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ABSTRACT

Labor Markets as Human Ecosystems: The Insider-Outsider Theory Reconsidered

Whereas labor markets are traditionally viewed as machine-like environments – where agents, coordinated by price signals, solve constrained optimization problems or adhere to established heuristics – this paper views labor markets as human ecosystems, containing living things, namely, the human beings who participate in these markets. Living things adapt to their environment and evolve across their domains of life. Consequently, activities in labor markets cannot be understood independently of their social and political foundations. Labor markets are embedded in social, economic, political and environmental systems, and their adaptiveness to their social and natural environments. In this context, the insider-outsider theory may be generalized by reconceptualizing insiders and outsiders in terms of their relative adaptive advantages and the structural barriers to adaptation. The functions and misfunctions of adaptively embedded labor markets can be specified in terms of the adaptiveness as systems or the adaptiveness of the components of these systems. The ecosystemic approach also involves a reconceptualization of agents operating in labor markets, implying a new theories of the firm and workers.

JEL Classification: J0, J2, J6

Keywords: insider-outsider theory, embedded labor markets, evolution, theory of the firm

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Introduction

Think of labor markets as human ecosystems. After all, humans are living things – living things that trade with one another, allocate power to one another in accordance with manmade rules, and interact with the natural world.

Ecosystems are complex systems of living organisms interacting with each other and with their physical environment. Human ecosystems are systems in which human beings are integrated into ecological relationships with each other and with the biophysical environment. They are coupled human–natural systems that combine the properties of both ecosystems and human social systems. Unlike natural ecosystems, human ecosystems are shaped by culture, technology, institutions, values, and intentional planning, alongside ecological processes.

In human ecosystems the biophysical components (air, water, soil, flora, fauna, climate) and human components (population, social institutions, infrastructure, economy, culture) interact dynamically in co-evolutionary ways (Machlis et al., 1997). Human ecosystems are complex adaptive systems (CAS) with multiple interacting agents (individuals, institutions, technologies), emergent behavior (e.g., urban sprawl, pollution, resilience), feedback loops (e.g., between consumption and resource depletion), and nonlinear dynamics (small actions can have large, cascading effects).

Unlike other ecosystems, humans in human ecosystems possess agency, allowing for intentional transformation of the environment (e.g., agriculture, urbanization), pursued with collective organization (e.g., governance, planning, education) and following normative goals (e.g., justice, sustainability, economic growth). (See Ostrom, 2009.) Human behaviors and their ecosystem impacts are shaped by cultural beliefs and values (e.g., nature stewardship vs. exploitation), social norms and institutions (e.g., property rights, market systems), as well as legal frameworks and governance systems (Berkes & Folke, 1998).

Human ecosystems extend across various scales (household, community, city, region, nation, biosphere) and domains (economy, polity, society). These are nested systems (Gunderson & Holling, 2002), in which local decisions influence and are influenced by global systems (e.g., climate change, trade, migration).

Labor markets are human ecosystems because they consist of complex, interdependent relationships between human agents (workers, firms, governments, unions, etc.) and their social, economic, institutional, and environmental contexts. Like natural ecosystems, labor markets involve the flow of energy (labor effort), material (wages and goods), and information (skills, expectations, norms), and they evolve over time through feedback, adaptation, and co-evolution. Labor markets involve flows of energy (human effort), material (goods and services produced) and information (skills, job matching, expectations, social networks).

Two key features of labor markets as human ecosystems are

- Embeddedness: Labor markets are shaped by the social values, economic structures, political rules, and environmental constraints)
- Adaptiveness: Labor markets evolve through institutional, cultural, technological, and ecological changes, co-evolving with the systems in which they are embedded.

In this context, the message of this paper is simple and can be summarized in the following steps:

(1) Labor markets are not self-regulating mechanisms operating in a social vacuum. Instead, they are *embedded* in their social, political and environmental milieu. Labor market activities do not just depend on this milieu; these activities cannot be understood independently of this

milieu. Labor markets are socially embedded, institutionally structured, and ecologically constrained systems.

(2) Furthermore, labor markets *adapt* to their milieu. In the process, they affect their milieu. In fact, labor markets co-evolve with their milieu. Changes in labor market activity cannot be understood independently of this coevolution.

(3) The reason for the coevolution is that labor markets are complex adaptive systems (CAS) that are dynamically interrelated with broader societal structures. The behaviors of workers, employers, and institutions both influence and are influenced by their cultural, political, and ecological environments. This mutual, path-dependent adaptation is what makes the study of labor markets a *co-evolutionary* endeavor rather than a purely economic one.

(4) This co-evolutionary process is driven the *Darwinian triad* of variation selection and transmission, applied to the domain of cultural evolution in addition to natural evolution. In labor markets, these evolutionary processes operate on institutions, behaviors, norms, technologies, and policies.

(5) In this framework of "extended Darwinism," the *relationship between insiders and outsiders* plays a potentially important role. Broadly speaking, "insiders" are advantaged agents whose positions of power are protected by "net adaptation costs" (NAC). These NAC are the costs of adapting to changed circumstances in ways that are disadvantageous to the insiders. "Outsiders" are disadvantaged agents who do not enjoy such protection. The insiders wield power on account of the NAC and thus have an incentive to maintain and augment the NAC. This frame of reference calls for a reconsideration of the insider-outsider theory.

(6) A core feature of the co-evolutionary process of labor markets and their milieu is *multilevel selection*—a process in which selection pressures operate simultaneously at multiple levels, notably at the level of individuals (e.g., workers, firms) and at the level of groups (e.g., trade unions, firms-as-collectives, employers' associations, or policy regimes). This framework, which is shaped by the relative power of insider versus outsiders, provides a powerful lens for explaining why cooperative or competitive behaviors emerge and persist in labor markets, and under what conditions group-level adaptive traits (like labor protections or wage norms) prevail over individual-level selfish traits (like wage undercutting or free-riding).

(7) Labor markets operate as part of a *hierarchy of complex adaptive systems* (CAS) in which multilevel selection occurs simultaneously within, across, and above labor market structures. Below the level of labor markets are individual workers and firms. At the level of labor markets are networks of employers, workers, unions, and regulators. And above the level of labor markets are macroeconomic institutions, states, global economic systems, and planetary boundaries. This ecosystemic hierarchy is shaped by adaptive interactions and multilevel selection processes—where adaptation and selection occur at the level of individuals, groups, institutions, and systems. Labor markets are emergent systems that adapt to changing internal and external conditions while influencing the broader economic and environmental contexts in which they are embedded. The process of adaptation at all levels depends on the NAC governing the relative power of insiders versus outsiders.

(8) In this ecosystemic framework, labor market policies and macroeconomic policies should not aim merely to promote employment, "good jobs," and economic growth while keeping inflation in check. Rather, *the policies should aim to promote human flourishing*, which involves mobilizing people's collective capacities (such as their human, social, economic and political capital) to address their collective challenges (such as involuntary unemployment, disempowering jobs, climate change and biodiversity loss).

(9) In response to each collective challenge, the collective response needs to be *adaptive at the relevant systemic level* (CAS1), rather than adaptive at the level of the agents composing the relevant system (CAS2). The relevant systemic level depends on the scale and scope of the collective challenge (e.g., local challenges require local systemic responses while global challenges require global systemic responses).

(10) Human flourishing can be promoted through CAS1 policymaking devoted to the following important contextual drivers of flourishing: solidarity (social cohesion and networks of social support), agency (the ability to shape one's life through one's own efforts, individually and collectively), gain (material sufficiency) and environmental sustainability. This may be called *SAGE policymaking*.

We now proceed to examine each of elements of an "adaptively embedded" approach to the analysis of labor markets.

Embedded Labor Markets

The concept of *embedded labor markets*—originating in the work of Karl Polanyi and later developed by scholars in economic sociology, institutional economics, and labor market studies—emphasizes that labor markets are not self-regulating mechanisms operating in a social vacuum. Instead, they are embedded in broader social, institutional, cultural, and political contexts that fundamentally shape the behavior of workers, entrepreneurs, and managers, as well as labor market structures, opportunities, and outcomes. The major aspects of embeddedness may be summarized along the following lines.

The concept of "embeddedness" is foundational. Granovetter (1985) argues that economic actions, including labor market behavior, are embedded in social networks and relationships. Hiring and job mobility often depend on personal connections, reputation, and trust—not just wages and productivity.

Karl Polanyi (1944) introduced the idea that labor is a "fictitious commodity" because it is not produced for sale; thus, labor markets must be institutionally regulated to prevent social dislocation.

David Marsden (1999) further develops this by showing how institutional arrangements (contracts, norms, HR practices) coordinate expectations between employers and workers.

Socially embedded labor markets are characterized by social networks. Labor market access often depends on informal social ties (Granovetter, 1985). Hiring, referrals, promotions, and entrepreneurial opportunities are often mediated by personal relationships. Workers rely on social networks for job information, entrepreneurs seek trust-based relationships with clients and investors, and managers recruit and retain workers based on social trust and reputation. For example, job referrals are more effective than open applications, even in formal sectors (Granovetter 1973; Castilla 2005).

Social norms shape ideas of appropriate work, fair pay, and acceptable authority. Workers' motivation is influenced by social recognition and peer respect, not just monetary incentives (Akerlof & Kranton, 2005). Managers may exercise authority through relational strategies rather than formal control, particularly in flatter organizations.

Institutionally embedded labor markets affect firms both internally and externally. Firms often develop internal labor markets (Doeringer & Piore, 1971), in which promotions, wages, and job assignments are governed by organizational rules, seniority, and trust—not only external market signals. Externally, wage bargaining systems, employment protection laws, minimum wage regulations, and vocational training systems shape firm behavior and worker options (Marsden, 1999; Hall & Soskice, 2001). These institutions create structured expectations for

how workers and firms relate to one another and reduce uncertainty in labor relations. In coordinated market economies (e.g. Germany), strong institutions support long-term employment relationships and skill formation; in liberal market economies (e.g. U.S., U.K.), employment is more flexible and market-driven (Thelen, 2014).

