

# 1 Kappa

*What are the common wages of labour, depends every where upon the contract usually made between those two parties, whose interests are by no means the same. The workmen desire to get as much, the masters to give as little as possible. The former are disposed to combine in order to raise, the latter in order to lower the wages of labour.*

(Adam Smith: Wealth of Nations, Book 1 part VIII, p. 65)

## 1.1 Introduction

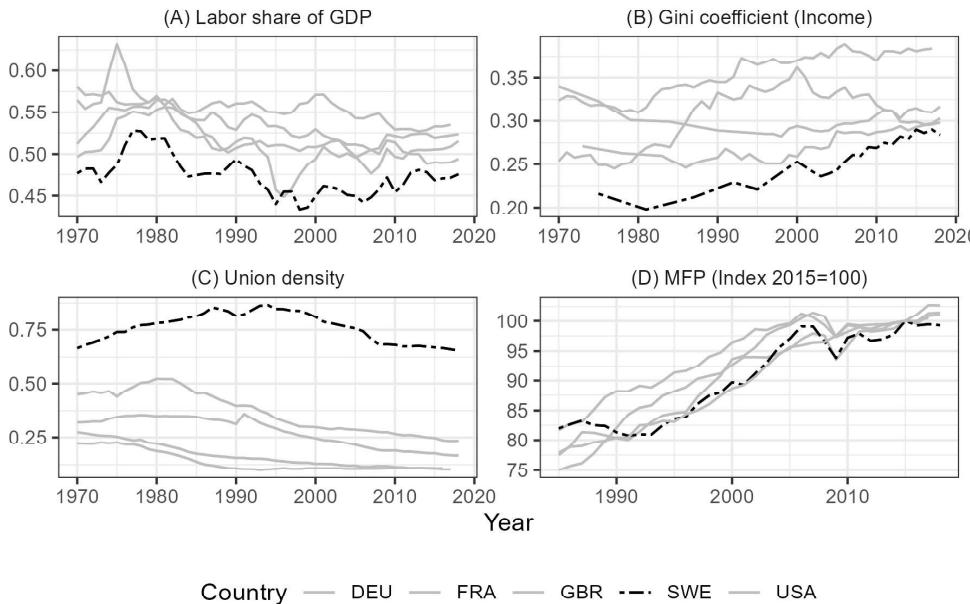
In this introductory *kappa*<sup>1</sup> chapter, I tie together four essays exploring how labor markets and workplaces are shaped by complex interactions between firms, workers, and labor market institutions. Such interactions are the result of social processes which can affect organizational and technological choices at the firm level, local and aggregate productivity developments, the boundaries of the firm, the distribution of rents, and ultimately the overall function of labor markets.

Above all, the dissertation is an inquiry into the role of bargaining power in modern labor markets. Theoretically and methodologically, the essays span over several disciplines of the social sciences, addressing the intertwined concepts of individual and collective bargaining power in applied settings. The essays are (mostly) set in Sweden, where we can observe considerable variation in both individual and collective bargaining power dynamics, resulting from the Swedish industrial relations system (Dunlop 1958).

The sources, distribution, and impact of bargaining power in labor markets deserves more attention in the social sciences, and in particular from economists. In the past four decades the balance of power between workers and employers has arguably shifted in favor of the latter in most Western democracies. The labor shares of national income has decreased in most settings (see figure 1.1 A), income inequalities have widen (1.1 B), and union density has fallen (1.1 C) (ILO and OECD 2015).

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<sup>1</sup>In Swedish compilation dissertations – i.e. non-monograph dissertations that are composed of individual papers – the *kappa* (translation: cloak or overcoat) is an introductory chapter which binds the chapters/papers together and places them in a context.



**Figure 1.1:** Included countries are Germany (DEU), France (FRA), The United Kingdom and Northern Ireland (GBR), Sweden (SWE, highlighted), and the United States (USA), from 1970 (A to C) or 1985 (D) to the latest available year of data. Panel (A) indicates compensation of employees as the share of gross domestic product (labor share of GDP), measured in real 2010 prices and fixed exchange rates. (B) shows the Gini coefficient, which measures net income dispersion across the population (i.e. post-tax and post-transfer income). A Gini coefficient of 1 indicates total concentration of incomes to a single individual (or household) while a value approaching 0 totally equal distribution of incomes. Panel (C) indicates national union density, i.e. the estimated ratio of union members in the labor force. Panel (D) shows multifactor productivity (MFP) developments, with Index=100 in 2015. Sources: ILO and OECD (A), Luxembourg Income Study (B), OECD (C) and (D).

Although there are many explanations behind these developments, we will focus on the decline of organized labor, represented as declines of union density and collective bargaining coverage. This trend is found in most Western settings, and suggests that collective bargaining power has been reduced in these labor markets. I argue that this decline is the result of two intertwined causes. First, political reforms that were aimed at weakening unions and the labor market institutions which give workers bargaining power. And second, an inability of unions and labor market institutions to adapt to changing labor markets. The two causes are arguably intertwined, as the inability to adapt labor market institutions to changes in labor markets (institutional sclerosis) may itself be an intended or unintended effect of political reforms.

On what intellectual grounds were (or are) such policies motivated? Or specifically, what are the economics behind labor market liberalization?

Labor market liberalization can be seen as a means to spur economic efficiency by reducing market distortions and removing barriers to competition. If labor markets are efficient, it implies that wages will be set at market (equilibrium) rates, allowing each worker to be paid exactly her contribution in productivity. In an effi-

cient market, institutional interventions such as minimum wages (Stigler 1946) or collective bargaining agreements (Oswald 1982) may create inefficiencies by setting wages above equilibrium/competitive market rates, resulting in higher wages for *insiders*, but overall lower employment and disutility to *outsiders* (Lindbeck and Snower 1986). By allocating more decisions to the price mechanism, competitiveness and growth should improve as resource allocation is delegated to supply and demand – the invisible hand of the free market. Thus, the role of unions to monopolize labor supply and bargain collectively over the wages and terms and conditions of employment (Freeman and Medoff 1984) produces similar adverse welfare effects as monopolies or cartels would in a product market. Therefore, such ventures should not be encouraged by policymakers.

But what if labor markets are inherently inefficient to begin with?

#### *The competitiveness of labor markets*

Stating that labor markets are efficient implies that labor markets are competitive. A competitive labor market implies that an employer who set wages below equilibrium rates will lose a significant number of workers to unemployment or the competition. If workers are well informed about wage levels in the labor market, have low costs of switching jobs, and there are plenty of vacancies at competing firms, an employer paying below-equilibrium wages will be punished by workers moving to outside options. Thus, diverging from market wage rates is costly and ultimately an irrational behavior. However, if a labor market is not competitive, an employer will not be punished as severely by workers if wages are set at below equilibrium rates. (Robinson 1933)

From this, it is straight forward to conclude that some labor markets may be more competitive than others. In a geographically isolated or slack labor market, an employer may be able to pay lower wages because workers lack of viable outside options, compared to a tight labor market in an urban region, where outside options are plentiful. Thus, the question of labor market efficiency should rather be addressed as: how competitive are labor markets?

The question is well suited for empirical testing and exploration. By assessing how competitive labor markets are, we can explore research questions which seek to confirm or reject the notion that labor markets are efficient.

Among the most important results of the so-called credibility revolution (Angrist and Pischke 2010) is a mounting body of evidence that labor markets are far from competitive, implying that employers have wage setting power in most labor markets (e.g. Card 2022). Under such circumstances, minimum wages or collective bargaining can raise wages closer to market clearing levels compared to a labor market where bargaining power asymmetries go unchecked. In such circumstances, collective bargaining should yield both higher wages and higher overall employment

than when the employer has monopsony power<sup>2</sup>. Monopsony power has various sources including search frictions, switching costs, worker and job heterogeneity, and information asymmetries (e.g. Manning 2003, Jäger et al. 2024). This is not to say that unions or minimum wages can raise wages above market clearing rates. Rather, the results imply that it is imprudent to assume that intervening labor market institutions will automatically worsen economic efficiency in the labor market.

Rejecting the efficient labor market hypothesis should have large policy implications. The liberalizing labor market reforms of the 1980's and 1990's were largely informed by the implicit (or explicit) assumption that labor markets are efficient. Thus, the importance of asking and answering research questions relating to labor market competition, bargaining power asymmetries, and the institutions which attempt to address such asymmetries, can hardly be understated.

So, if a central assumption underpinning yesteryear's economic orthodoxy (labor markets are competitive) have been rejected using theories and methods building on the positivist tradition of orthodox economics, what other adverse effects have resulted from widened bargaining asymmetries in labor markets, beside lower wages and employment?

### *Structural change and bargaining power*

Returning to figure 1.1, panel (D) shows that multi-factor productivity (MFP) has been stagnant in the post-financial crisis period across the observed settings. Productivity is likely the most important indicator of human prosperity. In the long run, all economic growth is productivity growth (Solow 1956). Productivity growth is often a result of using existing resources more effectively (Solow 2016), which should bring some comfort to those of us worried about our planet's limited resources.

Productivity is something we want more of if we are interested in improving prosperity. So, if there is a connection between poor productivity growth and the weakening of labor market institutions, it is also something we should also care deeply about. Or at least explore if there is any cause to such claims.

For simplicity, we assume that productivity growth is a result of firms improving the arrangement of labor and capital inputs, where it is the job of the entrepreneur to decide on how labor and capital inputs are arranged and used to produce outputs. An investment in technologies can be motivated by many reasons, but for the sake of simplicity we assume that the ultimate goal is to increase profits by producing (and selling) more outputs and/or reducing the costs of producing outputs.

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<sup>2</sup>Monopsony defines a market with a single buyer, and is related to the more common concept of monopoly, which defines a market with a single seller. Having monopoly power implies benefiting from selling goods in a market characterized by monopolistic competition, which is what characterizes most real-world markets, where brand names or patents, for example, allow firms some exclusivity in marketing their products and services. Having monopsony power similarly implies benefiting from a market with monopsonistic competition, allowing the buyer to procure inputs at lower prices than what a competitive market would have allowed.

The technological and organizational choices made by the entrepreneur will reflect available technologies, the skills of labor, and the relative cost of each set of inputs. If labor inputs become relatively more expensive compared to capital, it will have an effect on the choice and arrangement of the production function. If the cost of labor increases, the entrepreneur will seek to use more capital inputs. But if labor inputs cannot be entirely substituted by capital inputs, the entrepreneur will invest in capital that augments costly labor inputs to capital, allowing the firm (and workers) to produce more output with fewer labor inputs. We call this an automation process.

The outcomes of an investment in automation can result in both benefits and costs. On the benefit side, more capital intensive production can remove "dull, dirty, and dangerous" tasks from jobs. It can increase productivity and generate greater surpluses at the firm, which provides the necessary conditions for raising wages or paying greater dividends to shareholders. On the cost side, the new and more automated production function may result in unemployment if there are no alternative tasks for technologically displaced laborers to perform. The size of the social costs produced by automation depend on how well displaced workers fare in the post-automation event. The number and the quality of outside job options, the quality of active labor market policies, and the generosity of unemployment insurance all affect the quality of the transition that the displaced worker experiences, and ultimately the social cost of automation.

