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Supply Chain Finance and Working Capital Efficiency in Chinese Listed Manufacturers

Yanjun Liu[1, *]

[1]College of International Education, Hong Kong Baptist University, Hong Kong SAR, China
[*] Corresponding author: 25644831@life.hkbu.edu.hk

Abstract: Whether a firm's working capital looks efficient can depend heavily on how supplier-finance arrangements are disclosed and where their balances are classified, and this paper examines that dependence directly. The evidence is a hand-collected set of six consolidated firm-year observations for Haier, Lenovo and Midea, four of which carry a quantified supplier-finance balance. Three tools are applied to them: a decomposition of the cash-cycle proxy, a reconciliation of financing liabilities across captions, and a check of how far the results move when closing balances are replaced by period averages. At Haier the operating-cycle proxy fell by 6.43 days, yet its cash-cycle proxy barely moved. Lenovo disclosed a 32.51% rise in its supplier-finance balance even as its cash-cycle proxy lengthened by 7.18 days. Midea's cash-cycle proxy shortened by 2.33 days while its operating-cycle proxy lengthened by 17.61 days, a pattern from which no supplier-finance status can be read off. For Lenovo, 25.84% of the disclosed 2025 supplier-finance balance sat outside trade and notes payables, and folding that balance back in shifts the year-end cash-cycle proxy by 7.43 days. Programme scale, buyer financing and operating turnover thus behave as separate empirical quantities rather than one. The study offers completed descriptive evidence and an auditable accounting reconciliation instead of a population estimate of any causal effect of supplier finance, and the supplementary Haier observations further show how much the figures depend on reporting vintage and on management turnover conventions.

Keywords: Supplier finance; working capital; cash conversion cycle; financial statement analysis; Chinese listed manufacturers; disclosure.

1. Introduction

Analysts routinely read working capital measures as a signal of how well a manufacturer turns operating investment back into cash. A healthy headline ratio, however, need not mean that goods are produced or receivables collected any faster. The same ratio can improve simply because the firm has taken on more of the liabilities that fund its operations. Supplier finance sharpens this ambiguity, because it lets a supplier be paid before the buyer settles the matching obligation.

This article pursues that ambiguity through reported financial statements. The question it asks is whether movements in disclosed supplier-finance balances track movements in working capital indicators, and how far the answer turns on which liabilities those indicators include. Three Chinese listed manufacturing groups supply the evidence. Their consolidated reporting perimeters, overseas operations included, are used as reported, rather than being treated as though each observation measured manufacturing activity inside China's mainland.

Three contrasting patterns emerge. Haier shows a shorter operating-cycle proxy without a matching fall in its cash-cycle proxy. Lenovo pairs a larger supplier-finance balance with a longer cash-cycle proxy. Midea presents the mirror-image difficulty, a shorter cash-cycle proxy sitting beside a longer operating-cycle proxy. That final case is informative as an accounting comparison, but it settles neither adoption nor non-adoption of supplier finance.

What the paper contributes is a transparent reconciliation between observable financing balances and the components of working capital. Prior work has already established that working capital matters for corporate performance and that supply chain finance is interorganisational by nature. The addition here is a small, auditable set of calculations built from current disclosures. No claim is made that these cases stand in for the population of Chinese manufacturers, or that three corporate histories recover an average treatment effect.

For that reason the word “efficiency” is used in a deliberately restricted sense. Fewer receivable or inventory days can accompany faster turnover, but shifts in sales, product mix, acquisitions and accounting classification can move the same figures. Until operational evidence is available, a shorter buyer cash cycle is read as a financing outcome. Holding these readings apart lets the data answer a narrower question with more precision.

The puzzle is not whether finance can underpin manufacturing; plainly it can. It is whether a single balance-sheet indicator can reveal the channel through which that support flows. Lower inventory, quicker customer collection and later buyer payment each shorten the cash cycle, yet they carry different consequences for production capacity, customer relationships and supplier exposure. One aggregate figure cannot tell them apart. The cases were chosen to make that separation visible, not to maximise the count of statistically usable rows.

The setting should interest an international audience as well. These groups report through listed-company disclosure channels, yet their operations cross national and product lines. Their statements let the same arithmetic be applied to different reporting structures. The evidence therefore bears on how financial-statement ratios are read in multinational manufacturing groups, and it should not be recast as an estimate for all Chinese factories. Separating legal listing identity from economic reporting perimeter matters especially when a study mixes mainland and Hong Kong listings.

Disclosure quality is treated here as part of the empirical

problem rather than a given. A financing arrangement can be economically material even when its balance sits outside the most familiar liability caption and, conversely, a larger payable balance can appear without any documented supplier-finance programme. Reading the statements together with their notes therefore recovers information that an isolated ratio series would discard. The analytical payoff comes from tying each interpretation to a visible component and showing how that interpretation shifts when the measurement boundary shifts.

2. Literature and Analytical Expectations

Deloof (2003), in studying working capital management and profitability, gives grounds for analysing receivables, inventories and payables separately. Baños-Caballero et al. (2014) examine working capital alongside financial constraints and performance and report a nonlinear relationship. Neither result licenses the assumption that any cut in working capital raises economic performance. What matters is the balance between operating needs and the cost and availability of funding.

Supply chain finance reaches past any single balance sheet. Gelsomino et al. (2016) catalogue the competing definitions and approaches in this literature, while Wuttke et al. (2013) study the financial flows where supply chain and finance functions meet. The present paper narrows that wide field to disclosed supplier-finance arrangements in the accounts of purchasing manufacturers. Receivable factoring undertaken by a selling manufacturer is not, by default, folded into the same exposure.

After the International Accounting Standards Board amended its disclosure requirements, firms now have to report more about their supplier-finance arrangements, which makes those arrangements easier to spot in the accounts (IFRS Foundation, 2023). Better disclosure makes accounting reconciliation more tractable, but it does not manufacture a clean adoption event. A first disclosed balance can mark a new reporting requirement, a programme already in place, or a change in materiality. This study therefore compares balances and classifications without pinning down an unobserved first-use date.

Three expectations frame how the evidence is read. First, a cash-cycle change should be broken apart, since its operating and financing components can pull in opposite directions. Second, because supplier-finance balances can land in different liability captions, a measure built only on trade payables may cover firms unevenly. Third, programme balances and the amounts already paid out to suppliers need not match. Each expectation is examined through arithmetic and documentary comparison, not advanced as a statistically tested causal hypothesis.