In culturally embedded labor markets, workers' access to jobs and promotions is shaped by their cultural capital—language, dress, demeanor, and credentials (Bourdieu, 1990). Cultural assumptions also define which jobs are "men's work" or "women's work," or suitable for immigrants, reinforcing occupational segregation. Cultural perceptions of identity affect hiring and managerial expectations. For example, women or minority candidates may be subject to implicit biases, limiting their access to leadership roles or high-paying sectors (Akerlof and Kranton, 2000).

Politically embedded labor markets are shaped by collective actors – trade unions, employer associations, the state – and their power relations (Howell & Givan 2011; Thelen 2014). These markets are often characterized by power asymmetries between capital and labor, which influence wage setting, job security, and working conditions.

Trade unions and employer associations play a central role in shaping wages and working conditions (Korpi, 2006). Labor market structures are typically shaped by state regulation, including welfare policies, tax incentives, union rights, and immigration laws. Political ideologies influence the balance between labor protections and market flexibility (Howell, 2003).

The implications of embedded labor markets are far-reaching and differ radically from those of neoclassical labor markets. In neoclassical labor markets, worker behavior is determined by wage incentives under rational choice, entrepreneur behavior is driven by profit maximization, and managers treat workers as interchangeable labor units. By contrast, in embedded labor market, worker behavior is shaped by social networks and social norms, entrepreneur behavior depends on trust, reputation and informal support by colleagues, and manager behavior involves navigating organizational norms and institutional rules. In neoclassical labor markets, opportunities are assumed to be equally distributed and merit-based and the outcomes coverge to efficient equilibrium outcomes. By contrast, in embedded labor markets, opportunities are unevenly distributed due to social stratification, cultural capital and institutions, while the outcomes are often segmented, unequal and path-dependent.

Adaptively Embedded Labor Markets

Adaptively embedded labor markets may be understood as complex adaptive systems (CAS). This approach captures the dynamic, interdependent, and evolving nature of labor markets, in contrast to static and equilibrium-based neoclassical models. In this framework, labor markets are not simply mechanisms for matching supply and demand, but adaptive, evolving systems shaped by the interactions of heterogeneous agents operating within broader social, political, and institutional environments.

Adaptively embedded labor markets exhibit the following features of CAS:

(1) *Deep interdependence*: Labor markets are deeply interdependent: the decisions of workers, managers, firms, unions, and policymakers affect one another through dense networks of social ties, institutional rules, and market structures. For example, the hiring decisions are affected by informal referrals; changes in labor laws affect employer strategies and worker choices. Interdependence also spans across firms,

industries, and sectors, such that local shocks propagate systemically (Granovetter, 1985; Marsden, 1999).

(2) *Emergent Behavior*: Labor market structures (e.g., occupational hierarchies, job segmentation, norms of fairness) emerge from the interactions of agents over time, not from central design. Segmented labor markets (Doeringer & Piore, 1971) emerge from firm-level practices, institutional constraints, and historical path dependencies. Informal job queues, cultural expectations about gendered labor, or patterns of labor migration are emergent phenomena (Piore, 1979; Bourdieu, 1990; Arthur, 1994).

(3) *Nonlinearity and Disequilibrium Dynamics*: Small changes (e.g., shifts in hiring norms or new technologies) can lead to nonlinear shifts in employment patterns or inequality, and labor markets are often far from equilibrium. For instance, the introduction of AI may displace entire classes of workers or restructure skill demands. Markets may exhibit lock-in or tipping points (e.g., informalization of whole sectors). (Arthur, 1994; David, 1985).

(4) *Feedback Loops*: Labor markets contain positive and negative feedback mechanisms. Success breeds success—early career advantages (elite education, networks) enhance future opportunities. On the other hand, institutional protections (minimum wage laws, collective bargaining) can stabilize market dynamics (Bourdieu, 1990; Giddens, 1984); DiMaggio & Powell, 1983).

(5) *Self-Organization*: Labor markets self-organize through adaptive interactions, even without central coordination. Informal norms around job matching, wage expectations, or worker-client relationships emerge organically. Firms develop internal labor markets and HR systems tailored to their environment (Holland, 1995; Doeringer & Piore, 1971).

(6) *Multiple Basins of Attraction & Sensitivity to Initial Conditions*: Labor markets may stabilize around multiple equilibria or regimes, shaped by history and context. Based on institutional histories, coordinated market economies exhibit different employment practices from liberal market economies (Hall & Soskice, 2001). Path dependency ensures that small initial differences in training systems or regulation can result in divergent long-run labor market outcomes (Thelen, 2014); Pierson, 2000).

(7) *Adaptive Agents*: Agents in labor markets—workers, managers, policymakers—are adaptive and respond strategically to changing environments. Workers upskill or shift sectors; firms change employment contracts or relocate; unions adapt organizing strategies. Employers adjust their recruitment and retention in response to demographic shifts or regulatory changes (Akerlof & Kranton, 2000; Marsden, 1999; Gigerenzer & Selten, 2002).

(8) *Learning and Evolution*: Labor markets evolve through learning, experimentation, and imitation. Firms learn best HR practices through benchmarking or institutional pressures. Workers learn which occupations offer resilience or upward mobility. Norms and practices evolve through institutional innovation and social learning **(**March, 1991); Nelson & Winter, 1982).

(9) *Coevolution with Society, Polity, and Environment*: Labor markets coevolve with changes in politics, social values, and the natural environment. Labor regulations reflect and shape political ideologies (e.g., neoliberalism vs. social democracy). Environmental shifts (e.g., climate policy) reconfigure employment in energy, agriculture, and logistics. Social movements (e.g., #MeToo, racial justice) change labor practices and expectations (Polanyi, 1944; Beck, 2000; Thelen, 2014).

(10) *Multilevel Selection*: Labor markets are shaped by dynamics operating at multiple levels—individual, firm, sector, nation, and global economy. Competition and cooperation occur not only among workers but also among firms, unions, and countries. Some labor market practices persist because they benefit the collective (e.g.,

coordinated wage bargaining), even if not individually optimal (Beinhocker, 2006; Hall & Soskice, 2001; Ostrom, 2010; Wilson & Wilson, 2007).

Viewing labor markets as complex adaptive systems has far-reaching implications, particularly for the roles of insiders and outsiders in these markets.

The literature on complex adaptive economic systems is growing rapidly, after this field was founded by Brian Arthur (1989, 1999, 2015), Kenneth Arrow (Arrow, 1994), Herbert Simon (Simon, 1955, 1962), Eric Beinhocker (2006), Robert Axtell (Axtell, 2005; Epstein & Axtell, 1996), Robert Axelrod (Axelrod, 1997), and Joshua Epstein (1997).

Viewing labor markets as complex adaptive systems from the perspective of multilevel selection theory has far-reaching implications, particularly for the roles of insiders and outsiders in these markets.

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Since multilevel selection (MLS) suggests that selection-like forces can act simultaneously at multiple organizational levels (individuals, groups, firms, institutions), so that traits (or behaviors, norms, institutions) that are disfavoured within groups can nonetheless spread because groups that possess them outcompete other groups, many problems in labor markets — regarding cooperation, public-goods provision, institutional emergence, and cultural change — can be reframed as outcomes of interacting selection pressures across levels rather than solely the aggregation of individual rational choices.

The application of MLS theory to economics has led to various significant insights. For example, Bowles & Gintis (2011) argue that multilevel processes (inter-group conflict, group competition) are central to explaining human cooperation beyond kin selection or reciprocal altruism — with clear implications for collective action and redistribution policies. Van den Bergh (2009), Zinovyeva (2010) and others have applied MLS ideas to explain institutional change and collective behaviour. Recent work uses MLS to justify polycentric and nested governance arrangements (e.g., Schaefer, 2023; Wilson, et al., 2023): groups that can coordinate internally and compete or cooperate externally tend to be more adaptive. Cliodynamics and historical-comparative work (e.g., Peter Turchin, 2010) use multilevel selection logic to explain state formation, warfare, and rises/falls of complex societies, which in turn shape economic organization. Traulsen and Novak (2006) provide a useful baseline for stochastic economic models of public goods that show how group selection can foster cooperation in subdivided populations.

The application of MLS theory to labor economics is still in its infancy. Bowles & Gintis (1998, 2011) argue that labor contracts are incomplete and depend on worker reciprocity, fairness, and trust. MLS helps explain why cooperative norms (costly to individuals) persist because groups of workers in firms with these norms outcompete less cooperative groups. Fehr & Gächter (2000, 2002) show empirically that altruistic punishment and strong reciprocity help enforce effort norms in labor settings. These behaviors can be sustained by group-level selection. Historical work (e.g., Turchin, 2016) applies MLS logic to the rise of cooperative labor movements and state–labor compromises that supported industrial growth. This chapter provides a systematic application of MLS theory to labor economics, arguing that the exploitation of collective benefits through cooperative groups can be ostructed through insider-outsider power disparities.