In terms of productivity growth and human prosperity, the twentieth century is a remarkable moment in human history. Structural change produced benefits for the masses which largely outweighed the costs it incurred<sup>3</sup>. Looking to the twenty-first century, it is far from certain that the benefits of structural change are as massive in relation to its costs<sup>4</sup>.

As economists, we often equate technological change with productivity growth, and in extension, productivity growth with human prosperity. Acemoglu and Johnson (2023) defines the notion that technological innovation and productivity go hand-in-hand with broadly distributed economic growth as the Productivity Bandwagon. Based on a survey of economic history, they argue that the technological bandwagon is a parenthesis in human history, which is hardly a controversial claim. More controversially, they also argue that the ability and momentum of the bandwagon in the late nineteenth and most of the twentieth century to deliver broad based gains, was dependent on a historically unique period when workers had significant bargaining power in relation to their employers. The mechanism they propose, rests on a Acemoglu and Restrepo's (2019) "so-so technologies" hypothesis, suggesting that worker bargaining power can have a significant impact on the types of investments that employers make.

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<sup>3</sup>I do not consider externalities from greenhouse gas emissions or other pollutants in this simplified example.

<sup>4</sup>Again, excluding the previously mentioned externalities.

A critique of Acemoglu and Johnson (2023) relates to a vague definition of bargaining power (e.g. Smith 2024). My own view is that the book does not sufficiently separate demand-driven bargaining power from political or "persuasive" bargaining power. The authors make a strong case for the former in the context of economic history; labor scarcity in the rapidly industrializing nineteenth century United States, for example, prompted entrepreneurs to invest and invent labor saving technologies that improved productivity, while creating high quality jobs in new innovative sectors of the economy. This allowed wages and living standards to improve with productivity. What I find lacking in the book are concrete examples of technologies or innovation that were intentionally created as a result of political interactions. Without such cases, it is difficult to prove a causal link between worker power and innovation.

A choice of technology which implies no loss of jobs can also be detrimental to workers if the resulting labor process becomes more dull, makes workers more replaceable, or is designed to increase employer control while decreasing worker autonomy (e.g. Braverman 1974, Kellogg et al. 2020). Such choices could result in decreased worker satisfaction and increased labor turnover. But are firms less likely to make adverse choices if workers have a say in how and which technologies are implemented in the workplace? Do more satisfied workers make a firm more productive and profitable compared to an identical firm with less satisfied workers?

In *The labor market as a social institution*, Solow (1990) argues that a defining feature labor markets, which set them apart from product markets, is the role of fairness in shaping the behaviors of its agents<sup>5</sup>:

*"all our experience teaches us that the motives governing behavior in the labor market are not exactly the same as those that govern the market when a fleet of fishing vessels returns to port and auctions off its combined catch at dockside"*

(Solow 1990, p. 57)

Solow illustrates that downward wage rigidity and involuntary unemployment can be explained by a simple model of workers facing an oversupply of labor, accepting (unfair) lower wages or staying on "the dole". If workers are forward looking and anticipate wage increases in the future, they may discount the costs of staying unemployed today with future benefits of higher wages once labor demand increases. Further, accepting lower wages today risks lowering future wages even further via the prisoner's dilemma.

Akerlof (1982) suggests that employers may pay workers more than market clearing wages (efficiency wages) as a means to incentivize worker productivity by the means of a partial gift exchange. Paying efficiency wages should elicit a gift

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<sup>5</sup>A fact also recognized by Alfred Marshall (1887).

of effort, loyalty and longer tenure from workers. Assuming that wages are interchangeable with "utilis", and workers can derive more or less pleasure from work, employers can do any number of things to incentivize effort or productivity from their workers which may result in such productivity bearing gifts. For example, they can choose to treat their workers well and invest in technologies that make their jobs better.

Both Solow (1990) and Akerlof (1982) build their reasoning around employers paying wages at or above market clearing rates. However, as it is now (relatively) well established that employers have wage setting power, allowing employers to pay below-equilibrium wages, what are the consequences to productivity? For an employer to elicit Akerlof's gift exchange from its employees, the employer must resist the urge to pay monopsony wages or offer monopsony working conditions to get their workers to experience a sense of fairness on which the gift exchange is conditioned. What can persuade employers to resist their monopsonist urges?

### *Research questions*

The remaining sections of the kappa addresses three broad research questions, which attempts to provide the reader with some context and an idea about the bigger questions that I hope to address in the dissertation:

- *What gives workers bargaining power?*
- *How can bargaining power affect technological change?*
- *What can labor market institutions do to assure that technological change has a positive impact on society and the economy?*

In the following three sections, I will address these three research questions in order, followed by a summary of the papers included in the dissertation.

But first, I provide a brief introduction to the Swedish industrial relations system, as it is the main setting of the essays. As I will hopefully show: Swedish institutional arrangements and their ideational foundations are largely based on answering these three big questions above.

## 1.2 Primer: The Swedish Industrial Relations System

The Swedish model is a common epithet of the Swedish industrial relations system, describing a model where employers and unions – through collective bargaining at the national, sectoral, and firm level – are delegated a relatively high level of capacity and autonomy to regulate the labor market. Sweden has no legislated minimum wages or systems to extend collective bargaining agreements to non-organized firms. It is a subset of the Nordic labor market models, which although heterogeneous, include national settings which share certain traits and historical commonalities that are normally defined by high union density, high collective bargaining coverage, and a high share of employers organized in employer associations. Having well-organized employers is one of the more distinguishing features of the Nordic models (e.g. Swenson 2002)

As of 2021, approximately 70 percent of employed Swedish workers are union members. 88 percent are employed in a workplace covered by a collective agreement, while 84 percent are employed in workplaces where their employer is a member of an employer association<sup>6</sup>.

Unions typically represent either blue- or white collar workers, where union density in white-collar occupations has recently surpassed the levels of blue collar occupations (Kjellberg 2023). Unions either organize along the line of the industry principle (all of the occupations inside the "factory gates") or as occupational unions (for example, contractors or specialists). Blue-collar unions are defined by their association with the Swedish Trade Union Confederation (LO), whereas white-collar unions are (mostly) defined by being associated with the Swedish Confederation of Professional Employees (TCO) or The Swedish Confederation of Professional Associations (Saco). Among these confederations, collective bargaining is only coordinated through the LO. White-collar unions instead coordinate collective bargaining through separate organizations, such as The council for negotiation and cooperation (PTK) or the Public Employees' Negotiation Council (OFR).

Employer associations typically organize a sector (public sector) or some industry (e.g. engineering industries, transportation, hospitality or retail). In the public sector, municipalities and regions are organized by The Swedish Association of Local Authorities and Regions (SKR), or Swedish Agency for Government Employers which organizes employers of the state. Most private sector employer associations are members of The Swedish Confederation of Enterprise<sup>7</sup>. Apart from engaging in political lobbying, providing member services, and running institutions co-owned with the union movement, The Swedish Confederation of Enterprise represent their members in collective bargaining in topics that cover the national cross-sectoral level

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<sup>6</sup>The remaining four percent are non-members and have signed collective agreements directly with a trade union, according to Kjellberg (2022).

<sup>7</sup>Other private sector umbrella organization include Fremia, who organize employers in cooperative or popular-movement (associations) sector.

(usually with the LO, and PTK or Unionen). Bargaining topics may include diverse topics such as pensions, employment protection, non-compete clauses, or any other topics that the parties have judged are suited for national cross-sectoral regulation.

Together with their main-level union parties (LO and PTK), the Swedish Confederation of Enterprise may conclude collective agreements which include legislative proposals. This produces a distinctly Swedish version of tripartite bargaining. Such agreements often imply that the main level unions and employers agree to a regulatory package, which may stretch outside of their regulatory capacity. In cases where regulatory package includes changes to legislation, the agreement implies that employers and unions bargain jointly against the government. Thus, the Swedish tripartite model does not follow tripartite bargaining patterns found in continental Europe. Rather, it implies one-on-one bargaining rounds (employers vs. unions), followed by two-on-one bargaining rounds (employers and unions vs. legislators/the government).

The model can be described as producing a self-regulated labor market, although legislation plays a prominent role, often setting frameworks which often allow for considerable deviation in collective bargaining. The role of legislation in the model is a contested topic. As shown above, employers and unions may at times mutually agree to change legislation. At other times, legislation has been used to further unilateral interests of one party to the behest of the other (e.g. Nycander 2004 for a discussion). We will return to the question of why "running to the legislator" is an ideational faux-pas in the model.

High levels of both union and employer association membership density are prerequisites to self-regulate a labor market, as such ventures require both organizational capacity, legitimacy, and a relative balance of power to fill the large role which government agencies and legislation plays in other settings (Rönnmar 2019). If one party loses the capacity to regulate their delegated side of the labor market, there is a risk of unwanted legislative intervention. This, as we shall soon discuss, is an ideationally rooted fear which may create large incentives for institutional change.

## Wage bargaining

To exemplify the Swedish model in action, I will briefly present how wage formation works in somewhat general terms<sup>8</sup>. Wage setting exemplifies the autonomy of the social partners, how the state supports such ventures, the role of labor conflicts, and how unions and employers are relatively free to develop and structure prominent features of the industrial relations system without heavy-handed interference from the state<sup>9</sup>.

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<sup>8</sup>Parts of the system deviate from this description, but are excluded for the sake of brevity and simplicity.

<sup>9</sup>See Bender (2024) for a discussion on the role of organizational flexibility in collectively bargained wage formation.

According to the OECD's classification, Swedish wage bargaining follows "pattern bargaining with high degrees of coordination", enforced by both peace clauses and obligatory mediation (OECD 2019). Specifically, wage bargaining is sectoral and centrally coordinated. Collective agreements are typically negotiated on an annual, biannual, or triennial basis, and under which employers are generally subject to labor peace<sup>10</sup>.

Since 1997, national collective agreements are struck in a specific sectoral and temporal order, where the unions and employer associations in export sensitive industries bargain first in national bargaining rounds. The resulting wage increases negotiated in this first round of bargaining sets the norm for the rest of the labor markets, where the percentage wage increase is known as *The Mark* (*Märket*).

The current framework of wage formation replaced a system of uncoordinated sectoral bargaining<sup>11</sup>. The period of uncoordinated sectoral bargaining produced wage-price-spirals – where collective agreement wage increases tried to compensate for high prices – high levels of industrial conflicts, and a reduction of international competitiveness in export-oriented industries. After (several) legislative threats to infringe on the social partners' autonomy in wage formation, the current order emerged in 1997 (e.g. Lundh 2002).

Figure 1.2 shows the development of real wages and strike activities from 1960 to 2022, with the periods of coordinated wage formation highlighted in grey. Since 1997, the level of industrial conflicts in Sweden have been reduced to among the lowest in Europe (ETUI 2023), while real wages between 1995 and 2020 grew at the second highest rate<sup>12</sup> in Europe (MI 2023).

