	285	63	0.18	133
Travel, Personal & Leisure	321	69	0.18	58
Business Services	1930	361	0.16	322
Information Services	NA	3	NA	75

Only Danish firms

Sector	Firms w/o codet.	Firms w/ codet.	Codetermined share of firms	Avg. employee count per firm
Information Services	2	1	0.33	75
Utilities	61	29	0.32	178
Leather, Stone, Clay & Glass products	59	23	0.28	212
Printing & Publishing	68	26	0.28	107
Chemicals, Petroleum, Rubber & Plastic	155	48	0.24	217
Transport Manufacturing	36	11	0.23	668
Food & Tobacco Manufacturing	140	40	0.22	163
Banking, Insurance & Financial Services	190	51	0.21	454
Communications	52	13	0.2	835
Industrial, Electric & Electronic Machinery	451	114	0.2	263
Waste Management & Treatment	25	6	0.19	105
Wood, Furniture & Paper Manufacturing	149	34	0.19	158
Metals & Metal Products	355	64	0.15	215
Textiles & Clothing Manufacturing	47	7	0.13	118
Computer Hardware	7	1	0.12	62
Biotechnology and Life Sciences	53	6	0.1	90
Mining & Extraction	26	3	0.1	509
Business Services	1781	178	0.09	322
Miscellaneous Manufacturing	21	2	0.09	271
Transport, Freight & Storage	464	46	0.09	164
Public Administration, Education, Health Social Services	115	10	0.08	108
Retail	221	19	0.08	133
Media & Broadcasting	64	5	0.07	103
Wholesale	1499	106	0.07	104
Computer Software	419	26	0.06	81
Travel, Personal & Leisure	370	22	0.06	58
Agriculture, Horticulture & Livestock	103	4	0.04	100
Construction	1107	48	0.04	67
Property Services	164	6	0.04	92

Only Norwegian firms

Sector	Firms w/o codet.	Firms w/ codet.	Codetermined share of firms	Avg. employee count per firm
Utilities	63	75	0.54	178
Printing & Publishing	112	121	0.52	107
Chemicals, Petroleum, Rubber & Plastic	80	51	0.39	217
Banking, Insurance & Financial Services	101	60	0.37	454
Biotechnology and Life Sciences	28	16	0.36	90
Communications	51	28	0.35	835
Mining & Extraction	113	54	0.32	509
Wood, Furniture & Paper Manufacturing	158	71	0.31	158
Industrial, Electric & Electronic Machinery	217	91	0.3	263
Leather, Stone, Clay & Glass products	71	27	0.28	212
Transport Manufacturing	135	46	0.25	668
Public Administration, Education, Health Social Services	811	235	0.22	108
Computer Software	380	89	0.19	81
Metals & Metal Products	296	66	0.18	215
Textiles & Clothing Manufacturing	46	10	0.18	118
Waste Management & Treatment	84	19	0.18	105
Media & Broadcasting	98	14	0.12	103
Business Services	2159	254	0.11	322
Wholesale	1232	145	0.11	104
Transport, Freight & Storage	968	104	0.1	164
Food & Tobacco Manufacturing	526	54	0.09	163
Miscellaneous Manufacturing	24	2	0.08	271
Property Services	237	19	0.07	92
Agriculture, Horticulture & Livestock	304	19	0.06	100
Construction	2662	169	0.06	67
Travel, Personal & Leisure	2806	86	0.03	58
Retail	1969	37	0.02	133
Computer Hardware	NA	1	NA	62
Information Services	1	NA	NA	75

