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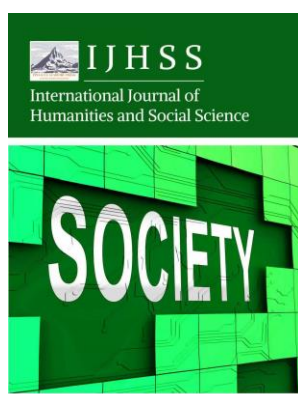
Leveraging Large Language Models for Compliance and Productivity: Economic Implications of AI Adoption in the U.S. Small Business Sector

Siqi You [1,*]

[1] University of Southern California, Los Angeles, CA, 90007, USA
[*] Correspondence: Siqi You, University of Southern California, Los Angeles, CA, 90007, USA

Abstract: This paper investigates the economic implications of adopting Large Language Models (LLMs) to automate compliance and administrative functions within the U.S. small business sector. Small and medium-sized enterprises (SMEs) currently face disproportionate regulatory burdens that consume approximately 19 percent of operating budgets and cost over $50,000 per employee annually. By transforming compliance from a labor-intensive cost center into a scalable digital process, LLM-enabled automation offers a structural remedy to the SME productivity gap. The analysis estimates that widespread adoption could reallocate $50 to $90 billion annually from non-productive administrative tasks to high-value productive uses. Beyond immediate cost savings, the paper demonstrates that this technological shift promotes capital deepening, as firms redirect resources from recurring operational expenses toward long-term intangible capital formation. The study concludes that supported by adaptive federal policies and deregulation, AI-driven compliance automation will serve as critical economic infrastructure, enhancing total factor productivity, fostering entrepreneurship, and strengthening U.S. competitiveness in global markets.

Keywords: large language models; compliance automation; small business productivity; AI economics; workflow efficiency; capital deepening

1. Executive Summary

1.1. Overview

Small and medium-sized enterprises account for nearly 99.9 percent of private businesses in the United States and contribute more than 43 percent of national gross domestic product [1]. Despite their economic significance, these firms face substantial compliance and administrative obligations related to taxation, regulatory reporting, contracting, auditing, payroll management, and cross-jurisdiction labor requirements. Collectively, these activities absorb approximately 19 percent of annual operating expenditures and can impose direct costs exceeding 50,100 U.S. dollars per employee each year [2].

Rising labor costs, persistent inflationary pressures, and the rapid expansion of digital reporting and documentation requirements have further intensified this burden. As a result, small and medium-sized firms experience constrained productivity, reduced investment capacity, and weakened competitive positioning. Within this context, recent advances in artificial intelligence, particularly large language models, present a structural opportunity to alleviate administrative frictions and redirect economic resources toward

higher-value activities. By enabling automated document interpretation, regulatory submissions, reporting workflows, and audit preparation, LLM-based systems have the potential to shift compliance functions from a labor-intensive fixed-cost model to a scalable digital framework.

1.2. Economic Rationale

Compliance-related activities do not directly generate revenue and typically function as non-productive expenditures. Empirical estimates indicate that regulatory compliance imposes substantial costs across the business sector. Existing research suggests that compliance-related labor and capital expenses represent between 1.34 percent and 3.33 percent of the corporate wage bill, translating into approximately 239 to 289 billion U.S. dollars per year in economy-wide regulatory costs. [3]. When administrative obligations consume limited managerial attention and employee labor hours, firms encounter slower decision-making processes, reduced profitability, and diminished capacity for innovation.

Assuming that intelligent automation technologies can reduce administrative and operational costs by 30 percent, when these efficiency gains are extrapolated to compliance-intensive workflows, the widespread deployment of AI-enabled systems could plausibly release between 50 and 90 billion U.S. dollars annually for more productive economic uses. Such reallocation has the potential to enhance firm-level efficiency while supporting broader productivity growth.

1.3. The Productivity Gap

Recent empirical evidence demonstrates that small and medium-sized enterprises consistently exhibit lower labor productivity than larger firms, and in many industries this disparity has widened since 2018 [4]. Firm-level analyses further show that regulatory and administrative burdens exert a measurable negative impact on productivity and growth, with smaller firms experiencing disproportionately adverse effects [5]. Industry survey findings indicate that employees in small firms spend approximately 36 percent of their working time on routine administrative tasks.