### Coordination

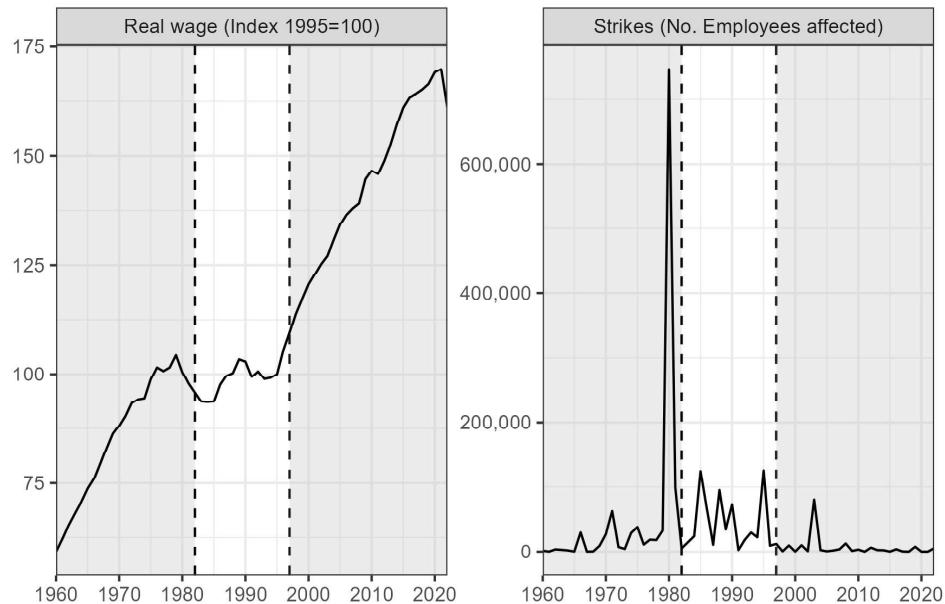
In national bargaining rounds, unions coordinate across industries and occupations. In blue-collar occupations, the Swedish Trade Union Confederation (LO) coordinates 14 unions across the public and private sectors. The "LO coordination" provides input and provides pressure in the first export-industry bargaining round, and in all subsequent collective bargaining rounds of its members. Pressure in the latter rounds assures that employers do not pay *below* the Mark, where pressure can be applied in the form of strikes, sympathy strike actions, or blockades. On the white-collar side similar coordination can also exist, but may be more or less formalized. Unions are

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<sup>10</sup>Employers buy labor peace. Longer-term contracts imply greater predictability in labor costs. Hence, unions tend to sell longer contract terms to employers. An employer can still become subject to sympathy actions. For example, if an employer delivers components to a firm which is subject to a union blockade, the employer will receive economic damages, despite being subject to sectoral labor peace.

<sup>11</sup>Which is often defined as starting in 1983 when industrial unions and employers started bargaining on a purely sectoral basis. The break from central coordination was sparked by the two oil crises in 1973 and 1979, and the introduction of public sector collective bargaining. This reduced the impact of centralized wage coordination practiced in the private sector.

<sup>12</sup>In the Eurovision Wage Contest, the 12 points went to... Norway...



**Figure 1.2:** Real wage development and strikes in Sweden (1960-2022). The grey areas highlight periods of centralized wage formation.

backed up by large strike funds.

Employers similarly coordinate across industries to assure that wage increases in subsequent contracts do not go *above* the Mark. The Swedish Confederation of Enterprises plays a mirroring role to the LO. Employers can enforce their demands by coordinating lockouts and offering strike- and lockout insurance, backed up by large lockout funds. Firms that conclude agreements above the Mark risk not being paid lockout insurance, which is a condition that is regulated in the statutes of the Confederation (e.g. Swenson 2002 or Lundh 2002).

The main role of the state is to provide mandatory mediation, which is done by the National Mediation Office. This implies that state appointed mediators are tasked to assure that collective agreements that bargain after export industries strike agreements with wage increases within the Mark. However, a mediator has little formal authority to hinder behavior or agreements from being reached which are outside their stated mandate (e.g. Bender 2024, Chapter 1 and Chapter 2).

The framework which regulates the conduct of bargaining in wage setting rounds are largely found in collective bargaining agreements or in the organizational statutes of the bargaining organizations. This is one of the more prominent features of the model, as in many settings such rules are regulated in law or by other government ordinances.

### *Terms and conditions of employment and wage setting practices*

Sectoral collective agreements regulating the terms and conditions of employment are also open for renegotiation during national bargaining rounds, and are usually set in separate contracts from the wage agreements. Most efforts spent in collective bargaining rounds center these agreements, as annual wage increases are often exogenous in sectoral negotiations (which are set by the Mark<sup>13</sup>).

As a result, the terms and conditions of employment can be quite heterogeneous across sectors, industries, and occupations. Topic-wise, there may be large variation between industries in how holiday pay, working time, scheduling, over time pay, seasonal employment, redundancy notice periods, the rights and obligations of both the employer and employee party, and more.

In some areas of labor regulation, legislation provides a base plate for bargaining. The Working Time Act, for example, sets out rules and regulations for working time, but where sectoral collective agreements have large possibilities to deviate from legislation. As a result, employers and unions can reach agreement at the sectoral level, for example, to allow for night-time work, which is tightly regulated in Working Time Act (e.g. Anxo and O'Reilly 2000, Paper II). Another notable area where the terms and conditions of employment can deviate from the law are employment protection (e.g. Rönnmar et al. 2023, Stern and Weidenstedt 2022).

Wage setting procedures at the firm level also display significant heterogeneity. The National Mediation Office (Medlingsinstitutet 2023b) recognizes seven variations of local wage setting procedures, ranging from workers negotiating their wages on an entirely individual basis (most commonly found in higher skilled white-collar agreements) to union being delegated all wage negotiation capacity (most common in blue-collar agreements). In terms of minimum wages, the National Mediation Office (Medlingsinstitutet 2023a) identifies more than 150 different minimum wages levels found in 650 national sectoral collective agreements.

The bargaining topics above are the instrument through which the Swedish model allows for sectoral adaptation and flexibility. Sectoral adaptation arguably provides one of the stronger incentives for employers to favor a collective bargaining model over a legislative model.

### **Labor peace and collective agreement implementation**

Once collective agreements are signed, employers have bought labor peace for the entire duration of the negotiated contract. Sectoral agreements are implemented locally, which may imply some local level bargaining, for example, on how the wage increases are to be distributed between different groups within the firm.

An important, but perhaps obvious point to the Swedish reader, is that employ-

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<sup>13</sup> Although the interpretation as to how the wage increases set by the Mark should affect the "wage space" is often contested.

ers have a far-reaching managerial prerogative, or a "right to lead and direct work" (see Kumlien 2004 for a historical background). The managerial prerogative was enshrined in the original Basic Agreement of 1938 (*Saltsjöbadsavtalet*), in which the Swedish Confederation of Enterprise (SAF) and the Swedish Trade Union Confederation (LO) regulated the rules of play and conduct in Swedish industrial relations. The agreement is usually described as the unions selling managerial prerogative in exchange for union recognition as a legitimate co-regulator of labor markets and workplaces. Although today, legislation formalizes some aspects of the original Basic Agreement, "the rules of the game" are largely an affair between unions and their employer counter-parties.

### Spontaneous order and self-regulation

The web of rules (Kerr and Siegel 1955) of the Swedish model of today draws from rules and frameworks set in both collective agreements and legislation. Nycander (2004) proposes that one of the main tenets of the Swedish model – a scepticism of legislative intervention – is rooted in the period when regulating the labor market was largely a contractual affair, and that the period of legislative intervention in the 1970's and 80's were an exception that resulted in corporatist interventions which unilaterally favored one party (unions) over the other (employers).

In recent years, we have seen a resurgence of main level (national, cross-sectional) collective bargaining in Sweden. The most prominent example is new main agreement of 2020, which makes changes to employment protection and adds generous life-long learning schemes (and mid-life career changes financially possible for workers). Another recent agreements includes The labour market entry agreement, which was signed in response to the large number of asylum migrants arriving in 2015. It implies that employers with collective agreements can hire unemployed workers (that are deemed to be far from the labor market) at collective agreement wages. The subsidy implies that all employer contributions are paid by the state during a set period of time, while allowing targeted workers to undergo training and education programs during this period of subsidized employment. Although there already exists subsidised employment programs, the collectively bargained version addresses a major employer concern – red tape in existing subsidized programs – and a major union concern – wage dumping. Thus, the agreement exemplifies a solution which (arguably) does not worsen the position of any involved party, while solving a salient challenge in Swedish labor markets. Whether this agreement will be successful or not, remains to be seen.

The re-kindled interest in main level bargaining is usually rationalized on three intertwined grounds. First, in the past decade-or-so, Swedish governments have been built on relatively fragile parliamentary majorities. Political capacity to solve urgent problems identified by either party are thus left unresolved.

Second, the experiences from the large and contested legislative packages on codetermination, employment protection, and the so-called wage earners funds<sup>14</sup> in the 1970's and 80's are now almost half a century in the past. For brevity's sake, it is sufficient to state that these reforms were loathed by the employer side<sup>15</sup> and that employers responded with counterattacks on unions. The loss of trust resulting from "running to the legislator" came at a cost in terms of trust and foregone capacity to solve problems at the bargaining table. Doing similar runs to the legislator in the future could result temporal benefits but similar long-term costs. For example, if employers were to persuade a right-of-center government to make legislative changes that eroded unions' right to strike, a left-of-center government in the next election might reverse the change and make some retaliatory changes negatively affecting the employer side. The resulting regulatory "ping-pong" brings uncertainty and transaction costs from having an unstable set of rules. In the longer-term perspective, if employers enjoy predictability and co-ownership of labor market regulations, "running to the legislator" is perhaps not a good strategy. Unions face a similar logic.

And third, continuous threats of legislative intervention from the European Union has created a common "enemy" of both unions and employers, where the autonomy of the social partners is seen as under threat. If unions and employers strike more agreements in coming years, solving problems which result in mutual benefits for both parties, the taste for more main level bargaining might increase further, while showing Brussels that there are alternatives to federal labor market regulations.

Thus, the scepticism of legislative intervention we may note in today's Swedish model, with roots in the periods before the 1970's, arguably still informs unions and employer organizations today when considering strategies and venues to pursue to solve the problems identified by their respective members. The state is not the central actor of the industrial relations system, as it does not mirror the contractual preference which informs the behaviors of the social partners. Perhaps, as Nycander's (2004) proposes, the model is better understood as a spontaneous order in the tradition of Hayek, where market actors have an ability to self-correct problems and errors in the labor market over time.

My feeling is that the Swedish model is undergoing a period of re-evaluation which may result in revived interest in using collective bargaining to solve problems faced by opposing interests. This will not only require that the social partners' autonomy and capacity to solve problems remains intact, but also that there exists some interest alignment between the parties, which in turn necessitates a relative balance of power between the parties (Wright 2000). Thus we turn to the question of bargaining power.

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<sup>14</sup>Which would successively transfer the means of production to the unions via corporate taxes.

<sup>15</sup>Although some reforms have proven popular by the employers in hindsight.

## 1.3 What gives workers bargaining power?

*No matter how well a society's basic institutions are devised, failures of some actors to live up to the behavior which is expected of them are bound to occur, if only for all kinds of accidental reasons.*

(Albert Hirschman: Exit, voice, and loyalty, p. 1)

### The exit-voice framework

The recent findings that employers have wage setting power implies that bargaining power is an important feature in labor markets, shaping the behaviors of both workers and firms. Having bargaining power implies having some influence over another party, and the ability to make them do something they would otherwise not have done.