2.1. Financing access, operating coordination and the distribution of gains

Trade credit offers a helpful starting point for the arrangements studied here. Petersen and Rajan (1997) read trade credit through financing and commercial logic rather than as an incidental accounting balance. Their account motivates a separation between the mere existence of an unpaid purchase obligation and the financing service attached to it. Supplier finance can change who funds the gap between delivery and final payment while leaving the underlying purchase relationship intact. A buyer's payable balance need not, then, reveal the moment at which the supplier actually receives liquidity.

Take the sequence of events: a purchase, invoice approval, an optional early payment, and the buyer's settlement. These are separate steps. Faster invoice approval could let a supplier draw funds sooner even when the contractual buyer payment date is unchanged. Longer buyer payment terms could widen the buyer's financing interval while the supplier is paid earlier through a bank. A programme might also do no more than replace an existing line of supplier credit. These are conceptual possibilities rather than mechanisms identified in the present cases, and they explain why both the financing balance and the operating components must be observed before any programme is tied to a particular efficiency channel.

Any gain is also shared among the parties. A buyer may free up cash, a supplier may secure cheaper or steadier funding, and a financier may earn a return for carrying credit and operational risk. More than one party can benefit from the same transaction, though that is not guaranteed. Programme fees, revised payment terms, administrative costs and the available funding alternatives all bear on the outcome. Because the present accounts do not report these items against matched invoices, the study measures the buyer's accounting position without converting it into an estimate of total supply-chain surplus.

Wuttke et al. (2016) model the introduction and adoption decisions explicitly and show that payment terms and procurement volume shape both the appeal and the timing of supplier finance. Wuttke et al. (2019) study how quickly firms adopt and separate efficiency-driven from legitimacy-driven motives. Taken together, these studies support treating programme use as a context-dependent choice. They do not license reading a disclosed balance as if it were randomly assigned. In the evidence here, a rising balance could reflect more purchasing, more participating suppliers, different settlement timing, or a change in the share of eligible obligations that is funded.

Coordination is a second channel. Dependable invoice approval and predictable settlement might reduce the uncertainty around financing production. Such coordination, though, is better evidenced by approval times, delivery reliability or supplier-level funding costs than by buyer payables alone. That these measures are absent does not make the channel unimportant; it simply places the channel beyond the reach of this dataset. What the case evidence speaks to most clearly is the link between visible financial balances and the language used to describe operating efficiency.

2.2. Why a shorter cash cycle is not an unconditional objective

A trade-off sits at the centre of the working capital problem. Inventory ties up cash, yet it also cushions production continuity and customer service. Give customers longer to pay and collection slows, though sales may hold up. Pay suppliers quickly and cash goes out the door, but the firm might keep its access to them, pick up early-payment discounts, or simply stay on good terms with a relationship it values. The right policy weighs these benefits against their costs. The nonlinear view in Baños-Caballero et al. (2014) is pertinent here: a move toward fewer days does not, in itself, mark a move toward an economic optimum.

The same caution applies to a negative cash-cycle proxy. It

signals only that, under the chosen stock-to-flow convention, the payable component outweighs the sum of the receivable and inventory components. It does not mean that every product is sold before its inputs are paid for. Consolidated balances pool many transactions with different dates, currencies and terms, so a group can post a negative aggregate proxy while individual subsidiaries or suppliers feel liquidity pressure. A positive proxy, equally, can accompany profitable growth rather than slack management. The sign is an accounting summary, not a full diagnosis.

The financing lens also opens a gap between private and network outcomes. A buyer can lift its own cash position by paying later, but the supplier must then fund a longer interval unless early-payment terms make up for it. Where financing inside the programme is genuinely cheaper, that interval may be sustainable; where the programme adds costs or dependence that outweigh the funding gain, the buyer's apparent improvement can mask a burden carried elsewhere. The present results cannot adjudicate between these outcomes. Their role is to stop a buyer-level ratio from being read as proof that the whole chain became more efficient.

2.3. Disclosure as a measurement environment

The reporting note does more than supply one extra variable; it sets the boundary of the observation. An arrangement booked within trade payables enters the conventional DPO numerator automatically, whereas a substantively similar balance in another liability category does not. The same formula can thus absorb different financing content from one firm to the next. This is an interaction between economic arrangements and reporting classification, not a flaw in the ratio itself, and the appropriate response is to present both the conventional calculation and the disclosed reconciliation.

Disclosure shapes comparisons over time as well. A newly visible programme balance may reflect improved reporting rather than a newly created programme, and an omitted balance may be immaterial, described under another heading, or simply not identified separately in the material reviewed. These states differ from verified non-use. The study therefore keeps a reconciled numerical zero distinct from an unknown programme status. That separation is central to the reading of Midea, whose working capital components are observed but whose programme exposure is not quantified in this extraction.

3. Data and Methods

3.1. Case selection and source boundaries

The dataset spans Haier's years ended December 2024 and 2025, Lenovo's years ended March 2024 and 2025, and Midea's years ended December 2023 and 2024. These come from Haier's 2025 annual report, Lenovo's 2024/25 annual report and Midea's 2024 annual report. Within each pair the current and comparative figures are drawn from the same report. Haier's 2024 figures and Midea's 2023 income-statement figures keep the comparative restatements presented there. Appendix A, the source register, pins down the relevant statement pages and notes.

Selection was purposive. The cases offer accessible English-language consolidated statements together with contrasting disclosure structures. Haier and Lenovo carry quantified supplier-finance notes, while Midea adds a further working capital comparison. No quantified programme balance was found for Midea in the extraction used here, so that field stays missing. Midea is therefore neither an untreated control nor evidence of zero programme use.

These are six firm-year observations rather than a balanced calendar-year panel. Lenovo is a Hong Kong-listed manufacturing group, so the sample is not confined to mainland A-shares. Currency amounts stay in millions of the original reporting currency, and renminbi and dollar balances are never pooled. Ratios and their changes are computed within each firm, which curbs unit incompatibility without erasing differences in products, reporting dates or business composition.

Table 1 sets out the input values. Receivables here bring together trade and bill or note receivables carried at amortised cost and the separately reported trade receivables measured at fair value through other comprehensive income. Combining them this way prevents a transfer between those captions from being read as an improvement in collection.