According to the U.S. Bureau of Labor Statistics, average employer compensation costs in the U.S. private sector were 45.65 U.S. dollars per hour in June 2025 (BLS, 2025). This allocation implies that an employee in a ten-person firm forfeits nearly 33,000 U.S. dollars in potential annual output due to administrative inefficiencies. If AI-enabled automation were to reduce this inefficiency by 30 percent, the resulting productivity gains for such a firm would amount to approximately 98,600 U.S. dollars per year in recovered productive capacity.

2. The Economic Role of LLM Automation

2.1. LLMs as Cognitive Automation Infrastructure

LLMs mark a shift from rule-based automation toward cognitive infrastructure capable of interpreting text, extracting structured data, drafting and verifying documents, and monitoring policy changes. Unlike traditional software that executes predefined rules, LLMs generalize across heterogeneous inputs and can adapt to evolving regulatory frameworks. When applied to compliance workflows, these capabilities allow small businesses to process higher volumes of documentation at marginal costs near zero. Economically, this introduces nonlinear scalability: as business volume grows, compliance workloads no longer require proportional increases in labor or professional services.

2.2. Core Use Cases and Economic Effects

LLM applications in compliance now span document review, contract analysis, financial reporting, and audit readiness across legal and financial sectors. Case studies show that LLM-assisted workflows can substantially accelerate document processing

while improving multi-jurisdictional accuracy. In anti-money-laundering programs, research consistently finds that machine-learning models enhance detection performance and reduce false positives compared with rule-based systems [6].

Similar efficiencies are observed in investment-related compliance, where AI-driven processes have reduced due diligence time by approximately 25%. This acceleration leads to quicker deal closures and improved market timing, allowing firms to secure more favorable entry points for investments. Consequently, the increased operational speed directly translates into higher ROI, shifting compliance from an administrative cost center to a strategic driver of financial performance [7].

2.3. Labor Market Transformation

Automation reshapes administrative labor rather than eliminating it, diminishing routine tasks while boosting demand for oversight, interpretation, and exception management. According to the World Economic Forum's Future of Jobs Report 2025, AI and other information-processing technologies are projected to transform 86% of businesses by 2030, generating 170 million new roles even as 92 million jobs are displaced, leading to a net increase of 78 million jobs globally [8]. In this context, labor reallocates toward higher-skill areas such as data governance, compliance supervision, and AI auditing, as well as strategic functions like sales and product development. Over time, these structural shifts support greater labor productivity and wage growth in productive roles.

2.4. LLMs and Transaction Costs in Compliance

LLM-enabled automation reshapes compliance not only by lowering direct operating costs but also by reducing the underlying transaction costs that govern economic coordination. Many compliance tasks, document preparation, identity and credential verification, ongoing monitoring, incident triage, and regulatory reporting map closely onto Coasean categories of search, monitoring, and enforcement costs. Historically, these frictions have limited the scale and speed of coordination by making it expensive to find reliable information, verify counterparties, and demonstrate adherence to rules. LLMs compress these frictions by accelerating information retrieval across policies and records, standardizing the interpretation of documents and disclosures, and enabling continuous monitoring with near-zero marginal cost once systems are deployed.

As transaction costs fall, compliance shifts from episodic, manual checking to a more continuous and auditable control environment. Automated extraction and summarization reduce the time needed to assemble evidence packages, while consistent template-based reporting improves comparability across firms and transactions. Importantly, these gains are not merely internal efficiencies; they affect market access by changing the "cost of being trusted." Smaller firms, which typically face higher per-unit compliance burdens and weaker administrative capacity, can more easily meet documentation requirements for financing, procurement, and platform onboarding. Faster and more reliable compliance artifacts can shorten due diligence cycles, lower perceived counterparty risk, and improve bargaining positions in B2B contracting.

The effects may be especially significant in cross-border trade, where multiple regulatory regimes create layered documentation demands. By improving accuracy, timeliness, and traceability, LLM-assisted compliance can reduce delays and dispute risk, supporting smoother international transactions. In aggregate, the structural reduction in coordination costs expands participation, increases competitive pressure, and may contribute to more dynamic markets by lowering the non-productive friction that separates capable firms from opportunities.

