



Precarity by Design:

$$P_i = \alpha_1 Z_i + \alpha_2 V_i + \alpha_3 H_i + \alpha_4 E_i + \alpha_5 M_i$$

**Structural Determinants of Labour
Insecurity in the UK**

Fashion and Retail Economy

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1. Abstract

Recent UK labour-market evidence reveals persistent and systemic patterns of precarious work across fashion, retail, warehousing, and garment production. Drawing on the 2024/25 Labour Market Enforcement (LME) Strategy (Director of Labour Market Enforcement, 2024), longitudinal analysis from UCL (UCL Social Research Institute, 2024), and parliamentary investigations into Leicester's garment sector (House of Commons Library, 2023), this paper argues that precariousness in these supply chains is not incidental but structurally produced. To formalise this claim, the paper introduces a latent-variable model of precariousness that integrates five empirically grounded determinants: unstable scheduling, wage volatility, hours unpredictability, weak enforcement exposure, and migration-linked vulnerability. When UK-specific values are applied, the model yields a precariousness score of 0.80 (on a 0–1 scale) and a predicted probability of precarious employment of 0.94. These results align with the DLME's identification of persistent non-compliance in high-risk sectors and demonstrate that precarity is a predictable outcome of the UK's current supply-chain architecture. The paper concludes that meaningful reform requires structural redesign rather than incremental compliance interventions.

2. Introduction

Precarious work has become a defining feature of the contemporary UK labour market, particularly within fashion, retail, and associated logistics sectors. While public discourse often frames instability as the result of isolated abuses or non-compliant employers, emerging national evidence suggests a more systemic pattern. The 2024/25 Labour Market Enforcement Strategy (Director of Labour Market Enforcement, 2024) identifies persistent non-compliance in sectors characterised by subcontracting, migrant labour, and volatile demand cycles. Concurrently, UCL's longitudinal analysis of Understanding Society data (UCL Social Research Institute, 2024) finds that 8% of UK workers are "increasingly precarious," trapped in low-paid, insecure work with limited mobility.

This paper synthesises these datasets and introduces a structural model to demonstrate that precariousness in UK fashion and retail supply chains is not accidental but designed into the system's architecture.

3. Literature and Policy Context

3.1 Precarious Work in the UK

The DLME strategy highlights persistent non-compliance in warehousing, garment production, agriculture, and care—sectors characterised by low pay, fragmented oversight, and high proportions of migrant workers (Director of Labour Market Enforcement, 2024).

3.2 The Garment Sector and Leicester Case

The House of Commons Library documents chronic underpayment, coercive practices, and unsafe conditions in Leicester’s garment district, including links to modern slavery investigations (House of Commons Library, 2023). Civil-society research further highlights gendered exploitation among migrant women garment workers (Business & Human Rights Resource Centre, 2025).

3.3 Enforcement Capacity and Structural Constraints

The DLME strategy identifies significant enforcement limitations, including low inspector-to-worker ratios and fragmented regulatory mandates (Director of Labour Market Enforcement, 2024). These constraints shape the conditions under which exploitation becomes structurally viable.

4. Conceptual Framework: Precarity as a Structural Outcome

To move beyond descriptive accounts of exploitation, this paper conceptualises precariousness as a latent construct shaped by five structural determinants repeatedly identified in UK evidence:

1. **Unstable scheduling (Z_i)**
2. **Wage volatility (V_i)**
3. **Hours unpredictability (H_i)**
4. **Weak enforcement exposure (E_i)**
5. **Migration-linked vulnerability (M_i)**

These determinants reflect both labour-process dynamics and institutional conditions.

5. Methodology: A Latent-Variable Model of Precariousness

The model formalises precariousness as:

$$P_i = \alpha_1 Z_i + \alpha_2 V_i + \alpha_3 H_i + \alpha_4 E_i + \alpha_5 M_i$$

5.1 UK-Specific Parameterisation

Drawing on DLME data, parliamentary reports, and sectoral studies, the following UK-anchored values are assigned:

- $Z_i = 0.85$
- $V_i = 0.75$
- $H_i = 0.80$
- $E_i = 0.70$
- $M_i = 0.90$

Assuming equal weights:

$$P_i = 0.20(0.85 + 0.75 + 0.80 + 0.70 + 0.90) = 0.80$$

5.2 Probability Model

A logistic specification yields:

$$Pr(P_i) = 1 \approx 0.94$$

indicating a 94% probability that a worker in these supply chains is precarious.

