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Analysis of XCMG's Capital Return Payment Capability from the Perspective of Free Cash Flow

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Abstract: This study investigates the dynamic evolutionary trajectory of XCMG's capital return payment capacity through the lens of free cash flow (FCF), leveraging the company's financial data spanning the period from 1998 to 2024. By integrating free cash flow metrics with indicators of debt-servicing capability and profit quality, the research conducts a systematic analysis of the core determinants that shape the firm's ability to meet capital return obligations. The findings reveal that both FCF1 and FCF2 of XCMG exhibit pronounced cyclical volatility; moreover, the rigid growth of interest expenses has the effect of amplifying cash flow gaps, which in turn renders the capital return payment capacity highly sensitive to external financing sources during periods of industry downturn. In light of these results, the paper puts forward a set of recommendations, including the compression of leverage ratios, the optimization of investment pacing, and the strengthening of cash recovery mechanisms, with the aim of providing empirical evidence to support the construction machinery industry in enhancing free cash flow creativity and realizing high-quality development

Keywords: free cash flow (FCF) ; capital return payment ability ; debt repayment ability; earnings quality

1. Introduction

In recent years, against the backdrop of high-quality development, listed manufacturing companies in China have been confronted with the dual challenges of enhancing financial soundness and improving their capacity to meet capital return obligations. As a pillar industry of the national economy, manufacturing exerts a direct impact on the stability and growth of the overall economy. Particularly in the current context of a complex and ever-changing global economic landscape, coupled with increasingly intense market competition, manufacturing enterprises must continuously elevate their financial management capabilities to sustain a competitive edge in the fierce marketplace. Within the construction machinery sector, XCMG Group, as a leading enterprise in China's construction machinery industry, demonstrates typical and representative characteristics in the management of free cash flow and the fulfillment of capital return payments. XCMG not only holds a pivotal position in the domestic market but also wields a certain degree of influence in the international arena. Free cash flow serves not only as a direct manifestation of an enterprise's profitability and cash flow management proficiency but also as a crucial indicator reflecting its debt-servicing capacity and dividend-paying potential (Xie Deren, 2018). Consequently, an exploration into XCMG's free cash flow not only facilitates an understanding of its financial health but also provides a scientific foundation for enhancing its ability to meet capital return commitments.

Furthermore, the management of free cash flow bears significant implications for the long-term sustainable development of an enterprise. A company capable of consistently generating free cash flow indicates that it not only possesses robust profitability and effective cash flow management but also can achieve self-sustained growth and value enhancement without imposing additional financial burdens. Conversely, if an enterprise relies heavily on external financing activities over an extended period—such as issuing bonds or stocks—to satisfy the funding requirements of its daily operations and investment initiatives, this often signals deficiencies in internal cash flow management and asset utilization efficiency. In such scenarios, the company's ability to create free cash flow tends to be weak, asset quality may be suboptimal, and it will struggle to achieve long-term stable growth and value creation (Xie Deren, 2013; Xie Deren et al., 2020).

The marginal contributions of this paper are as follows: From the perspective of free cash flow, this paper conducts a systematic analysis of the capital return payment capabilities of listed companies in China's construction machinery industry, with a specific focus on XCMG as a case study for in-depth investigation. In the existing body of literature, while there exists a considerable volume of research on free cash flow, studies specifically targeting enterprises within China's construction machinery industry remain relatively scarce. This paper thus addresses the research gap in this domain and enriches the application of free cash flow theory within specific industrial contexts.

2. Literature Review

As a critical metric for evaluating corporate financial health and value creation, free cash flow has garnered widespread attention from scholars both domestically and internationally. Jensen (1986) was the first to put forward the concept of free cash flow, highlighting its significant role in addressing corporate agency problems. This pioneering work laid a solid

theoretical foundation for subsequent research on free cash flow and spurred a multitude of empirical studies in the field.

Myers and Majluf (1984) explored the influence of free cash flow on corporate financing decisions from the perspective of information asymmetry. Their findings revealed that under conditions of information asymmetry, enterprises may opt to retain free cash flow rather than resort to external financing to meet investment needs. Lang and Stulz (1994) further examined the relationship between free cash flow and corporate governance structures, discovering that firms with higher levels of free cash flow tend to adopt a more dispersed ownership structure as a means to mitigate agency issues.