Only Swedish firms

Sector	Firms w/o codet.	Firms w/ codet.	Codetermined share of firms	Avg. employee count per firm
Printing & Publishing	151	57	0.27	107
Transport Manufacturing	139	52	0.27	668
Utilities	158	54	0.25	178
Leather, Stone, Clay & Glass products	81	24	0.23	212
Chemicals, Petroleum, Rubber & Plastic	316	88	0.22	217
Information Services	7	2	0.22	75
Wood, Furniture & Paper Manufacturing	365	94	0.2	158
Textiles & Clothing Manufacturing	52	12	0.19	118
Industrial, Electric & Electronic Machinery	724	144	0.17	263
Metals & Metal Products	763	137	0.15	215
Mining & Extraction	45	8	0.15	509
Waste Management & Treatment	90	15	0.14	105
Biotechnology and Life Sciences	91	14	0.13	90
Food & Tobacco Manufacturing	305	46	0.13	163
Communications	121	13	0.1	835
Transport, Freight & Storage	1391	106	0.07	164
Property Services	763	48	0.06	92
Wholesale	2397	142	0.06	104
Banking, Insurance & Financial Services	472	25	0.05	454
Business Services	5147	271	0.05	322
Computer Hardware	19	1	0.05	62
Media & Broadcasting	117	6	0.05	103
Miscellaneous Manufacturing	35	2	0.05	271
Public Administration, Education, Health Social Services	1444	60	0.04	108
Agriculture, Horticulture & Livestock	186	5	0.03	100
Computer Software	1141	25	0.02	81
Construction	3039	54	0.02	67
Retail	1183	26	0.02	133
Travel, Personal & Leisure	1567	31	0.02	58

11 Appendix D: Selected regression tables for Section 4 (Nordic states)

Model specifications

First, a simple linear estimator with a codetermination dummy only:

$$Y = \alpha + \beta_1 C + \epsilon \tag{1}$$

where Y is the outcome of interest and β_1 captures the relationship of interest with the dummy for codetermination presence C; second,

$$Y = \alpha + \beta_1 C + \beta_2 E + \epsilon \tag{2}$$

where E controls for firm size (employee count); third,

$$Y = \alpha + \beta_1 C + \beta_2 E + \beta_N N + \epsilon \tag{3}$$

where N is a vector of national fixed effect terms; fourth,

$$Y = \alpha + \beta_1 C + \beta_2 E + \beta_N N + \beta_S S + \epsilon \tag{4}$$

where S is a vector of sectoral fixed effect terms.

Table 18: Log. average costs per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.308***	0.311***	0.388***	0.295***
	(0.011)	(0.011)	(0.010)	(0.009)
Avg. employee count		−0.00000***	−0.00000***	−0.00000***
		(0.00000)	(0.00000)	(0.00000)
Norway (country dummy)			−0.621***	−0.447***
			(0.008)	(0.007)
Sweden (country dummy)			−0.043***	0.004
			(0.007)	(0.007)
Observations	48,463	48,463	48,463	47,780
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 19: Women's representation as a share of supervisory board

	(1)	(2)	(3)	(4)
Codetermined firm	1.753***	1.639***	2.281***	3.400***
	(0.487)	(0.489)	(0.486)	(0.489)
Avg. employee count		0.0002**	0.0001**	0.0001*
		(0.0001)	(0.0001)	(0.0001)
Norway (country dummy)			4.070***	1.031***
			(0.375)	(0.380)
Sweden (country dummy)			9.529***	7.588***
			(0.351)	(0.349)
Observations	47,663	47,656	47,656	46,895

Table 20: Avg. profit margin (%)

	(1)	(2)	(3)	(4)
Codetermined firm	1.509***	1.501***	1.494***	1.308***
	(0.179)	(0.180)	(0.181)	(0.185)
Avg. employee count		0.00001	0.00000	0.00000
		(0.00001)	(0.00001)	(0.00001)
Norway (country dummy)			−1.805***	−0.902***
			(0.219)	(0.222)
Sweden (country dummy)			−0.763***	−0.501**
			(0.215)	(0.215)
Observations	44,936	44,936	44,936	44,223

Table 21: Log. avg. revenue per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.508***	0.511***	0.502***	0.407***
	(0.018)	(0.018)	(0.017)	(0.015)
Avg. employee count		−0.00000***	−0.00001***	−0.00001***
		(0.00000)	(0.00000)	(0.00000)
Norway (country dummy)			−1.012***	−0.807***
			(0.021)	(0.018)
Sweden (country dummy)			−0.437***	−0.318***
			(0.020)	(0.018)
Observations	44,294	44,294	44,294	43,613