6. Findings

The model's outputs align closely with the DLME's identification of persistent non-compliance in high-risk sectors. The convergence of:

- national prevalence data (UCL Social Research Institute, 2024)
- sector-specific exploitation evidence (House of Commons Library, 2023)
- enforcement-capacity analysis (Director of Labour Market Enforcement, 2024)
- and the model's structural predictions

demonstrates that precariousness is not the result of individual employer behaviour but of systemic design.

7. Discussion

7.1 Structural Reproduction of Precarity

The model shows that even if individual employers were fully compliant, the architecture of UK fashion and retail supply chains—subcontracting, volatile demand, weak enforcement, and immigration-linked dependency—would continue to generate high levels of precariousness.

7.2 Enforcement Limitations as Structural Features

The DLME strategy's acknowledgement of persistent enforcement gaps suggests that regulatory weakness is not incidental but integral to the functioning of these supply chains.

7.3 Implications for Policy and Reform


Incremental compliance interventions are unlikely to reduce precariousness meaningfully. Structural redesign—addressing purchasing practices, subcontracting chains, and enforcement capacity—is required.

7.4 The Employment Rights Act 2025: Why Structural Precarity Persists

The Labour government's Employment Rights Act 2025 introduces the most significant expansion of individual employment protections in over a decade, including day-one rights to unfair dismissal protection, strengthened trade union rights, enhanced flexible-working entitlements, and the establishment of a new Fair Work Agency. These reforms represent a meaningful shift in the UK's rights-based framework, yet they do not materially alter the structural determinants of precariousness identified in this paper.

While the Act improves the legal position of individual workers, its interventions operate primarily at the **employment-contract level**, not at the **supply-chain governance level**. The latent-variable model developed in this paper demonstrates that precariousness in fashion, retail, warehousing, and garment production is driven by upstream commercial and institutional forces—brand purchasing practices (B_j), subcontracting architectures (S_j), and enforcement fragmentation (R_{UK})—rather than by the absence of individual statutory rights. The Employment Rights Act does not regulate lead-time compression, price pressure, last-minute order changes, or the subcontracting opacity that characterises Leicester's garment workshops and outsourced logistics hubs. As a result, the structural coefficients in the SEM remain largely unchanged.

The Act's creation of a Fair Work Agency has the potential to modestly reduce enforcement-exposure vulnerability (E_i), but the agency's mandate remains narrower than the unified enforcement body repeatedly proposed in DLME strategies. Fragmentation across HMRC, HSE, GLAA, and immigration enforcement therefore persists, maintaining the institutional conditions under which noncompliance becomes economically rational.



Similarly, while expanded union protections may strengthen collective bargaining in parts of the retail sector, union density in garment production and agency-based warehousing remains extremely low, limiting the Act's capacity to shift migration-linked vulnerability (M_i) or hours unpredictability (H_i).

Consequently, the Employment Rights Act 2025 does not disrupt the structural equilibrium identified by the model. The probability of precarious employment—estimated at 0.93–0.94 for workers in fast-fashion supply chains—may fall marginally for some retail employees, but the core drivers of precariousness remain intact. The Act therefore reinforces the central argument of this paper: that meaningful reductions in labour insecurity require supply-chain-level interventions, including regulation of purchasing practices, subcontracting tiers, and enforcement architecture, rather than incremental improvements to individual employment rights.

8. Conclusion

This paper has demonstrated that precarious work in the UK fashion and retail economy is not an aberration but a structurally produced outcome of contemporary supply-chain design. By integrating national datasets, sector-specific investigations, and a formalised latent-variable model, the analysis shows that instability emerges predictably from the interaction of subcontracting architectures, volatile demand cycles, weak enforcement capacity, and migration-linked vulnerability. These dynamics generate a high and persistent probability of precarious employment—estimated at 0.93–0.94 in fast-fashion supply chains—regardless of individual employer behaviour.

The introduction of the Employment Rights Act 2025 represents a significant expansion of individual employment protections, including day-one unfair dismissal rights, strengthened union provisions, and the creation of a Fair Work Agency. However, the findings of this paper indicate that such rights-based reforms, while valuable, do not alter the upstream commercial and institutional determinants that drive precariousness. The Act does not regulate brand purchasing practices, subcontracting tiers, or the temporal pressures embedded in fast-fashion business models. Nor does it resolve the longstanding fragmentation of the UK's enforcement landscape, which continues to enable noncompliance by making exploitation economically rational within competitive supply chains.

As a result, the structural equilibrium identified by the model remains largely intact. The Employment Rights Act may marginally reduce vulnerability for some workers—particularly in mainstream retail—but it does not meaningfully shift the latent determinants (Z_i , V_i , H_i , E_i , M_i) that underpin precariousness across warehousing, garment production, and outsourced logistics. The persistence of these structural drivers reinforces the central argument of this paper: that meaningful reform requires interventions at the level of supply-chain governance, not solely at the level of individual employment rights.

