Business Prospects

Chinese Creativity and Innovation Development Association (CCIDA)
journal homepage: www.ccidanpo.org

https://doi.org/10.52288/bp.27089851.2022.12.02

Research on the J.P. Morgan in Digital Ecosystem

Ting Zeng [1, *]

[1] School of Finance, Xiamen University Tan Kah Kee College
***** Correspondence: 2408659089@qq.com

Received: 2022.06.26; **Accepted:** 2022.09.26; **Published:** 2022.12.01

Abstract: J.P. Morgan is a global leader in financial services, offering solutions to the world's most important corporations, governments and institutions in more than 100 countries. The paper mainly analyzes the leader of digital transformation in the banking industry by Grey Relation Analysis. J.P. Morgan is actively deploying advanced technologies such as blockchain and artificial intelligence to enhance its digital capabilities and promote the implementation of digital scenarios. We believe that the research into J.P. Morgan's digital transformation has important reference significance for China's banking institutions to accelerate digital transformation and build the core competitiveness of digital banks with technological innovation as the key gene.

Keywords: Universal Service Positioning; Top-level Digital Strategy; Wholesale Business Scenario Application; Grey Relation Analysis

1. Introduction

J.P. Morgan Chase was founded in 1968 as a universal provider of services banks, and J.P. Morgan is one of the most profitable banks in the world, with more than $2.5 trillion in assets and more than $1.5 trillion in funds under management. The company has 772 sales staff worldwide, covering nearly 5,000 institutional investors. Equity research covers 5,238 listed companies, including 3,175 in Asia.

Table 1. J.P. Morgan's finance (As of for the year ended December 31, in million dollars).

Year	2019	2020	2021
Total net revenue	115,720	119,951	121,649
Total noninterest expense	65,269	66,656	71,343
Pre-provision profit	50,451	53,295	50,306
Provision for credit losses	5,585	17,480	9,256
Income before income tax expense	44,866	35,815	59,562
Income tax expense	8,435	6,684	11,228
Net income	36,431	29,131	48,334

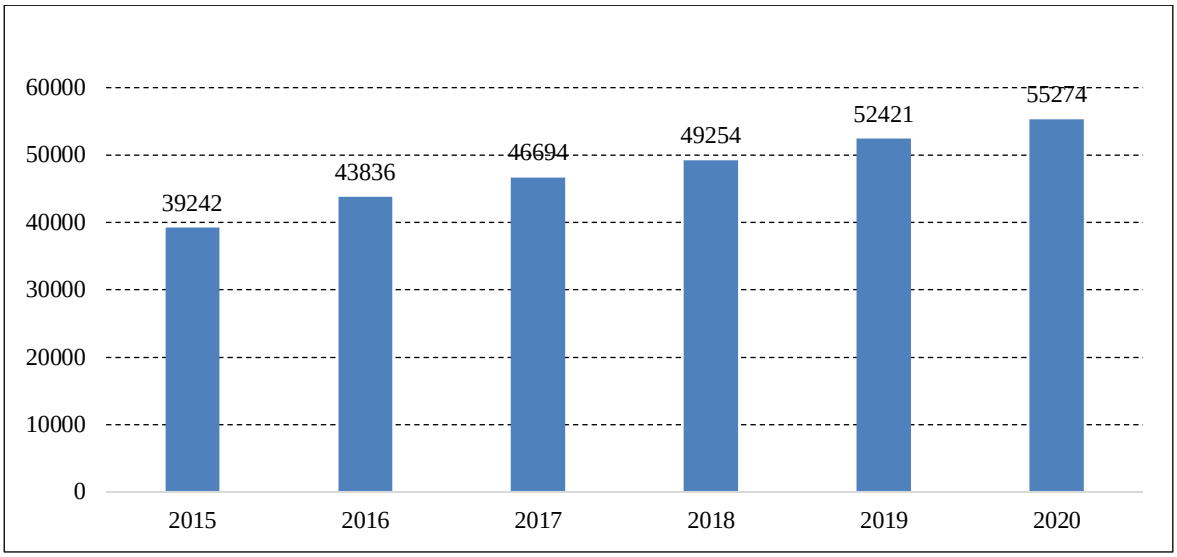
Source: J.P. Morgan's finance reports.

