UNVEILING THE IMPACT OF CHINESE MANUFACTURING SMES' INTERNATIONALIZATION ON PERFORMANCE

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1. Introduction

Internationalization represents a primary growth strategy for small and medium-sized enterprises (SMEs) in emerging economies such as China. Although entry into global markets offers substantial opportunities for efficiency improvements, the performance outcomes associated with such expansion remain contested within academic literature (Lu & Beamish, 2001; Tallman & Li, 1996). Traditional trade theories, including the Melitz (2003) model, typically propose a linear progression in which more productive firms self-select into exporting. In contrast, recent empirical studies indicate a more complex, non-linear relationship, frequently described as an inverted U-shaped pattern (Hitt et al., 1997; Qian et al., 2013).

By integrating Working Capital Management theory with the Resource-Based View (RBV), this study posits that the observed performance downturn is driven by a "liquidity-performance trade-off." Initial internationalization enables firms to benefit from scale economies and learning-by-exporting effects. However, excessive export intensity extends the cash conversion cycle a prolonging foreign receivables (Manova, 2013). For SMEs operating in imperfect credit markets, this dynamic creates a structural mismatch in which production outflows exceed foreign inflows, ultimately leading to a "Working Capital Trap."

2. Theoretical framework and hypotheses

2.1. The Resource-Based View and Internationalization Gains

The Resource-Based View (RBV) suggests that firms possess unique, valuable, and inimitable resources that drive competitive advantage (Barney, 1991). In the context of SMEs, internationalization serves as a mechanism to exploit underutilized resources and achieve economies of scale (Lu & Beamish, 2001). Early-stage internationalization enables firms to benefit from "learning by exporting," as exposure to foreign markets enhances technological capabilities and operational efficiency. However, as firms move beyond a moderate level of export intensity, the complexity of managing disparate markets begins to strain these internal resources, leading to diminishing marginal returns.

2.2. The Working Capital Mechanism: Explaining the Downturn

While traditional International Business (IB) literature attributes the downturn of the I-P curve to coordination costs (Hitt et al., 1997), we propose that, for manufacturing SMEs, the primary driver is financial, specifically related to Working Capital Management (WCM). Exporting inherently involves longer Cash Conversion Cycles (CCCs) than domestic operations. Manufacturing SMEs must finance the production, packaging, and shipping of goods long before foreign receivables are collected.

In emerging economies such as China, institutional voids and imperfect credit markets limit an SME's ability to bridge its liquidity gap (Manova, 2013). As export intensity increases, the volume of accounts receivable tied up in international trade grows proportionally. When this intensity surpasses a critical threshold, the firm enters a "Working Capital Trap". In this state, the liquidity mismatch between immediate production outflows and delayed foreign inflows becomes

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structural. The firm is forced to divert resources from productivity-enhancing investments to cover short-term financing needs or, worse, face insolvency risks due to overtrading. Therefore, the financial strain of managing high-intensity exports eventually offsets the efficiency gains from scale.

2.3. The Inverted U-shaped Relationship

Based on the integration of RBV and WCM perspectives, we argue that the internationalization-performance relationship is non-linear. At low to moderate levels, the benefits of market diversification and knowledge spillover dominate. However, as intensity approaches the identified optimal point of 47.8%, the marginal cost of financing the extended cash cycle begins to escalate. Beyond this point, the performance curve enters a downward slope as liquidity constraints become the dominant boundary condition.

Proceeding from the theoretical contentions previously advanced, internationalization tends to exhibit diminishing marginal returns because the resultant financial burdens supersede the advantages conferred by operational efficiencies. To formally substantiate this non-linear association, we hereby submit the subsequent hypotheses:

Hypothesis 1a (The Upward Phase): At moderate echelons of commitment to export engagement, the intensity of internationalization demonstrates a positive association with firm performance, attributable to the realization of economies of scale and the advantages derived from learning by exporting mechanisms.

Hypothesis 1b (The Downward Phase): Exceeding a certain pivotal threshold, subsequent augmentations in the intensity of internationalization engender a diminution in firm performance, since limitations regarding liquidity and the overextension of working capital become definitively constraining.