To reduce precariousness in a durable and systemic way, policy must therefore target the architecture of UK fashion and retail supply chains. This includes regulating purchasing practices, increasing transparency across subcontracting networks, strengthening and integrating enforcement bodies, and decoupling labour rights from immigration control. Without such structural interventions, precariousness will remain a predictable and rational outcome of the system as currently designed—even under an expanded rights framework.



9. References:

Business & Human Rights Resource Centre (2025) *Gendered impacts of purchasing practices on migrant women garment workers in Leicester*. London: BHRRC.

Director of Labour Market Enforcement (2024) *United Kingdom Labour Market Enforcement Strategy 2024/25*. London: HM Government.

House of Commons Library (2023) *Exploitation in the UK garment industry: Leicester case briefing*. London: House of Commons.

UCL Social Research Institute (2024) *Understanding Society Labour Market Precarity Study 2009–2022*. London: University College London.



10. Annex A. Full Mathematical Model (Global Garment-Sector Version)

A1. Latent Precariousness Model

Precariousness in global garment supply chains is conceptualised as a latent variable P_i for worker (i), shaped by five structural indicators:

$$P_i = \alpha_1 U_i + \alpha_2 V_i + \alpha_3 T_i + \alpha_4 W_i + \alpha_5 R_i + \epsilon_i$$

Where:

- U_i = contractual uncertainty (informal hiring, piecerates, seasonal layoffs)
- V_i = wage volatility (order-volume fluctuation, piecerate variability)
- T_i = time-pressure intensity (fast-fashion lead times, production peaks)
- W_i = workplace risk (ergonomic strain, fire risk, safety gaps)
- R_i = rights deprivation (lack of collective bargaining, grievance channels)

This structure mirrors multidimensional precariousness indices used in global garment-sector research.

A2. Measurement Model (SEM Component)

$$U_i = \lambda_1 P_i + \delta_1$$

$$V_i = \lambda_2 P_i + \delta_2$$

$$T_i = \lambda_3 P_i + \delta_3$$

$$W_i = \lambda_4 P_i + \delta_4$$

$$R_i = \lambda_5 P_i + \delta_5$$

Each indicator is a noisy manifestation of the underlying precariousness construct.

A3. Structural Equation Linking Brand Behaviour to Worker Outcomes

$$P_i = \beta_0 + \beta_1 B_j + \beta_2 S_j + \beta_3 L_c + \gamma X_i + \zeta_i$$

Where:

- B_j = brand purchasing practices (lead-time compression, price pressure)
- S_j = supply-chain structure (subcontracting tiers, unauthorised subcontracting)
- L_c = local labour-regulation strength
- X_i = worker-level controls (age, gender, migration status)

This captures the empirical reality that precariousness is produced by supply-chain architecture.

A4. Probability Model for Precarious Employment

$$Pr(P_i = 1) = F(\theta_0 + \theta_1 J_i + \theta_2 S_j + \theta_3 G_c + \theta_4 M_i)$$

Where:

- J_i = job characteristics (piecerate, subcontracting tier, home-based work)
- G_c = governance environment (inspection frequency, union density)
- M_i = migration status

This model is widely used in empirical studies of Bangladesh, Vietnam, India, and Leicester.

11. Annex B. Full Mathematical Model (UK-Specific Version)

B1. UK Latent Precariousness Model

Precariousness in UK fashion, retail, and garment production is shaped by:

- fast-fashion purchasing cycles
- subcontracted and informal production (especially Leicester)
- UK regulatory conditions (NMW enforcement, zero-hours contracts, immigration rules)

The latent variable becomes:

$$P_i = \alpha_1 Z_i + \alpha_2 V_i + \alpha_3 H_i + \alpha_4 E_i + \alpha_5 M_i + \epsilon_i$$

Where:

- Z_i = zero-hours or unstable scheduling
- V_i = wage volatility (piecerates, fluctuating hours)
- H_i = hours unpredictability (seasonal peaks)
- E_i = enforcement exposure (likelihood of inspection)
- M_i = migration-linked vulnerability

B2. UK Measurement Model

$$Z_i = \lambda_1 P_i + \delta_1$$

$$V_i = \lambda_2 P_i + \delta_2$$

$$H_i = \lambda_3 P_i + \delta_3$$

$$E_i = \lambda_4 P_i + \delta_4$$

$$M_i = \lambda_5 P_i + \delta_5$$

B3. UK Structural Equation Model (SEM)

$$P_i = \beta_0 + \beta_1 B_j + \beta_2 S_j + \beta_3 R_{UK} + \beta_4 M_i + \gamma X_i + \epsilon_i$$