In 2020, under the impact of COVID-19, J.P. Morgan, as a benchmark of the banking industry in the United States and even around the world, showed strong resilience, seized market opportunities, gave full play to the advantages of digital transformation, actively fulfilled social responsibilities, and bucked the trend of rapid growth in asset scale.

The COVID-19 pandemic since 2020 has accelerated the digital transformation of all industries. Over the past few years, J.P. Morgan has aggressively embraced digital, using data intelligence as a tool to build channels, customer experience, product research and development, business operations, risk management and other aspects of innovation and optimization. J.P. Morgan also implemented emerging technologies in trade finance, cross-border payment, compliance review, repurchase transactions and other business scenarios, and the creation of an online, open and intelligent whole ecosystem, striving to achieve the transformation and

development of traditional banking business. As one of the Big Four banks in the United States, J.P. Morgan Chase is poised to take a lead in the digital economy.

J.P. Morgan was named one of the 50 most innovative companies by The Boston Consulting Group. Its customer-centric digital strategy is transforming various business segments of the bank and reaping huge economic benefits. “Mobile first-digital first-multiple channels” services and “deep business integration-total payment solutions” are the key objectives of J.P. Morgan’s digital strategy. Based on the basic understanding that customers are the center of all business, they believe that digital capabilities matter to the survival of the bank.



Data Sources: Earnings Release Financial Supplement.

Figure 1. Active users on J.P. Morgan digital platforms.

Through the digital ecological platform, the company explores and builds a digital customer acquisition model, enriches channel types, and creates new customer acquisition growth points. In 2018, more than 1 million users opened checks or savings accounts through digital channels; In 2019, an average of 28 million users visited the bank through digital channels every day. Some self-help functions of digital channels also reduced the average number of transactions of users in traditional branches by 49% since 2014; In 2020, the number of active users of digital platforms in J.P. Morgan Chase exceeded 55 million, representing a year-on-year increase of approximately 6%, and the number of users of digital channels reached a new high. The COVID-19 epidemic has further accelerated this digital trend: more than half of the new active users of the company’s digital platforms are new users over the age of 50. After the outbreak, 40% of customers cashed electronic checks through the mobile channel Chase QuickDeposit, compared with 30% before the outbreak.

J.P. Morgan Chase has taken many measures to attract and build a strong team of high-quality technical personnel, including continuously introducing high-end technical experts, actively recruiting technical personnel, and attracting technical staff through war investment and mergers and acquisitions. In 2020, J.P. Morgan Chase had more than 50,000 technologies out of approximately 250,000 employees worldwide, accounting for approximately 20% of the total staff, of which more than 30,000 are engaged in development and engineering work. Apart from the traditional recruitment channels, J.P. Morgan Chase also attracts and supports talents in the technical field through strategic investment and merger and acquisition.

2. Major Fields of Digital Innovation

J.P. Morgan established a blockchain Center to develop and research blockchain technology and launched Quorum, a licensed blockchain platform designed to meet the needs of financial institutions and enterprises to process private transactions using blockchain technology. In February 2019, J.P. Morgan Chase launched MorganCoin, a cryptocurrency designed to address the problem of costly and inefficient settlement processes in financial markets and the volatility of cryptocurrencies. Tied to the U.S. dollar, each Morgan coin can be exchanged for $1 from a J.P. Morgan bank account, instantly clearing payments between customers. When MorganCoin is connected to the public blockchain network via a hybrid platform, users can interoperate

between J.P. Morgan's private ledger account and the public blockchain. Through the hybrid network, it benefits from the liquidity and market access of the public blockchain, while ensuring data privacy and security through the licensing chain (Hu, 2022)

To better understand how J.P. Morgan is using technology to increase revenue, let's look at the two main scope of J.P. Morgan's business. J.P. Morgan's business scope involves investment banking, face financial services to consumers and small businesses, commercial banking, financial transaction processing, asset management, etc.

Table 2. J.P. Morgan's business scope.

