

Beyond Inventory

The New Era of Credit in Cross-Border E-commerce

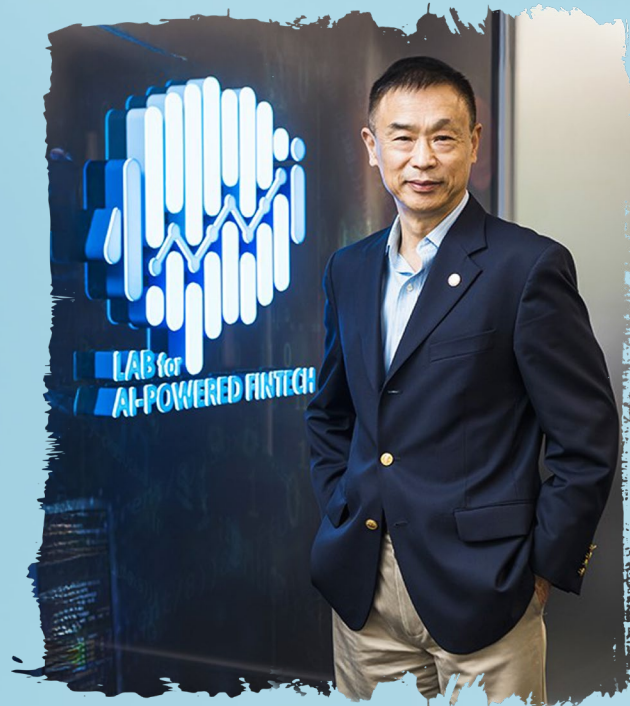


Professor Houmin Yan is Director of the Laboratory for AI-Powered Financial Technologies (AIFT), Chair Professor of Management Sciences, and Director of MSc in Accounting and Finance with AI and Fintech Applications at City University of Hong Kong. Here he explains how AIFT is pioneering a new era of smart credit in supply chain finance.

Financial technologies are rapidly changing how money moves around the world, especially in the complex world of supply chain finance. We are seeing a paradigm shift, moving away from older, less efficient methods toward a new era powered by smart credit and a fresh perspective on Risk-Weighted Assets (RWA). This transformation is being spearheaded by innovators like the Laboratory for AI-Powered Financial Technologies, a startup supported by the Hong Kong government's InnoHK platform, which is bringing together cutting-edge research from City University of Hong Kong and Columbia University.

From Pledges to Platforms

Traditionally, cross-border supply chain finance often relied on tangible assets like inventory pledges and warehouse receipts. While widely used, this approach had its drawbacks: a lack of transparency, higher risks of fraud, and sluggish financing processes. Imagine a scenario where a small business in China needs funds to produce goods for an overseas buyer. Under the old



system, they might have to tie up their physical inventory as collateral, a cumbersome and often slow process.

However, the rise of global e-commerce giants like Amazon, Shopee, and TikTok has dramatically changed the game. These platforms generate a

wealth of real-time sales and logistics data. This data is the key to the new paradigm. Instead of relying on physical inventory, financing is now increasingly shifting towards accounts receivable-based approaches, leveraging the verifiable cash flow and sales data generated by these platforms.

Smart Credit and the Power of Data-Driven Models

At the heart of this shift is smart credit, which utilises advanced analytics and AI to assess creditworthiness. A prime example is the KMV model. The KMV model is a structural credit risk framework, originally developed by KMV Corporation and later acquired by Moody's,

BOCHK Launches "Account Opening EXPRESS" for Amazon E-commerce Customers with AIFT Analysis Report

Bank of China (Hong Kong) (BOCHK) has launched the "Account Opening EXPRESS for Amazon E-commerce Customers", offering exclusive, fast-track account opening services for Amazon-based e-commerce businesses. This initiative supports the sector's growth by streamlining onboarding through the use of the E-commerce Analysis Report from AIFT.

Formed through a strategic partnership between BOCHK and AIFT, the service leverages AIFT's advanced data analytics and research to provide in-depth business insights and risk assessments. These reports support BOCHK's Know Your Customer (KYC) procedures, enabling quicker and more efficient account openings.

This Express Channel allows banks to better understand the operations of e-commerce clients, delivering more tailored financial services. The collaboration marks a key step in applying financial technology to enhance inclusive finance in Hong Kong.

For more details, visit the BOC CONNECT mobile app.

grounded in Merton's (1974) option-theoretic model of corporate liabilities. In this formulation, a firm's equity is modeled as a European call option on the value of its underlying assets, where the strike price corresponds to the book value of debt maturing at the default horizon. The analytical tractability of this approach stems from the Black-Scholes option pricing model (1973), which provides closed-form solutions for valuing equity given asset volatility and capital structure.

Within the KMV implementation, the central output is the Distance to Default (DD), which is empirically calibrated against historical default data to produce the Expected Default Frequency (EDF)—a market-implied, forward-looking estimate of the firm's Probability of Default (PD). By the early 2000s, the concepts of PD, Loss Given Default (LGD), and DD had become integral to the banking industry's credit risk evaluation frameworks and were formally embedded in regulatory capital and stress testing regimes (e.g., Basel II/III). A critical requirement of this approach, however, is that the firms under evaluation are publicly listed with sufficient equity market data available.