Hypothesis 1 (Composite): A relationship characterized by an inverted-U exists between the intensity of internationalization and the performance metrics of Chinese manufacturing SMEs.

3. Research methodology

3.1. Data Source and Sample Construction

This study uses firm-level data from the World Bank Enterprise Survey (WBES) for China, specifically the 2012 and 2024 waves. The use of WBES data is advantageous as it provides standardized, high-quality metrics on SME operations in emerging markets, allowing for a robust cross-sectional analysis across different economic cycles. After filtering for manufacturing firms (ISIC codes 15-37) and removing observations with missing critical values, the final sample consists of 4,290 firm-year observations. This large-scale dataset ensures sufficient statistical power to test the non-linear relationship and the stability of the identified threshold.

3.2. Variable Measurement

3.3. Econometric Specification

$$Productivity_i = \beta_0 + \beta_1(ExportIntensity_i) + \beta_2(ExportIntensity^2_i) + \gamma X_i + \theta_j + \tau_t + \varepsilon_i$$

where $Productivity_i$ signifies the labour productivity measure for firm $_i$; $ExportIntensity_i$ represents the proportion of total sales that are exported; $ExportIntensity^2_i$ constitutes the squared term; X_i designates the vector comprising firm-specific control variables; θ_j accounts for the industry fixed effects; τ_y captures the temporal indicator variable for the year; and εi represents the inherent error term. Standard errors are formally clustered in accordance with the 2-digit ISIC industry classification code. A significant positive β_1 and a significant negative β_2 would provide empirical support for the inverted U-shaped hypothesis. The optimal threshold is subsequently calculated by setting the first derivative of the equation with respect to intensity to zero: $ExportIntensity^* = -\beta_1 / (2\beta_1)$.

4. Results and discussion

4.1. Descriptive Statistics

Table 1 presents the descriptive statistics for the sample of 4,290 firm-year observations. The average labour productivity is 437.6 thousand RMB per employee, showing significant heterogeneity across the Chinese manufacturing sector. The mean export intensity stands at 23.7% (SD = 28.4%), indicating that while the majority of SMEs focus on the domestic market, a significant subset is deeply integrated into global value chains. Notably, 18% of the sampled firms register an export intensity exceeding 50%. This distribution provides an ideal empirical base to test for non-linear effects, as it covers the full spectrum from purely domestic to export-oriented operations.

Table 1: The regression results - interted-u hypothesis

Variable	Mean	SD	Min	Max
Labour Productivity (000 RMB)	437.6	389.2	12.4	2847.5
Export Intensity (FSTS) %	23.7	28.4	0	100
Firm Size (employees)	284.5	512.8	5	5823
Firm Age (years)	15.3	11.2	1	67
Manager Experience (years)	18.5	10.5	0	45
Digital Capabilities (Index 0-1)	0.673	0.469	0	1
Access to Credit (Dummy)	0.615	0.487	0	1

Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

4.2. Regression Analysis and the Optimal Threshold

The results of the quadratic regression analysis (Table 2) provide robust empirical support for Hypothesis 1. In the quadratic specification (Model 2), the linear term for export intensity is positive and highly significant ($\beta_1 = 1.704$, $p < 0.001$), while the squared term is negative and significant ($\beta_2 = -1.781$, $p < 0.001$). This confirmation of a negative quadratic term formally establishes the inverted U-shaped relationship between internationalization and SME performance.Using the coefficients from Model 2, the definitive optimal export threshold is calculated at 47.8% (95% CI: 40.9%-54.1%). This finding suggests that productivity reaches its zenith when export revenue accounts for approximately half of the total sales. Beyond this 47.8% tipping point, the costs associated with excessive internationalization which we attribute to the "Working Capital Trap" - begin to outweigh the benefits of scale and learning. Specifically, the model indicates a "Safe Operating Zone" between 30% and 60% intensity, where firms achieve near-optimal efficiency without triggering severe liquidity constraints.