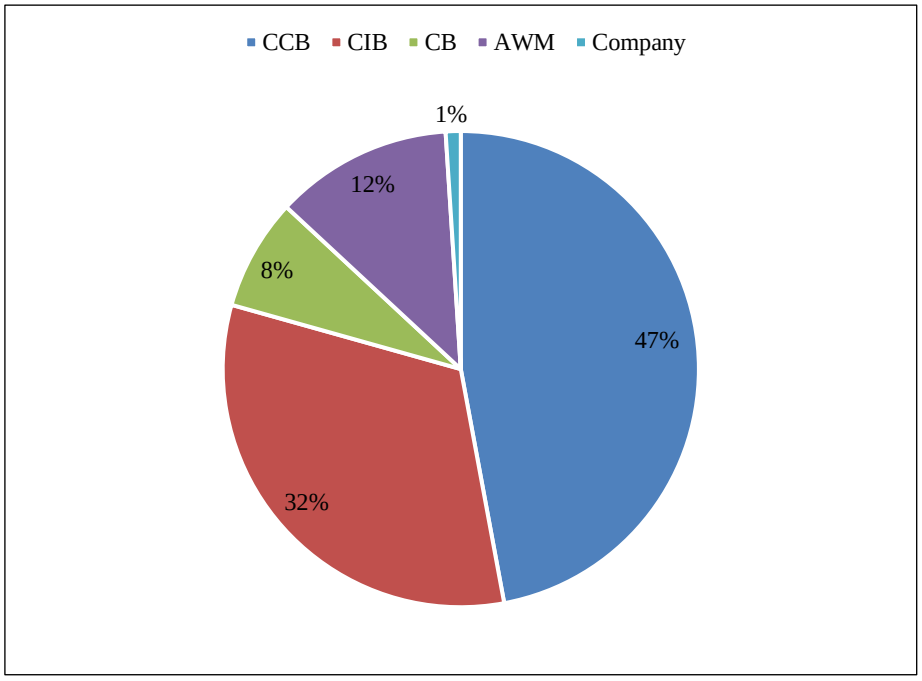
Consumer Businesses			Wholesale Businesses			
Consumer & Community			Corporate & Investment Bank		Commercial Banking	Asset & Wealth Managemant
Consumers Banking	Home Lending	Card Services	Investment Banking	Fixed Income Markets	Middle Market Banking	Asset Management
Business Banking	Home Lending Servicing	Auto	Treasury Services	Equity Markets	Corporate Client	Wealth Management
	Real Estate Portfolios		Lending	Securities Services	Commercial Real Estate Banking	

Source: J.P. Morgan Firm.

J.P. Morgan Chase's business line is complete, and the synergy between the four major sectors is obvious. In 2019, J.P. Morgan Chase's operating income was 118.7 billion US dollars, and the four business segments accounted for 47.08%, 32.27%, 7.57% and 12.06% respectively. Share of consumer and community banking sectors are highest. In 2019, the ROE of the four sectors were all above 10%, CCB: 31%, CIB: 14%, CB: 17%, AWM: 26%. Among them, the Consumer and Community Banking line has the highest ROE.

Although the Consumer and Community Banking line of business provides access to financing for consumers and small businesses, revenue from this line of business is not limited to the interest earned on the funds provided. Non-interest income accounts for a high percentage of its revenue mix, at 33.36%. Among non-interest income, the most unusual is "other income," which accounts for 9.67% of all Consumer and Community Banking line revenue and is growing at an annual rate of 22%, second only to mortgage fees and related income in all revenue categories. Since "other income" includes income from legal proceedings and changes in fair value, the high share and growth rate of other income implies a high and increasing "non-standardized" character of the Consumer & Community Banking business line (Guo, 2020).

Investment advisors are the core of wealth management business, and a market-competitive team is the key. All banks attach importance to the cultivation of high-end and specialized talents. For example, the scale of investment advisors of J.P. Morgan Chase, UBS and Bank of America has remained relatively stable in the past decade, remaining around 3,000, 11,000 and 17,000 respectively, with a high growth rate of assets under management per capita. UBS is the most typical, with $260 million in assets under management per advisor as of 2019, growing at a CAGR of 11.1% from 2010~2019, driving average annual advisor productivity from $820,000 in 2010 to $1.62 million in 2019. While J.P. Morgan Chase's investment advisor team is about 1/3 the size of UBS's, its average assets under management likewise grew at a high rate from 2010-2019, at a CAGR of 7.0 % (Wang *et al*., 2022).