Traditional Insiders versus Outsiders in Adaptively Embedded Labor Markets

The insider–outsider theory, founded by Assar Lindbeck and Dennis Snower (e.g., Lindbeck & Snower, 1984, 1988, 2001), has also generated a large literature, for example on hysteresis (e.g., Blanchard and Summers, 1986), unemployment persistence (e.g., Lindbeck & Snower, 1987; Karanassou & Snower, 1998), macroeconomic policy (e.g., Lindbeck & Snower, 1988b, 1990b, 1994; Merkl & Snower, 2006; Chen, Snower & Zoega, 2003), job security (e.g., Lindbeck & Snower, 1988a), job matching (e.g., Brown, Merkl & Snower, 2015), the natural rate of unemployment (Karanassou & Snower, 1997, 1998), and much more. This provides a compelling framework for understanding inequality of opportunity, wage inflexibility, involuntary unemployment, labor market segmentation, involuntary underemployment and involuntary secondary employment, and the persistence of employment, underemployment and unemployment in labor markets.

In this theory, "insiders"—incumbent workers with secure jobs—wield bargaining power that enables them to defend high wages and restrict competition. "Outsiders", in contrast, are disadvantaged individuals who face barriers to entry and lack voice in wage determination. The wage-setting process is thus controlled by insiders, generating more favorable employment opportunities for insiders than for outsiders and limiting downward wage flexibility in response to economic shocks.

Persistent labor market inefficiencies and inequities are inadequately explained by standard neoclassical models that assume competitive, frictionless, and self-equilibrating labor markets. The insider–outsider theory challenges this assumption by positing that labor turnover costs generate asymmetric bargaining power in favor of employed insiders, who are incentivized to maintain high wages and limit outsider entry. While the insider–outsider theory was originally formulated to explain wage rigidity and hysteresis in unemployment following adverse macroeconomic shocks, the theory applies equally to deep-rooted labor market segmentation, inequality of opportunity, and the structural marginalization of vulnerable workers.

In both developed and developing countries, outsiders face systemic barriers to entry due to lack of social capital, credentials, or work experience. Because insiders dominate recruitment networks and internal labor markets, outsiders are excluded from upward mobility. Young people, immigrants, women re-entering the workforce, and formerly incarcerated individuals are disproportionately affected. Access to stable employment becomes path-dependent, reinforcing intergenerational inequality and segregated labor markets.

At the core of the insider-outsider explanation of inefficiencies and inequities in the labor market are labor turnover costs, which comprise “production-related” costs (necessary to make outsiders productive within a firm) and “rent-related” costs (which result from insiders’ rent-seeking activities). The rent-related turnover costs are the outcomes of wasteful redistributive battles; they could take the form of firing costs (severance pay); risk-related turnover costs (arising because outsiders abilities and attitudes are unknown before they are hired, whereas insider’s abilities and attitudes are known); cooperation costs, arising when insiders cooperate with one another (thereby raising each other’s productivity) but refusing to cooperate with outsiders) and harassment costs, arising when insiders harass outsiders (thereby raising their reservation wages) but do not harass one another (Lindbeck and Snower, 1990).

The major implication of these rent-related labor turnover costs is that they give the firm an incentive to keep the insiders, even in the absence of wage and productivity differentials between insiders and outsiders. Consequently, outsiders face discrimination in labor markets,

since they have less favorable choices than insiders. In short, the rent-related labor turnover costs generate inequalities in labor market opportunities.

The result may be involuntary unemployment i.e., there are outsiders without jobs even though, under identical employment conditions (the absence of rent-related labor turnover costs), they would prefer to be employed at less than the insider wages, adjusted from insider-outsider productivity differentials. This labor market outcome is both inefficient and inequitable. In the presence of secondary labor markets, the result may be underemployment or relatively undesirable jobs (in terms of working hours, safety, nonpecuniary benefits, wages and job security). These, too, are inefficient and inequitable outcomes.

The labor turnover costs are also responsible for the persistence of unequal labor market opportunities, since the employment effects of an adverse temporary labor market shock (e.g., a recession) last longer than the shock itself. After all, the labor turnover costs discourage firms from rehiring workers – or rehiring them on the same favorable terms as those of the previous insiders – once the shock has disappeared.

While insider-outsider theory is typically situated in a comparative static or dynamic equilibrium framework, understanding labor markets as complex adaptive systems (CAS) has profound implications for the labor market roles of insiders and outsiders. This reconceptualization invites new insights into how insider power is sustained, transformed, or destabilized through adaptive, nonlinear, and emergent processes.

In CAS labor markets, power asymmetries between insiders and outsiders are not merely the result of bargaining institutions, but also of network embeddedness, institutional feedback, cultural norms, and coevolving labor practices. These features, on balance, tend to augment the insider-outsider disparities in labor market opportunities.

A first channel of enhanced discrimination lies in *social network effects*. Insiders are often embedded in dense social networks within firms and industries that provide information, influence, and access to resources (Granovetter, 1985). These networks reinforce their positional advantage. Outsiders, by contrast, may be excluded from these networks due to weak ties, lack of credentials, or social stratification (Bourdieu, 1990). As firms rely on referrals and internal promotions, outsider exclusion becomes self-reinforcing.

A second channel arises from *emergent behavior and institutional lock-in*. Insider power emerges from the interactions of micro-level incentives, firm strategies, and policy environments. These patterns can lock-in over time through feedback loops. For example, labor law that initially protects job security can evolve into institutional entrenchment of insider dominance, limiting labor market dynamism.

A third channel, initiated by the social exclusion that comes with *outsiders' loss of network connectivity*, involves skill decay and stigmatization. Insiders, shielded from these effects, have less incentive to support inclusionary reform. Once insiders dominate, firms evolve structures (e.g., seniority-based promotion, union rules) that raise the cost of outsider integration. These dynamics mirror the persistence and hysteresis mechanisms identified by the insider-outsider theory, but are now seen as emergent properties of CAS.

A fourth channel arises through the *job matching process*. The standard search-and-matching framework (e.g. Mortensen & Pissarides, 1994) assumes that all agents are essentially similar and act independently, ignoring power asymmetries, institutional dynamics, and adaptive behavior. By contrast, in complex adaptive labor markets, agents (workers, firms, institutions) are heterogeneous, interdependent, and adaptive, and interact under evolving norms and structures (Holland, 1995; Arthur, 1994).

In these markets, job information is not equally distributed. Insiders, embedded in organizational and occupational networks, have privileged access to internal job postings, referrals and informal vacancies, and influence over hiring managers. As Granovetter (1985) and Burt (2001) argue, strong-tie networks (e.g., among insiders) can result in network closure, limiting outsiders' access to job-relevant information. Consequently, outsiders are systematically excluded from efficient matches, even when qualified. Insiders filter or block access, reinforcing segmentation.

In firms organized as CAS, norms of trust, collaboration, and communication emerge over time. Insiders often exhibit in-group preference and are reluctant to cooperate with newcomers. This magnifies the cooperation and harassment turnover costs for employers when hiring outsiders (Lindbeck & Snower, 1990a). Employers rationally prefer insiders or referrals from insiders to avoid productivity losses. Thus, even when vacancies exist, firms underutilize the external labor market, distorting the allocative function of matching. Firms prefer to overutilize insiders (e.g., through overtime) rather than incur the cost of integrating outsiders. Productivity gains are lost due to mismatch and redundancy.

Job matching is also impeded through feedback loops and path dependence. Once insiders dominate access to jobs, positive feedback loops reinforce their control: Employment leads to experience, which leads to promotion, which leads to greater influence over hiring. Outsiders remain unemployed or in precarious work, lowering their employability signals (e.g. due to skill depreciation or stigma). Over time, job market stratification becomes path-dependent and increasingly resistant to change (Pierson, 2000). The system becomes sticky; disadvantaged groups face increasing marginal barriers over time, even if qualifications improve.

A fifth channel arises from *unequal opportunities for adaptation*. Insiders and outsiders are adaptive agents who respond to institutional and economic changes. Insiders may shift their strategies by lobbying, upskilling, or relocating. Outsiders may adapt through informal work, entrepreneurship, or migration—but their adaptation is often constrained by institutional barriers and lack of feedback channels. This dynamic underscores the bounded rationality and learning processes central to CAS (Holland, 1995; Gigerenzer & Selten, 2002).

Furthermore, insiders learn to strengthen their positions through informal norms, selective cooperation, or strategic resistance to reform. For example, cooperation costs become self-reinforcing as insiders develop tight-knit networks that exclude outsiders.Firms internalize these costs and respond by reducing external hiring, thus reinforcing outsider exclusion.

A sixth channel involves *multiple equilibria and path dependence*. Ecosystemic labor markets allow for multiple stable states, including high-unemployment equilibria dominated by insider power. A country with strong unions and employment protection (e.g., Italy or Spain) may converge toward an insider-biased equilibrium with low job turnover and high youth unemployment. Other economies (e.g., Denmark or the Netherlands) may develop inclusive models with better reintegration mechanisms. The initial conditions and institutional legacies determine which equilibrium prevails (Thelen, 2014; Pierson, 2000).

A final channel involves the *coevolution of policy and society*. The insider–outsider dynamic coevolves with social norms, political institutions, and economic structures. Populist political mobilization can result from long-term outsider exclusion (Standing, 2011). Policies such as dual labor contracts, temporary work schemes, or minimum income guarantees emerge as adaptive responses to persistent insider-outsider divides.

Generalizing the Insider-Outsider Theory

The insider-outsider theory can be meaningfully extended within the framework of complex adaptive systems (CAS) by reconceptualizing insiders and outsiders in terms of their relative

adaptive advantages and the structural barriers to adaptation. Central to this reconceptualization is the concept of Net Adaptation Costs (NAC). NAC are the costs of changing rules, institutions, norms, or practices in ways that would reduce the insiders' advantages in the labor market.

In labor markets, these net adaptation costs include the above-mentioned labor turnover costs (the costs of replacing insider workers by outsider workers), but they also can take the form of firm turnover costs (i.e., the costs of replacing insider firms by outsider firms). As for the labor turnover costs, it is possible to distinguish between production- and rent-related firm turnover costs.