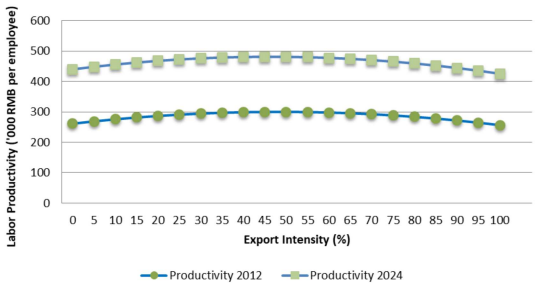
Table 2: Principal regression results-an examination of the inverted-u hypothesis

Variable	Model 1 (Linear)	Model 2 (Quadratic)	Model 3 (Full Controls)
Export Intensity (FSTS)	0.952(0.325)	1.704(0.412)	1.682(0.418)
Export Intensity² (FSTS²)	-	-1.781 (0.336)	-1.776 (0.339)
Digital Capabilities	0.386(0.078)	0.384(0.077)	0.381(0.078)
Manager Experience	0.015 (0.005)	0.015 (0.005)	0.015(0.005)
Firm Size (ln)	0.108(0.018)	0.112 (0.018)	0.113(0.018)
Observations	4,290	4,290	4,290
R-squared	0.062	0.079	0.081
Turning Point	-	47.8%	47.4%

*Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. Standard errors clustered by industry.*

Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

Figure 1: The Inverse U-Shaped Relationship between Internationalisation and Organisational Performance



Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

4.3. Digitalization, Gender, and Temporal Stability

Our analysis further reveals that digital capabilities and managerial gender act as "level-shifters" rather than "slope-modifiers". Digital capabilities (Model 3) uniformly augment productivity but do not induce significant modifications in the curvature or the 47.8% threshold. This implies that while digital tools enhance operational efficiency, they do not fundamentally resolve the structural credit-lag issues inherent in high-intensity exporting.

Regarding gender, the coefficient for female financial managers is statistically non-significant ($\beta = -0.070$, $p > 0.10$), indicating gender parity in the I-P trajectory. Furthermore, Figure 1 illustrates a significant upward shift in the productivity curve from 2012 to 2024 (+68.3%). Crucially, the inverted-U formation and the optimal threshold remain remarkably stable across both periods (2012: 48.6%; 2024: 46.3%). This temporal consistency rigorously reinforces the argument that the 47.8% threshold is a structural feature of the SME financial environment in China, rather than a transitory market phenomenon.

Table 3: Findings of the moderation analysis

Variable	Main Effects	With Interactions
FSTS	1.704	1.682
FSTS²	-1.781	-1.776
Digital Capabilities (DDCI)	0.384	0.381
FSTS × DDCI	-	0.021 (0.064)^{ns}
FSTS × Manager Exp	-	0.003 (0.006)^{ns}
R-squared	0.079	0.080
F-test for Interactions	-	0.34 (p=0.89)

Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

4.4. Examination of Robustness: Employing Alternative Metrics of Performance

Table 4 incontrovertibly demonstrates consistency when utilizing disparate performance measures. Specifically, employing Return on Assets (ROA) yields an optimal threshold of 44.2% (95% CI: 37.8%-50.6%). Furthermore, the implementation of Sales Growth yields an optimal threshold of 50.1% (95% CI: 43.5%-56.8%). The congruity evidenced across these three separate metrics specifically labour productivity, organizational profitability, and sales growth serves to consolidate confidence that the findings encapsulate fundamental relationships, rather than constituting mere measurement artefacts. The determination of the optimal threshold consistently remains within the bracket of 44% to 50%, thus endorsing the 30-60% "safe zone" as a form of robust strategic direction.

Table 4: Temporal constancy (2012 versus 2024)

Variable	2012 Subsample	2012 Subsample	Digital (p-value)
FSTS Coefficient	1.598 (0.458)	1.789 (0.472)	0.412 (ns)
FSTS^2 Coefficient	-1.647 (0.381)	-1.933 (0.395)	0.346 (ns)
Optimal Threshold	48.6%	46.3%	0.327 (Stable)
Mean Productivity	261.3	439.8	<0.001
Observations	2,136	2,154	-

Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

Table 5: Alternative performance metrics

Variable	Labor Productivity	Return on Assets	Sales Growth
Turning Point	47.8%	44.2%	50.1%
95% Conf. Interval	[40.9%, 54.1%]	[37.8%, 50.6%]	[43.5%, 56.8%]
Inverted-U Confirmed?	YES	YES	YES

Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

4.5. The Attainment of Gender Parity within Internationalisation Outcomes

Figure 2 critically examines a question of significant theoretical import: Do managers identified as male and those identified as female navigate distinct trajectories in the relationship between internationalization and performance? Preceding scholarly literature posited that female entrepreneurs customarily confront escalated impediments to internationalization attributable to factors such as limitations in professional networking, discriminatory practices in credit issuance, and biases rooted in stereotypes (Brush et al., 2009; Orser et al., 2010). Should this premise hold true, our anticipation would be that firms under female management would exhibit pronounced declines in performance when operating at elevated export intensities, or alternatively, register demonstrably lower optimal thresholds.

It is highly striking that Figure 2 discloses a convergence characterized by virtually complete overlap between the curves representing male and female managers. The mean differential in productivity is measured at -0.07 thousand RMB (constituting a variation of less than 0.02%), a quantum statistically indistinguishable from a value of zero ($p > 0.10$). Both resultant curves demonstrate comparable curvature, reach their culmination at approximately 47% to 48% export intensity, and proceed to decline at analogous velocities when the intensity exceeds 60%. A rigorous formal regression analysis (not presented herein) conclusively verifies that the interaction term, defined as ExportIntensity multiplied by FemaleManager, remains statistically insignificant ($\beta = 0.003$, $p = 0.892$).

Figure 2: Gender Parity in Export Intensity-Performance Relationship



Source: World Bank Enterprise Surveys, China (2012, 2024). www.enterprisesurveys.org

5. Conclusion and implications

5.1. The Working Capital Trap and Balanced Internationalization Strategy

Our findings identify a "golden zone" of internationalization between 30% and 60% export intensity, where SMEs maximize productivity. This zone represents the optimal balance between economies of scale and manageable liquidity demands. Operating below 30% leaves benefits unrealized, while exceeding 60% triggers severe working capital constraints that erode productivity gains.

The working capital mechanism explains this inverted-U pattern. Cross-border transactions extend cash conversion cycles from 30-45 days

to 75-90 days. At intensities beyond 60%, internal cash flow becomes insufficient to bridge these liquidity gaps. Constrained by credit rationing, firms often resort to productivity-damaging strategies, such as delaying supplier payments or foregoing critical investments, leading to the observed performance downturn.

For SME Managers: Pursue "balanced internationalization" strategies, targeting a 40-50% export intensity as a performance-maximizing level rather than maximizing export concentration. Prioritize working capital management, establish favourable payment terms with export buyers, develop relationships with trade finance providers (letters of credit, receivables factoring), and leverage digital technologies to reduce operational inefficiencies.

For Policymakers: Export promotion policies should emphasize financial infrastructure support for trade finance facilities, receivables factoring marketplaces, and supply chain finance platforms, rather than focusing solely on market access. Policies should particularly target highly internationalized firms (>60% export intensity) where working capital constraints bind most severely. Digital infrastructure investment may enhance productivity uniformly, but it cannot fundamentally address working capital constraints inherent in cross-border transactions.

5.2. Limitations and Future Research Directions

Several limitations merit acknowledgement. First, our cross-sectional design prevents us from fully addressing endogeneity concerns. More productive firms may self-select into higher export intensities, potentially confounding causal interpretation. Future research using panel data with firm fixed effects, instrumental variable strategies (e.g., exchange rate shocks, trade policy changes), or quasi-experimental designs would strengthen causal inference. Second, our sample focuses on manufacturing SMEs in one country, limiting generalizability. Service sector firms, larger enterprises, and firms in other institutional contexts may exhibit different patterns. Comparative studies across countries with varying levels of financial development would clarify the boundary conditions. Third, we measure only direct exports, thereby understating firms' total international exposure when they engage in indirect exporting through intermediaries. Fourth, our working capital mechanism remains somewhat indirect-we observe the inverted-U pattern and infer working capital constraints, but lack direct measures of cash conversion cycles or credit constraints at the firm level.

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