Table 1. Financial-statement inputs

Firm / year	Unit	Revenue	Cost	Inventory	Receivables	Payables
Haier 2024	RMB	286,005.000	208,098.000	43,189.000	39,088.000	75,886.000
Haier 2025	RMB	302,329.000	223,374.000	46,847.000	35,336.000	77,415.000
Lenovo 2024	USD	56,863.784	47,060.601	6,702.677	8,147.695	10,505.427
Lenovo 2025	USD	69,076.968	57,979.358	7,923.804	10,506.610	11,978.933
Midea 2023	RMB	373,709.804	278,248.191	47,339.255	51,736.707	94,238.073
Midea 2024	RMB	409,084.266	301,982.533	63,339.188	60,163.998	118,774.248

Units: million RMB or USD. Receivables and payables include trade bills/notes; receivables are carrying values. Sources: Haier (2026), Lenovo (2025), Midea (2025); author aggregation. Fiscal-year ends and comparative restatements are specified in Section 3.1.

The basic unit of extraction is the reporting pair, not the isolated year. Pairing keeps the comparative figures that management presents next to the current statements and lowers the risk of splicing incompatible vintages together. It does not resolve every comparability issue, since a restatement can itself signal changes in reporting scope or presentation. For that reason the supplementary Haier extraction is kept explicitly as a vintage comparison. It is not tacked onto the primary series as though a second annual report amounted to a second independent economic event.

The data structure keeps three kinds of information apart. Financial inputs hold amounts and units; source fields record the report, the fiscal endpoint and the statement location; interpretive fields separate a disclosed programme amount from an unidentified exposure. Keeping these categories distinct heads off a common extraction fault in which an analyst's assumption ends up stored in the same field as an observed number. Every calculation runs on the financial inputs, while the source and interpretation fields govern which comparisons are defensible. The dataset is small enough that each reported quantity can be traced back to a

statement or a note.

Relying on consolidated information is deliberate but limiting. Consolidation strips out intra-group transactions while leaving those with outside customers, suppliers and financiers in place. A group-level cash-cycle proxy therefore does not capture the financing experience of any representative subsidiary or supplier, nor can it isolate the contribution of a given manufacturing segment where segment-level working capital is unavailable. Comparisons across Haier, Lenovo and Midea serve to illustrate different accounting patterns; they are not rankings that hold business model and reporting perimeter fixed.

3.2. Measures and reconciliation

Let R denote annual revenue, C annual cost of sales/revenue, AR closing trade receivables including bills/notes, I closing inventory and AP closing trade payables including bills/notes. The primary measures are year-end proxies, identified by the subscript E:

$$DSO_E = 365 \times AR / R; \quad DIO_E = 365 \times I / C; \quad DPO_E = 365 \times AP / C. \tag{1}$$

$$OC_E = DSO_E + DIO_E; \quad CCC_E = OC_E - DPO_E. \tag{2}$$

These stock-to-flow ratios are neither observed transaction durations nor the cash-cycle measures that management reports. Cost of sales is a workable denominator, though it is not the same as credit purchases. Holding the convention at a fixed 365 days keeps the calculations comparable across reporting years, leap years included. Contract assets, cash, general prepayments and unrelated financial assets are left out of the primary receivable measure.

The change identity $\Delta CCC_E = \Delta DSO_E + \Delta DIO_E - \Delta DPO_E$ is checked numerically. For the later year of each pair, a second calculation substitutes the mean of opening and closing balances for AR, I and AP while retaining that later year's revenue and cost. This average-balance measure evaluates endpoint sensitivity. It cannot establish an average-balance trend because the dataset does not include the earlier opening balances needed for both years.

Supplier-finance liabilities are split into amounts within AP, within other payables and within borrowings. Two mechanical sensitivities follow from that split. The expanded-liability calculation adds disclosed programme balances outside AP to the payment numerator; the programme-exclusion calculation strips out disclosed programme liabilities already sitting within AP. The first lowers CCC_E, the second raises it. Neither describes an actual withdrawal of financing, a change in contractual payment terms, or a recommended accounting reclassification.

Reported programme liabilities and the balances for which suppliers have already been paid are also kept apart. The ratio between them is a funded share at the balance date, not an annual utilisation rate. The method reads neither financing fees, nor supplier welfare, nor approval delays from either balance.

A further descriptive calculation separates balance growth from denominator growth. For any component $q = 365 \times X/Y$, where X is the relevant closing balance and Y is annual revenue or cost, the exact two-factor decomposition averages the two possible orders in which the factors can change. The balance contribution is $365 \times (X_1 - X_0) \times (1/Y_0 + 1/Y_1)/2$. The flow contribution is $365 \times (X_0 + X_1) \times (1/Y_1 - 1/Y_0)/2$. Adding them reproduces $q_1 - q_0$ exactly. This symmetric allocation avoids selecting one reporting year as the sole denominator benchmark.

The decomposition is an accounting identity. It splits the interaction between a changing balance and a changing flow evenly across the two contributions and estimates no behavioural parameters. A negative flow contribution means that growth in the denominator pulls the ratio down under this allocation; it does not point to higher physical productivity or to a change in contractual collection speed. The calculation earns its keep when a balance rises while its days-based ratio falls, because it accounts for that apparent contradiction without inventing an operational story.

No pooled regression is fitted to the manufacturing cases. Six primary observations, mismatched fiscal endpoints and only four quantified programme records cannot carry a credible multivariable estimate of the effect of financing. A coefficient could be produced mechanically, but its mere existence would not make the comparison informative. The completed analysis turns instead to exact identities, matched reporting pairs and transparent boundary changes, each of which addresses an observable question the available accounts can actually answer.

4. Results

4.1. Cash-cycle and operating-cycle movements

Table 2 reports the computed levels, and Figure 1 shows the exact additive contributions to each within-firm change. All calculations run on unrounded input values, while the tables display two decimal places.