Opler et al. (1999) investigated the role of free cash flow in corporate dividend policies, noting that companies with higher free cash flow are more inclined to distribute dividends, whereas those with lower free cash flow tend to retain cash reserves. Bhojraj and Sengupta (2003) validated, through an analysis of capital market data, the conclusion that enterprises with higher free cash flow typically enjoy a higher market value. In more recent studies, Nekhili (2016) found that robust corporate governance mechanisms can significantly reduce the risk of earnings management driven by free cash flow. Padmini (2020) observed that companies with abundant free cash flow are prone to adopting more aggressive dividend policies to lower agency costs, while financial leverage can constrain managers' overinvestment behaviors. Additionally, M.R. Sari et al. (2021) pointed out that firms with high free cash flow are more likely to encounter earnings management problems, particularly when their governance structures are weak.

In China, relevant research has also advanced progressively. Xiao Min (2005) confirmed, through empirical studies, the validity of both the "free cash flow hypothesis" and the "interest transfer hypothesis" in explaining cash dividend behaviors. Chu Junhong and Hu Zhehua (2007) analyzed the nature and statistical measurement methods of free cash flow, and conducted empirical tests on the relationship between free cash flow and capital structure. Wang Ping and Sun Shixia (2009) pointed out that, under the condition of unchanged investment opportunities, the more free cash flow a company holds, the greater its investment scale tends to be.

Mei Bo (2012) empirically found that the agency cost of free cash flow is lower in growing and recessionary industries, whereas it is higher in mature industries. Xie Deren (2013) made a significant contribution by proposing the concept of free cash flow creativity (FCFC), which greatly enriched the theoretical system of free cash flow. Xie Deren and Zhang Mei (2016) conducted empirical research to explore the impact of free cash flow creativity on the capital return payment capacity of A-share listed companies, finding that enterprises with stronger free cash flow creativity are more capable of meeting the return demands of capital providers.

Mou Weiming (2018) discovered that abundant corporate free cash flow tends to enhance cost stickiness. Han Xiaochen et al. (2022) improved the traditional free cash flow discount model by incorporating a fuzzy binary tree approach, thereby enhancing the valuation accuracy of the model. Xie Deren and Liu Jinsong (2022) found that the weaker the free cash flow creativity, the higher the corporate default risk. Most recently, Xie Deren et al. (2023) pointed out that in non-state-owned enterprises, there exists a negative correlation between donation levels and donation capacity—specifically, the stronger a firm’s free cash

flow creativity, the lower its donation level tends to be.

3. Research indicator design

The capacity of an enterprise to fulfill long-term capital return obligations is primarily contingent upon its ability to generate free cash flow. Free cash flow is defined as the residual cash available for distribution to shareholders and creditors after the enterprise has satisfied its own investment requirements. Specifically, it refers to the portion of cash remaining after deducting the funds necessary for essential investment activities—such as equipment upgrades, business expansion, and other capital expenditures—from the net cash flow generated through the enterprise's daily operating activities.

From this perspective, free cash flow serves as a critical indicator of whether a company possesses sufficient funds to reward investors while simultaneously maintaining and expanding its core business operations. In other words, it quantifies the extent to which a company can autonomously generate additional cash flow that is not tied to operational continuity, which can then be allocated to dividend payments, debt repayment, or other forms of capital returns. To delineate free cash flow with greater precision, it can be decomposed into two fundamental components: the first is net cash flow from operating activities, which represents the balance derived by subtracting cash outflows (such as payments to suppliers, employee salaries, and taxes) from the cash inflows generated by the company's routine operational activities (including revenue from product sales, service provision, and other core business transactions); the second is net cash flow from investing activities, which reflects the difference between cash outflows incurred when acquiring fixed assets, intangible assets, or other long-term investments, and cash inflows obtained from the disposal of these assets (such as proceeds from selling equipment, real estate, or equity investments). By integrating these two components, we arrive at the basic calculation formula for free cash flow:

Free cash flow = net cash flow from operating activities + net cash flow from investing activities

Free Cash Flow 1 (FCF1)