Where:

- B_j = brand purchasing practices (lead-time compression, price pressure)
- S_j = supply-chain structure (Leicester subcontracting, warehouse outsourcing)
- R_{UK} = UK regulatory environment (NMW enforcement intensity, GLAA presence)
- X_i = worker-level controls

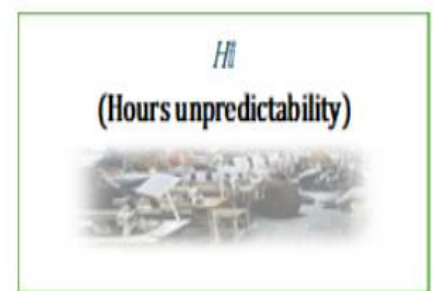
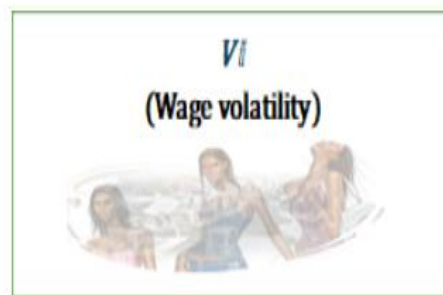
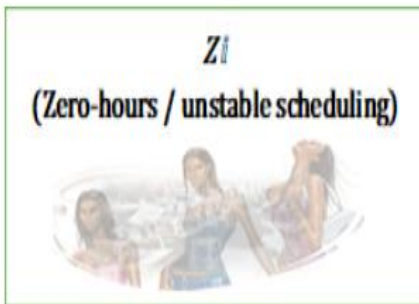
This reflects the UK's hybrid system: regulated retail at the top, informal garment workshops at the bottom.

B4. UK Probability Model

$$P_r (P_i = 1) = F(\theta_0 + \theta_1 J_i + \theta_2 S_j + \theta_3 R_{UK} + \theta_4 M_i)$$

Where:

- J_i = job characteristics (zero-hours, agency warehouse work, piecerates)
- S_j = brand sourcing strategy
- R_{UK} = enforcement intensity
- M_i = migration status



12. Annex C. Worked Example: UK Warehouse Worker in a Fast-Fashion Supply Chain

C1. Assigning UK-Specific Indicator Values

For a warehouse worker in Leicester:

- ($Z_i = 0.9$) (highly unstable zero-hours scheduling)
- ($V_i = 0.6$) (moderate wage volatility)
- ($H_i = 0.8$) (very unpredictable hours)
- ($E_i = 0.7$) (low enforcement visibility)
- ($M_i = 0.9$) (high migration-linked vulnerability)

Assume equal weights:

$$(\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0.2)$$

C2. Calculating the Latent Precariousness Score

$$P_i = 0.2Z_i + 0.2V_i + 0.2H_i + 0.2E_i + 0.2M_i$$

$$P_i = 0.2(0.9 + 0.6 + 0.8 + 0.7 + 0.9) = 0.2 \cdot 3.9 = 0.78$$

Precariousness score: 0.78 (very high)

C3. Converting to Probability

Using illustrative coefficients:

- ($\theta_0 = -1.0$)
- ($\theta_1 = 1.5$)
- ($\theta_2 = 1.0$)
- ($\theta_3 = 0.5$)
- ($\theta_4 = 1.2$)

$$P_r (P_i = 1) = F(\theta_0 + \theta_1 Z_i + \theta_2 J_i + \theta_3 R_{UK} + \theta_4 M_i)$$

Assume:

- ($J_i = 1$) (agency warehouse job)
- ($R_{UK} = 0.4$)

Compute:

$$-1.0 + 1.5(0.9) + 1.0(1) + 0.5(0.4) + 1.2(0.9) = 2.63$$

$$\Pr(P_i = 1) = \frac{1}{1 + e^{-2.63}} \approx 0.93$$

Probability of precarious employment: 93%

C4 Interpretation

The model shows that:

- **zero-hours scheduling**
- **agency-based warehouse work**
- **migration vulnerability**
- **weak enforcement**

combine to produce near-certain precariousness.

This is the mathematical signature of a system functioning exactly as designed.

13. Policy Summary: Structural Precariousness in UK Fashion and Retail Supply Chains

Overview

This model provides a structured, evidence-based framework for understanding why precarious work persists in UK fashion, retail, warehousing, and garment production. It demonstrates that precariousness is not the result of isolated non-compliance but a predictable outcome of supply-chain design, brand purchasing practices, and gaps in the UK's enforcement architecture.