Table 2. Working capital proxies

Firm / year	DSO_E	DIO_E	DPO_E	OC_E	CCC_E	CCC_AVG
Haier 2024	49.88	75.75	133.10	125.64	-7.47	—
Haier 2025	42.66	76.55	126.50	119.21	-7.29	-6.76
Lenovo 2024	52.30	51.99	81.48	104.28	22.80	—
Lenovo 2025	55.52	49.88	75.41	105.40	29.99	24.55
Midea 2023	50.53	62.10	123.62	112.63	-10.99	—
Midea 2024	53.68	76.56	143.56	130.24	-13.32	-11.92

Days. CCC_AVG uses opening/closing means for the later year only; a dash indicates not calculated. Source: author calculations from Table 1, Equations (1)–(2). These proxies are not the companies' own reported turnover measures.

At Haier, DSO_E drops by 7.22 days while DIO_E edges up by 0.80 days, for a net 6.43-day fall in OC_E. DPO_E, meanwhile, declines by 6.60 days. Because these moves very nearly cancel, CCC_E rises only slightly, from −7.47 to −7.29 days. Reading the aggregate alone would hide the sizeable shift in the receivable component. The reverse caution also holds: that component change is not, by itself, enough to show that collection procedures drove the improvement.

At Lenovo, DSO_E climbs by 3.22 days while DIO_E falls by 2.10 days, so the operating-cycle proxy lengthens by 1.12 days. A further 6.07-day cut in DPO_E then lifts CCC_E by 7.18 days, from 22.80 to 29.99. The larger closing trade payable balance does not translate into higher payable days, because the cost denominator rises as well.

At Midea, CCC_E falls from −10.99 to −13.32 days, a shortening of 2.33 days. Yet DSO_E and DIO_E rise by 3.15 and 14.46 days respectively, so OC_E lengthens by 17.61 days. A 19.94-day increase in DPO_E more than absorbs that movement. The favourable direction of the aggregate therefore traces arithmetically to the payable component, not to a shorter combined inventory-and-receivable proxy, and the observation does not single out supplier finance as the cause.

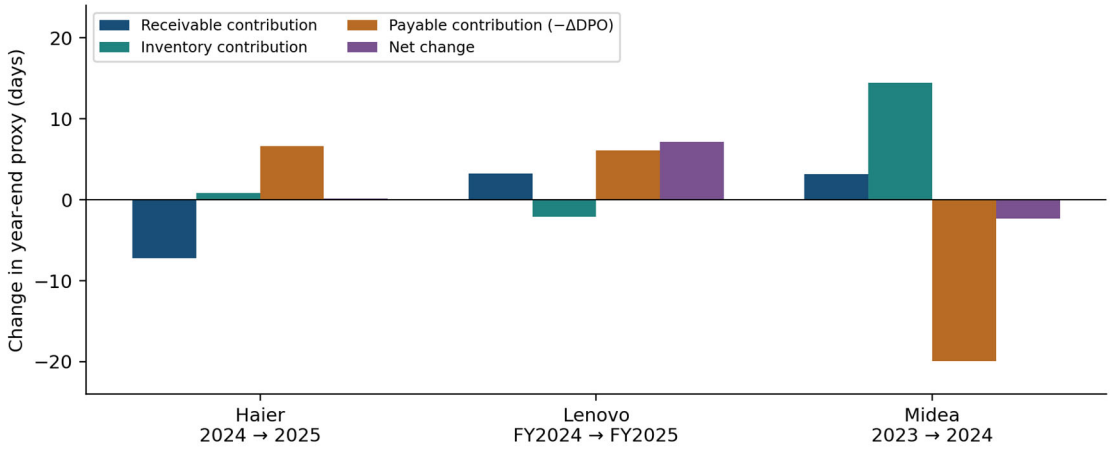


Figure 1. Within-firm decomposition of the cash-cycle change

Source: author calculations. A positive bar lengthens CCC_E. The payable bar equals −ΔDPO_E. Periods differ by firm and are not pooled into a treatment comparison.

4.1.1. Balance growth and flow growth explain the apparent contradictions

The extra decomposition sharpens Haier's receivable movement. Of the 7.22-day reduction in DSO_E, 4.66 days attach to the lower closing receivable balance and 2.56 days to the higher revenue denominator, so both pull in the same direction. Inventory behaves differently: balance growth adds 6.20 days while cost growth subtracts 5.40 days, leaving a net rise of 0.80 days. Describing inventory days as roughly stable would thus bury substantial movement in both the stock and the annual flow against which it is scaled.

Haier's payable result is just as telling. The higher payable balance adds 2.59 DPO days, but the higher annual cost denominator removes 9.19 days, and their net is the reported 6.60-day decrease. A decline in payable days is therefore not evidence that the absolute payable balance fell; it is evidence that the balance grew more slowly than the relevant annual cost flow. The data cannot say whether this came from faster supplier settlement, purchasing seasonality, shifting procurement conditions or some mix of these.

At Lenovo the same issue runs through all three components. Receivable growth adds 13.80 DSO days, offset by 10.59 days from revenue growth. Inventory growth adds 8.58 days, while the cost denominator takes away 10.68 days, so the net inventory proxy declines even as the inventory balance rises. For payables, the balance contribution is plus 10.35 days and the flow contribution minus 16.42 days. The observed fall in DPO_E therefore cannot be read off the sign of the payable balance change alone.

Midea shows the strongest balance-side expansion in this comparison. Inventory growth adds 20.16 days, trimmed by 5.71 days from cost growth. Payable growth adds 30.92 DPO days, offset by 10.98 days from the cost denominator. The net payable increase still outruns the combined rise in receivable and inventory days, and that is the arithmetic source of the shorter cash-cycle proxy. The pattern is consistent with greater financing against the operating balance, but the present data cannot name the commercial or financial arrangement behind it.

These nine exact decompositions live in the accompanying calculation file rather than appearing as yet another visual of the same three company changes. They refine the reading of Figure 1, since each plotted contribution already fuses a balance movement with a flow movement. None should be taken as a directly observed change in invoice duration. The decomposition adds explanatory depth while leaving the original financial statements, denominators and observation count intact.

4.2. Programme balances and accounting location

Table 3 reconciles the four quantified supplier-finance observations. The totals are balances outstanding at the reporting date. They are not annual financing flows or committed facility limits. Figure 2 compares where those balances are presented.

