

Discussion of “The Dynamics of Labor Market Frictions, Input Substitution, and Corporate Investment” by Sreedhar T. Bharath, DuckKi Cho, and Michael Hertzel

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Paper Summary

Fact: Declining Investment-Wage Sensitivity

- 1984-2000: Minimum wage \uparrow 1 SD \rightarrow Investment \downarrow 24.6% (highly significant)
- 2001-2017: Investment-wage sensitivity \approx 0 (insignificant)

Research Question:

- How have structural changes in labor markets affected firms' investment responses to labor cost shocks?
- Specifically: Why has the investment-wage sensitivity declined since 2000?

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Main Argument:

Investment sensitivity to wage shocks reflects firms' **elasticity of input substitution**

- When substitution constrained (earlier era) \rightarrow wage \uparrow reduces marginal product of capital \rightarrow investment \downarrow
- When substitution easier \rightarrow firms absorb wage shocks without cutting investment

Baseline Specification (augmented Fazzari, Hubbard and Petersen, 1988):

$$\frac{I_{i,s,t}}{K_{i,s,t-1}} = \beta \cdot \text{minwage}_{i,s,t-1} + \gamma \cdot \text{minwage}_{i,s,t-1} \times \text{Sub}_{i,s,t-1} + \zeta \cdot \text{Sub}_{i,s,t-1} + X_{i,s,t-1} + \epsilon_{i,s,t}$$

Main Empirical Findings

4 Mechanisms Explaining the Decline in IWS:

- 1 **Automation & Technology** (Routine Task Exposure)
 - High-exposure firms see greater decline in IWS
 - Enables capital-labor substitution
- 2 **Globalization** (1999 U.S.-China Bilateral Agreement)
 - Firms with China subsidiaries (1997) sees greater decline in IWS
 - Facilitates foreign-domestic labor substitution
- 3 **Union Decline** (Right-to-Work Laws)
 - RTW adoption (union decline) reduces IWS
 - Effect stronger in states with large union coverage decline
- 4 **Import Competition** (China WTO Entry, 2001)
 - High-exposure firms see greater decline in IWS
 - Limits ability to pass costs to consumers

Bottom-line: Effects of labor costs on firm investment depend on context – substitution constraints matter critically

My Takeaway

Enriching the Labor-Technology Substitution Literature

- Much of the literature focuses on **capital price shocks**
- Theory: [Autor and Acemoglu \(2011\)](#) develops a task-based production function
- Empirical: [Tuzel and Zhang \(2021\)](#) using state adoption of investment tax incentive
- **This paper focuses on labor cost shocks**

The current draft focuses on the empirical facts. My main comments aim at improving the rigor of the conceptual framework

- To suggest a framework that tightens the empirical facts
- To help remove some tension with existing labor literature

Comment 1: A conceptual framework can be helpful

The relation between labor costs and capital investment is non-trivial:

- A large body of literature recognizes that workers are “heterogeneous” by
 - Skilledness (Krusell et al. 2000)
 - Routiness (Autor et al. 2003)
 - Offshorability (Blinder 2009)
 - Generative AI exposure (Esifeldt et al. 2025)
- Hence, “which labor” matters! This paper → minimum-wage workers

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- Hence, “which labor” matters! This paper → minimum-wage workers
- A potential tension when using the above mechanisms to explain decline IWS is:
 - Recent changes in labor market structure, such as routine-automation, do not directly impact minimum-wage workers
 - They tend to directly affect mid-wage workers → the famous “hollowing-out” in the U.S. labor market
- How do forces that hollowed out “mid-wage workers” rationalize the impact of “minimum wage” on firm investment?

Comment 1: A conceptual framework can be helpful

Suggestion: A “task-based production framework” (Autor & Acemoglu 2011) can help

- Firm Production: The firm combines tasks $y(i)$ to produce output Y :
- Task Production: Tasks can be performed by workers of different skill levels and capital $k(i)$:

$$y(i) = A_L \alpha_L(i) l(i) + A_M \alpha_M(i) m(i) + A_H \alpha_H(i) h(i) + A_K \alpha_K(i) k(i)$$

where A_L, A_M, A_H are skill-augmenting technologies, and $l(i), m(i), h(i)$ are the number of low, medium, and high-skilled workers allocated to task i .

- Task Allocation: Tasks are allocated based on the comparative advantage of skill groups in performing each task, subject to the labor supply of each skill (L, M, H).
- Labor Market Clearing Condition: Wages w_L, w_M, w_H for each skill group clear the market, e.g.,

$$w_L = p(i) A_L \alpha_L(i)$$

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Model prediction without capital:

In this framework, an exogenous increase in low-skilled wages (w_L) leads to:

- Substitution between low and mid-skilled workers (L and M)
- Mid-skilled workers “down-skill” and in equilibrium earn reduced hourly wages
- e.g., “Walter White may need to wipe tires in Bogdan's Car Wash”



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- Downward rigidity: **What if Walter—a mid-skilled worker—does not want to down-skill?**
- **Substitute!**

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How does task-based production framework help?

- **High elasticity of substitution** between capital K and mid-skilled worker M (as in Autor and Acemoglu 2011)
- **New intuition:** When minimum wage rises, firms invest in capital not because capital directly substitute low-skilled workers, but because automation can help firms to solve the wage down-skill problem with “mid-skilled” workers

Reconciliation with literature:

- This intuition reconciles with the existing literature that automation “hollows out” mid-skilled workers in the U.S.

Comment 2: Measurement of Investment-Wage Sensitivity

Conceptual:

Minimum wage increase → **Average wage increase** → **Capital investment?**

The test is kept reduced-form: Regressing investment on minimum wage.

Suggestion:

- Explicitly check the first-stage — how does average wage respond to minimum wage change
- **Two-stage structure:**

$$\text{Investment} = \beta \cdot \text{Wage}, \quad \text{Wage} = \delta \cdot w_{\min}$$

- Currently: Reduced form estimates $\beta \times \delta$
- Could you show explicitly whether the effect is through β (preferred inference) or δ ?

Comment 3: Discussing alternative explanations

The “Declining Relevance” Hypothesis:

Even if elasticity of substitution *unchanged*, IWS could decline because:

- Fewer workers affected by minimum wage
- Shift from manufacturing to services (different capital intensity)
- Rise of intangible capital (less substitutable with labor?)

This is partially addressed in the paper, e.g., share of manuf. firms and non-R&D firms are relatively stable. Yet, the authors may further considering ruling out:

① *Within-industry* changes?

- Manufacturing in 2017 \neq Manufacturing in 1990
- More automated, more capital-intensive, fewer low-wage workers

② The rise of “intangible capital” (Corrado & Hulten 2010):

- Intangible share: 25% (1973-94) \rightarrow 34% (1995-2007)
- Intangible can go beyond R&D. How does intangible capital substitute with minimum-wage labor?

Conclusion

Overview:

- **Novel macro fact:** Dramatic decline in investment-wage sensitivity over time
- **Multiple mechanisms:** Automation, China agreement, RTW laws, import competition
- **Rich implications:** How should we understand the full impact of minimum wage on various workers and firm growth?
- **Important topic:** Intersection of labor economics and corporate finance
- The richness of the results can have great potential to exemplify the “task-based production” (Autor & Acemoglu 2011)
- Highly recommend.