The free cash flow 1 (FCF1), as defined herein, is constructed solely from the perspective of a company's overall value creation. However, for modern enterprises, maximizing shareholder value stands as an indispensable strategic objective. Consequently, it becomes imperative to analyze free cash flow through the lens of shareholder value creation. In the course of daily operations, companies often secure funds through borrowing (i.e., debt financing), with such funds typically originating from banks or other creditors. The capital provided by these creditors is not without cost; instead, it requires the payment of interest as both compensation for the use of funds and a return on the creditors' investment. Owing to the legally binding nature of contractual agreements, the portion of funds allocated to interest expenses constitutes a cash outflow that the company cannot arbitrarily alter or avoid. As such, this portion cannot be classified as "free cash" available for distribution to shareholders. Against this backdrop, a formula for free cash flow rooted in the perspective of shareholder value creation can be derived, specifically:

Free cash flow = net cash flow from operating activities + net cash flow from investing activities - interest expense

Free Cash Flow 2 (FCF2)

4. Case introduction and analysis

4.1. Overview of XCMG group

Xugong Machinery Co., Ltd. (hereinafter referred to as "Xugong Machinery", stock code: 000425) traces its origins back to 1943 and made its debut on the Shenzhen Stock Exchange in 1996; with its corporate headquarters situated in Xuzhou City, Jiangsu Province, the company stands as a preeminent enterprise within China's construction machinery sector and a globally recognized manufacturer of construction equipment. Xugong Machinery has consistently maintained a strategic focus on the core domain of construction machinery, and over the course of more than eight decades of development, it has evolved into a large-scale comprehensive industrial group, boasting a complete portfolio of product lines that span lifting machinery, excavators, compaction machinery, road machinery, concrete machinery, pile-driving machinery, mining machinery, aerial work machinery, intelligent logistics equipment, and new energy construction machinery. Endowed with leading-edge technological research and development capabilities, a full range of high-quality products, and a global marketing and service network, Xugong Machinery has secured a pivotal position in both domestic and international markets; notably, in the realm of high-end equipment—such as super-large tonnage cranes and large excavators—it has achieved critical breakthroughs in core technologies, while its international footprint has continued to expand, with products exported to over 180 countries and regions worldwide, thereby establishing itself as a global brand benchmark for Chinese construction machinery.

4.2. Analysis of XCMG group's capital return payment capability

The essence of the capital returns payment ability lies in "whether a company can cover interest, maintain operations, and return capital using endogenous cash flow without relying on external capital infusions." This chapter takes the complete time series from 1998 to 2024 as a sample, integrating free cash flow (FCF) with debt repayment capacity and profit quality to analyze the company's ability to pay capital returns. Given that China's A-share companies only started preparing cash flow statements in 1998, although XCMG was listed in 1996, this paper selects XCMG's financial data from 1998 to 2024 for statistical analysis.

Table1

Unit: 100 million/yuan

years	FCF1	FCF2	ROA	ROE	Current Ratio	Quick Ratio	Debt-to-asset ratio	Equity Multiplier
2024	38.02	24.33	0.037171	0.098963	1.354563	0.946725	0.624391	2.662342
2023	49.82	33.29	0.032323	0.091083	1.285921	0.911023	0.64513	2.817935
2022	-40.72	-56.05	0.024529	0.078578	1.337335	0.973794	0.687841	3.203494
2021	-0.52	-6.62	0.051325	0.151933	1.349126	1.082549	0.662188	2.960225
2020	17.70	11.67	0.040804	0.109617	1.37957	1.122634	0.627759	2.686433
2019	22.99	19.52	0.047164	0.108344	1.637343	1.353026	0.564685	2.297189
2018	3.92	0.47	0.033562	0.067753	1.690507	1.312956	0.504644	2.018749
2017	18.51	14.69	0.02067	0.042766	1.730681	1.282404	0.516661	2.068942
2016	9.05	4.18	0.004925	0.010575	1.561352	1.221159	0.534267	2.147151
2015	-16.44	-23.71	-0.00147	-0.00304	1.702435	1.403899	0.517557	2.072785
2014	-1.33	-10.22	0.00833	0.019909	1.84887	1.458529	0.581602	2.39007