Table 3. Disclosed supplier-finance reconciliation

Firm / year	Within trade	Outside trade	Total	Already paid	Paid share
Haier 2024	8,503.000	98.000	8,601.000	4,773.000	55.49%
Haier 2025	8,675.000	151.000	8,826.000	4,669.000	52.90%
Lenovo 2024	1,913.114	1,533.201	3,446.315	3,446.315	100.00%
Lenovo 2025	3,386.752	1,180.060	4,566.812	4,566.812	100.00%

Million RMB for Haier; million USD for Lenovo. Haier outside-trade amounts are borrowings; Lenovo amounts are other payables. Source: Haier (2026), Note 29(d); Lenovo (2025), Notes 21(b), 22(c). Zeros apply only to the classified disclosed programme, not to every possible financing arrangement.

Haier's disclosed programme balance rises from RMB8,601 million to RMB8,826 million, a gain of 2.62%, while its already-paid balance falls from RMB4,773 million to RMB4,669 million. The funded share therefore slips from 55.49% to 52.90%, so programme balance growth and balance-date supplier funding move in opposite directions. Across both years the trade-caption programme balance holds at about 11.21% of total trade and bills payables.

Lenovo's disclosed total climbs from US$3,446.315 million to US$4,566.812 million, a rise of 32.51%, and its trade-caption programme balance grows from 18.21% to 28.27% of total trade and notes payables. CCC_E nonetheless lengthens. The pair shows that programme expansion need not come with a shorter observed cash-cycle proxy; what it cannot show is what the proxy would have been in the absence of that expansion.

For Lenovo, counting only the programme amounts in Note 21 would leave out US$1,180.060 million reported in other payables in 2025. That omission is 25.84% of the disclosed programme total, against 44.49% in 2024. Haier's outside-trade share is far smaller, at 1.71% in 2025. Together these figures pin down a concrete comparability problem: a shared trade-payables formula need not capture a shared financing perimeter.

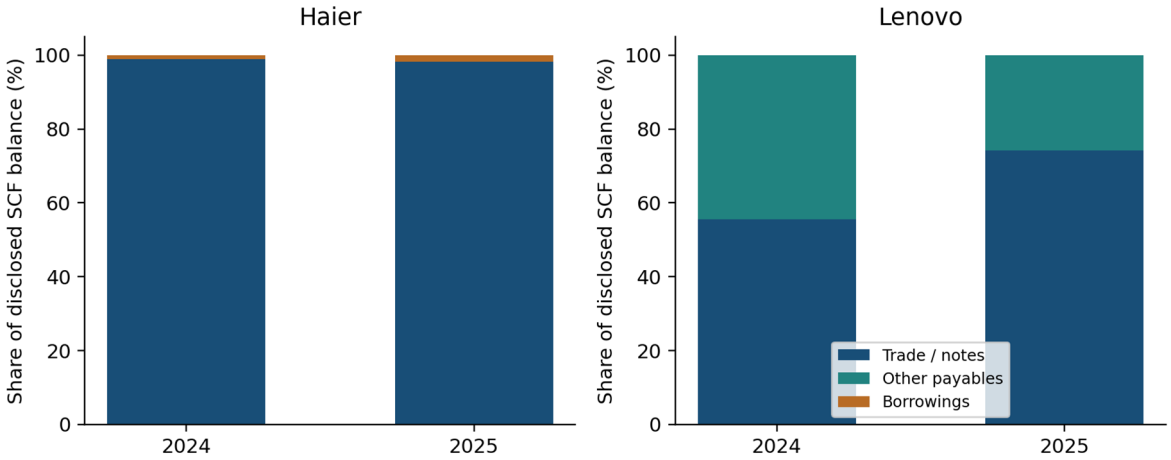


Figure 2. Accounting location of disclosed supplier-finance liabilities

Source: author calculations from Table 3. Each column sums to 100%. Classification shares are not financing-cost shares and do not imply a preferred financial-statement presentation.

The gap between an outstanding programme balance and completed early payment matters most for Haier. A liability can belong to the reported arrangement before the supplier has chosen or completed early funding, so the programme total and the amount already paid answer different questions about the balance date. A fall in the latter alongside growth in the former does not establish lower annual supplier participation. Measuring annual participation would need the flow of eligible invoices and funding decisions across the whole period, and neither the stock ratio nor its change supplies that denominator.

Haier's note frames supplier participation as optional and states that early-payment financing costs fall on participating suppliers. The note is also careful to keep two things apart: the payment terms originally agreed in the contract, and the point at which the suppliers actually receive their money early (Haier, 2026, Note 29(d)). That distinction matters for the proposed mechanism. Early payment can reset the supplier's liquidity timing without moving the buyer's contractual due date, so a barely changed buyer cash-cycle proxy is still compatible with an economically meaningful financing service, even though the accounts do not quantify the supplier's net benefit after fees.

Lenovo's classification pattern poses a different question. A falling outside-trade share does not mean the outside-trade balance has gone; it stays material in 2025. At the same time, the larger programme amount booked within trade and notes payables means more of the conventional payment numerator now belongs to an identified financing arrangement. An analyst watching only total trade payables would miss both moves: the programme liabilities that persist outside the caption and the shifting composition inside it. The note-level reconciliation surfaces both without any assumption about why the classification shares changed.

The cross-company comparison is thus qualitative in its economic interpretation and quantitative in its accounting reconciliation. Haier and Lenovo receive no better-or-worse programme score; their currencies, business models and reported programme perimeters differ too much. What can be fixed is the share of each disclosed total that each caption represents and the matching effect on a consistently computed proxy. The figures in Table 3 and Figure 2 carry that limited but concrete comparison.

4.3. Sensitivity to measurement boundaries

Table 4 puts numbers on the liability-boundary sensitivity. At Haier, adding programme borrowings moves the 2025 proxy by just 0.25 days. At Lenovo, adding programme balances held in other payables moves it by 7.43 days. Lenovo's expanded-liability proxy is 22.56 days in 2025 against 10.91 in 2024, so the direction of the within-firm change stays an increase.

Table 4. Liability-boundary sensitivity of the cash-cycle proxy

Firm / year	Primary CCC_E	Expanded liability	Exclude programme trade	Outside-trade difference
Haier 2024	-7.47	-7.64	7.45	0.17
Haier 2025	-7.29	-7.53	6.89	0.25
Lenovo 2024	22.80	10.91	37.64	11.89
Lenovo 2025	29.99	22.56	51.31	7.43

Days. Expanded liability adds only identified programme balances outside trade payables. Exclusion removes identified programme balances within trade payables. Difference is 365 × outside-trade programme balance / annual cost. These are accounting sensitivities, not causal counterfactuals.