Basel III and the Role of External Ratings

In the world of banking, regulations play a crucial role in ensuring financial stability. The Basel III Accord provides a framework for how banks calculate their capital requirements and manage risk. Under its standardised Approach, Basel III allows banks to use external credit ratings from recognised credit rating agencies, like Moody's Investors Service, to assign risk weights to different assets. This means that a loan to a highly-rated company would require less capital for the bank to hold than a loan to a lower-rated company.

However, Basel III also offers an Internal Ratings-Based (IRB) Approach, which permits banks to use their own internal models to calculate credit risk metrics such as PD, Loss Given Default (LGD), and

Exposure at Default (EAD). This is where models like the KMV model, and AIFT’s innovations, become incredibly valuable. Moody’s KMV model, with its Expected Default Frequency (EDF) calculations, provides explicit estimates of PD, enabling banks to use more sophisticated, data-driven approaches to risk assessment under the IRB framework.

Hong Kong’s Strategic Role and Regulatory Alignment

The Hong Kong Monetary Authority (HKMA) plays a vital role in ensuring the integrity and stability of Hong Kong’s financial system. The HKMA issues guidelines on how recognised institutions should estimate and confirm Probability of Default for capital adequacy ratio purposes. These guidelines emphasise the importance of regularly comparing actual default rates with PD estimates and ensuring that validation methods remain consistent across economic cycles. Furthermore, the HKMA expects banks to actively use their internal ratings in various aspects of their operations, from credit approval to risk monitoring and reporting.

AIFT’s innovative credit risk modeling method aligns perfectly with these regulatory expectations. By leveraging observable, controllable, and interconnected real-time cash flow data, AIFT’s model provides a robust foundation for estimating PD, LGD, and expected returns. This not only aids in portfolio risk management but also helps financial institutions comply with regulatory requirements, strengthening Hong Kong’s position as an international financial hub.

AIFT Patented Upgrades

AIFT has taken the KMV concept even further, developing its own patented upgrades to the KMV model specifically designed for non-listed enterprises that operate on e-commerce

platforms. This enhanced model doesn’t just support credit risk assessments for small and medium-sized enterprises; it also allows for real-time dynamic updates and risk aggregation capabilities. This means lenders can get a continuously updated, more accurate picture of an SME’s financial health, significantly reducing risk and improving efficiency.

This move from traditional Asset-Backed Loans (ABL) to more market-driven Asset-Backed Securities (ABS), with the potential for tokenisation based on Real-World Assets, is a fundamental architectural change. Tokenisation, in particular, could revolutionise liquidity by representing real-world assets (like accounts receivable) as digital tokens on a blockchain, making them easier to trade and finance.

The Journey to Commercialisation

AIFT is proactively addressing challenges such as the impact of legal and regulatory frameworks; changes in investors’ exit mechanisms (today venture capitalists often expect results within 2-3 years); building customer acquisition channels; and designing and utilising innovative technology consistent with industry experience. A multi-pronged strategy has been developed:

• **Dual-Track Market Strategy**
To navigate regulatory complexities, AIFT is employing a dual-track market strategy, targeting both regulated and unregulated domains. This allows us to test and refine our technology in less restrictive environments while simultaneously laying the groundwork for future regulatory compliance. A key example is the partnership with Shenzhen Huazhongtong (HZT) for factoring services for Amazon merchants. As HZT lists its loan products on the Macau Exchange, AIFT’s model will be crucial for evaluating and structuring these offerings,



gaining valuable experience and demonstrating its capabilities.

• **Alternative Exit Strategy**
To align with investors’ shorter return expectations, AIFT is pursuing an alternative exit strategy. This involves collaborating with listed companies to integrate AIFT’s technology and operations into existing frameworks. This approach provides investors with earlier liquidity through financial instruments like rights issues or placements, while AIFT benefits from the established resources, networks, and market presence of these larger entities, accelerating mutual growth.

• **Partnership-Driven Customer Acquisition Strategy**
To overcome the challenge of customer acquisition, AIFT is focusing on joint ventures or mergers and acquisitions (M&A) with companies that already possess established sales networks. This allows AIFT to quickly tap into existing customer bases, accelerate market penetration, and scale operations more effectively. The collaboration with Changying Technology Services (CYTS) on a supply chain finance project is a prime example of this, leveraging CYTS’s expertise and market share to drive growth.

• **Clear IP Strategy**
Protecting intellectual property is crucial for safeguarding competitive advantage. AIFT is intensifying its efforts to file patents, demonstrating the uniqueness and defensibility of the technology. Robust IP protection not only instills confidence in investors and partners but also opens up new licensing opportunities and provides additional revenue streams, reinforcing AIFT’s long-term business strategy.

The landscape of supply chain finance is undergoing a profound transformation, driven by advancements in AI, data analytics, and a fresh look at how credit risk is assessed. AIFT, with its innovative credit risk modeling and strategic approach to commercialisation, is at the forefront of this shift, working to redefine the fintech landscape and shape a more digital, inclusive, and intelligent financial future.



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