To consider sources of bargaining power, I will briefly present Albert Hirschman's (1970) framework developed in "Exit, voice, and loyalty – Responses to decline in firms, organizations, and states". The framework is powerful due its simplicity, allowing it to be applied on a vast number of topics. It explores a straightforward question of high relevance to the human experience: what mechanisms forces organizations to cope with failure?

In economics, market competition provides a familiar answer. If a firm fails to produce a good at a sufficiently high quality (or at sufficiently low price), market agents will respond by *silently* taking their business elsewhere. This incurs losses to the firm which provides strong economic incentives to address (or avoid) failure altogether, lest they be eliminated by a self-inflicted decline in demand. Demand-side agents therefore have bargaining power over the firm supplying the goods, as they can discipline the firm to deal with the failure by a threat of *exit*.

But the real world is not silent and economic agents can communicate with one another. If a firm is failing to produce a good with sufficiently high quality, an agent can also make the producer aware of this problem by communicating that there are quality problems. Thus, customers have an "*un-silent*" mechanism to make the firm deal with the quality problem, giving demand-side agents bargaining power over the firm by using *voice*.

Both exit and voice can be used as measures of decline in organizations: a large outflow of customers and a large inflow of complaints will both tell the firm that something is awry. As opposed to purely market-driven (and silent) exit mechanisms, voice may predate and anticipate exit; voice allows responsive organizations to address failures *before* incurring the losses associated with exit.

The third notion, which interplay with exit and voice, is *loyalty*. More loyal agents are more likely to voice concerns over quality. In this context loyalty does not necessarily reflect a measure of endearment – it can also reflect dependency. If the producer is a sole provider of a demanded good, voice may be an agent's sole option.

## Worker power in the exit-voice framework

Perhaps the most famous application of the exit-voice framework in labor markets is Freeman and Medoff's (1984) "*What do unions do?*", describing the two faces of unionism. The monopoly face, which captures the traditional notion of unions monopolizing labor supply to raise wages; and the voice/response face, which allow unions to bring improvements to the firm by raising problems that may be difficult for individual employees to raise, or to collect and prioritize problems experienced by workers in the firm, lowering the transaction of employers to find and address such problems.

In line with the economic orthodoxy of the 1980's (which we also observed in Solow 1990 and Akerlof 1982) Freeman and Medoff discuss a trade-off between the monopoly face and voice/response face of unions, where the benefits of unions largely come from voice (make firms more productive), and the costs from raising wages above market-clearing rates. However, as suggested by the recent monopsony literature, there should be no or less of a trade-off between the two if unions raise wages closer to competitive rates.

Considering worker bargaining power more broadly implies having the power to influence or make employers things they would otherwise not do. Bargaining power thus stems from both exit and voice.

The *exit*-mechanism, most familiar to the economists, implies that dissatisfied workers will leave their jobs for better outside options. Satisfied workers may also leave their job if a more attractive outside option is available, however, an employer concerned by the risk of hemorrhaging workers to the competition would do well to set her wages closer to the market rate. In sum, threats of *exit* can discipline employers to set wages higher than they would if the threat of *exit* was more subdued. As discussed above, the *exit*-mechanism can still leave employers with considerable wage setting power if workers' outside options are poor.

The *voice*-mechanism in labor markets can take many shapes or forms, but all imply some political decision resulting from a social process, rather than some pure transaction. Examples of exercising *voice* to improve wage levels may include:

- an individual employee requesting a wage increase as a result of greater responsibilities.
- a local union demanding wage increases for all its members from their employer after a year with good results.
- a national union demanding wage increase for all workers in a sector (or country) from an employer association.
- an advocacy group successfully lobbying government to pass legislation which increases the statutory minimum wage.

Although discontent over wage levels is a good starting point to explore the *exit-voice*-framework in labor markets, dissatisfaction with wages is a very particular form of failure which by its nature seldom has a solution which will make everyone satisfied.

In *A behavioral theory of labor negotiations*, Walton and McKersie (1991) proposes that the topics of labor negotiations will range between distributive (zero-sum) bargaining, where the gains of one party will be equally detrimental to the other; and integrated (plus-sum) bargaining, where bargaining topics may result in mutually realized gains and interest alignment. Wages are usually seen as a prime example of zero-sum bargaining, but may also contain aspects of plus-sum bargaining depending on the circumstances.

If a firm is suffering from high labor turnover due to the firm paying below-market wages, and some loyal workers propose an alternative wage policy which solves this acute problem to the (reluctant) satisfaction of the employer, we have an example of *voice* being used to address problems relating to *exit*. If the employer would not have thought of the new wage policy on her own, the loyal workers have exercised bargaining power over the employer.

In this framing, our definition of bargaining power may seem awkward – why involve power politics from a friendly suggestion by a loyal employee? If we exchange the loyal workers with a local trade union, skilfully leveraging problems deriving from tight labor markets to improve the wages of their members, the definition might fit better with our preconception of worker power, but implies little changes to the context. Unions can be a manifestation of loyalty, even though it may be tough love. And unions can use both the voice and exit channels simultaneously to leverage bargaining power.

### Exit and voice as compliments in the Swedish setting

In a tight labor market, where labor demand outstrips labor supply, it may rational for an employer to form cartels to keep wages below market rates. This rationality lies at the historical core of the Swedish model, where employers pushed for nationally coordinated sectoral bargaining at the end of the nineteenth century. To contain regional and sectoral wage differentials, and dealing with some of the highest industrial conflict rates in the world<sup>16</sup>, Swedish employers pursued a strategy of solidary wage formation. The Swedish Confederation of Enterprise offered members strike and lockout insurance, but only if they concluded collective agreements which set wages at specified monopsony rates. Unions did not like this, as it would imply that their members would be paid less than if wage negotiations were conducted locally. However, the well organized employer side forced unions to respond. Thus, collec-

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<sup>16</sup>Which were strongest in parishes where workers have *exited* to America (Karadja and Prawitz 2019).

tive bargaining and solidary wage formation was used by employers to set wages below market rates, but also created the foundations of the Swedish model (Swenson 2002).

Today, the term solidary wage formation is largely associated with the Swedish Trade Union Confederation (LO), defining "equal pay for equal work" among its blue-collar members<sup>17</sup>. But, in a twist of historical irony, the term was invented by the Swedish Confederation of Enterprise.

The fact that the solidarity wage formation has changed hands between employers and unions in the past century is interesting, as it reflects who stands to benefit most taking wages out of competition through collective bargaining. During high levels aggregate demand, unions may gain more by letting the market mechanism set wages, as there are presumably more *exit* options in the labor market. Thus, the employer side will benefit from using the *voice* mechanism to take wages out of competition if labor markets are tighter. If aggregate demand is low, workers will have fewer *exit* options, and thus unions may stand to benefit more from taking wages out of competition via the *voice* mechanism.

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<sup>17</sup>This principle still allows for wage differentials between occupations, but practically results in high wage compression. See figure 1 in paper III for an illustration.

## 1.4 Productivity and bargaining power

Although most are probably aware of growing income inequalities in the past decades, many may be surprised fact that productivity growth has been relatively stagnant since the financial crisis. In particular if we set these developments against the recent decades' hype and circumstance stemming from the tech industry<sup>18</sup>. It has been suggested that we are experiencing a second productivity paradox, following Solow's (1987) observation in the 1970's and 1980's that "we see computers everywhere except in the productivity statistics".

A paradox can be a statement which, despite sound reasoning (productivity is stagnant), leads to conclusions which run contradictory to one's belief (but computers are everywhere). Thus a paradox require us to hold some prior belief, logic, or expectation in order to puzzle us.

We tend to think of productivity – and in extension technological change – as the sole long-term driver of economic growth (Solow 1956, Swan 1956). Since the industrial revolution, technology has driven growth and subsequent improvements in welfare and prosperity. The benevolence of technical change, which I presume inform our priors, will henceforth be defined as the *technological bandwagon* (Acemoglu and Johnson 2023, as above).

In this section, we will explore the priors that inform the paradox itself, which is that fantastic technological developments should lead to productivity growth and broadly distributed prosperity, as it has done in our recent past. Then, why does this not appear to be happening right now?

### Secular stagnation?

Summers (2016) argues that stagnant growth and productivity developments since the financial crises of 2008-2009 amounts to Hansen's (1939) notion of secular stagnation, implying that these developments are simply the result of an increased propensity to save and a decreased propensity to invest. Gordon (2015) posits that our recent technological advances, although impressive, are bleak in comparison to those of the twentieth century – the aggregate time and labor saving effects we derive from our smart phones are minor in comparison to the time and labor saving effects experienced by previous generations when tractors, automobiles, airplanes, or indoor plumbing were introduced.

Another set of explanations relate to the shifting of firm boundaries – internationally and domestically. The most prominent example is China's ascendance into the World Trade Organization in 2001, which drove Western investments offshore to the Far East, creating growth and productivity increases in China, but economic stagnation at home. Regions especially exposed to this "China shock" (Autor et al. 2016) has effected the incomes, health, sectoral composition, investment, andulti-

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<sup>18</sup>Think digitization, the fourth industrial revolution, or AI.

mately economic distributions in communities where well-paid middle-income jobs were off-shored. The new jobs that would replace the off-shored ones were largely benefiting higher skilled workers compared to the recently displaced lower skilled workers (e.g. Autor et al. 2006, Yakymovych 2022, Bertheau et al. 2023).

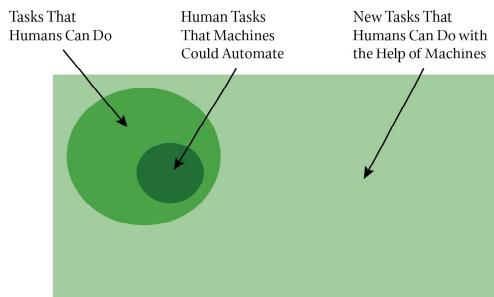
In home markets, firms have increasingly focused on core competencies, outsourcing jobs that were traditionally performed within the boundaries of the firm to subcontractors. Domestically outsourced workers, which is a large group, seem to experience worse wage growth (e.g. Dube and Kaplan 2010, Goldschmidt and Schmieder 2017) likely a result of subcontracting firms generating smaller surpluses compared to the outsourcing firms, implying lesser opportunities for rent sharing (Card et al. 2018). Such processes of domestic outsourcing may also impact the efficiency of work organizations, as workers are no longer directly managed by the firm where the work is conducted, but rather managed by a subcontractor whose obligations to the firm are regulated in contracts (Weil 2014). This may adversely affect worker effort and ultimately productivity (Bilal and Lhuillier 2021).

### Labor-automating or labor-augmenting technologies

With the above-mentioned developments in mind, it may still be perplexing that widely observed investments and advances in digital technologies have not yielded productivity increases or broadly shared benefits. This is not to say we are deriving benefits from the current process of technological change, but it does not appear to have yielded the same level of widely shared prosperity or productivity growth that my parents or grandparent's generation experienced. And this is perhaps because our priors are informed by the past century's *technological bandwagon*, where widely observed advancements in technology resulted in productivity increases, low unemployment, and broadly-shared gains.

Is the assumption that technology, productivity, and prosperity always go hand-in-hand a well-informed prior? Or, is the *technological bandwagon* a temporal phenomena, particular to a bygone place and time when these developments were particularly profound, as proposed by Gordon (2015), and perhaps never to return? Or does the momentum of the technological bandwagons depend on other factors than just technologies, entrepreneurs, and product markets?