Stripping programme trade balances out of the primary numerator flips the sign of Haier's proxy, from −7.29 to 6.89 days in 2025. This is not a forecast of what ending the programme would do, since replacement credit, payment terms and operations would all adjust. It simply shows how much of the chosen liability numerator belongs to identified programmes.

The average-balance calculation offers a separate check. For the later observation, CCC_AVG is −6.76 days at Haier, 24.55 days at Lenovo and −11.92 days at Midea. The gap between the closing and two-point-average measures is widest at Lenovo, at 5.44 days. The primary conclusions should accordingly be read as endpoint accounting comparisons; monthly balance averages or invoice-level duration data could land at different levels.

The sensitivities tackle separate uncertainties and should not be merged into one adjusted score. Shifting the liability boundary asks which obligations count as financing the operating balance. Moving from closing to opening-to-closing average balances asks how sensitive the level is to a single endpoint. A third matter, taken up next, is which reporting vintage supplies the inputs. All three can matter, yet each answers a different question, and picking whatever combination yields the lowest cash cycle would defeat the purpose of the exercise.

The programme-exclusion calculation is best read as a contribution to the numerator. It keeps the rest of the financial statements fixed and takes out only the identified programme amount already sitting in AP. A real programme withdrawal would not hold all those quantities still: suppliers might be paid on different dates, alternative financing could be arranged and commercial terms could shift. The sign change at Haier therefore gauges how much a disclosed balance matters for the arithmetic indicator; it does not estimate the effect of programme termination on actual cash requirements.

The expanded-liability calculation plays an equally narrow role. Folding in disclosed outside-trade programme liabilities improves the visibility of a chosen financing perimeter, but it does not turn the result into a universally better CCC. Other obligations may also fund operating activity, and accounting classifications answer to more than an analyst's ratio preference. Reporting both versions lays bare the effect of one explicitly documented boundary, letting the reader separate a conventional trade-payables proxy from a broader programme-inclusive sensitivity without mistaking either for an observed cash settlement duration.

4.4. Reporting vintage and management metric checks

A supplementary extraction from Haier’s 2024 annual report extends the historical comparison and tests whether reporting vintage affects the result. This adds one distinct firm-year, 2023, and a second published version of 2024. It does not add two independent firm-years. The six observations in Tables 1–2 remain the primary comparison; the supplementary records are kept separate so that overlapping and restated observations are not pooled as independent evidence. Table 5 reports the supplementary statement inputs.

Table 5. Haier financial inputs in the 2024 reporting vintage

Year	Revenue	Cost	Inventory	Receivables	Payables
2023	274,198	200,557	39,525	31,673	72,179
2024	285,971	208,128	43,044	38,952	75,737

RMB million. Source: Haier (2025), printed pages 159 and 161; 2023 comparative is restated in that report. Receivables include RMB200 million and RMB360 million at FVTOCI for 2023 and 2024. These records are supplementary, not replacements for the later vintage in Table 1.

Within this internally consistent reporting pair, CCC_E is −17.27 days in 2023 and −7.62 days in 2024, a move of 9.65 days, and the 2024 average-balance calculation is −12.23 days. The later 2025 report, by contrast, gives restated 2024 inputs that yield −7.47 days. For the same 2024 endpoint the reporting-vintage difference is 0.15 days. That is small here, yet treating it as an economic change would be a mistake.

The management-reported turnover metrics add a further, independently presented comparison. Haier's 2024 financial review gives receivable, inventory and payable days of 45, 72 and 130, against 40, 74 and 130 for 2023. Their arithmetic differences imply cash-cycle figures of −13 and −16 days. These implied numbers are author calculations from the three disclosed components and are not labelled as a separately reported company CCC.

Table 6. Haier cash-cycle measurement and reporting-vintage comparison

Reporting year and source	Closing proxy	Average proxy	Implied management CCC
2023 in 2024 report	-17.27	—	−16
2024 in 2024 report	-7.62	-12.23	−13
2024 in 2025 report	-7.47	—	−12
2025 in 2025 report	-7.29	-6.76	−7

Days. The management figure for 2024 in the 2025 report is implied by 45 + 73 − 130, using the comparative levels stated or implied in its financial review. The average proxy uses opening/closing statement balances from the same report. Dashes mean not calculated, not zero. Sources: Haier (2025), p. 71; Haier (2026), p. 72; author calculations.

The 2025 review gives 44 receivable days, 74 inventory days and 125 payable days, implying −7 days. Its wording implies a 2024 inventory comparative of 73 days, whereas the earlier report disclosed 72 days. Table 6 keeps both published vintages; no unexplained difference is patched by quietly overwriting a value. Management metrics can depart from the present calculations in averaging convention or denominator detail, and these disclosures do not establish their exact reconciliation.

This comparison qualifies the economic interpretation without discarding the data. In both the management components and the financial-statement decomposition, the payable component materially affects the overall movement. Nevertheless, the magnitude depends on the chosen measure. A regression assembled from mixed reporting vintages or a mixture of management-reported and analyst-calculated CCC values could capture inconsistent measurement alongside genuine operating differences. Keeping source year, reporting vintage and calculation rule as separate fields prevents that avoidable error.

4.5. Cash-cycle days and the monetary working capital position

The results also let cash-cycle days be set apart from a monetary operating working capital balance. Define W as AR + I − AP, using the same three closing captions as the primary ratios. This narrow subtotal is not total net working capital, since it leaves out cash, other current assets, borrowings and other current liabilities; it is useful here precisely because its components match those already examined. All six primary observations show a positive W even though four carry a negative CCC_E. There is no contradiction in that: the receivable term in CCC_E is scaled by revenue, whereas inventory and payables are scaled by cost.

The relationship can be written exactly as CCC_E = 365 × W/C + 365 × AR × (1/R − 1/C). Whenever revenue exceeds cost, the second term is negative, so the sign of CCC_E need not agree with the sign of the monetary subtotal. This identity is a further reason not to read a negative cash-cycle proxy straight off as a claim that suppliers fund every monetary unit tied up in the selected operating assets. The conventional ratio applies different flow bases to different components, and that choice leaves an observable mark on interpretation.