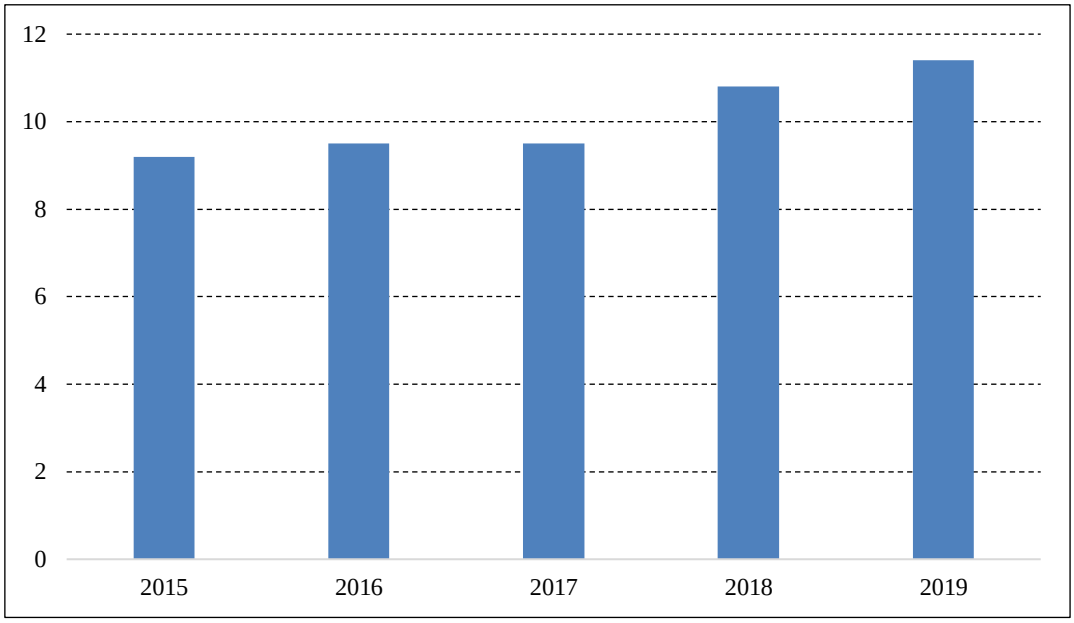


Source: Company Financial Report, TF Securities Institute.

Figure 2. The percentage of four parts revenue.

The company has been investing in fintech for a long time and continuously. In the past five years, the annual investment in science and technology accounted for about 10% of the company's operating income and 40% of its net profit. In 2019, the investment in science and technology reached 11.4 billion US dollars, ranking first among listed banks in the US, accounting for 10.9% of the operating revenue and 31.3% of the net profit in the previous year.

Global strategy managed by Lori Beer, global Chief Information Officer, J.P. Morgan is headquartered in Israel and has offices in New York, Bournemouth and Glasgow. The technology center focuses on research at the cutting edge of technology such as anti-fraud, information security, blockchain, machine learning and cloud computing, considering the potential for large-scale use of technology from a technical and business perspective, and how it can empower financial businesses.



Data Sources: Earnings Release Financial Supplement.

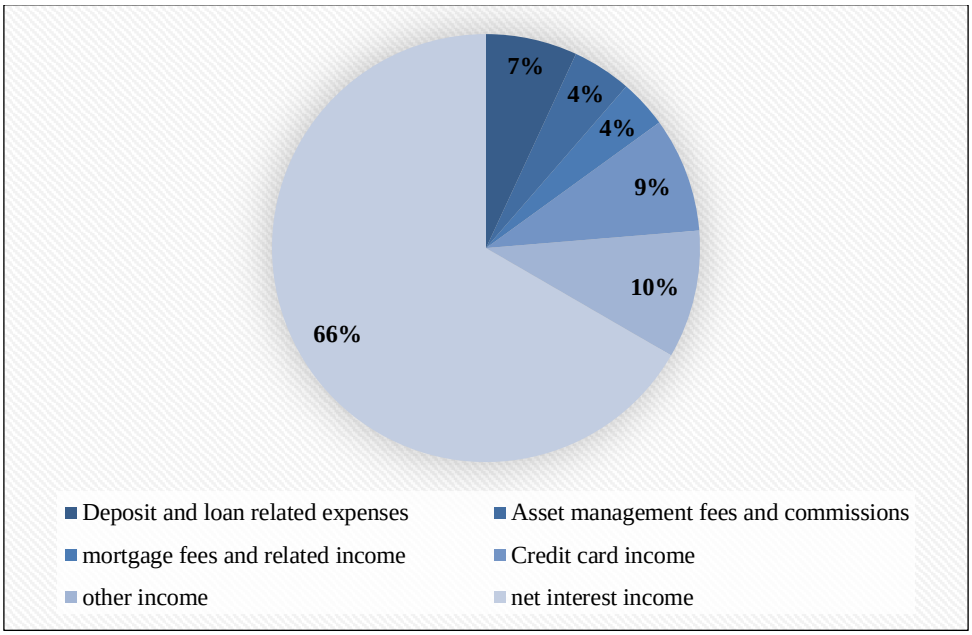
Figure 3. Science and technology investment budget ($billion).