2013	-25.51	-32.81	0.03153	0.07853	1.958613	1.614369	0.598504	2.490682
2012	-63.01	-67.74	0.054361	0.140717	1.701986	1.392845	0.613681	2.588535
2011	-51.39	-53.09	0.097328	0.222938	1.7086	1.296804	0.563431	2.290589
2010	-3.09	-3.78	0.117672	0.242076	1.638257	1.181901	0.513903	2.057202
2009	29.63	28.61	0.113605	0.38842	1.05954	0.728419	0.707521	3.419048
2008	1.30	1.03	0.027994	0.077294	1.067582	0.572408	0.637826	2.7611
2007	3.86	3.57	0.008139	0.020702	1.248372	0.691337	0.606849	2.543552
2006	2.62	2.11	0.003162	0.00952	1.124704	0.539921	0.667893	3.011076
2005	1.13	0.49	-0.04053	-0.1194	1.12435	0.535223	0.660507	2.945566
2004	-3.00	-3.54	0.018841	0.052974	1.159924	0.483569	0.644346	2.811722
2003	-1.26	-1.59	0.037299	0.097906	1.218868	0.475833	0.619032	2.624895
2002	0.03	0.03	0.0418	0.099941	1.221788	0.543289	0.581754	2.390935
2001	-1.18	-1.18	0.040541	0.08895	1.464896	0.762616	0.544233	2.194102
2000	-0.18	-0.18	0.050182	0.118049	1.327928	0.619284	0.574906	2.352422
1999	-0.38	-0.38	0.052267	0.135512	1.27261	0.594221	0.614299	2.59268
1998	0.38	0.38	0.041572	0.121031	1.182807	0.729551	0.656515	2.911334

With respect to free cash flow dynamics, the trajectory of XCMG's conventionally defined free cash flow metric (FCF1) during the period 1998–2024 exhibits pronounced cyclicality. Specifically, the indicator attained a cyclical apex of RMB 2.963 billion in 2009, contracted precipitously between 2011 and 2013, registering a nadir of negative RMB 63.01 billion in 2012, and subsequently staged a monotonic recovery from 2016 to 2019, peaking at RMB 2.299 billion in 2019. Thereafter, FCF1 deteriorated to negative RMB 4.072 billion in 2022 before re-entering an expansionary phase from 2023 to 2024, ultimately achieving RMB 3.802 billion in 2024. The more stringent measure, FCF2, defined as FCF1 net of interest expenditures, exhibits commensurately wider amplitude, oscillating from negative RMB 5.309 billion in 2011 to positive RMB 3.329 billion in 2023. Escalating interest charges impose a persistent and inflexible decrement upon FCF2, thereby exacerbating the cash deficit during intervals in which FCF1 is already negative. From a cash-flow-composition vantage, operating cash flow (CFO) constitutes the primary determinant of FCF1, while the magnitude of net cash outflows under the investing cash-flow category (CFI) traces the identical cyclical pattern; for instance, the pronounced CFI outflow recorded in 2012 materially compressed FCF1 for that fiscal year.

Regarding solvency, the debt-to-assets ratio fluctuated from 65.65 percent in 1998 to a cyclical peak of 68.78 percent in 2022, subsequently moderating to 62.44 percent in 2024. The equity multiplier exhibits synchronous variability, corroborating an elevated leverage profile. As of 2024, the current ratio and quick ratio registered 1.35 and 0.95, respectively. Although the current ratio marginally exceeds the customary industry threshold, the protracted sub-unity quick ratio signals an elevated concentration of inventory and contract assets within current assets, thereby indicating constrained immediate liquidity. The FCF2-based interest-coverage ratio manifests pronounced intertemporal volatility; during industry downturns, this metric declines, evidencing a fragile debt-service safety margin under scenarios of demand contraction or interest-rate escalation. A cash-to-short-term-debt ratio below unity implies that maturing obligations necessitate refinancing, engendering discernible rollover pressure.

Concerning earnings quality, return on equity (ROE) experienced cyclical escalation between 1998 and 2009, culminating at 38.84 percent in 2009, followed by a secular decline to 9.90 percent in 2024. In select years—exemplified by 2011—ROE remained elevated at 22.29 percent, yet FCF2 registered negative RMB 5.308 billion, yielding a depressed cash-to-profit ratio (CFO/net profit) and an evident divergence between accounting profitability and cash generation. Conversely, in 2020, ROE stood at 10.96 percent with relatively congruent cash-flow performance; however, the deterioration of ROE to 9.90 percent in 2024 signals a commensurate erosion in earnings quality.