For Haier in 2025, W is RMB4,768 million. Its cost-scaled contribution is a positive 7.79 days, while the adjustment from the different receivable denominator is minus 15.08 days, and together they give the reported CCC_E of minus 7.29 days. In 2024 the same subtotal is RMB6,391 million. The narrow monetary commitment thus falls across the pair even as the cash-cycle proxy rises slightly. The two readings are compatible because the scaling flows and their relationship change as well, and neither should be quietly swapped for the other.

Midea offers another instructive comparison. Its narrow subtotal slips from RMB4,837.889 million to RMB4,728.938 million. The later-year cost-scaled contribution is 5.72 days, offset by minus 19.04 days from the revenue-versus-cost adjustment, leaving a cash-cycle proxy of minus 13.32 days. A positive monetary subtotal and a negative days-based measure thus sit side by side within the same statements and chosen captions. A negative CCC_E does not remove the need to examine how the residual operating balance, or other assets outside this narrow subtotal, are funded.

At Lenovo, W rises from US$4,344.945 million to US$6,451.481 million. The 2025 cost-scaled contribution is 40.61 days and the denominator adjustment minus 10.63 days, producing a CCC_E of 29.99 days. Here the monetary subtotal and the cash-cycle proxy both increase. Their agreement in direction, though, should not mask the separate role of the supplier-finance liabilities outside AP. Those liabilities drop out of this conventional monetary subtotal just as they drop out of the primary payment numerator, so a broader financing reconciliation is still needed.

These calculations also show why a cash-cycle change cannot, in general, be multiplied by a single daily sales or cost figure to recover an exact cash release. Different components carry different denominators, and those denominators move between reporting years. Such a multiplication would smuggle in assumptions about which balance changes, which flow stays constant and how the financing boundary is drawn. The present analysis instead takes the monetary subtotal straight from the accounts and uses the exact ratio identities for changes in days, which keeps a convenient approximation from being presented as a realised cash-flow amount.

The monetary subtotal is not itself a cash-flow statement measure. Its movement from year to year can absorb consolidation changes, foreign-currency translation, non-cash adjustments and valuation effects as well as settlements and purchases. The accounts supplied here do not reconcile every such influence for the selected captions. The fall in Haier's W is therefore described as a lower closing monetary subtotal, not as an independently verified cash inflow of equal size. That phrasing holds the line between a balance-sheet movement and the cash transactions that help bring it about.

Taken together, the monetary and days-based calculations make the meaning of efficiency more exact. The monetary subtotal reports the residual amount in a chosen set of operating captions; the cash-cycle proxy scales those captions by different annual flows; the programme reconciliation identifies financing that may fall inside or outside the conventional payable boundary. None suffices on its own. Read jointly, they give a richer account of the observed statements without conjuring extra firms, transaction dates or causal effects. The supporting calculations sit in the same reproducibility package as the ratio decomposition.

5. Discussion and Limitations

The cases pull apart three ideas that the language of efficiency tends to compress: the length of an operating-cycle proxy, the financing available against operating obligations, and the buyer's resulting cash-cycle proxy. Haier shows that the first can improve while the third hardly moves. Lenovo shows that a larger disclosed financing balance is not enough to predict the third. Midea shows why an improvement in the aggregate should not be relabelled, without more, as faster operations.

That separation has consequences for how existing research is read. A statistically significant cash-cycle association can stay economically ambiguous as long as the payable contribution and the liability boundary go unexamined. The present evidence does not overturn earlier estimates; it points to specific measurements that ought to travel with their interpretation. In particular, leaving supplier-finance liabilities outside trade payables unaccounted for can render otherwise identical ratio definitions economically inconsistent from one company to another.

The comparison also warns against ranking programme quality by funded share. Haier reports a perimeter that still contains liabilities not yet paid to suppliers, whereas Lenovo's disclosed balances are identified as already paid. Differences in disclosure perimeter and in settlement timing move the ratio. A reading of 100% does not, on its own, signal better access, lower fees or stronger supplier welfare than a lower reading.

Several limitations place real bounds on inference. Case selection follows what firms disclose. There is no untreated comparison group, no verified adoption history and no exogenous funding shock. The three groups differ in product mix and consolidated activities, and their fiscal-year endpoints do not coincide. Growth, acquisitions, currency translation and shifting customer or supplier terms all remain candidate explanations for the ratios. Standardising units through ratios does not remove any of them.

Closing balances may be seasonal or shaped by year-end management. Two-point averages lean less heavily on a single date, yet they are not monthly averages. Receivables held on different accounting bases are combined at carrying values, and credit purchases are not available as a shared denominator. These choices are set out so that other researchers can reproduce or replace them, rather than being waved away as negligible.

Finally, matched supplier invoices, realised financing charges and delivery metrics are all absent. The analysis cannot, therefore, compute how benefits are distributed along the chain. Its evidence underwrites an accounting interpretation of the observed working capital, not a causal verdict on supplier finance or a welfare conclusion for suppliers.

5.1. What the cases add to the working capital literature

The evidence draws a line between statistical association and accounting content. Earlier research on working capital and corporate performance asks whether firms in different working capital positions end up with different outcomes. These cases take up a prior, interpretive question: what does a given movement in that position actually contain? A cash-cycle measure can be computed consistently while blending changes in operating assets, supplier obligations and financing classifications. The contribution of the cases is to unpack that blend in settings where the financing note is detailed enough to allow reconciliation.

Seen this way, the three comparisons take on a coherent role. Haier illustrates operating and payment components that offset one another. Lenovo shows that programme growth and a lengthening cash-cycle proxy can coexist while a material financing balance is disclosed outside the conventional numerator. Midea illustrates an aggregate improvement generated by a larger payment component even as operating-cycle days rise. The cases are not three independent tests of one treatment effect; they are three observable configurations that show why one aggregate label can carry different economic readings.

The extra ratio decomposition also tempers the familiar vocabulary of acceleration and delay. A fall in receivable days is often called faster collection, and a fall in inventory days faster turnover. Here those labels stay as hypotheses about transactions. Revenue and cost growth contribute sizeable arithmetic, particularly at Lenovo. Acknowledging the denominator channel does not render the ratio useless; it pins down what corroborating information is required before a stock-to-flow movement is translated into a claim about the speed of operating processes.