2.1. Retail Business

The advance of retail business mainly represents on unstandardized value-added driven service charges, and digital transformation is expected to reduce retail business operation and service costs. The retail business of J.P. Morgan, which mainly provides credit and financial solutions to consumers and small enterprises, has become increasingly characterized by "non-standardized" services in recent years. Digital transformation facilitates the provision of such non-standardized services, thereby replacing the risk-reward model of higher interest rates with service charges.

Primary retail business, from the perspective of reducing the cost of basic services, relies more on the hardware environment and the technology carried by it, rather than highly skilled employees, while the digital transformation driven by the capital-heavy model helps to reduce the internal operating costs and reduce repetitive labor (Hu, 2022). From 2014 to 2018, the company saved 7,000 operation staff positions while adding 2,000 technical staff positions in the retail business line. From 2015 to 2019, the efficiency of operating personnel of the company's retail business line increased by 20%.

In addition, digital transformation helps reduce the cost of a company to serve its customers. From 2015 to 2019, the transaction volume completed by consumer finance customers through self-service channels increased by 10%, while the average service cost of corporate households decreased by 14%. However, in the brokerage business, because of the lack of channels of retail brokerage commission and downward pressure on prices, foreign securities firms should be able to avoid the traditional retail brokerage and trading business credit compete with domestic brokerages in this piece of the red sea. On the high-end wealth management for high-net-worth clients, foreign brokerages may rely on their leading international experience and the global asset allocation ability and bring no small impact to domestic brokerage. Financial derivatives, for example, China's financial derivatives on the variety and size are relatively backward compared to developed markets. With the large gap and development space in the dimension of China's economy, foreign securities companies can use their understanding of financial derivatives to carry out investment strategies, risk management and differentiated competitive advantages (Zhao, 2021)



Data Sources: CITICST.

Figure 3. J.P. Morgan retail revenue composition.

2.2. Wholesale Business

"Science and technology empower" to promote "transaction", improving wholesale business omni-channel service capacity and service efficiency are J.P. Morgan's wholesale business innovations. J.P. Morgan Chase has applied advanced technologies to carry out digital transformation, and at the same time improved the service efficiency of wholesale business. This will help banks improve the efficiency of cross-border payment, transaction settlement, asset management and other businesses. By providing a package of financial services for core enterprises and their upstream and downstream customers, it will build an industrial chain ecology.

They will continue to increase non-interest income from asset management and investment banking. Such investment in fintech to cover the whole business area of front, middle and back office will be driven by machine learning, big data, intelligent investment, electronic transaction and blockchain to realize the deep integration of investment banking and digital technology, and significantly improve the company's omni-channel service capability and service efficiency of wholesale business.

In addition, digitisation can help reduce the cost of risk control and compliance for companies. McKinsey firm's experience shows that digitisation can increase risk control ability, and reduce risk activities operating costs by 20%~30%. Mainland China's outstanding achievement in rural poverty alleviation has been attained by pragmatic problem-solving measures evolved into thoughtful and prudent planning and implementation in tandem with the country's development plans at progressing stages (Guo, 2017).