Table 22: Log. working capital per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.480***	0.483***	0.542***	0.321***
	(0.027)	(0.027)	(0.026)	(0.022)
Avg. employee count		−0.00000*	−0.00001***	−0.00000***
		(0.00000)	(0.00000)	(0.00000)
Norway (country dummy)			−1.074***	−0.615***
			(0.021)	(0.018)
Sweden (country dummy)			−0.523***	−0.306***
			(0.020)	(0.016)
Observations	41,677	41,677	41,677	41,056

Table 23: Log. value added per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.372***	0.374***	0.374***	0.331***
	(0.014)	(0.014)	(0.014)	(0.012)
Avg. employee count		−0.00000**	−0.00000**	−0.00000***
		(0.00000)	(0.00000)	(0.00000)
Norway (country dummy)				−0.548***
				(0.009)
Sweden (country dummy)				−0.023***
				(0.008)
Observations	43,287	43,287	43,287	42,635

Table 24: Log. market cap

	(1)	(2)	(3)	(4)
Codetermined firm	2.012***	1.837***	1.738***	1.787***
	(0.158)	(0.158)	(0.160)	(0.166)
Avg. employee count		0.00002***	0.00002***	0.00002***
		(0.00000)	(0.00000)	(0.00000)
Norway (country dummy)			0.355	0.408*
			(0.238)	(0.244)
Sweden (country dummy)			−0.274	−0.103
			(0.193)	(0.199)
Observations	746	746	746	746

Table 25: Avg. rate of growth in market cap

	(1)	(2)	(3)	(4)
Codetermined firm	0.098**	0.095**	0.054	0.036
	(0.045)	(0.045)	(0.046)	(0.046)
Avg. employee count		0.00000	0.00000	0.00000
		(0.00000)	(0.00000)	(0.00000)
Norway (country dummy)			0.015	−0.106
			(0.068)	(0.068)
Sweden (country dummy)			−0.174***	−0.171***
			(0.055)	(0.055)
Observations	746	746	746	746

12 Appendix E: Selected regression tables for Section 5.4 (Germany)

Table 26: Log. average costs per employee

	(1)	(2)	(3)	(4)
Codetermined firm	−0.039***	−0.039***	−0.065***	−0.063***
	(0.008)	(0.008)	(0.008)	(0.008)
Avg. employee count		0.00000	−0.00000**	−0.00000***
		(0.00000)	(0.00000)	(0.00000)
Constant	3.860***	3.860***	3.946***	3.682***
	(0.003)	(0.003)	(0.007)	(0.036)
Observations	45,891	45,891	45,713	45,281
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 27: Women's share of supervisory board seats

	(1)	(2)	(3)	(4)
Codetermined firm	3.436***	4.186***	4.516***	4.698***
	(0.959)	(1.035)	(1.052)	(1.101)
Avg. employee count		−0.001*	−0.001*	−0.001*
		(0.0003)	(0.0003)	(0.0004)
Constant	18.442***	18.506***	15.453***	19.355***
	(0.519)	(0.520)	(1.280)	(4.162)
Observations	3,220	3,220	3,162	3,124

Table 28: Average profit margin of firm

	(1)	(2)	(3)	(4)
Codetermined firm	0.206	0.159	0.078	0.103
	(0.150)	(0.153)	(0.155)	(0.158)
Avg. employee count		0.00002*	0.00002	0.00002
		(0.00001)	(0.00001)	(0.00001)
Constant	3.428***	3.426***	3.810***	4.289***
	(0.053)	(0.053)	(0.142)	(0.728)
Observations	48,951	48,951	48,734	48,311

Table 29: Output (Log. average revenue per employee)

	(1)	(2)	(3)	(4)
Codetermined firm	0.296***	0.290***	0.263***	0.332***
	(0.013)	(0.013)	(0.014)	(0.012)
Avg. employee count		0.00000**	0.00000	0.00000
		(0.00000)	(0.00000)	(0.00000)
Constant	4.826***	4.825***	4.900***	4.911***
	(0.004)	(0.004)	(0.009)	(0.040)
Observations	106,082	106,082	105,510	104,375