Production-related firm turnover costs are the legitimate costs of new firms entering an industry and becoming productive competitors. They reflect the real adaptive effort required to build operational capacity, relationships, and knowledge. Examples of these costs include learning costs (the costs of acquiring industry knowledge, supplier networks, customer relationships), investment in industry-specific technology or standards, training employees to meet industry norms, and regulatory compliance costs in areas such as safety, labor, and quality. These costs represent barriers to entry that are efficiency-preserving, reflecting economies of scale, scope, and institutional fit.

Rent-related firm turnover costs are artificial or strategically imposed costs that incumbent firms use to deter new competitors—often through lobbying, exclusionary practices, or regulatory capture. Examples include licensing regimes or zoning laws disproportionately influenced by incumbent lobbying, patent thickets that make it costly for new firms to innovate (Shapiro, 2001), exclusive contracts or long-term deals that lock customers or suppliers away from entrants, lobbying for complex or customized standards that only incumbents can meet, and informal entry barriers, like denial of access to professional networks or reputational gatekeeping.These rent-related costs do not improve efficiency but reduce dynamic competition, innovation, and diversity in the economic system.

Insider firms gain market power through rent-related firm turnover costsThese rent-related costs are not necessary for productive adaptation but are rather mechanisms of rent extraction, entry deterrence, and market entrenchment. As such, they lead to significant economic inefficiencies and social inequities.

Insider firms use rent-related turnover costs to gain market power through the following means:

(a) *Entry Deterrence:* Incumbents raise the cost of entry by lobbying for complex licensing, zoning restrictions, or other regulatory burdens. (For example, Large pharmacy chains lobbying for restrictive location regulations that make it harder for small independent pharmacies to operate.)

(b) *Lock-In and Switching Barriers:* Long-term contracts with suppliers or platform exclusivity deals prevent new firms from accessing key supply chains or customer bases. (For example, Dominant food delivery platforms imposing exclusivity clauses on restaurants, preventing them from partnering with new competitors.)

(c) *Patent Thickets and IP Bullying:* Incumbents accumulate large patent portfolios, sometimes with overlapping claims, to intimidate or delay entrants through costly legal battles. (For example, incumbent tech firms like Apple or Microsoft have used extensive patent portfolios to stall smaller rivals (Shapiro, 2001).)

(d) *Standard-Setting and Regulatory Capture:* Insiders influence the design of industry standards or public tenders to favor their own technologies or models. (For example, Large utility firms shaping grid standards to exclude decentralized renewable energy providers.)

As is well-known (e.g., Zingales, 2017), the exercise of insider firm power arising from rent-related firm turnover costs is inefficient and inequitable. The inefficiencies can take the form of misallocation of resources (e.g., entrants that could offer better technologies or services are excluded), innovation suppression (e.g., new entrants that drive disruptive innovation are deterred or bought out), and reduced dynamism (when industries suffer from "incumbency inertia," economic ecosystems become less adaptable to changing circumstances. (For example, fossil fuel incumbents lobbying to maintain subsidies and delay the energy transition, even when clean alternatives become cost-effective.)

The inequities are numerous as well. Small firms, startups, and minority entrepreneurs face disproportionate obstacles, increasing inequality of opportunity. Insider firms accumulate rents that can be used to consolidate political influence and further entrench advantage. Consumers face higher prices and less choice. And workers may be locked into dominant employer ecosystems, reducing their bargaining power (e.g., gig workers on dominant platforms).

In addition to these labor-market-based NACs, there are political NACs (e.g., costs of changing political institutions) and social NACs (e.g., identity-switching costs).

All these NACs play a pivotal role in shaping selection mechanisms in labor markets. These costs influence who succeeds or fails, who is included or excluded, and which behaviors, practices, and institutional forms persist or disappear over time. Within a complex adaptive systems framework, NACs affect the evolutionary dynamics of labor markets by biasing the processes of variation, selection, and transmission.

NACs distort the selection mechanisms by creating asymmetries in the ability of agents to adapt in the following ways:

- **Reduced Variation and Exploration:** High NACs deter experimentation by raising the cost of adapting to new roles, firms, or technologies. The result is path dependency and institutional inertia (North, 1990; Arthur, 1989).
- **Biased Selection Pressures:** NACs privilege insiders by artificially inflating outsiders' entry or adaptation costs. Selection favors incumbents, not necessarily those with higher productivity or adaptive value. Inefficient and inequitable equilibria become stable due to the sunk costs of adaptation (Lindbeck & Snower, 1986; Snower, 2019).
- **Distorted Transmission Mechanisms:** Institutions, skills, and norms that thrive are those protected by high NACs—not necessarily those that are most efficient or just. Learning systems become biased toward maintaining the status quo. Outsiders often lack access to transmission channels (e.g., networks, norms, mentorship), reducing intergenerational mobility or organizational innovation. Outsiders often lack access to transmission channels (e.g., networks, norms, mentorship), reducing intergenerational mobility or organizational innovation.

Over time, these micro-level distortions in selection lead to macro-level outcomes. Labor market segmentation tends to arise as insiders capture the stable jobs, protected wages, and access to learning ecosystems, while outsiders are left with the precarious work, limited voice, and high vulnerability to shocks. Outsiders face high adaptation barriers (e.g., reskilling, relocation), leading to long-term unemployment or underemployment even when jobs are available. Labor markets may come to feature fewer startups, less occupational mobility, and stagnant productivity growth. Finally, NACs reinforce systemic advantages and disadvantages, often along lines of class, race, or gender. This results in persistent inequality of opportunity and inequitable labor market outcomes.

The Functions and Misfunctions of Adaptively Embedded Labor Markets

To understand the functions and misfunctions of adaptively embedded labor markets, it is useful to distinguish between CAS1 and CAS2 systems. According to Wilson (2016) and Wilson & Madhavan (2020), a CAS1 system is a complex adaptive system that adapts as a system, with its parts cooperating to produce outcomes beneficial to the whole. A CAS2 system consists of adaptive agents pursuing individual or factional interests, often in ways that undermine systemic coherence. In CAS2, agents compete for relative advantage, leading to internal conflict, inefficiencies, or instability. This distinction applies to all domains where collective function depends on aligned incentives, including labor markets.

The concept of CAS1 can be usefully applied to multiple levels of economic and social organization: the firm, the worker, the labor market, and society as a whole. At each level, a CAS1 system exhibits cohesion, goal alignment, and adaptive coherence among its parts. But while the underlying CAS1 principles remain constant, the meaning and implications of system-level adaptiveness differ markedly across levels.

A firm is a firm-level CAS1 when it functions as an integrated, coherent system, in which workers, managers, and units adapt collectively toward shared organizational goals. Feedback mechanisms enable joint learning and adjustment. Incentives, culture, and governance structures foster collaboration over conflict. For example, a mission-driven cooperative with distributed decision-making, transparent feedback, and shared value generation. CAS1 at the firm level entails internal coherence and organizational unity.

A CAS1 firm at the firm level may adapt coherently toward its own objectives (e.g., productivity, innovation), but these objectives may still undermine societal goals (e.g., by externalizing environmental costs or exacerbating inequality). By contrast, a CAS1 firm at the societal level is one whose adaptive behavior is functionally aligned with societal and planetary value (Kelly & Snower, 2021). It is embedded in broader systems and contributes to their adaptive coherence. In short, CAS1 at the firm level is about internal cohesion, whereas CAS1 at the societal level is about external alignment with collective values and systems.

A worker is CAS1 at the worker level when her own behaviors, beliefs, and aspirations are integrated internally (such that the worker acts as a unified, self-organizing whole), align with meaningful goals within larger social and organizational contexts, and adapt based on personal reflection, feedback, and purposeful orientation. An example is a professional who integrates personal values with skill development and workplace engagement, adapting purposefully across roles.

At the worker level, a CAS1 worker exhibits internal coherence, purposeful agency, and the ability to adapt meaningfully to changing work environments and personal goals. At the societal level, a CAS1 worker's behavior is aligned with the adaptive goals of society—such as equity, sustainability, and collective wellbeing. In essence, CAS1 at the worker level is about self-organization and internal integrity, while CAS1 at the societal level is about functional integration of the worker's behavior into the broader adaptive system of society.

A CAS1 labor market at the labor market level is a system in which firms, workers, and institutions coordinate adaptively to promote efficient, inclusive, and resilient employment outcomes. By contrast, a CAS1 labor market at the societal level is a labor system that adapts in coherence not only internally, but also with society's ethical, ecological, and developmental goals. It is one component of a larger societal CAS1 system.

In a CAS1 labor market at the societal level, labor market institutions and dynamics are aligned with planetary and societal priorities, such as environmental sustainability, equity of

opportunity, health and wellbeing, and social cohesion and democratic agency. Employment policies are designed to foster long-term collective resilience (e.g., just transitions in response to automation or decarbonization). Such a labor market is coevolutionary with the educational system, health system, climate policy, and the political economy.

Adaptively Embedded Labor Market Agents

The concepts of "firms," "workers," and "labor markets" are not merely pre-given institutional units or roles, but emergent phenomena—that is, they arise from the dynamic, decentralized interactions of adaptive agents and are shaped by multilevel feedback loops, co-evolutionary processes, and systemic constraints.

In neoclassical economics, firms are black boxes that minimize transaction costs (Coase, 1937) or optimize production functions. In the ecosystemic approach, firms emerge as coherent organizational forms out of repeated interactions among economic agents (entrepreneurs, financiers, workers, regulators) and evolutionary selection for effective coordination and productive capacity. Cultural norms, identity, and trust networks that support cooperation (Akerlof & Kranton, 2005; Ostrom, 2010).