The notion that technological change may not always generate broad based growth can be explained by Acemoglu and Restrepo's (2019) "so-so technology"-hypothesis, which considers that technology can either give humans a comparative advantage in performing new tasks (augmentation) or make humans redundant by focusing on automating existing tasks (automation). In the former case, technology increases employment and wages, whereas in the latter case technology has the opposite effect. Importantly, in their model the entrepreneur can improve her profits by utilizing either form of technology. Although the former case is the social opti-



**Figure 1.3:** The figure illustrates a field representing a universe of tasks. The lightest shade of green, the largest field, illustrates the tasks that humans can do with the help of machines. The middle-shade of green represents a slightly larger set of tasks which only humans can do. The darkest green and smallest field represents the set of human tasks which machines can do today. Thus, the diagram highlights the claim that the largest innovative potential of technology lies in human-augmenting machines rather than labor automating machines. Source: Brynjolfsson (2022)

mum, choosing the latter is likely if automation gives more benefits to the individual entrepreneur. Thus, technology can produce prosperity with different distributional properties.

In a similar vein, Brynjolfsson (2022) warns of the implications if AI keeps its current labor-automating trajectory. If firms are excessively focusing on automating tasks that humans can do – preferring to cut labor costs rather than improve labor productivity – this will have negative implications for the distribution of generated surpluses – as its benefits will befall capital, not labor – and implies that the innovative potential of AI is severely reduced. In figure 1.3 Brynjolfsson illustrates this argument by considering a universe of tasks, comparing the largest set of tasks (labor-augmenting) to a much smaller set of tasks (labor-automating) constrained within the human domain of tasks.

### Power and progress

In *Power and progress*, Acemoglu and Johnson (2023) argue that the catalyst, momentum, and direction of the technological bandwagon were produced and sustained by institutional and social power dynamics, thus rejecting the deterministic notion of technology automatically increasing labor productivity or broadly shared prosperity.

Acemoglu and Johnson (2023) provides a rich illustration of examples from economic history highlighting that in more flourishing periods of technological development were subject to countervailing powers (Galbraith 1952) which created incentives to invest in labor productivity enhancing technologies, where the generated surpluses were shared more widely.

Below, I summarize three claims that I find most central to these arguments, where the third claim – that of the role of worker power – is most relevant to the following dissertation chapters.

The first claim is that the technological bandwagon is a historical parenthesis in the long line of human history. Although significant innovations were made prior to the nineteenth century, they stand in bleak contrast to the leaps in growth, productivity increases, and prosperity that were sparked by the first industrial revolution at the turn of nineteenth century. Industrialization enabled Western nations to escape the Malthusian trap over a century ago, and still today, an ever increasing share of the world's population is escaping poverty, misery, and reliance on the whims of nature to assure the survival of one's offspring.

Second is the claim that institutional power dynamics played a central role in igniting the industrial revolution. The transition from mercantile to modern market economies, and eventually the virtuous cycle of growth, productivity and prosperity which we associate with the technological bandwagon, implied that the social conventions and institutions which shielded beneficiaries of mercantilism or serfdom were removed.

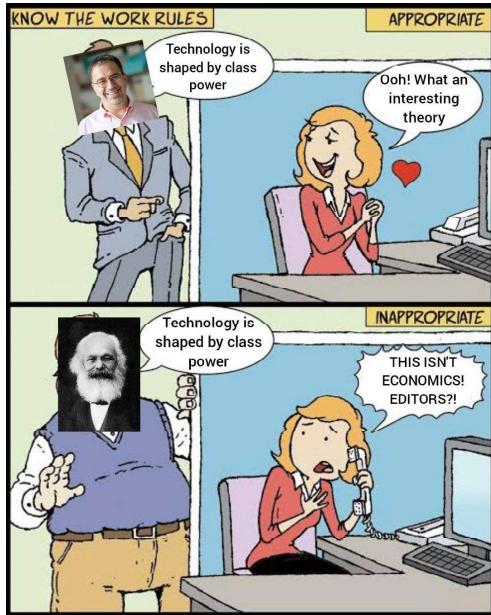
Third – and the most profound claim of *Power and progress* – is that worker power constitutes the missing component explaining an apparent loss of technological bandwagon momentum. It is worth noting that this claim may not be viewed as particularly profound in the social sciences other than economics (see figure 3).

#### *Why child labor is bad for productivity*

To illustrate how power dynamics can be central to the technological bandwagon gaining momentum, I will briefly summarize an interesting chapter from the book, describing how changing worker power dynamics were central to improving the dismal outcomes of workers in the United Kingdom in the nineteenth century.

Early industrialization (late 1700's to around 1840) implied workers migrating from villages and homesteads to towns and cities to engage in wage labor in industry. For many, the change to wage labor resulted in lower real wages, increased work intensity, worsened living standards, sanitary conditions, and health outcomes in increasingly cramped cities. The reaction to these developments were worker strife, public outrage, and eventually legislative interventions. Most famous among such strives were the Luddites that smashed the automated looms which were (indirectly) responsible for the social and economic deterioration they experienced in a relatively short space in time. Although the earliest known coordinated work stoppage (strike) occurred in 1178 BC (Edgerton 1951), the Luddites were an early example of social movements that would eventually develop into modern trade unions (e.g. Thompson 1963).

The second half of the century looked much different. Between 1840 and 1900, real wages more than doubled, for many the working day was reduced to 9 hours, and limitations to the usage of child labor was successively introduced. All the while, output per worker rose by 90 percent. Acemoglu and Johnson argue that these developments resulted from both institutional interventions *and* technological developments



**Figure 1.4:** (Joke explainer) The comic strip is an internet meme spoofing an original comic by artist Sunny Street. The original comic describes how two male coworkers deliver identical compliments to a female coworker, but where the response differs due to variation in attractiveness, resulting in the compliment being deemed appropriate in the workplace if uttered by the handsome coworker, or inappropriate if uttered by the less handsome coworker (manifested by a distressed call to Human Resources). The template-based meme above makes a comment about the reception of Acemoglu and Johnson's (2023) *Power and Progress*. Daron Acemoglu (appropriate, handsome coworker in the original strip) and Karl Marx (inappropriate, less handsome coworker) proposes an identical theory – technology is shaped by class power – to an economist (female coworker), presumably an anonymous reviewer. While Acemoglu's theory is met with interest, Marx's theory results in the economist making a distressed call to the journal editors, likely because Marx's theory is not "real" economics. Source: Sunny Street/random Twitter account.

endowing workers with bargaining power, incentivizing firms to invest in and implement labor productivity-enhancing technologies.

Considering the role of voice in shaping technologies, the example which I find most illustrative<sup>19</sup> relates to banning child labor in coal mining. Steam powered industries increased the demand for coal manifold. Initially, mining companies relied extensively on child labor, most notably as pushers of railroad carts<sup>20</sup> up and down the mine through child-sized mining shafts. Thus, a novel innovation in the form of railroad carts were used in the work organization, but were propelled by small, human beasts of burden.

Looking to the economics of such an organizational choice, child laborers had two main advantages over adults – cost and size. The unit labor cost of children was much lower than adults, given that adults had better outside labor market options than children. The small size of children implied that the ramps and tunnels could be built

<sup>19</sup>It also shares industry code with the firm studied in paper 3.

<sup>20</sup>Often with their soft foreheads, resulting in deformations of the skull.

using smaller dimensions, reducing the cost of the mine's fixed cost infrastructure.

For a mine dependent on child labor, a ban would necessitate significant adaptations to its operations. Assuming that children were replaced by adults as beasts of burden and thus keeping the same production method but scaling it up to adult size, implied both fixed costs from investments to enlarge operational areas of the mine, and higher marginal costs as cheaper labor inputs were replaced with more expensive adult inputs. Thus, making adjustments, but keeping the production method constant, the ban on child labor would adversely affect the coal company's profits.

A prospective ban on child labor might also make the firm evaluate alternative methods to transport coal to the surface. For example, by building mechanized transportation systems. Replacing human beasts of burden with machines improved labor productivity as fewer labor inputs were required to operate coal transportation. However, mechanization required more qualified labor inputs to operate and service the machines, to which the employer would have to pay higher wages.

Ultimately, improvements to the machine would imply that the mechanized system outperformed any system which relied exclusively on human muscle power – large or small – regardless of labor costs. All the while, mechanization would improve output and leave the firm better off, despite having to pay higher wages.

In this case, the institutional intervention which banned child labor not only implied setting social and moral limits to firm behaviors, the social constraint forced entrepreneurs to look for alternative production methods. By removing the cheapest inputs from the labor market, it made capital-intensive technological solutions more palatable. Mechanization created new, more qualified and thus better-paying tasks. Redundant child labor could focus on more productive tasks, such as going to school.

Although the entrepreneurial freedom was severely limited by this political intervention, it created a strong incentive to redirect technological vision towards labor productivity-enhancing technologies. Although child workers were made redundant, mechanization would create new and better paying tasks, improving the typical worker's wage bargain, and provide children with better job prospects once they had reached adulthood. And thus, a so-so-technology depending on the exploitation of vulnerable workers was replaced by a labor augmenting technology with greater potential to productivity and more widely shared prosperity.

### Beneficial constraints

Limitations can foster innovation; as goes the ancient proverb "necessity is the mother of invention". Necessity may be imposed by market forces, or by politically and socially imposed constraints. A tight labor market may incentivize employers to raise wages, invest in labor saving technologies, and training. But so can political intervention. Both pressures deriving from the market or political decrees fit well within the *exit-voice*-framework. However, it is worth noting that "there was nothing au-

tomatic about the improvements that ushered in a broader sharing of productivity gains... They resulted from a contested process of political and economic reforms" (p. 196 Acemoglu and Johnson 2023).

Technological change can be a painful process resulting in unemployment, lost privileges, or bankruptcies. An agent threatened by technological change may seek to use the *voice*-mechanism to shield its firm or its members from the onslaught of creative destruction. In such cases, regulatory capture (Stigler 1971) can in fact be well within rational behavior of an individual agent.

Addressing the adverse effects of technological change is arguably a collective action problem. How do we assure that the social costs of technological change can compensate or mitigate the adverse effects felt by the most vulnerable groups? Telling people that technological change is something positive when their experiences say otherwise is a great way to become disliked. If technologies are used to increasingly monitor workers, and treat them as bio-robots, technologies that enable such behavior may become contested, even though they may have applications that can benefit workers.

But political interventions and labor market institutions can also stifle innovation. This is more likely if technologies themselves become contested and associated with the plights which it produces (such as the case of the Luddites versus the looms). Poorly crafted regulation risks missing out on productivity improvements that may improve overall prosperity. Something that I find lacking in *Power and progress* are concrete, direct examples of when the political *voice* channel is leveraged to purposely steer technological change in a prosperous direction. The rationale behind banning child labor was largely based on moral grounds. The fact that industries became better off without child-labor was (presumably) not an intended part of the plan. Banning things left and right can also impede innovation and productivity increases. It begs us to ask, how can voice be used to design good regulations that result in good outcomes and technological bandwagon momentum?

The next section will look specifically at how the Swedish labor market model has been designed to steer, live with, and adapt to technological change in a small open economy, providing an example of how institutional design may foster innovation, growth, and acceptance of creative destruction.