2.5. Competitive Advantages for Small Firms

LLM adoption can help small businesses approach the compliance sophistication traditionally associated with large corporations by reducing the fixed costs of producing high-quality documentation, audit trails, and timely reports. When AI supports contract review, policy mapping, evidence collection, and standardized reporting, smaller firms can meet vendor onboarding requirements with fewer delays and fewer specialized staff. This capability matters because many B2B relationships hinge on compliance readiness: customers and prime contractors increasingly require structured documentation for privacy, security, quality assurance, and ESG-related disclosures. By generating clearer, more consistent compliance artifacts, AI-enabled firms may be better positioned to pass due diligence, win bids, and remain eligible for renewal or scaling within supplier networks.

Faster reporting cycles can also improve internal decision-making and external credibility. More frequent and reliable compliance updates support better cash flow planning by reducing surprise remediation costs and shortening payment and approval cycles tied to reporting milestones. For lenders and investors, improved transparency and traceability can lower perceived governance risk, strengthening confidence and potentially improving financing terms. In trade contexts, automated preparation of shipping, customs, and origin documentation can reduce errors, rework, and border delays frictions that disproportionately burden smaller exporters. By lowering administrative barriers and increasing the reliability of cross-border compliance, LLM-assisted workflows can make participation in global value chains more feasible.

In this sense, compliance automation functions not only as risk mitigation but as a capability-building pathway to market expansion and revenue diversification. It helps small firms convert compliance from a defensive cost center into an enabling infrastructure that supports scaling, partnership formation, and entry into more regulated, higher-value markets.

3. Macroeconomic Implications

3.1. GDP and Productivity Effects

OECD estimates that regulation-related tasks account for 4.2% of the U.S. wage bill, or about 521 billion U.S. dollars (1.8% of GDP) in 2024, highlighting the macroeconomic weight of administrative burdens [9]. Earlier European Commission modelling similarly found that reducing administrative burdens by 25% could raise EU GDP by roughly EUR 150 billion [10]. Looking ahead, OECD simulations show that AI adoption could increase annual labor-productivity growth in G7 economies by 0.4-1.3 percentage points, with the United States among the most exposed beneficiaries [11]. Applied to the current scale of compliance-related labor demand, even modest AI-enabled reductions imply tens of billions of dollars in potential annual productivity gains.

3.2. Investment and Capital Formation

The adoption of large language models (LLMs) in compliance functions is increasingly reshaping how firms allocate resources, shifting spending from recurring operational outlays toward longer-term capital formation. Traditionally, compliance activity has been treated largely as a labor-intensive service function: firms hired additional staff, expanded review teams, or purchased ongoing external support to manage regulatory monitoring, documentation, reporting, and audits. While these expenditures were necessary for risk control, they often behaved like "consumption" in the economic sense-incurred repeatedly to maintain baseline performance, with limited accumulation of durable organizational capability.

LLM-enabled compliance changes this profile. Instead of relying primarily on manual labor and fragmented vendor services, firms begin to invest in AI systems, data infrastructure, and workforce capabilities that generate persistent value over time.

Examples include building secure model deployment environments, curating and labeling policy and case data, integrating workflow orchestration tools, and developing internal governance processes for model monitoring and auditability. These investments create intangible capital: codified knowledge embedded in systems, standardized processes, reusable prompt and policy libraries, and institution-specific compliance "memory" that can be leveraged across business units. As a result, compliance capacity becomes more scalable and less sensitive to headcount constraints, while response times, consistency, and documentation quality improve through automation and standardization.

This reorientation also changes the nature of compliance talent investment. Firms increasingly allocate resources to training legal, risk, and operations staff to work effectively with AI-learning how to design controls, validate outputs, interpret model rationales, and manage exception handling. Such human capital complements the technical infrastructure, improving the organization's ability to adapt to new regulations, update internal policies, and maintain operational resilience as rules evolve. Over time, the combination of AI-enabled workflows and upgraded workforce skills strengthens competitive durability by lowering marginal compliance costs and enabling faster entry into regulated markets.

Capital markets appear to be reinforcing these dynamics. Investors have directed growing attention toward compliance automation, governance tooling, and AI platforms that promise repeatable and auditable processes, signaling expectations of sustained returns rather than one-off cost reduction. This is particularly relevant as regulators increasingly emphasize traceability, documentation, and consistent control execution features that align well with software-based compliance architectures. At the macroeconomic level, the gradual reclassification of compliance activity from operating expense toward investment implies a structural contribution to capital accumulation and productive capacity. When compliance becomes technology-enabled organizational capital improving the reliability of decision-making, reducing risk externalities, and enhancing institutional trust it can support long-run growth by raising the quality and scalability of firm-level governance and productivity.