Firms are not centrally planned structures; they evolve as solutions to coordination problems. Different types of firms emerge depending on environmental context (e.g., platform firms, cooperatives, transnationals). The boundaries of firms (what is internal vs outsourced) shift over time through adaptive processes (Nelson & Winter, 1982). In this sense, firms are dynamic, learning entities whose structure and function are emergent and historically contingent.

In the traditional view, workers are factors of production with utility-maximizing preferences over wages and leisure. In the ecosystemic approach, by contrast, workers are adaptive agents whose roles, skills, motivations, and identities are emergently shaped by social, institutional, and technological environments.

Workers are not predefined inputs but become skilled, socialized, and goal-directed through interactive learning and institutional embedding (Granovetter, 1985). The category of "worker" is historically emergent: from craftsperson to factory worker to gig worker to knowledge worker. Worker identity and behavior are shaped by network effects, norms, and feedback from labor organizations, firms, and peers. Thus, "workers" are not static entities but evolving roles constructed through interactions in social and economic networks.

In the traditional view, labor markets are price-clearing mechanisms matching supply and demand for labor. In the ecosystemic approach, by contrast, labor markets are self-organizing ecosystems of firms, workers, institutions, norms, and regulations that evolve through decentralized adaptation and path-dependence.

Labor markets do not pre-exist the actors within them; they form through interactions among adaptive agents, shaped by institutions like wage-setting norms, unions, and training systems. They exhibit nonlinear and path-dependent dynamics (e.g., hysteresis in unemployment, labor market segmentation). Market structures evolve. Industrial labor markets, internal labor markets, gig platforms, etc., are all emergent outcomes of technological, institutional, and behavioral interactions (Piore, 1971; Marsden, 1999). The labor market is thus not a frictionless auction, but a multi-layered, historically evolving system whose outcomes emerge from adaptive behaviors under social constraints.

As noted, labor markets exist within a hierarchy of complex adaptive systems. On this account, it is important to reconsider the agents – the firms and workers – that participate in labor markets. It turns out that traditional labor market theory has a highly restrictive understanding of these agents.

We begin with the adaptively embedded firm.

Towards a Theory of the Adaptively Embedded Firm

A firm may be understood as a complex adaptive system that can be organized in various ways. The following cases are particularly useful as a conceptual guide.

CAS1 Firm

A CAS1 firm is a complex adaptive system whose parts cooperate reliably to promote the adaptive success of the firm as a whole, rather than competing destructively for internal advantage. The firm exhibits adaptive behavior at the collective level, not just among individual units. The organization evolves structures, practices, and goals in response to environmental change while maintaining internal coherence.

All parts of the organization are functionally integrated. Employees, departments, and leadership roles contribute to common goals. Redundancy and modular structure (Holland, 1995) enhance resilience without fragmentation.

Members share a collective identity and mission that guides adaptive behavior. The firm fosters a culture of trust, mutual accountability, and participatory decision-making (Ostrom, 2010; Senge, 1990). For example, in Toyota's lean production system, the entire workforce shares responsibility for product quality and continuous improvement (Liker, 2004).

Decision-making authority is distributed to the edge of the system, enabling rapid and context-sensitive responses. Front-line employees are trusted to innovate and adapt, consistent with firm-level goals. This reflects principles of self-organizing teams and holacracy (Robertson, 2015).

Selection pressures at the individual, team, and organizational levels are aligned, such that what benefits an individual or team also benefits the firm. Internal incentives and evaluations promote cooperative over competitive adaptation. For example, compensation systems that reward team performance and knowledge sharing, not just individual outputs.

A CAS1 firm embeds mechanisms for experimentation, feedback, and adaptive learning (Argyris & Schön, 1978). Errors are seen as opportunities for system-level learning, not blame.

By contrast, a CAS2 firm, by contrast, is a fragmented system where each agent adapts independently. Agents optimize their own utility functions in locally rational but globally inconsistent ways. Principals and agents pursue divergent goals without adequate alignment. System-wide coherence breaks down, leading to miscommunication, mistrust, and inefficiency.

There are many possible types of CAS2 firm. Let us consider a few interesting special cases.

Bilaterally Cohesive Firm

In a bilaterally cohesive firm, both the management and the workforce function as internally coherent, purpose-driven CAS1 systems. Management operates with clear hierarchy, aligned incentives, and adaptive strategic coordination. The workforce—comprising insiders that may be organized through a union or strong informal networks—acts cohesively, sharing goals, norms, and tactics. However, these two CAS1 subsystems are not aligned in purpose. Instead of functioning as parts of a single superordinate CAS1, the management and workforce interact as competing CAS1s—rendering the overall firm a CAS2 at the organizational level.

This structure leads to the following inefficiencies. First, each side adapts in response to the other, rather than jointly responding to external market or technological shifts. Management

may introduce productivity-enhancing technologies or new work systems. The union, perceiving threats to job security or bargaining power, resists implementation through strikes or restrictive work rules. This arms race of adaptation creates system-wide inefficiencies, such as underutilized technology, delays in innovation adoption and rigidities in production processes. An example is the British automobile industry in the 1970s, where strong shop-floor unions and hierarchical management engaged in frequent confrontation, led to falling productivity and international competitiveness (Turner, 1991).

Second, a bilaterally cohesive firm generates wasteful transactions costs, in the form of negotiation, monitoring, enforcement, and conflict resolution costs. Time and resources are spent on adversarial bargaining. Informational asymmetries increase, as each side withholds knowledge to protect its strategic position. Each side engages in signaling behaviors rather than authentic communication. This erodes dynamic efficiency and organizational learning (Argyris & Schön, 1978).

Third, because the two CAS1 subsystems do not align, the firm as a whole fails to act as a single adaptive entity. Rapid adaptation to changing environments (market shocks, new regulations, digital transformation) is blocked by internal conflict loops. Innovations are either poorly implemented or symbolically adopted. In system terms, positive feedback loops within each CAS1 unit become negative feedback loops between them, degrading the system's capacity for coordinated change (Holland, 1995).

A bilaterally cohesive firm is also inequitable. When both management and labor are cohesive, power asymmetries can persist due to differences in access to capital, strategic decision-making and legal protections. This means one side (typically management) retains disproportionate control over rents and outcomes, even if the other side (workforce) is organized. The result is a "negotiated underclass"—strong enough to block decisions, but not strong enough to shape them equitably (Streeck, 1992).

Employees may face conflicting loyalties, to the union (which protects rights and promotes equity) and to the employer (who controls opportunities for advancement and investment). This results in divided workplace identities, undermining trust and creating inequity in access to resources, influence, and recognition (Akerlof & Kranton, 2005).

Bilateral cohesion increases each group's ability to capture rents, but does not guarantee equitable distribution. Wage increases may come at the cost of employment stability. Management's cost-cutting may protect firm solvency but reduce job quality. Instead of mutual gains bargaining, outcomes reflect power-based compromises that can be unfair.

The "Divide-and-Conquer" Firm: Cohesive Management and Fragmented Workforce

In the "Divide-and-Conquer" firm, the management is CAS1 (i.e., internally cohesive, strategically aligned, and functionally organized to pursue firm-level objectives efficiently), but the workforce is CAS2 (i.e., internally fragmented). The employees, though insiders whose positions are protected by labor turnover costs, are isolated, disempowered, and in competition with each other. There is no shared identity, collective representation, or cooperative structure. This structure often deliberately results from managerial strategy—intended to minimize labor resistance, suppress wages, and maintain control (Edwards, 1979; Burawoy, 1979).

Production and employment are inefficient under this structure because workers do not share norms of collaboration, knowledge and skills are siloed, and mutual distrust and rivalry undermine team-based productivity. This produces coordination failures and lost synergies in complex production systems where cooperation is essential. In high-tech manufacturing or logistics, for example, if workers cannot trust each other or share knowledge, task flows are disrupted—even if management is strategically sound (Holland, 1995).

Without internal cohesion, workers lack collective voice mechanisms (e.g., unions or participatory structures). Since these workers cannot provide bottom-up feedback for organizational learning (Argyris & Schön, 1978), they are less likely to report problems, suggest improvements, or innovate. Thus, the organization becomes adaptive only from the top, losing the capacity to sense and respond to problems at the ground level—a vital property of high-performing CAS1 systems (Senge, 1990).

Fragmented workers can be pitted against one another through individualized contracts, zero-hours contracts, or algorithmic management. This makes them more easy to discipline. While this increases short-term managerial control, it undermines long-term organizational health on account of high turnover, low morale, poor customer service, skill decay and training underinvestment. These are classic symptoms of under-adaptive systems (Ostrom, 2010).

The resulting employment relationships are inequitable. Since management has strategic coherence, voice, and institutional influence whereas workers are isolated and lacking mechanisms for collective adaptation, bargaining power is unbalanced. Employers can extract value without reciprocation in wages, conditions, or respect (Streeck, 2011). For example, Gig economy firms use algorithmic control and individual performance metrics to maintain dominance over fragmented workforces, with little transparency or recourse (Rosenblat & Stark, 2016).

Management may intentionally fragment the workforce to prevent unionization or collective bargaining and promote "divide-and-rule" dynamics, where workers compete for shifts, bonuses, or promotion. This behavior generates "wasteful redistributive battles" (Lindbeck & Snower, 1990a), where time and energy are diverted from production into intra-labor conflict—benefiting management but harming systemic productivity and fairness.

A fragmented (CAS2) workforce lacks a shared identity, reducing organizational commitment and mutual responsibility. Workers feel instrumentalized, replaceable, and alienated. The firm lacks moral legitimacy, leading to disengagement, absenteeism, and silent resistance. This leads to social inequity, in which workers' contributions are undervalued, and their rights undermined. Akerlof & Kranton (2005) show how the resulting identity-based exclusion reduces productivity and trust in organizations.