## 1.5 Institutions, bargaining power, and creative destruction

*"An essential task for the union movement should be to create the conditions for a mobile and dynamic labor market, which in turn promotes sensible rationalization. As such facilitating transitions of labor from areas of unemployment to areas with labor shortages. Thereof creating a greater measure of freedom for the individual. It will make it easier for him to find pleasant and fitting work."*

(LO 1951, p. 73)

Technology and automation can produce benefits and costs which may be distributed unevenly. But as technological change is manifested by the technologies and their implementation in the workplace, the developments can take many different paths; the outcomes of technological change are by no means deterministic.

If unions care about fairness, the attitude of organized labor towards technology and its resulting structural change will be largely hinged upon if it benefits or harms its members. In a scenario where a firm implements a technology which results in some technological unemployment among union members, a union's attitude towards this new technology will depend on if their redundant members have good prospects outside of their current employment, and if the technology itself benefits the remaining members.

A union which organizes and bargains for members at the firm level may be more sceptical towards labor saving technologies if their employer lacks the capacity or will to cover the social costs that result from technological unemployment, and if the local labor market provides relatively poor outside options to unemployed members. If unions were given some agency in the formation of active labor market policies, would that change their perception?

In a workplace where a manager suddenly introduces some new technology which workers feel are detrimental to their own work situation or the overall function of the firm, a union may become more hostile towards management due to what is perceived as poor technological and organizational choices. If workers and their representatives were consulted earlier in the process and were given some voice in shaping the new socio-technical arrangements, would that change their attitudes?

Swedish unions and workers generally have a positive attitude towards new technologies and structural change (e.g. Meidner 1986, Bäckström 2013). I argue that this is because Swedish unions have some agency over labor market transition processes of redundant workers and can play an important consultatory role when technologies are implemented in their members' workplaces.

Unions having some agency over the impact of technological change is a function of the Swedish industrial relations system, giving unions and employers the capacity to solve problems within and outside the boundary of the firm, and allowing

the social partners to solve practical issues. Having these capacities require unions to be endowed with, and an ability to leverage significant bargaining power. But also that they hold strong beliefs that the possible pains caused by creative destruction are either temporary or beneficial to their members in the longer run.

### The Rehn-Meidner model

Such institutional arrangements exist in Sweden because they are founded on ideas. The ideational foundation on which the Swedish trade union movement's positive stance on structural change stands is often attributed to the LO congress report "The union movement and full employment" (LO 1951), in particular the chapters written by LO economists Gösta Rehn and Rudolf Meidner.

The Rehn-Meidner (RM) framework was a formalization of discussions and ideas flourishing at the Swedish LO during and after the Second World War (Johansson 2018), and thus its ideas are perhaps best understood in the historical context in which they were developed. Post-war Sweden faced labor shortages, high aggregate demand, and rising wages, which created challenges from an overheated economy and from a miss-allocation of labor. As Sweden was spared from the destruction of the Second World War, its intact industrial capacity provided inputs to the rebuilding of post-war Europe. Along with innovative products developed and marketed by a large set of Swedish firms, exports of innovative products were propelling Sweden from being one of the poorest countries in Europe to one of the richest in the world over the course of a few decades (e.g. Lundh 2002, Erixon 2003, Erixon 2010).

The revival of centralized wage formation, which had been paused by wage freezes during the Second World War, implied that wage levels would rise across the national economy. Industries with low profit margins, producing goods with readily available and cheaper imported substitutes<sup>21</sup>, were unlikely to survive these increasing wage levels. Rising real wages were a precondition of the Social Democratic Party's post-war political goal of creating the welfare state (Wigforss et al. 1946). If Swedish workers were employed in industries that were unable to support high wages and a high standard of living, what good are such jobs?

The main challenges in post war Sweden were identified as inflation and a miss-allocation of labor in lower margin industries, which could be used more effectively in higher margin-industries where labor demand was high. The raising wage levels would imply that lower-margin industries would either have to raise prices or go bankrupt. High inflation risked strengthening the national currency, resulting in reduced exports – the most important sources of highly paid jobs and growth.

To encourage improved resource allocation, generous active labor market policies were proposed as a remedy. Along with improved labor resource allocation, strict fiscal budgetary rules, and centralized wage setting would keep inflation in

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<sup>21</sup>The textile industry in the city of Norrköping is the most commonly used example.

check. Prudent macroeconomic finances and low inflation were both central to avoid currency appreciation, which would damage exports. As a result, the four macroeconomic goals of the RM-model could be achieved. The ultimate goals of the RM-model are:

1. Low inflation.
2. Full employment.
3. High growth.
4. An even distribution of incomes.

As such, the plan of the Swedish labor movement would not be to protect the old jobs, but rather to encourage workers to accept that both the welfare state and higher living standards required the forces of creative destruction to do their part. Rather than protect jobs, the Swedish model strove to protect workers in the labor market; labor market institutions would provide workers with the "security of wings" rather than the "security of the seashell" (Erixon and Wadensjö 2012).

Returning to Nycander's (2004) observation of spontaneous order, we note that these ideas were developed before the legislative interventions of the 1970's and 80's. Thus, their eventual implementation rested on the ideational foundation that the social partners could solve such matters at the bargaining table, or jointly delegate matters outside of their capacity to legislators. It is arguable that the ideas fall close to Nycander's spontaneous order perspective, as labor markets had an ability to self-correct, giving a smaller role to the state than a corporatist perspective would suggest.

### How the Rehn-Meidner model informs our view of today's labor market

Looking to the application of the RM model in the present, I recognize that there is a large and interesting literature dealing with the state and survival of the RM-model in Sweden at specific moments in time, reflecting the political topics and challenges of its day (e.g. Erixon 2003, Erixon 2010, Czech 2015).

I will conclude this section by providing a personal account on the state of the RM-model today, addressing common problems and issues found in the Swedish political discourse. I allow myself this relatively high degree of interpretation based on my day job as an LO economist<sup>22</sup>. The reader should note that the LO-economists have a relatively high degree of autonomy within the LO to develop our own policies and perspectives in matters of the economy. The reader should also note that this

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<sup>22</sup>The original LO economists were Rudolf Meidner and Gösta Rehn.

autonomy also exists within the eight person collective of LO-economists<sup>23</sup>. It is therefore appropriate to label this as a personal account, rather than reflecting the perspective of the entire collective.

### *Rising wages and unemployment*

I begin by addressing a classical challenge mounted to centralized wage formation, which is at the heart of the RM-model. First, I present a diagram that we (the LO economists) often use to explain how centralized wage formation incentivizes productivity growth, drives creative destruction, and the important role of active labor market policies.

Figure 1.5 illustrates a labor market with ten firms (Firms 1-10, x-axis) who produce output at a decreasing rate of productivity (Firm productivity, y-axis), which are subject to a new centrally coordinated wage level (dashed line). The new wage levels are above the productivity levels of firms 9 and 10. As a result, firms 9 and 10 are no longer competitive, resulting in firm exit and involuntary unemployment. Active labor market policies kick in to cover the social costs of unemployment, reallocating workers in less productive firms to more productive jobs. Central wage formation thus produces externalities/social costs if there are unproductive firms. The size of the externalities/social costs are variable however, and depend on the quality of transition of unemployed workers.

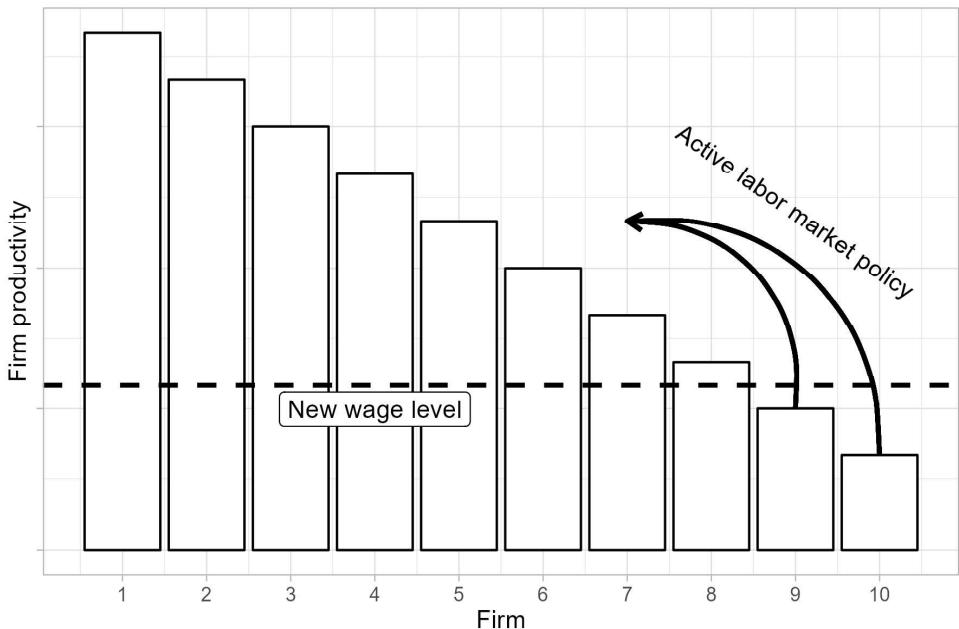
Of central relevance is that raising wage levels incentivizes firms to make productivity enhancing investments. RM discusses at length how wage formation can be used as a means to discipline firms to improve productivity, which would not occur if there existed no external pressure for such investments to occur<sup>24</sup>. Acemoglu and Restrepo's (2019) "so-so technology" hypothesis supports this observation, and so does Acemoglu and Johnson's (2023) observation of productivity bandwagon stagnation. Without upward wage pressure, firms 9 and 10 would employ labor resources that could be of better use elsewhere in the labor market, resulting in lower productivity growth, lower wages, and less prosperity than if the firms were taken out of competition and the workers reallocated to more productive jobs.

A neoclassical economist might claim that in any scenario, the "new wage level" set by collective bargaining in figure 1.5 introduces inefficiencies to the labor market, as the collective agreement distorts the market mechanism by setting wages above their market clearing rates. If the lower productivity of firms 9 and 10 can be ex-

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<sup>23</sup>Individual LO economists can chose to withdraw their names from collectively produced manuscripts if the individual feels that they cannot stand behind the message.

<sup>24</sup>Specifically, they argue that "an individual entrepreneur generally acts out of the interest of the firm, and less out of the interest of society... leading to an irrational division of labor between firms and the industry, and to other forms of waste with the means of production" (LO 1951, p. 67). As an interesting historical note, they motivate a collectivization of the means of production on the grounds that private enterprises' are disinclined to make rational, productivity enhancing, and – in extension – profit maximizing investment decisions.



**Figure 1.5:** Wage formation in the Rehn-Meidner model, illustrating how firms with productivity levels below the new wage level will exit, resulting in redundant workers, who are then relocated to more productive firms through active labor market policy. Source: Thomas Carlén/LO-Economists.

plained by workers sorting into jobs which matches their productivity levels, the removal of such jobs through wage formation produces involuntary unemployment and labor market outsiders.