3. Method

In order to analyze the impact of technology revenue on J.P. Morgan's overall revenue, we use the Grey Relation Analysis method. Grey Relation Analysis method is a quantitative description and comparison method for the development and change of a system. By determining the geometric similarity between reference data columns and several comparison data columns, we can judge whether they are closely related, thus reflecting the degree of correlation between curves. As a system that is constantly developing and changing, because the information people get is limited, they choose to ignore the information they can't get. To do correlation analysis is to do trend analysis of the two systems and compare the fit between them. The following are analytical procedures:

Step1: Carry out dimensionless processing (initial value) on the data; Initial value: As the name implies, it is to uniformly divide the data of this series by the initial value. Because the magnitude difference of the series of the same factor is not big, all these values can be sorted to the magnitude of 1 by dividing the initial value;

Step2: Solve the Grey Relation value between the parent sequence (comparison sequence) and the characteristic sequence;

Step3: Solve the Grey Relation value;

Step4: Rank the values of Grey Relation degree and draw a conclusion.

We selected six main income modules in J.P. Morgan Chase's non-interest income, and used Grey Relation Analysis to test the correlation between science technology income and the overall income of J.P. Morgan Chase (Table 3).

The correlation degree indicates the similar correlation degree between each evaluation item and the "reference value" (parent sequence), which is calculated by the correlation coefficient. The correlation degree value is between 0 and 1. The larger the value, the stronger the correlation between the evaluation item and the "reference value" (parent sequence), and the higher the correlation degree, which means the closer the relationship between the evaluation item and the "reference value" (parent sequence), so the higher its evaluation. Combined with the correlation value, all the evaluation items are sorted to get the ranking of each evaluation item.

Table 3. Principal business income (million dollars).

Year	Investment bank fees	Asset management income	Mortgage income	Profit and loss on investments	Income from investment transactions	Science and technology Income
2015	102,102	6,751	15,509	2,036	258	10,408
2016	101,006	6,448	14,591	1,254	-395	11,566
2017	105,486	7,248	15,377	1,616	-66	11,347
2018	113,899	7,550	17,118	2,491	141	12,059
2019	131,412	7,501	17,165	2,531	202	14,018

Data Sources: Annual report of J.P. Morgan Chase.

Combined with the above correlation coefficient results, the correlation degree value is finally obtained, and the correlation degree value is used to evaluate and sort the six evaluation objects. The correlation value is between 0 and 1. The larger the value, the stronger the correlation between it and the "reference value" (parent

sequence), which means the higher its evaluation.

As can be seen from Table 4, according to six evaluation items (Investment bank fees, Asset management income, Mortgage income, Profit and loss on investments, Income from investment transactions, Science and technology income) and five items of data were analyzed by Grey Relation degree, and Stockholders' equity was used as the "reference value" (parent sequence). There are six evaluation items (Investment bank fees, Asset management income, Mortgage income, Profit and loss on investments, Income from investment transactions, Science and technology income) and Stockholders' equity (correlation degree), and provides analysis reference based on correlation degree. When using Grey Relation degree analysis, the resolution coefficient is 0.5, and the correlation coefficient calculation formula is combined to calculate the correlation value, and then the correlation degree value is calculated for evaluation and judgment[1].

As can be seen from Table 4 for the six evaluation items, Asset management income has the highest evaluation (correlation: 0.9544), followed by Income from investment transactions (correlation: 0. 0.9437) and Science and technology income (correlation: 0.9436).

Table 4. Grey Relation Analysis result on stockholders' equity.

Year	Investment bank fees	Asset management income	Mortgage income	Profit and loss on investments	Income from investment transactions	Science and technology Income
2015	0.9752	1	0.9624	0.9576	0.9854	0.9851
2016	0.9335	0.9545	0.9205	0.9165	0.9466	0.9444
2017	0.9190	0.9394	0.9054	0.9014	0.9291	0.9285
2018	0.9161	0.9400	0.9039	0.8984	0.9272	0.9295
2019	0.9139	0.9380	0.9021	0.8966	0.9300	0.93078
MEAN	0.9315	0.9544	0.9189	0.9141	0.9437	**0.9436**

As can be seen from Table 5, among the six evaluation items, income from investment transactions has the highest evaluation (correlation degree: 0.995), followed by Science and technology income (correlation degree: 0.992).