The "Schizophrenic Firm:" Fragmented Management

A "schizophrenic firm" is one in which management is fragmented, meaning different managerial units, departments, or leaders pursue conflicting goals, lack coordination, and compete for influence or resources. Though the insider workforce may be relatively coherent or cooperative, the top-level disunity prevents the firm from functioning as a systemically adaptive whole. In terms of complex adaptive systems theory, this is a firm where the managerial component is CAS2—a fragmented network of agents—rather than CAS1. The result is organizational inefficiency in production and inequity in employment due to incoherent decision-making, internal conflict, and systemic dysfunction.

The schizophrenic firm is inefficient. Departments in compete for budgets, authority, and recognition rather than collaborate. This leads to duplicated efforts (e.g., separate software systems or incompatible processes) and undermined initiatives (e.g., sales overpromises that operations can't deliver). Each unit maximizes its own KPIs at the expense of the firm's overall performance (March & Simon, 1958). For example, the R&D department may pursue long-term innovation while finance department cuts budgets for short-term cost control—resulting in underperformance on both fronts.

A schizophrenic firm suffers from delayed decisions due to inter-departmental disputes and contradictory directives passed down to frontline employees. This creates cascading inefficiencies as errors and adjustments proliferate across units. These coordination failures

impair the firm's adaptive capacity, especially in fast-changing environments where coherent strategic alignment is critical (Senge, 1990; O'Reilly & Tushman, 2016).

Learning in CAS1 firms occurs when feedback loops reinforce beneficial adaptations (Argyris & Schön, 1978). In a schizophrenic firm, learning is localized and not shared across the organization. Best practices may be hoarded or resisted by competing units. Errors are blamed on other departments, reducing psychological safety and learning culture. This blocks the emergence of firm-wide intelligence and resilience.

Production and employment activity at the schizophrenic firm is also inequitable. Employees' fates depend heavily on which department or manager they report to. Those in politically powerful or revenue-generating units enjoy better training, pay, and promotion. Others, especially in support functions (e.g., HR, compliance), are marginalized. This creates arbitrary inequalities, unrelated to merit or contribution (Akerlof & Kranton, 2005).

In the absence of managerial unity, different departments have incompatible work cultures, evaluation criteria, and HR policies. Employees face conflicting signals about what is valued—innovation vs compliance, speed vs quality, autonomy vs control.This creates confusion, stress, and perceptions of unfairness, especially when performance is judged across these inconsistent standards.

Fragmented management fosters politicized promotion, rewards, and layoffs. Managers promote allies or loyalists rather than best performers. Workforce downsizing may reflect inter-departmental power struggles, not firm needs. This undermines trust and procedural fairness, increasing turnover and disengagement.

The schizophrenic firm's fragmented management structure makes it slow to respond to crises (since no one has full control or clarity) and incapable of coherent transformation, as digitalization, ESG compliance, or globalization require integrated action across silos. Such firms may appear functional in stable environments but break down under pressure due to lack of system-level adaptivity.

Which CAS structures turn out to be adopted depends on the process of variation, selection and transmission in labor markets. Needless to say, other CAS structures of firm governance are possible. For example, fragmented management can exist alongside a cohesive or fragmented workforce. But the above cases of CAS firm misfunctions is sufficient to provide a basic understanding for what the CAS theory of the firm entails.

Principal-Agent versus Ecosystemic Theories of the Firm

The area that deals with CAS2-type problems in the economic literature is principal-agent theory (PAT). This theory focuses on the problem that "principals" (owners or shareholders of firms) have goals that the "agents" (managers, workers, subcontractors) do not share. The principal-agent problem, when analyzed through the lens of complex adaptive systems (CAS) theory, can be reinterpreted as a failure to achieve systemic coherence within the firm.

In standard economic theory, the principal-agent problem arises when principals hire agents in the firm to perform tasks on their behalf, but agents may pursue their own goals (e.g., leisure, empire-building, shirking) rather than maximizing the principal's interests (e.g., profit). Agents have more information about their actions and effort than principals. Thus principals cannot fully monitor agent behavior. This leads to agency costs in the form of monitoring expenses, bonding costs, and residual losses (Jensen & Meckling, 1976).

The principal-agent problem is addressed very differently in principal-agent theory (PAT) than in the complex adaptive systems (CAS) framework. While principal-agent theory treats the issue primarily as a matter of incentive alignment under information asymmetry, the

ecosystemic approach treats it as a systemic misalignment of adaptive goals, and seeks to resolve it by integrating adaptive agents into a coherent system (CAS1).

In principal-agent theory of the firm, agents are typically assumed to be self-interested, rational utility maximizers. Principals are typically risk-neutral and design contracts to incentivize agents efficiently. Firms are assumed exist to minimize agency costs (Jensen & Meckling, 1976; Alchian & Demsetz, 1972).

The main models in the principal-agent theory of the firm can be summarized succinctly. In the theory of Jensen & Meckling (1976), the firm is a legal fiction where owners (principals) hire managers (agents) and managers may shirk or pursue private benefits. The implied solutions to the resulting inefficiencies are equity-based incentives, debt monitoring, and reformed internal governance mechanisms. Holmström (1979, 1982) models incentive contracts under moral hazard, emphasizes the trade-off between risk-sharing and incentives. He shows that multitasking and team production are particularly prone to incentive distortion. In the incomplete contract models of Grossman & Hart (1986) and Hart & Moore (1990), ownership matters because contracts are incomplete—they cannot specify actions in all future states. Residual control rights determine who has power in unforeseen contingencies. The firm is defined by the allocation of ownership and control. In the relational contracts of Baker, Gibbons & Murphy (1999), incentives are sustained by repeated interactions, reputation, and informal understandings. Formal contracts are often supplemented or replaced by relational governance within firms.

The solutions to the principal-agent problem in principal-agent theory involve (i) incentive contracts in the form of pay schemes (e.g., bonuses, stock options) that tie agent rewards to observable outcomes (Holmström, 1979); (ii) monitoring and control through oversight mechanisms (auditing, supervision, reporting) to reduce moral hazard; (iii) bonding and screening, when agents may provide guarantees or signals to reassure principals (e.g., educational credentials, reputational capital); (iv) ownership and residual rights, allocating ownership and control rights to align incentives when contracts are incomplete (Grossman & Hart (1986); and relational contracts, whereby trust and reputation may substitute for enforceable contracts (Baker, Gibbons, & Murphy, 1999).

By contrast, the ecosystemic theory's approach to the principal-agent problem focuses not on tighter contracts, but on cultivating shared purpose, mutual adaptation, and systemic coherence. Firms can develop an organizational mission that is genuinely internalized by agents by embedding identity, meaning, and values to reduce divergence in goals (Akerlof & Kranton, 2005). Agents can be given a voice in setting firm goals, thus internalizing principal interests. This requires flattening hierarchies and increasing deliberative coordination. Feedback (not just incentives) can be structured to promote collective learning and long-term adaptation. Cooperative norms can reduce the need for monitoring. Trust can be fostered through reputation and peer accountability. Individual and departmental adaptation can be aligned with whole-system objectives, via shared KPIs, system mapping, and transparency (Wilson & Madhavan, 2020). In short, the ecosystemic framework involves solving the principal-agent problem means transforming the firm into a coherent, adaptive whole—a CAS1 firm—rather than controlling agents as isolated individuals.

From an ecosystemic perspective, however, principal-agent theory (PAT) underestimates cooperation. PAT assumes conflict is primary; CAS highlights how cooperative norms evolve to align behavior. Furthermore, PAT ignores emergent structure. The focus on contracts misses how spontaneous order, culture, and identity shape firm dynamics (Akerlof & Kranton, 2005).

Beyond that, PAT fails under uncertainty. In environments of high complexity, contract design is insufficient; adaptive capacity matters more. And finally, PAT neglects systemic coherence.

PAT doesn't address how to align multiple agents toward collective system-level goals (Wilson, 2016).

Some recent contributions point towards a synthesis of ecosystemic insights into P-A frameworks. In particular, relational contracting (Baker et al., 1999) moves toward adaptive governance. Behavioral agency theory (Pepper & Gore, 2015) incorporates identity and bounded rationality. Systemic governance approaches (Ostrom, 2010) model firms as polycentric, evolving institutions. These approaches move beyond strict individualism and recognize the firm as a living, adaptive system embedded in social and ecological networks.

Towards a Theory of Adaptively Embedded Workers

Once again, we focus on a few instructive special cases of workers as adaptively embedded systems.

We have already consider the difference between a worker who is CAS1 at the worker level and one who is CAS1 at the societal level. Similarly, we can distinguish between worker collectives that are CAS1 at these two levels.

The distinction between a worker collective that is a CAS1 at the worker level and a worker collective that is a CAS1 at the societal level lies in the scale and scope of coordination, the alignment of goals, and the orientation of adaptive behavior toward either narrow self-interest or system-wide value creation.

A worker-level CAS1 worker collective (e.g., firm-specific union, works council, or worker cooperative) displays coordination and adaptation that serve the interests of the workers involved, such as job security, wage stability, or working conditions. It exhibits adaptive behavior that is coherent among the members, but not necessarily aligned with broader systemic goals (e.g., firm success, innovation, societal wellbeing). For example, the collective may oppose technological change that threatens jobs, resist hiring outsiders to protect insider rents, and engage in industrial actions that defend narrow group interests. While the group acts cohesively (CAS1 internally), it may behave as a CAS2 relative to larger systems (e.g., firm, industry, society) because its goals are not aligned with higher-level adaptiveness.

By contrast, a societal-level CAS1 worker collective organizes adaptively not only for the benefit of its members but also in service of the broader societal good. It demonstrates alignment of interests across levels (worker, firm, industry, society). Typically, it may promote social inclusion (e.g., support for new entrants and marginalized workers), responsible innovation (e.g., just transitions in response to automation or climate change), and sustainable development (e.g., fair labor standards that enhance long-term economic resilience).