I would respond to this argument by referencing the recent dynamic monopsony literature to illustrate that employers have wage setting power, but importantly that wage setting power is largely rooted in labor market frictions. Vacancies are seldom abundant. As a worker gets more educated and specialized (read older), there will be fewer relevant or interesting vacancies in the open labor market. Search costs might imply that most of us do not even bother to keep an eye on job vacancies<sup>25</sup>. The fact that blue collar workers tend to underestimate the wages they will receive in their local labor markets by taking outside job options (which would improve their wages), while white-collar workers overestimate the wages in their local labor markets (Jäger et al. 2024), supports the notion that most of us are poorly informed about the size and possible payoffs we can find in our relevant labor markets. Likely because job search is a depressing activity. Or because many are sufficiently happy in their current jobs to not bother looking at wanted adds. Thus, job changes are rare occurrences, allowing for mismatches to occur in the labor market. Manning's (2003) *Monopsony*

<sup>25</sup> Recruitment agencies exist because people are too lazy to continuously keep an eye on their relevant job market.

*In Motion* perhaps summarizes this finding best:

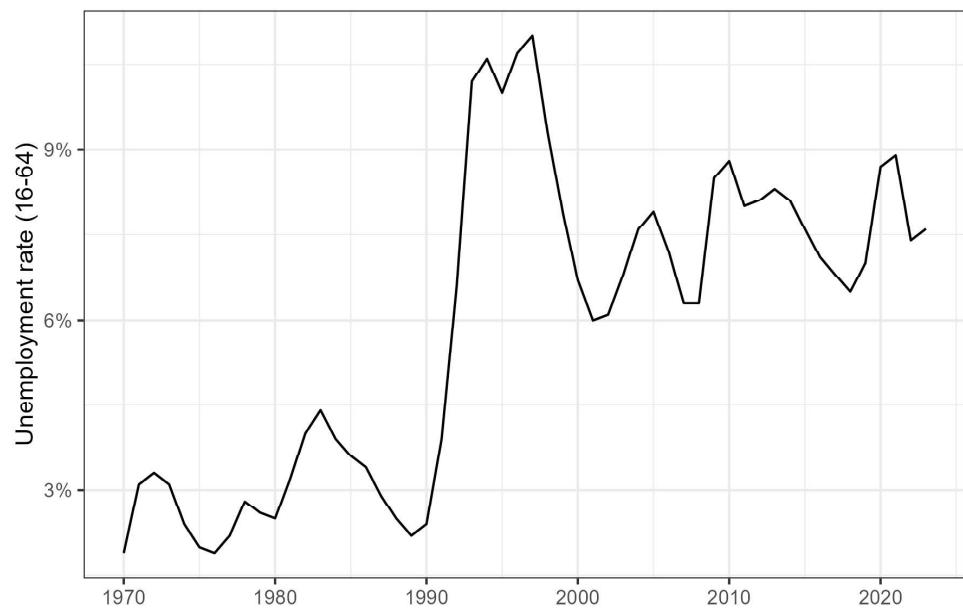
*"That important frictions exist in the labour market seems undeniable: people go to the pub to celebrate when they get a job rather than greeting the news with the shrug of the shoulders that we might expect if labour markets were frictionless. And people go to the pub to drown their sorrows when they lose their job rather than picking up another one straight away."*

(Manning 2003, p. 2)

Holding competition from product markets constant, if labor market frictions reduces the pressure on firms to make productivity enhancing investments, pressures of structural change (*struktuvandlingstryck*) deriving from collective bargaining and the voice mechanism can provide some momentum to the Technological Bandwagon.

#### *Skills, job transitions, and Sweden's unemployment problem*

Looking at Swedish unemployment data is depressing. Figure 1.6 shows Sweden's unemployment rate from 1970 to 2023. Before 1990, the unemployment rate averages 2.9 percent. In the period after 1990, the unemployment rate is, on average, 7.6 percent.



**Figure 1.6:** Swedish unemployment rate 1970-2023 (16-64 years). Source: Statistics Sweden, AKU.

Looking at specific groups, unemployment rates are highest in certain regions, among the youth, and among the foreign born. We note that these three categories are by no means isolated, and often overlap<sup>26</sup>.

A common critique of the Swedish model – and in extension the RM-framework – is that this post-1990 development is, to varying degrees, a result of Swedish wage formation.

Upward wage pressure, forcing firms to invest in more capital intensive production may raise the skill requirements on labor. We can see this effect in a recent empirical study of monopsony power in Swedish labor markets, which suggests that collectively bargained wage increases can have a positive impact employment (consistent with monopsony) but also increases the skill profile in the available jobs (Bustos 2023). In light of the RM-model, this is a feature, not a bug.

If redundant workers cannot keep up with the new skill profiles demanded by increasingly productive firms, do we have a dynamic case of the insider outside-dilemma (Lindbeck and Snower 1986), causing involuntary unemployment?

To answer this critique, I return to the RM-model, using the LO economists' set of conditions under which structural change is acceptable to workers:

1. Rationalized workers should have security in labor market transitions.
2. The surpluses which arise from structural change shall be fairly divided.
3. The new jobs should be better than (or at least as good) as the old jobs.

If Sweden's labor market institutions are failing to deliver on these three conditions, we should expect to see more adverse effects from structural change and ultimately reduced acceptance of it. If we fail to produce security in transition, high unemployment is a likely result.

It is quite clear that "security in labor market transitions" is not delivering security as well as it could. Bertheau et al. (2023) find that the income penalty from becoming unemployed in Sweden is low compared to other European settings<sup>27</sup>, but still implies an income penalty of up to 10 percent, on average, five years after the unemployment event. Yakymovych (2022) finds that income penalties are much larger for workers in lower skilled occupations.

To consider why labor market transitions are failing, we first consider public spending on labor market programs. Between 1985 and 2005, public spending on labor markets – including active labor market policies and unemployment insurance

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<sup>26</sup>Youth and migrants in economically weak regions of Sweden will have the highest rates of unemployment.

<sup>27</sup>Five years post employment, Swedes receive, on average, a 10 percent income penalty from unemployment, which is similar to "top performer" Denmark. The probability of being unemployed is similar

– averaged 3.2 percent of GDP per year, whereas between 2006 to 2021, the average average spending on labor markets was nearly halved to 1.8 percent of GDP (OECD 2024). The disillusion with publicly provided active labor market policies have led unions to increasingly focus their energies on improving the private job security councils, which are co-owned with the employer associations (OECD 2015), again lending some support to Nycander's (2004) spontaneous order-perspective.

Looking to the groups that are furthest from the labor market, the unemployment rate among the foreign-born was 12 percent on average in 2023, according to the Swedish Labor Force survey. In the Swedish born population, the unemployment rate was 3.7 percent.

The segmentation of the labor market<sup>28</sup> between foreign and native-born are one of the most debated and contested political topics in Sweden in the past decade. Sweden has received large inflows of refugee migrants over the past decades. The integration of these groups of workers is among the most pressing challenges facing the Swedish model today.

Viewing this challenge as a problem to be handled by the RM-framework implies helping foreign-born workers transition from war and poverty into a labor market with relatively high skill requirements. There may also be less formal barriers to job entry in the form of discrimination or an unwillingness to accept formal qualifications from other countries. If the job options among foreign-born citizens and residents look bleak, in particular among young men, some may seek work in informal labor markets (organized crime).

From one perspective, Swedish wage formation can be seen as causing high unemployment among the foreign born working population by reducing the number of lower qualification jobs (firms 9 and 10). Removing or excluding certain sectors from centralized wage formation would, however, lower the wages of both the foreign-born "outsiders" and native-born "insiders". If we believe that fairness matters in labor markets, such policies would prove highly unpopular. They would certainly not be Pareto optimal.

If there are alternative solutions to the problem, they should be considered. Such solutions include more targeted measures such as subsidized employment, as they do not necessarily imply as large adverse spillover effects. In section 1.2, I show how unions and employers have tried to address this question through The labour market entry agreement, which although allowing employers to hire targeted workers at much reduced costs, the reform does not impact the wage levels. And thus the reform has union acceptance.

It is perhaps also acceptable to conclude that the labor market integration of migrants implies costs<sup>29</sup>. The almost halved share of GDP spent on labor market policies in the past 20 years (compared to preceding 20 year period) seems counter-

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<sup>28</sup>As well as other topics relating to segregation, law and order, and more.

<sup>29</sup>This does not exclude the fact that this may deliver benefits in the long run.

productive, to put it mildly. If integrating our new residents and citizens of Sweden to our labor market is so important, why aren't we spending more on getting it done?

### *The failure of monetary policy to deliver full employment*

Second, another explanation may lie in the failure of monetary and fiscal policy to sufficiently stimulate aggregate demand. A central idealational tenet of the RM-framework is that it is designed to handle adverse effects resulting from full employment. However, Sweden has not experienced full employment in nearly three decades (see figure 1.6).

One possible explanation is that Sweden, in this period, has never experienced aggregate demand levels above lukewarm temperatures. It should be fairly obvious that problems relating to labor market integration and high unemployment are easier to solve in an economy with higher aggregate demand levels compared to an economy with lower levels.

Looking to Sweden's macroeconomic balance sheet, the national debt as a share of GDP was less than 16 percent in 2023, while the government ran a surplus of 19 billion SEK<sup>30</sup>. From the Keynesian perspective, which is implicit in the RM-framework, high unemployment is largely the result of too little aggregate demand.

To answer why Sweden has not tried to improve its chances of successfully integrating foreign born workers by stimulating aggregate demand, we need to briefly consider a set of reforms that were implemented in Sweden after a national financial crisis in the early 1990's. High debt, an over-appreciated national currency, high inflation, and a general loss of economic competitiveness, paired with a large economic crisis, motivated a large set of liberalizing reforms that aimed to "modernize" the Swedish economy.

As a result, the goals of macroeconomic policy were shifted from full employment to prize stability, replacing Keynesian with monetarist ideas on how to balance aggregate demand over the growth cycle. Growth cycles were to be balanced through counter-cyclical monetary policy rather than government budgets, using inflation as a gauge of aggregate demand. Fiscal policy was constrained by implementing budgetary rules and processes aimed at reducing the national deficit, implying that over a growth cycle, aggregate revenues must exceed aggregate spending. Thus, fiscal policy would on average be contractive over the growth cycles rather than neutral.

In a textbook setting, monetary policy should produce similar results as fiscal policy at balancing growth. This is built on the assumption that the transmission mechanism deriving from central banks stimulating or contracting the economy through monetary policy should produce similar multiplier effects<sup>31</sup> as fiscal policy: if the central bank targets two percent inflation, monetary stimulus or contraction should stabilize inflation at unemployment rates which are identical to the inflation

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<sup>30</sup>It is worth noting that 2023 was a recession year.

<sup>31</sup>The effects on aggregate demand from fiscal or monetary stimulation or contraction.

rates that would result if unemployment was target in an idealized fiscal policy framework. But if fiscal and monetary transmission multipliers are asymmetrical, monetary and fiscal policy will have different effects on aggregate demand.

In recent months, the asymmetrical effects of monetary and fiscal policy have sparked a (small) Keynesian resurgence in Swedish economic policy circles, based on the findings of the 2023 Long Term Survey<sup>32</sup> (SOU 2023:85 2023). The main results and recommendations of the report rest on empirical findings that the stimulating effects from monetary policy have been much lower than anticipated, while international studies find that the multipliers from fiscal policy are often underestimated.