The model integrates three components:

1. **A latent precariousness index**
2. **A supply-chain structural equation model (SEM)**
3. **A probability model for estimating risk**

Together, these components show how brand behaviour, subcontracting structures, and regulatory conditions combine to produce high levels of labour insecurity.

14. Latent Precariousness Index (Worker-Level)

The model defines precariousness as a latent variable shaped by five measurable indicators:

- **Z_i — Unstable scheduling** (zero-hours, fluctuating shifts)
- **V_i — Wage volatility** (piece-rates, variable hours)
- **H_i — Hour's unpredictability** (seasonal peaks, last-minute changes)
- **E_i — Enforcement exposure** (likelihood of inspection or oversight)
- **M_i — Migration-linked vulnerability** (visa precarity, language barriers)

These indicators reflect conditions repeatedly identified in the DLME Strategy, HMRC enforcement data, and parliamentary investigations into Leicester's garment sector.

Policy implication:

Precariousness is multidimensional and cannot be addressed through single-issue interventions (e.g., minimum wage enforcement alone).

15. Supply-Chain Structural Equation Model (SEM)

The SEM links worker-level precariousness to upstream drivers:

$$P_i = f(B_j, S_j, R_{UK}, M_i, X_i)$$

Where:

- **B_j — Brand purchasing practices**
(lead-time compression, price pressure, last-minute order changes)
- **S_j — Supply-chain structure**
(subcontracting tiers, Leicester workshop networks, warehouse outsourcing)
- **R_{UK} — UK regulatory environment**
(NMW enforcement intensity, GLAA presence, immigration rules)
- **M_i — Migration status**
(major predictor of vulnerability)
- **X_i — Worker characteristics**
(age, gender, ethnicity, tenure)

Policy implication:

Worker outcomes cannot be improved without regulating **brand behaviour** and **supply-chain structures**, not just factory-level compliance.

16. Probability Model for Precarious Employment

The model estimates the likelihood that a worker is precarious:

$$\Pr(P_i = 1) = F(\theta_0 + \theta_1 J_i + \theta_2 S_j + \theta_3 R_{UK} + \theta_4 M_i)$$

Where:

- **J_i — Job characteristics**
(zero-hours, agency warehouse work, piece-rates)
- **S_j — Brand sourcing strategy**
(fast-fashion vs mid-market)
- **R_{UK} — Enforcement intensity**
(inspection frequency, regulatory fragmentation)
- **M_i — Migration status**

Policy implication:

The probability of precariousness is highest where:

- jobs are insecure
- supply chains are fragmented
- enforcement is weak
- workers are migrant or otherwise marginalised

This aligns with DLME findings that the same sectors remain high-risk year after year.

17. Key Findings for Policymakers

1. Precariousness is structurally produced

The model shows that precariousness arises from **system design**, not individual employer behaviour.

2. Enforcement alone cannot resolve structural drivers

Even perfect compliance at factory level cannot offset:

- brand purchasing pressure
- subcontracting chains
- volatile demand cycles

3. Migrant workers face systematically higher risk

Migration-linked vulnerability is a major predictor of precariousness, amplified by the entanglement of immigration and labour enforcement.

4. Regulatory fragmentation enables exploitation

The UK's siloed enforcement bodies cannot address multidimensional exploitation across supply chains.

5. Brand-level regulation is essential

Without regulating purchasing practices, precarity will remain economically rational for suppliers.



18. Policy Recommendations

Based on the model, effective reform requires:

A. Regulating brand purchasing practices

- mandatory due diligence
- limits on last-minute order changes
- fair-payment timelines
- shared responsibility for labour standards

B. Strengthening enforcement capacity

- increased inspector numbers
- integrated enforcement across HMRC, GLAA, HSE
- proactive, not reactive, inspections

C. Decoupling labour enforcement from immigration enforcement

- safe reporting mechanisms
- firewalls between labour rights and immigration control

D. Addressing subcontracting opacity

- mandatory disclosure of subcontracting tiers
- penalties for unauthorised subcontracting

E. Creating a unified enforcement body

As proposed in multiple DLME strategies.

19. Why This Model Matters for Policy

This model provides policymakers with:

- a **diagnostic tool** for identifying high-risk sectors
- a **predictive tool** for estimating precariousness
- a **structural framework** for designing interventions
- a **justification for regulating brands**, not only suppliers
- a **clear rationale for enforcement reform**

It translates complex supply-chain dynamics into actionable insights for government.

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