Collectively, the cyclical oscillations of FCF1 and FCF2, the inexorable escalation of interest burdens, and the persistently elevated leverage jointly configure XCMG's capital-return-disbursement capacity as acutely "prosperity-dependent." During industry up-cycles, FCF2 suffices to service both interest and dividends; conversely, at cyclical troughs, negative FCF2 obliges the corporation to rely upon external financing to meet debt-service and dividend commitments. Although FCF2 exhibited recovery in 2024, solvency indicators such as the debt-to-assets ratio underscore the imperative for financial-structure optimization. Consequently, management must pursue leverage compression, turnover enhancement, and cash-collection intensification to fortify the firm's endogenous capacity for capital remuneration.

5. Suggestions on improving XCMG's capital return payment capability

5.1. Recalibrate operations to amplify free cash flow

5.1.1. Data-driven demand calibration and systematic acceleration of Cash-Flow conversion across the operating cycle

Leveraging the globally deployed sales network spanning more than 180 sovereign states and territories, the corporation shall intensify granular market reconnaissance along the entire trajectory of the Belt and Road Initiative, subsequently formulating meticulously differentiated product portfolios calibrated to heterogeneous regional infrastructure exigencies. Priority shall be accorded to the systematic promotion of super-large-tonnage crane systems and new-energy construction machinery—product categories distinguished by elevated value-added coefficients—so as to expand sales gross profit margins. Concurrently, customer credit protocols are to be rigorously optimized, the velocity of accounts-receivable recovery materially accelerated, and the cash-conversion cycle decisively compressed. Illustratively, the corporation will institutionalize an "order prepayment plus installment payment" contractual architecture for large-scale overseas clientele, thereby systematically attenuating the probability and severity of bad-debt contingencies.

5.1.2. Focus on core product lines, control costs and expenses

Concentrate strategic resources on the firm's core product portfolios—specifically high-advantage categories such as lifting machinery and excavators—so as to exploit economies of scale and thereby compress unit production costs. Concurrently, rigorously

curtail research-and-development and marketing expenditures directed at peripheral, non-core segments to preclude resource fragmentation. Intensify collaborative governance across the entire supply-chain network by executing long-term, price-locked procurement agreements with pivotal component suppliers; simultaneously embed lean-manufacturing protocols to minimize inventory accumulation. These synchronized measures directly mitigate the persistent cash-realization pressure arising from a chronically sub-unity quick ratio.

5.1.3. Balance the domestic and international market structure and disperse the risk of cyclical fluctuations

Systematically reconfigure the geographical revenue composition by counterbalancing domestic market deepening with aggressive yet disciplined international expansion, thereby attenuating exposure to region-specific cyclical volatility. Building upon a reinforced domestic franchise, deploy an internationalization architecture anchored by green-field assembly facilities and disciplined acquisitions of entrenched local brands, progressively diluting reliance upon any single macroeconomic jurisdiction. Illustratively, establish a fully-integrated assembly hub in Southeast Asia to compress lead-times, circumvent emergent trade barriers, and elevate the overseas revenue share, thereby generating a natural hedge that dampens the cash-flow perturbations originating from domestic industry cycles.

5.2. Synchronize investment cadence with Cash-Flow capacity

5.2.1. Forge a dynamic investment-cycle coupling mechanism to preclude overexpansion

In strict accordance with the pronounced cyclicality inherent to the construction-machinery sector, capital-expenditure (CAPEX) scheduling must be deliberately counter-cyclical. During phases of pronounced industry prosperity—exemplified by the 2023–2024 up-cycle—management should exercise disciplined restraint in scaling CAPEX so as to avoid a repetition of the severe free-cash-flow erosion that occurred in 2012, when FCF1 plunged to negative RMB 6.301 billion as a direct consequence of aggressively expanded investment outlays. Conversely, when the sector enters a cyclical trough, the firm should proactively curtail or defer discretionary capital projects, prioritizing the preservation of liquidity and the safeguarding of cash-flow adequacy above all other strategic objectives.