Table 5. Grey Relation Analysis result on profit.

Year	Investment bank fees	Asset management income	Mortgage income	Profit and loss on investments	Income from investment transactions	Science and technology income
2015	0.9873	0.9846	0.9779	0.4740	0.9971	0.9982
2016	0.9941	0.9950	0.9591	0.3335	0.9981	0.9932
2017	0.9934	1	0.9805	0.6941	0.9988	0.9958
2018	0.9863	0.9851	0.9623	0.6489	0.9926	0.9826
2019	0.9729	0.9753	0.9998	0.5591	0.9886	0.9920
MEAN	0.9868	0.9880	0.9759	0.5419	0.9951	**0.9924**

As can be seen from Table 6, for the six evaluation items, Income from investment transactions has the highest evaluation (correlation: 0.9970), followed by Science and technology income (correlation: 0.9959).

Through the above four Grey Relation Analysis results, it is found that the Income of science and technology investment is in an important place among the six factors from the analysis of shareholders' equity, profit and income.

[1] Resolution coefficient $\rho \in (0, \infty)$, the smaller ρ is, the greater the resolution. Generally, the value range of ρ is (0,1), and the specific value can be determined according to the situation. When $\rho \leq 0.5463$, the resolution is the best, in the paper $\rho = 0.5$.

Table 6. Grey Relation Analysis result on revenue.

Year	Investment bank fees	Profit and loss on investments	Mortgage income	Science and technology income	Asset management income	Income from investment transactions
2015	0.9965	0.4754	0.9868	0.9933	0.9937	0.9944
2016	0.9999	0.3335	0.9644	0.9990	1	0.9922
2017	0.9913	0.6944	0.9823	0.9977	0.9988	1
2018	0.9957	0.6523	0.9711	0.9918	0.9944	0.9987
2019	0.9834	0.5549	0.9887	0.9978	0.9859	0.9996
MEAN	0.9934	0.5421	0.9787	**0.9959**	0.9946	0.9970

4. Conclusions

4.1. Advice for J.P. Morgan

First, J.P. Morgan should accelerate the practice of digital vertical application scenarios and build a horizontal digital ecological platform. They should actively explore digital application scenarios, take users as the core, and focus on scenarios such as trade finance, cross-border finance, compliance review, and repurchase transactions to solve the pain points of traditional financial business models. They should also enhance their digital capabilities in an all-round way through digital channels, digital customer experience, digital products, digital operations, and digital risk control.

Second, J.P. Morgan should focus more on preventing new types of external risks. The development of science and technology cannot avoid some security problems. J.P. Morgan should clearly understand the cybersecurity challenges it faces, as well as the risks and challenges faced by fintech companies, large technology companies and shadow banking competition. Various technology risks, network risks and data security issues are becoming increasingly prominent, and the digital transformation process faces challenges such as higher compliance costs and stricter supervision. Therefore, we should pay attention to prevent these new risks, take the big data intelligent risk control system as the core to improve risk prevention and control capabilities, and firmly adhere to the risk bottom line in digital transformation.

Thirdly, J.P. Morgan should leverage the utility of big data and enrich cross-border financial big data resources. Data is an important basis for customer portrait, business opportunity exploration, precision marketing and risk prevention and control. The level of data collection, mining and utilization is directly related to the effect of digital transformation. First, the establishment of cross-border financial characteristics of the data mart. Based on the typical scenarios of cross-border transactions, the data of industry and commerce, taxation, customs, credit, international maritime, international shipping, cross-border payment, insurance, anti-money laundering, sanctions and compliance, judicial, administrative punishment and cross-border comprehensive service providers are actively introduced to construct a complete portrait of customers' cross-border transactions and behaviors. Second, we will enhance our ability to mine cross-border financial data. Through data models and analysis tools, massive cross-border transaction data are cleaned, integrated and professionally analyzed to provide data support for customer access, product marketing, grant credit, risk monitoring and so on (Liu *et al*, 2022).

Lastly, to address the asymmetry between loans and their corresponding income ratios, especially in the home loan business, J.P. Morgan should pay more attention to the macro economy and corresponding policies. J.P Morgan's consumer finance business line is no longer a simple financing intermediary between consumers and small businesses, but a provider of value-added services in the financing process. Since central banks' agency remains constrained by their hierarchical positions within global currency markets, J.P. Morgan should pay further attention since land and resource governance, public housing or asset taxation regimes could potentially mitigate the rate growth imperative, and its macroeconomics perspective becomes essential (Kimmich and Wenzlaff, 2022).