There are, of course, many types of formal worker collectives, in the form of institutionally recognized groups that operate within legal frameworks and are often party to labor law, collective bargaining, and tripartite dialogue systems. These include firm-level unions, sectoral unions, national union federations or confederations, worker cooperatives, as well as works councils and other employee representation bodies. In addition, there are many informal worker collectives, such as worker associations and mutual aid networks, occupational guilds and professional networks, and digital platform based worker organizations. The collective structures that emerge in practice are the product of a combination of selection, transmission constrained by net adaptation costs (opportunities for individual workers), and variation in past collective structures.

The important point to keep in mind is that classifying them into terms of their CAS1 and CAS2 properties at different levels helps guide policy formulation. The policy implications of the adaptively embedded approach to labor markets are far-reaching and exceed the bounds of this paper. Here we will focus only on a few major policy issues.

At the outset, it is important to distinguish between economic policy that is first-best (the optimal policy intervention) and second-best (when one or more first-best conditions cannot be satisfied). We begin with the latter.

Second-Best Policy Implications

A CAS1 labor market would exhibit: (a) functional cooperation between workers, firms, institutions, and society; (b) coordination mechanisms that ensure matching, skill development, wage setting, and participation align with collective efficiency and inclusion; and (c) adaptive capacity at the system level: feedback mechanisms, mutual trust, public goods provision, and continuous learning benefiting all. Such a labor market approximates the ideal of inclusive, dynamic, full-employment systems, where individual adaptation contributes to shared prosperity.

A CAS2 labor market, by contrast, is (a') a system in which agents (workers, firms, institutions) adapt individually, pursuing narrow interests, (b') dominated by insiders—incumbent workers or groups—who use their adaptive capacity to protect employment rents and restrict access and (c') characterized by fragmentation, rent-seeking, segmentation, and misaligned incentives. In CAS2 labor markets, adaptive behavior benefits agents but not the system. The labor market evolves, but in ways that sustain inequality, inefficiency, and exclusion.

Insider power turns labor markets into CAS2 systems through strategic adaptation and institutional barriers. First, insiders, as adaptive agents, evolve behaviors to protect their advantages—e.g., resisting changes in hiring practices, union rules, or work design. Their power enables them to shape institutions (e.g., hiring panels, seniority systems) to entrench insider status. This turns the labor market into a status-oriented game, not a cooperative system—hallmarks of a CAS2.

Second, outsiders (youth, migrants, long-term unemployed, gig workers) face institutional barriers—e.g., opaque recruitment, credential inflation, weak voice in wage-setting. Their exclusion is not incidental but a by-product of insider adaptation, increasing the labor market's adaptive disunity. As noted, insider behaviors produce feedback loops: exclusion leads to unemployment → skill atrophy → reduced employability → justification for exclusion. These loops stabilize CAS2 dynamics and create path dependence.

In these ways, the dominance of insider strategies over systemic outcomes transforms labor markets from CAS1 (collectively adaptive) into CAS2 (strategically fragmented) systems.

Contrary to optimistic assumptions in some market theories, CAS2 systems do not spontaneously become CAS1 systems, for the following reasons.

First, adaptive strategies in CAS2 labor markets are zero- or negative-sum: gains to insiders often come at outsiders' expense. There is no spontaneous incentive for insiders to give up rents or for firms to internalize long-run systemic benefits without policy intervention. Second, once institutionalized, insider advantages become difficult to reverse due to legal norms, organizational cultures, and expectation formation. Outsiders have limited political and bargaining power to reshape institutions from below. And finally, CAS2 labor markets suffer from coordination failures among firms, workers, and policymakers. For example, firms underinvest in training because trained workers may leave; workers avoid training because firms don't hire based on skills.

In sum, labor markets can evolve as CAS1 or CAS2 systems depending on the alignment of agent adaptation with system-level goals. When insiders dominate, and their adaptive strategies aim to protect rents rather than enable participation, the market becomes a CAS2 system—complex, dynamic, but not collectively adaptive. These systems do not self-correct;

they require intentional redesign to promote equity, cooperation, and resilience. Only through institutional realignment, participatory governance, and policy innovation can labor markets transition from fragmented CAS2 systems into functionally adaptive CAS1 systems.

Let's consider policy implications under these second-best conditions. Given the existence of inefficient and inequitable labor markets with insiders and outsiders, what are guidelines for socially desirable labor policies and macroeconomic policies?

The implications of these phenomena for *labor policy* are far-reaching. First, policies should place emphasis on targeting network reintegration (e.g., mentorships, inclusive hiring), skills upgrading, and mobility pathways for outsiders. Second, labor market institutions must evolve to rebalance bargaining power. For example, governments could offer portable social protections decoupled from traditional employment contracts. They could also offer conditional support for collective bargaining that includes outsider interests. Finally, and perhaps most importantly, governance structures must embrace adaptive experimentation, local feedback, and co-governance to account for adaptive complexity (Ostrom, 2010).

These policy issues are particularly important in the light of contemporary labor market trends. The rise of gig work platforms (e.g., Uber, Deliveroo, Amazon Mechanical Turk) reflects a new institutional form of outsider employment. Gig workers lack employment contracts, collective representation, or legal recourse, making them quintessential outsiders (De Stefano, 2016). Digital labor platforms externalize turnover costs—thus undermining insider protections—and amplify outsider precarity. Algorithmic management and opaque rating systems limit worker agency and suppress wage bargaining power (Rosenblat & Stark, 2016). Thus, the gig economy institutionalizes the outsider condition, shifting labor market norms toward fragmentation and individualization.

Furthermore, advanced automation and AI can replace both outsider and insider jobs, but disproportionately harm outsiders. Insiders with firm-specific or cognitive skills may be retrained or reallocated, whereas outsiders are less likely to be reabsorbed, particularly in the absence of active labor market policies. Technological change may exacerbate the insider–outsider divide by raising skill thresholds for stable employment and making traditional work patterns obsolete (Acemoglu & Restrepo, 2019). Without structural intervention, automation may produce a "permanent class of outsiders" lacking access to meaningful employment.

To reduce the insider–outsider divide and its deleterious macroeconomic effects, reforms should aim to encourage portable benefits systems and universal basic protections decoupled from firm tenure. Reforms should also incentivize firms to invest in outsider integration, e.g., through targeted training subsidies or inclusive hiring tax credits. Moreover, there is a strong case for building inclusive labor market institutions. Gig workers should be recognized with legal rights. There is a strong case for public investment in active labor market policies to address technological disruption.

Macroeconomic policy must also be adjusted to account for insider-outsider disparities in ecosystemic labor markets. When labor markets with insider-outsider disparities are embedded in complex adaptive systems, their nonlinear, path-dependent, and emergent behavior produces asymmetric responses to policy, limits automatic stabilizers, and complicates aggregate demand management.

As noted, insider-outsider inequalities tend to be self-reinforcing through feedback loops (Granovetter, 1985), social learning (Nelson & Winter, 1982), and institutional coevolution (Thelen, 2014). As a result, long-term unemployment and underemployment persist, labor market segmentation becomes entrenched, and policy responses often stabilize insider positions while neglecting outsider precarity.

Consider *monetary policy* first. In insider-dominated ecosystemic labor markets, policy transmission is asymmetric (Lindbeck and Snower, 1987). Rate cuts may stimulate investment and spending, but not hiring, if firms prefer internal flexibility (e.g. overtime) over external recruitment. Thus, the effectiveness of monetary policy in reducing unemployment is limited by structural insider dominance and weak outsider integration.

When outsider unemployment persists, expectations become unanchored, and structural hysteresis sets in (Lindbeck & Snower, 1988). Even with accommodative policy, labor force participation may not rise, while skills mismatch and scarring reduce employability. Thus, monetary policy alone cannot "reactivate" outsider participation without structural reforms and targeted interventions (such as active labor market policies).

The implications for *fiscal policy* are more far-reaching. In ecosystemic labor markets, fiscal multipliers become context-dependent. In dual labor markets insider-focused stimulus (e.g. tax relief, wage subsidies for formal sector) may generate limited multipliers if outsiders are excluded from formal consumption or savings channels. Outsider-targeted transfers and services (e.g. direct income support, reemployment schemes) yield higher marginal propensity to consume and increase aggregate demand more efficiently. Thus, fiscal policy effectiveness depends on distributional targeting and institutional context (Bowles & Gintis, 2000).

Under ecosystemic labor markets, fiscal space should prioritize institutional inclusion and capability-building over indiscriminate demand stimulus. Outsiders lack access to training, childcare, housing, and healthcare—all of which constrain labor market participation. Investing in public goods and inclusive infrastructure increases labor supply and productivity, and builds adaptive capacity in ecosystemic labor markets (Ostrom, 2010).

In segmented markets, conventional automatic stabilizers (e.g. unemployment insurance, tax progressivity) may not reach outsiders or reinforce insider biases. For example, gig workers may lack access to social insurance due to employment classification. Thus, fiscal stabilizers should be expanded, portable, and status-neutral to stabilize income in evolving labor markets (Standing, 2011).

First-Best Policy Implications

It is widely recognized that the evolutionary success of human beings—as a uniquely social, cultural, and adaptive species—has rested on four deeply interconnected factors: solidarity, agency, material gain, and environmental sustainability. These factors not only shaped our evolutionary fitness but also serve as contextual drivers of human flourishing today, because they enable individuals and societies to thrive in a manner that is adaptive, equitable, and sustainable.