3.3. Entrepreneurship and Equity

Administrative complexity disproportionately discourages new business formation, especially among women- and minority-owned startups facing resource constraints. LLM-enabled automation lowers the compliance barrier to entry by providing affordable access to professional-grade tools. Research from Harvard-affiliated scholars and the Federal Reserve indicates that broad and equitable adoption of artificial intelligence has the potential to substantially reduce productivity disparities across demographic and occupational groups [12]. This democratization of administrative capacity strengthens the diversity and resilience of the entrepreneurial ecosystem.

3.4. International Competitiveness

AI-powered compliance enhances the ability of small businesses to participate in international trade by reducing the documentation burden associated with exports, customs processing, and country-specific regulatory requirements. By lowering informational frictions and standardizing compliance documentation across jurisdictions, such systems reduce entry barriers for smaller firms that lack dedicated trade and legal teams. As the United States positions AI governance and infrastructure as strategic exports, domestic LLM tools grounded in U.S. regulatory standards could serve as anchors for global trade agreements and digital diplomacy.

4. Policy Environment

4.1. Federal Policy as Economic Infrastructure

Federal policy in 2025 treats AI as economic infrastructure critical to national competitiveness. The America's AI Action Plan and the One Big Beautiful Bill Act establish a supportive policy environment through deregulation, tax incentives, and public investment in compute infrastructure. These measures reduce adoption costs for small firms, accelerate product innovation among AI developers, and promote domestic leadership in AI governance.

4.2. Deregulation and Market Expansion

By harmonizing rules for AI software providers and reducing redundant licensing barriers, federal deregulation increases the accessibility of compliance automation tools. Regulatory sandboxes further accelerate innovation, allowing companies to test AI systems before full certification. This environment expands the market for low-cost compliance solutions and increases their diffusion among small enterprises.

4.3. Adaptive Fiscal Frameworks for Technology Diffusion

Unlike targeted industrial subsidies seen in other sectors, U.S. fiscal support for AI adoption in small businesses operates primarily through a technology-neutral adaptive framework. Rather than creating specific "AI tax credits," the existing federal tax code has proven sufficiently flexible to accommodate the unique cost structures of Generative AI. Key provisions, such as IRC §162, automatically extend to modern SaaS subscriptions and API usage fees, treating them as deductible operating expenses rather than capital investments. This "implicit subsidy" effectively lowers the marginal cost of AI experimentation without requiring new legislative action. Similarly, existing mechanisms for workforce education (IRC §127) have seamlessly absorbed the costs of AI literacy training. By relying on these broad, agnostic fiscal instruments, the policy environment allows small enterprises to rapidly integrate AI tools without waiting for niche bureaucratic approvals, thereby accelerating the timeline from innovation to implementation.

4.4. Policy-Induced Adoption Pathways

Taken together, federal AI policy, deregulation, and fiscal incentives shape not only the pace of AI adoption among small firms but also its quality and durability. By lowering regulatory uncertainty, reducing upfront costs, and easing cash-flow constraints, the policy environment encourages firms to move beyond experimental or ad hoc AI use toward deeper integration within routine administrative and compliance workflows. This institutional support enables small enterprises to reallocate managerial time away from repetitive oversight and toward higher-value decision-making. More importantly, it incentivizes complementary investments in process redesign, data governance, and workforce capability that determine whether AI adoption yields lasting productivity gains. In this sense, public policy functions less as a direct subsidy and more as an enabling framework that aligns private adoption incentives with long-term efficiency, scalability, and organizational learning rather than short-term cost cutting.

5. Conclusion

5.1. Summary of Findings

LLM-driven compliance automation represents a foundational economic shift rather than a marginal technological upgrade. For small businesses, it alleviates structural inefficiencies, restores managerial bandwidth, and enables capital reallocation toward innovation and growth. For the U.S. economy, it enhances productivity, supports labor-

market transitions, strengthens entrepreneurial diversity, and positions the nation for leadership in global AI governance.

5.2. Long-Term Significance

As adoption accelerates, compliance automation will evolve into a pervasive layer of economic infrastructure, transforming administrative obligations into engines of competitiveness and resilience. The structural benefits-cost compression, productivity amplification, expanded market access, and inclusive growth-suggest that AI-enabled compliance will play a central role in the next phase of American economic development.

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