Since the Global Financial crisis of 2008-2009 (excluding recent supply-driven inflation shocks) Swedish inflation has stayed well-below the inflation target, despite the Riksbank setting interest rates at or below the zero-bound. Instead, price increases have largely been observed in real estate, increasing household debt to some of the highest levels in Europe. Thus, low interest rates increased asset prices of housing, but appears to have had little impact on the prices of goods and services, as one would expect if monetary policy had a good ability to stimulate aggregate demand.

The Long Term Survey recommends that a reformed Swedish macroeconomic framework should strive for a better mix between fiscal and monetary policy, replacing Sweden's surplus budgetary rules with rules aiming at keeping the national at some specified percentage of GDP. Assuming that the economy will grow over time, this would mathematically imply a slight deficit goal. More fiscal policy should improve growth and resource allocation, and importantly, bring inflation closer to the Riksbank's goal<sup>33</sup> by allowing higher levels of aggregate demand to develop in the national economy. Replacing the surplus target would free up economic resources for reforms, and hopefully lift aggregate demand levels which would bring unemployment rates down to more acceptable levels.

## Challenges and looking ahead

To conclude, I argue that the problems found in Swedish labor markets are the result of failing to choose between two mutually exclusive strategies for growth and job creation. The first strategy focuses on increasing the quantity of jobs by creating low-productivity and low-wage jobs to unemployed workers, while being largely silent on quality job creation. The second strategy, based on the RM-model, focuses on creating quality jobs and improving productivity. The former strategy is arguably informed by the economic orthodoxy of the 1980's and 1990's. The latter strategy is

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<sup>32</sup>A report on economic issues written by academics on behalf of the Ministry of Finance every four years, released in December 2023.

<sup>33</sup>The report fails to recognize the impacts from centralized collective bargaining on price stability, however, indicating that Swedish macroeconomists should pay more attention to the institutions which affect the outcomes they care about (Almqvist et al. 2024)

arguably supported by more recent economic findings.

If we believe that the technological band wagon is a combined result of a vibrant, innovative, and growing economy, that places some restrictions on behaviors which incentivizes employers to treat labor as a precious resource, the job quality strategy should leave us better off in the longer run. However, it requires a set of conditions to be fulfilled by both policy makers and labor market actors to provide good results. The ideational foundation of the RM-framework requires higher levels of aggregate demand to function as intended. It requires high quality active labor market policies, and a relative power balance between labor and capital interests in labor markets. The fact that the framework is not living up to its potential today is largely a result of policy choices outside the capacity of unions.

In sum, the RM-model provides an ideational framework that encourages growth, innovation, and productivity increases under conditions that require some balance of power between labor and capital. If we believe that Acemoglu and Johnson (2023) are correct in their assertion that a balance of power is central to progress and prosperity, it can provide inspiration to policymakers.

## 1.6 Summary of papers

### Paper I

Paper I (coauthored with Anna Ilsøe) is a comparative study of how labor platforms have interacted with and integrated into two Nordic industrial relations models: Denmark and Sweden. We follow the entry of Uber and its ridesharing/taxi business into both markets, as well as food delivery platforms JustEat in Denmark) and Foodora in Sweden.

In the case of Uber, the company did not integrate with the models. In Denmark they exited the market failing to gain regulatory accommodation, but remained in Sweden. In the JustEat and Foodora cases, both firms signed collective agreements in 2021. The platform firms likely chose to sign collective agreements to improve public perceptions, and perhaps, to gain a first mover advantage in setting a new standard in sectoral collective bargaining. The process was not driven as much by worker resistance or strikes, although union litigation (in Sweden in particular) might have pushed Foodora to recognize the union and sign the collective agreement.

Our theoretical model adapts a governance framework consisting of rulemakers, intermediaries, and ruletakers to illustrate how legislators delegate significant regulatory capacity to the Nordic social partners, which also implies delegating a significant amount of rulemaking capacity to firms outside the collective bargaining regime. As the industrial relations system is voluntarist, platform integration into the system is important. However, integration may be contested depending on how much rulemaking capacity the firm has within or outside the collective bargaining regime.

Studying how new firms and business models integrate into industrial relations systems tells us something about the systems' ability to adapt to changing landscapes in the world of work, which is a condition for any industrial relations system's long-term survival. It also provides an example of how the Nordic industrial relations system deals with workplaces where workers have relatively little individual or collective bargaining power, given that many couriers are difficult to organize.

### Paper II

Inspired by Paper I and a clear lack of studies on how voice mechanisms can impact socio-technical choices relating to algorithmic management practices, Paper II (co-authored with German Bender) is a single case study of the rapidly advancing mining industry at the Swedish mining and metals company Boliden AB.

The case selection rests on wanting to observe rapid technological advances in workplaces we expect to have a strong union presence. We interview employer and union representatives about technological and organizational changes relating to the company's Mining Automation Program, which invites mining equipment and technology suppliers to solve automation-related problems through prototyping. The ultimate goal of the program is increase the level of automation in the mines to the

same level as the company's smelters (which is a controlled, process industry). The aims of the study is to observe if and how unions have influenced the technologies developed and implemented at the company's sites, and to discern why such technological bargaining takes place.

Theoretically we apply power resource theory<sup>34</sup> at the workplace level and apply process tracing to understanding the institutional framework which informs technological bargaining, finding that the Swedish Codetermination in the workplace act plays a prominent role in determining the procedures.

Our interview indicate a mostly cooperative and friendly union-management relationship signified by high levels of trust. As with any union-management relationship, there are contested topics. However, both parties strive to handle contested terrain in informal codetermination dialogue, which largely takes place during the "information sharing" phase of Swedish codetermination, and not the formal negotiation phase. Technology-wise, the interviews yielded more topics than a single paper could cover, but we have chose to focus on two technologies.

First, a safety positioning system, allowing management and other functions to monitor the positions of all persons in the mines instantaneously at relatively high resolution<sup>35</sup>. The positioning system would imply massive safety improvements to mining operations – the difference implies knowing *where* all personnel is located in the mine in case of an accident, as opposed to *if* they are in the mine. However, the company anticipated that such a system might be contested if privacy and integrity issues were not addressed. The company had persuade the unions and their members that the system would only be used as a safety feature. To assure that this would be the only application, the company paid the technology vendor to add an anonymization feature, which anonymize individuals during regular operations, but which can be switched off in case of an accident or incident. The rules and application of the software were formalized in local collective agreements (codetermination protocols).

When asked why the company chose to accommodate worker concerns about integrity, and keeping in mind that digital surveillance of movement and work has become common practice in many other industries, the company gave several responses; they do not believe that increased control would make their workers more productive<sup>36</sup>, that such surveillance wouldn't be ethical (or possibly legal under GDPR), but most prominently that they did not want to lose the trust of their workers or their union representatives.

The second sets of technologies we analyze are autonomous trucks and loaders. We chose this technology as it implies a significant change to the main task of mining operations – transportation – and the nature of such work. Autonomous trucks

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<sup>34</sup>For a recent overview see Refslund and Arnholtz 2022.

<sup>35</sup>Here we find some similarity to labor platforms which also use positioning technologies to monitor, lead, and direct work for their contingent labor force.

<sup>36</sup>Boliden have some of the highest productivity rates, as measured in tones of ore produced per man hour.

and loaders imply that miners can operate such machinery from comfortable control rooms, and enable them to operate or oversee several machines simultaneously. We also chose it as it illustrates a potent power resource held by the local miner unions – selling night shifts. Many mines often forgo night shifts, instead planning their blasting cycles to late nights, allowing the mine to be ventilated while the mine is empty of personnel. Remotely controlled or autonomous vehicles, however, can start loading ore while the air is still toxic. This required night shift operators, which the employer can only staff by making local agreements with the local unions.

To consider why the employer engages heavily in this setting, we identify the night shift as one of several potent power resource which endow the local unions with bargaining power. Night shifts are a bargaining chip which unions can sell to the employer during periods of labor peace – which the union gladly does – but implies that if the employer loses the trust of the union, they risk costly backlashes, such as not getting night shifts.

Our paper makes several contributions, among them providing a rare (and candid) account of a Swedish codetermination process, as well as a tangible empirical example of how worker bargaining power can impact productivity and well-being in the workplace. Applying process tracing allow us to study the web of rules which create the necessary conditions for constructive technological bargaining in Sweden, identifying which power resources informs the relationship. The identified power resources illustrate how limits to employer behavior can become beneficial constraints, making it easier for the employer to pick high road strategies, whilst not forsaking their pursuit of productivity increasing investments.

### Paper III

Paper III (coauthored with Johan Eklund) is a quantitative empirical exploration on the role of individual and collective bargaining power in Swedish occupational and regional labor markets. The model captures variation in the strength of worker outside options, which can be modelled as a function of employer concentration on hires, and the payoff and probability of changing occupations.

The main goals of the paper is to assess employer wage setting power in Swedish labor markets, but also to assess if a model of individual bargaining power (developed by Schubert et al. 2024) is applicable on administrative data, and to assert that the model can sufficiently separate wage effects stemming from individual bargaining power and collective bargaining power. We also identify and address other identification concerns relating to firm size.

Our results finds that in aggregate, concentration has a negative effect on wages in Sweden, but the negative effect is modest compared to other settings. To explore heterogeneity, we regress blue- and white collar occupations separately, broadly capturing differing wage setting practices, skills, and qualifications found in these oc-

cupational groups. Surprisingly, we find that for blue collar workers, concentration has a positive effect on the wage bargain - even when correcting for firm size (using value added).

Another important finding relates identifying and separating wage impacts from collective bargaining. By summarizing the yearly mean fixed effects estimates, capturing impacts to the wage bargain outside the parameters of the individual bargaining model, and comparing the fixed effect summations' yearly changes to the wage increases found in central collective bargaining agreements, we find that the two grow at almost identical rates. Thus, by using time-sensitive regional and occupational fixed effects we verify the model's ability to separate individual bargaining power from collective bargaining power effects.

#### Paper IV

Paper IV (solo-authored) takes stock in the counter-intuitive finding that the wage bargain of blue collar workers fares worse in less concentrated labor markets, while white collar workers fare better, exploring a possible explanation in the fissurization/domestic outsourcing literature (Weil 2014). Do all workers benefit from adding more outside employer options to a labor market?

To explore this research question I study the privatization of welfare and health-care services in Sweden between 2000 and 2020, by considering the impact to wages and incomes for (white collar) nurses and (blue collar) care workers. Privatization shares many rationalities and features of domestic outsourcing, while the extent of privatization in Swedish labor markets are largely based on exogenous political decisions.

To test implications to wages and incomes form privatization, I use the wage-concentration framework developed in Paper III, as well as the on-site domestic out-source approach of Goldschmidt and Schmieder (2017), which uses a difference-in-difference event study to compare the outcomes of outsourced/privatized workers with those who remained at the identified public employer.

The wage-concentration approach finds a negative effect on wages for nurses, but a small-to-insignificant effect for care workers. In the event-study, the incomes of nurses show no significant effects six years after the privatization event, but a significant negative impact to incomes of blue-collar care workers of 12 percent.

My contribution shines light on a politically contested topic relating to the effects of privatization for workers with weaker individual bargaining power. Privatization indicates similar levels of negative results to blue collar occupations found in other studies of domestic outsourcing in other settings. In the Swedish context, this is likely an effect of bargaining asymmetries rooted in collective agreements, perhaps reflecting differences in collective bargaining coverage and the relative strength of provisions found private and public sector collective agreements.

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