5.2. Implications for management and financial-statement users

For a manufacturing treasury team, the distinction argues for weighing programme balances against the reasons cash is tied up in operations. A growing programme can shore up liquidity during a sales expansion without shortening the reported cash cycle. A favourable ratio, conversely, can come from larger payment obligations while inventories build up. The first case should not be filed automatically as programme failure, nor the second as operational success. The cases show that the direction of the aggregate is not enough to support either verdict.

For procurement and supplier relationship management, buyer-level results should be read alongside the contractual sequence. The questions that matter include when an invoice becomes eligible, whether participation is voluntary, when the supplier is paid and what costs apply. None of these presumes that supplier finance is either beneficial or harmful; they identify the transaction features needed to judge its distributional effects. In this study the public notes settle some classification and funding-status questions, but they do not deliver a supplier-level assessment of net gains.

For investors and analysts, the practical step is to reconcile the financing note before any payment-related ratio is compared across firms. The Lenovo case shows that a material share of the identified programme perimeter can lie outside trade and notes payables. Reporting the conventional measure together with the specific reconciliation is more informative than quietly redefining the metric. The same holds for restated comparatives: a reader should be able to tell whether a change stems from a later reporting vintage, a different denominator convention or a different economic period.

For corporate reporting, the results favour a clear statement of amounts, accounting location and funding status. Those fields let an external user separate the total reported programme from the portion already paid to suppliers and tie both back to the balance sheet. Greater transparency does not remove the need for judgement: balance-date amounts still

omit turnover during the year, and classification does not reveal every contractual economic feature. Even so, the reconciliations show that specific disclosures markedly widen the range of questions public data can answer.

5.3. Generalisation and the meaning of an efficiency claim

The most transferable finding is a measurement principle rather than a company ranking. Where supplier-finance liabilities sit in different captions, a common payment numerator can stand for different financing perimeters. Where balance growth and flow growth diverge, a days-based ratio can move against the underlying monetary balance. Both propositions follow from the reported observations and from exact identities. Their reach extends beyond the three cases, though the size of the resulting differences must be established afresh for any other firm or period.

The study does not lean on the small sample to estimate how common each pattern is. Selection driven by disclosure may over-represent large groups with detailed notes and under-represent firms whose financing arrangements are less visible, and it leaves the experience of smaller suppliers largely outside the reporting perimeter. These restrictions cap external validity, but they do not undo the individual reconciliations. The empirical claim remains the narrow one: these patterns appear in the accounts examined and materially shape their interpretation.

A defensible claim about efficiency needs the asserted mechanism and the observed measure to line up. Faster operations call for evidence on operating processes; cheaper finance calls for evidence on financing costs; an improved buyer cash position calls for a consistent financing boundary. This manuscript tackles the last of these directly and decomposes the operating proxies that come with it. Its conclusion is accordingly narrower than a causal claim, yet more informative than an unqualified assertion that a falling cash cycle proves successful supply chain finance.

The findings also make clear which observations cannot, by themselves, establish programme success or failure. Had a programme expanded while every operating and payment component stayed fixed, the conventional cash-cycle proxy would have stayed fixed by construction, and that stability would not show the financing service to be worthless. In the other direction, had a payable component risen without any quantified programme change, the cash-cycle proxy could have fallen with no evidence of supplier-finance adoption. The observed Lenovo and Midea patterns give these logical distinctions empirical bite, steering interpretation toward the reported components rather than treating the direction of the aggregate as a sufficient programme evaluation.

The accounting reconciliation thus complements, rather than replaces, larger-sample analysis. It is no substitute for a population study, but it identifies features that can alter the meaning of the variables entering one. A larger database would still have to separate programme stocks from annual funding flows, preserve missing exposure status and hold reporting vintages consistent. More observations would sharpen some kinds of statistical precision while leaving these measurement choices just as consequential. The present contribution is to demonstrate those consequences with quantities that can be independently traced and recomputed.

The component results, finally, favour a balanced reading of management performance. The accounts to hand establish changes in financing and operating proxies, but they do not isolate management decisions from business conditions. Describing those changes accurately is more informative than awarding success or failure on the strength of one ratio. The conclusions keep to that discipline while still giving a detailed empirical account of the three reporting pairs.

6. Conclusion

Drawing on public sources alone, the completed analysis finds no uniform alignment between disclosed supplier-finance expansion and shorter cash-cycle proxies. More to the point, it explains why such alignment is not a sufficient test of efficiency. Operating components can move against the aggregate, and materially different financing balances can fall outside the trade-payables numerator. Reconciliation shifts Lenovo's 2025 proxy by 7.43 days and reveals that 25.84% of its disclosed programme balance sits in other payables. These are observable consequences of measurement. They support a component-by-component, liability-consistent reading of working capital while leaving the causal effect of supplier finance unresolved.

Appendix A. Source-to-variable Register

H25: Haier Smart Home Co., Ltd. Annual Report 2025. printed pp.163,165 (statements),272 Note29(d). URL: https://www1.hkexnews.hk/listedco/listconews/sehk/2026/0427/2026042702192.pdf

L25: Lenovo Group Limited 2024/25 Annual Report. printed pp.171,173–174 (statements),220 Note21(b),222 Note22(c). URL: https://doc.irasia.com/listco/hk/lenovo/annual/2025/ar2025.pdf

M24: Midea Group Co., Ltd. Annual Report 2024. printed pp.173,175–176 (statements),271 Note30. URL: https://www1.hkexnews.hk/listedco/listconews/sehk/2025/0424/2025042402398.pdf

Data checks: unit conversions precede all ratios; current and comparative figures come from the same annual report; receivable captions are added without double counting; each decomposition is checked against the cash-cycle identity. The data file preserves missing programme status for Midea by omitting it from the quantified programme series. Missing status is never coded as a zero balance.

Data Availability and Preparation Disclosure

The accompanying reproducibility package contains the hand-collected observations, source URLs and page locators, calculation code, and derived results. Running analysis.py reproduces the primary numerical tables; expanded/analyze_vintage.py reproduces the supplementary reporting-vintage calculations. Source reports remain with their respective publishers. No proprietary database access, confidential audit files or interviews were used. The additional balance-versus-flow decompositions are reproduced by expanded/analyze_depth.py and recorded in expanded/scf_ratio_decomposition.csv.

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