To institutionalize this cyclical linkage, investment decisions must be formally tethered to the prevailing magnitude of operating cash flow (CFO). Specifically, CAPEX budgets should be calibrated so that annual capital outlays do not exceed eighty percent of the corresponding CFO, thereby creating an endogenous funding buffer that materially diminishes dependence on external debt or equity financing. This self-financing discipline ensures that investment rhythms remain internally validated by the firm’s own cash-generation capacity, simultaneously mitigating both liquidity risk and the amplification of leverage during cyclical downturns.

5.2.2. Optimize investment structure and focus on high-return areas.

Concentrate capital allocation on strategically pivotal domains—namely, high-end equipment upgrades exemplified by intelligent mining machinery and the entire electric engineering-machinery value chain under the green-manufacturing rubric. These segments are characterized by formidable technological barriers and demonstrably resilient revenue profiles, thereby securing superior risk-adjusted returns on invested capital. Simultaneously, institute a rigorous ex-ante appraisal and approval protocol for any expenditure directed at non-core ventures exhibiting depressed gross margins and sluggish asset-turnover metrics. Proceed to systematically monetize under-utilized or non-strategic assets through targeted disposal programs, channeling the resultant proceeds directly into the augmentation of discretionary free cash flow.

5.2.3. Establish a Post-Investment evaluation mechanism for timely loss containment

Implement a rigorous quarterly cash-flow tracking and performance-evaluation regimen for all projects that have already entered commercial operation. Should a project fail to deliver the originally projected returns for two consecutive fiscal years, an immediate rectification protocol or a controlled exit mechanism must be activated without delay. Illustratively, re-examine the underperforming capacity-expansion initiatives that precipitated the pronounced FCF1 contraction recorded in 2022; subsequently, mobilize the previously immobilised capital through either an equity-transfer transaction or a strategic asset-leasing arrangement, thereby restoring liquidity and safeguarding overall free-cash-flow integrity.

5.3. Optimizing Capital Structure And Enhancing Debt Repayment Safety Margin

5.3.1. Proactively Deleverage And Mitigate The Rigid Burden Of Interest Expenditures

Implement a phased deleveraging program that methodically compresses the debt-to-asset ratio from 62.44 percent in 2024 to an industry-aligned corridor of 55–60 percent. Capitalize this transition by augmenting equity capital through a judicious mix of seasoned equity offerings and targeted debt-to-equity swaps, thereby directly extinguishing a commensurate tranche of interest-bearing obligations. Concurrently, prioritize the accelerated retirement of high-cost short-term credit facilities and refinance the residual balance with long-dated, low-coupon bonds whose maturity profiles are deliberately synchronized with the cash-flow gestation periods of underlying investment projects. Such tenor extension mitigates the recurring necessity of “borrowing new to repay old,” attenuates rollover risk, and materially narrows the FCF2 deficit customarily observed during cyclical troughs in the construction-machinery sector.

5.3.2. Reinforce Capital Budget Management And Enhance Cash Flow Reserves

Institute an integrated capital-budget architecture that dynamically triangulates operating cash flow, investment requirements, and financing schedules, thereby ensuring that the ratio of monetary funds to short-term interest-bearing liabilities—the cash-to-short-term-debt ratio—is durably elevated above unity. During industry up-cycles such as 2023–2024, ring-fence twenty to thirty percent of annual free cash flow as a dedicated counter-cyclical reserve. This reserve will be earmarked exclusively for the service of interest obligations and for mission-critical capital expenditures that arise during subsequent downturns, materially insulating the firm from heightened sensitivity to external funding sources.

5.3.3. Enhance Asset Liquidity And Strengthen Short-Term Debt Repayment Capacity

Leverage supply-chain-finance instruments and targeted accounts-receivable securitization programmes to unlock latent liquidity embedded in existing asset bases, thereby accelerating the transformation of chronically frozen inventory balances and contract-asset positions into immediately deployable cash. Illustratively, execute selective factoring transactions on high-credit-quality receivables to compress collection lead-times; concurrently rationalise the inventory matrix by liquidating obsolete or slow-moving stock, driving the inventory-turnover metric to a level that demonstrably exceeds the industry median. These coordinated initiatives directly redress the persistent quick-ratio shortfall by elevating the quantum of highly liquid current assets relative to maturing short-term obligations.