Solidarity refers to the psychological and social mechanisms—such as empathy, cooperation, trust, and shared identity—that enable individuals to organize into cohesive, prosocial groups. Human evolutionary success has depended on group selection, where cohesive groups that could cooperate, share resources, and enforce norms outcompeted more disorganized ones (Wilson & Sober, 1994). Solidarity promotes human flourishing by building networks of trust and support that enhance health, resilience, and opportunity (Putnam, 2000). Labor markets can either reinforce solidarity (e.g., through inclusive institutions) or fragment it (e.g., via precarity and exclusion).

Agency is the ability to shape one's life and environment through intentional, effortful action, both individually and collectively. Human agency allowed individuals to solve novel problems, invent tools, communicate symbolically, and develop cumulative culture (Henrich, 2016). Agency is essential to well-being, as people flourish when they feel they have control

over their lives and can pursue meaningful goals (Sen, 1999; Nussbaum, 2011). Labor markets should empower workers, not just allocate them efficiently.

Gain refers to access to goods and services that support a secure, healthy, and dignified life, without harming others' ability to do the same. Such material gain—especially **f**ood, shelter, and safety—has always been central to survival and reproductive success. Gain is also a foundation of basic needs satisfaction—including nutrition, health, housing, and education—which underpin higher capabilities (Maslow, 1943). A prosocial labor market must ensure access to sufficient income and productive opportunity.

Environmental sustainability entails using natural resources responsibly, protecting ecosystems, and regenerating the biosphere to ensure long-term survival. In addition, a healthy environment provides the ecosystem services—clean air, water, fertile soil, climate stability—on which all flourishing depends. Labor markets are key levers in both driving and mitigating environmental harm.

On this account, it may be argued that a societal-level CAS1 labor market—a labor market functionally organized to promote the adaptive success of society as a whole—should be devoted to promoting these four factors – SAGE, for short. These factors are all measurable and constitute a dashboard for flourishing (Snower (2025), Lima de Miranda and Snower (2020, 2022), and Ortega and Snower (2025)). These factors emerge when individual and collective actions are aligned via complex adaptive systems that are cooperative at scale (Wilson & Wilson, 2007; Wilson & Snower (2024); Snower & Wilson (2025)).

To achieve these objectives, the following needs to be promoted through a variety of instruments, discussed below:

- **Societal-Level CAS1 Workers:** They need to develop identities aligned with shared societal goals. They may be empowered through education, inclusive representation, and voice.
- **Societal-Level CAS1 Firms:** They need to pursue stakeholder value (Kelly & Snower, 2021), not just shareholder profit. This means aligning production with environmental goals (e.g., circular economy) and social outcomes (e.g., inclusive employment), as well as invest in long-term worker capabilities, promoting agency and material gain.
- **Societal-Level CAS1 Labor Market Organization:** This could be promoted through the appropriate collective bargaining, public employment services, and social insurance systems designed to promote inclusion, equity, and long-term resilience.
- **Societal-Level CAS1 Relations to the Economy:** This is necessary to ensure that labor markets support a CAS1 economy where employment supports planetary boundaries, and where investment, taxation, and innovation policies align with social and environmental goals.

Note that all these are CAS at the societal level. Clearly, a firm-level CAS1 worker or CAS1 firm may be harmful if the firm is CAS2 at the societal level. Similarly, a labor market that is CAS1 at the labor-market level may be harmful if the economy is CAS2.

Transforming a CAS2 labor market—where firms and workers behave as fragmented, individually adaptive agents pursuing divergent goals—into a society-level CAS1 labor market, where the system as a whole adapts coherently to promote societal wellbeing, requires deep psycho-social reorientation and institutional reform.

The psycho-social reorientation needs to include societal-level norms of reciprocity, inclusion, and stewardship (Akerlof & Kranton, 2000). Education, media, and public discourse should promote shared narratives of interdependence and mutual responsibility. Choice architecture and signaling can be used to promote roles such as “worker-citizen” or “firm-as-steward”

(Thaler & Sunstein, 2008). Governments can encourage and reward pro-social organizational cultures. For example, public employment programs could require training in democratic participation and sustainability. Prosocial identity formation is particularly important in the creation of societal-level CAS1 workers and managers of firms. It also provides legitimacy to governments aiming for societal-level CAS1 economies (Snower & Ortega, 2025).

A framework for institutional reform has been outlined by Elinor Ostrom's core design principles (Ostrom, 2005; Wilson et al., 2013), which are alleged to provide a scalable governance blueprint for collective action in labor markets:

Principle	**Application**
1. Boundaries	Inclusive and clearly defined worker and firm participation rights.
2. Proportional costs/benefits	Fair labor standards, social insurance, progressive taxation.
3. Collective choice	Worker representation in firm governance and labor policy.
4. Monitoring	Transparent impact reporting on wages, emissions, inclusion.
5. Graduated sanctions	Enforce labor and environmental standards equitably.
6. Conflict resolution	Accessible, non-adversarial labor mediation.
7. Recognition of rights	Legal support for unions, cooperatives, and platform workers.
8. Nested governance	Coordination across firms, sectors, regions, and international levels.

These principles aimed to make labor markets adaptive at scale, ensuring local flexibility and systemic coherence.

A crucial aspect of the institutional reform for moving from CAS2 to societal-level CAS1 labor markets hinges on aligning firm behavior with collective societal and planetary objectives (see Kelly and Snower, 2021). This realignment requires reform of the working environment of firms, to move business goals from shareholder value to stakeholder value and to ensure that stakeholder value is compatible with a rigorously defined concept of "societal and planetary value." That can be achieved through reform of the (1) legal obligations of firms, (2) government targets and (3) government procurement contract conditions, and (4) business incentives (taxes, subsidies, regulations and legal license to operate). This list is not exhaustive, but is sufficient to provide a general idea of the instruments at government's disposal for redirecting profit and other measures of business performance toward socially and environmentally desirable purposes.

First, to catalyze a shift from CAS2 to CAS1 labor markets, firms must be legally obliged to consider a broader set of interests beyond shareholders. This means redefining corporate purpose in company law to mandate fiduciary duties to all stakeholders (employees, communities, suppliers, future generations), not just shareholders (Mayer, 2018, 2024). It also implies legally requiring reporting and governance structures for stakeholder outcomes (e.g. workforce treatment, environmental impact). In addition, it requires enforcement of due diligence laws obliging firms to account for human rights and environmental risks in global supply chains. (For example, the UK's Companies Act could be revised to make Section 172 duties legally enforceable with respect to workers and the environment.) The CAS impact of this reform of legal obligations lies in creating shared adaptive constraints across firms,

reducing zero-sum competition that undermines wages, job quality, and cooperation, and promoting emergent alignment of labor market institutions toward social goals.

Second, governments should set macro-level coordination targets to define and steer systemic objectives for labor markets. In this vein, it is helpful to establish national wellbeing and sustainability targets alongside GDP (e.g. New Zealand's Wellbeing Budget; EU's "beyond GDP" metrics). These may be supplemented by employment quality indices (combining pay, security, autonomy, purpose) as official policy metrics (OECD, 2019). Finally, it is desirable to target net-zero carbon employment transitions, with place-based strategies for re-skilling and just transitions. In ecosystemic terms, appropriate targets enhance feedback coherence, as actors adjust behavior toward shared reference points. It also enables dynamic adaptation to global risks (e.g., climate change, digital automation).

Third, public procurement—accounting for 10–15% of GDP in many countries—can act as a lever for systemic transformation. Government contracts should be conditioned on compliance with living wage standards, job security, union recognition, gender equity, and environmental benchmarks. Public procurement could favor "social enterprises" and B Corps that embed stakeholder purpose. Governments should sse dynamic procurement criteria to reward firms for continuous improvement in stakeholder metrics (not just lowest cost). (For example, the UK's Social Value Act (2012) and the EU's Green Public Procurement framework are steps in this direction.)

The CAS impact of such reform of government procurement conditions creates networked adaptation, as firms shift business models to remain eligible for contracts. It also reinforces positive feedback loops among stakeholders and across supply chains and shifts market selection pressures from cost minimization to value maximization.

Fourth, firms respond to external incentives that shape the "rules of the game." To foster CAS1 dynamics, incentives must reward firms that generate stakeholder and planetary value.

Regarding tax policy, it appears desirable to offer tax credits for workforce training, employee ownership, and climate-positive business models; to penalize extractive models (e.g., gig work misclassification, carbon-intensive employment) and to implement progressive payroll tax relief for firms investing in job quality and inclusion.

Regarding subsidies and government finance, governments should tie subsidies to employment, equity, and sustainability outcomes, not just output. Furthermore, public investment banks and sovereign wealth funds can be used to support stakeholder-oriented enterprises.

Finally, in the area of regulation and licensing, it is important to introduce "license to operate" standards for all firms, assessed on stakeholder impact. It may also be useful to mandate inclusion of worker representatives in governance for large firms. In any case, multi-stakeholder audit frameworks should be developed to certify stakeholder compliance.

In ecosystemic terms, these reforms are meant to shift firm-level fitness functions from shareholder profits to system-compatible value functions. They also encourage bottom-up innovation aligned with shared norms and promotes coevolution between firm behavior, labor markets, and societal goals.

Overall, stakeholder capitalism alone is insufficient unless it is coupled to clearly defined collective ends (Kelly & Snower, 2021). Thus, stakeholder value must be rigorously tethered to social value (dignity of work, equality of opportunity, voice, agency) and planetary value (ecological limits, biodiversity, carbon neutrality). This requires metrics and institutions that can evaluate these forms of value and govern trade-offs between them—especially in employment transitions and environmental policy.

Such transformation is necessary not only for ethical reasons but to enable labor markets to evolve adaptively in the face of 21st-century challenges: automation, inequality, ecological breakdown, and democratic erosion.

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