Table 30: Log. average working capital per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.695***	0.685***	0.643***	0.976***
	(0.028)	(0.028)	(0.028)	(0.024)
Avg. employee count		0.00000**	0.00001**	0.00000
		(0.00000)	(0.00000)	(0.00000)
Constant	1.901***	1.900***	2.126***	2.557***
	(0.006)	(0.006)	(0.015)	(0.054)
Observations	140,007	140,007	139,843	138,351

Table 31: Log. average value added per employee

	(1)	(2)	(3)	(4)
Codetermined firm	−0.060***	−0.062***	−0.062***	−0.069***
	(0.011)	(0.011)	(0.011)	(0.011)
Avg. employee count		0.00000	0.00000	−0.00000
		(0.00000)	(0.00000)	(0.00000)
Constant	4.142***	4.142***	4.142***	4.167***
	(0.004)	(0.004)	(0.004)	(0.049)
Observations	47,020	47,020	47,020	46,414

13 Appendix F: Selected regression tables for Section 5.5 (Germany, restricted sample)

Table 32: Log. avg. cost per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.066	0.068	0.098	0.092
	(0.084)	(0.084)	(0.098)	(0.109)
Avg. employee count		−0.0004	−0.0001	−0.0002
		(0.0004)	(0.0005)	(0.0005)
Constant	4.066***	4.114***	3.947***	3.684***
	(0.058)	(0.076)	(0.143)	(0.382)
Observations	249	249	218	217

Note: *p<0.1; **p<0.05; ***p<0.01

Table 33: Women's share of board seats

	(1)	(2)	(3)	(4)
Codetermined firm	7.685*	7.708*	6.688	8.397
	(4.129)	(4.150)	(4.698)	(5.382)
Avg. employee count		0.002	0.002	0.014
		(0.021)	(0.024)	(0.025)
Constant	18.768***	18.613***	16.408***	12.390
	(2.584)	(3.189)	(5.894)	(12.723)
Observations	189	189	186	186

Table 34: Average profit margin of firm

	(1)	(2)	(3)	(4)
Codetermined firm	2.314	2.289	4.369**	2.278
	(1.874)	(1.883)	(2.138)	(2.271)
Avg. employee count		0.001	−0.009	−0.007
		(0.008)	(0.009)	(0.009)
Constant	3.971***	3.791**	3.384	3.565
	(1.247)	(1.584)	(3.012)	(7.675)
Observations	235	235	202	200

Table 35: Output (Log. avg. revenue per employee)

	(1)	(2)	(3)	(4)
Codetermined firm	0.085	0.088	0.142	0.005
	(0.140)	(0.141)	(0.154)	(0.150)
Avg. employee count		−0.0004	−0.0004	−0.00003
		(0.001)	(0.001)	(0.001)
Constant	5.423***	5.472***	5.168***	5.171***
	(0.090)	(0.113)	(0.210)	(0.485)
Observations	329	329	294	293

Table 36: Log. avg. working capital per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.525***	0.515**	0.477**	−0.007
	(0.201)	(0.201)	(0.213)	(0.202)
Avg. employee count		0.002	0.001	0.002**
		(0.001)	(0.001)	(0.001)
Constant	2.384***	2.235***	2.288***	4.275***
	(0.132)	(0.160)	(0.278)	(0.563)
Observations	384	384	355	354

Table 37: Log. avg. value added per employee

	(1)	(2)	(3)	(4)
Codetermined firm	0.082	0.080	0.080	−0.033
	(0.087)	(0.086)	(0.086)	(0.086)
Avg. employee count		−0.001**	−0.001**	−0.001**
		(0.0004)	(0.0004)	(0.0004)
Constant	4.424***	4.546***	4.546***	4.471***
	(0.060)	(0.079)	(0.079)	(0.304)
Observations	236	236	236	206