5.4. Refine Governance Architecture To Fortify Risk Management And Decision-Making Efficiency

5.4.1. Establish a cash flow-oriented governance mechanism

Establish a “Free Cash Flow Management Committee” as a permanent subcommittee of the Board of Directors, integrating senior representatives from Finance, Strategy, and Risk Control to jointly deliberate and ratify the annual investment blueprint, the comprehensive financing schedule, and the dividend distribution policy, thereby guaranteeing strict congruence between the magnitude of capital deployment and the firm’s demonstrable cash-flow-generative capacity. Embed the FCF2 interest-coverage ratio and the cash-to-short-term-debt ratio into the executive performance scorecard, directly coupling these metrics to variable remuneration so as to neutralize managerial proclivities toward overinvestment.

5.4.2. Strengthen internal control and risk warning

Construct an integrated risk-management architecture that spans the entire "investment–financing–operation" continuum; for every project whose capital expenditure exceeds RMB 500 million, conduct a compulsory cash-flow stress test that models solvency under a standardized industry-downturn scenario. Embed a free-cash-flow early-warning system that automatically triggers emergency protocols—such as an immediate freeze on discretionary investment and an accelerated cost-reduction program—whenever FCF1 remains negative for two consecutive quarters or the FCF2 interest-coverage ratio falls below 1.5 times.

5.4.3. Improve the professional level of management

Recruit hybrid professionals who combine deep construction-machinery expertise with advanced financial-management competencies, and institutionalize recurrent cash-flow-centric training programs for senior executives with a view to sharpening the organization's predictive acumen concerning cyclical fluctuations. Formalize a tripartite "strategy–finance–operations" collaborative decision-making protocol that subjects any expansionary initiative to simultaneous strategic, financial, and operational vetting, thereby precluding cash-flow disruption attributable to ill-considered growth commitments. Illustratively, had such a mechanism been operative during the 2022 industry downturn, management could have preemptively downsized the investment pipeline and safeguarded liquidity adequacy.

6. Conclusion

Employing a longitudinal free-cash-flow lens, this paper undertakes a comprehensive examination of XCMG's capital-return disbursement capacity, utilizing audited financial data spanning the 1998–2024 horizon. Empirical findings reveal that both entity-level free cash flow (FCF1) and shareholder-oriented free cash flow (FCF2) exhibit pronounced cyclical oscillations that are tightly synchronized with industry cycles, investment cadence, and operating cash-flow (CFO) dynamics. The principal driver of these fluctuations is the systematic misalignment between capital-expenditure (CAPEX) trajectories and CFO generation: pro-cyclical overinvestment during industry upswings precipitates acute free-cash-flow deficits—exemplified by the 2012 episode in which FCF1 collapsed to negative RMB 6.301 billion—whereas disciplined investment retrenchment during downturns (e.g., the 2016–2019 contraction phase) enables a sustained FCF1 recovery.

The firm's capital-return payment capability is therefore intrinsically "prosperity-dependent." At cyclical peaks (illustratively, 2023), abundant free cash flow (FCF2=RMB 3.329 billion) comfortably services interest obligations and shareholder distributions, affording a robust debt-service safety buffer. Conversely, at troughs (e.g., 2022), negative free cash flow (FCF2 = –RMB 5.604 billion) renders both debt amortization and capital returns critically reliant on external financing, thereby amplifying financial risk.

Structural fragility is further compounded by chronically elevated leverage metrics: the average debt-to-asset ratio of 60.2 %, sustained high equity-multiplier readings, a persistently sub-unity quick ratio, and an inadequate cash-to-short-term-debt ratio collectively erode solvency resilience. Intertemporal disparities between accounting profitability and cash

generation—most notably in 2011 when ROE reached 22.29 % despite FCF2 of –RMB 5.309 billion—underscore the imperative to improve earnings quality.

In aggregate, XCMG's capital-return payment capability is constrained by the interplay of free-cash-flow creativity, interest-expense rigidity, and leverage intensity. Beyond delineating the archetypal free-cash-flow and capital-return profile of a leading construction-machinery enterprise, this study furnishes actionable guidance for industry peers seeking to refine financial strategies and fortify endogenous capital-return capacity. By strengthening free-cash-flow generation, synchronizing investment with cash-flow sufficiency, optimizing capital structure, and enhancing governance mechanisms, firms can materially stabilize capital-return disbursements and establish a resilient foundation for the sector's high-quality, sustainable development.

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