4.2. Advice for Domestic Banks

Since J.P. Morgan Chase is a bank of U.S., some of its businesses are different from those of Chinese banks.

With the sustained and rapid development of the digital economy during the "14th Five-Year Plan" period and the deepening of customers' digital trading behavior, commercial banks need to further increase investment in science and technology, innovate financial products and services, and quickly respond to customer needs according to their own development.

First, we should adhere to the basic strategic orientation that is political and of the people's interest, and ensure that our strategies deliver results. Digital transformation strategy should be to serve the real economy and meet the needs of the masses as the foothold, clear benefit enterprises, combined with its own positioning, transformation objectives and development of internal and external environment, safety and stability as the premise (Wen, 2022). To improve customer experience, the breakthrough point is to promote the implementation of the transformation strategy by taking the digital transformation of the client as the breakthrough point and the effectiveness evaluation as the basis.

Second, we will promote organizational change to encourage the integration and innovation of science and technology business. Build a multi-center collaborative and integrated organization to achieve cross-functional, cross-level and cross-functional technology and business department collaboration and linkage, truly realize the concentration of physical logic and business logic; Improve the differentiated R&D mechanism with high agility and flexibility, effectively improve the response speed and attack capability of the flexible R&D team; Pay attention to the digital transformation of governance structure and deepen the digital intention of leadership. Strengthen the target management of digital transformation, and build an enterprise-level coordination mechanism to promote digital transformation.

As a pioneer in the application of information technology in the domestic banking industry, ICBC, through organizational structure adjustment, system and mechanism optimization, and smart bank ECOS project construction, is driven by technology to empower business innovation and create value (Shi, 2021). As a "financial technology bank", China Merchants Bank deeply integrates technology and business through "networking, dataization, and intelligence", rapidly iterates and continuously delivers products and services, and creates the best customer experience. Risk control and digital management promote the comprehensive development of banking business. China Merchants Bank as well as Industrial and Commercial Bank of China (ICBC), as leaders in digitalization, have great reference for corporate banks (Han, 2021).

References

1. Han, J. W., & Jia, J. X. (2021). Strong Always Strong: J.P. Morgan Chase 2020 Business Analysis. China Banking Industry, 6: 83-86.
2. Hu, M. (2022). Application and Enlightenment of Fintech in UK and US Private Equity Industry. Financial Perspectives Journal, 3: 89-94.
3. Guo, H. Y. (2017). Credit Sink: J.P. Morgan Chase Fixed Income Business Orientation in the Context of Easy Money. Bankers, 1: 14-17.
4. Guo, H. Y. (2020). J.P. Morgan's Three Core Competencies in Consumer Finance. Bankers, 4: 60-62+7.
5. Kimmich, C., & Wenzlaff, F. (2022). The Structure-Agency Relation of Growth Imperative Hypotheses in a Credit Economy. New Political Economy, 27(2): 277-295.
6. Liu, Q., Hao, P. Y., Wang, Y., Fu, Y., Tang, X. M., Xi, L., Yang, J. C., Liu, X. Y., & Zhuo, Z. Y. (2022). Study on Digital Transformation of Cross-Border Finance in Commercial Banks. Journal of Agricultural Banking, 3: 4-8.
7. Shi, Y. P. (2021). A Case Study of Digital Transformation of Commercial Banks under the Background of Financial Technology. Technology and Market, 4: 1-33.
8. Wang, X. T., Zhao, T. Y., Li, Q., & Hu, X. (2022). Research on Transformation and Development of Wealth Management in Chinese Commercial Banks. Practical Experience from International Universal Banks, 9: 169-171+196.
9. Wen, Y. T. (2022). Experience and Enlightenment of Digital Transformation of Global Commercial Banks. Guide to Modern Finance, 6: 18-22.
10. Zhao, A. L. (2021). The Catfish Effect of Foreign Securities Firms. China Foreign Trade, 9: 22-23.

(Editor: Yuxin Ke)