

PSEUDO-CAML PERFORMANCE OF THE ASEAN-5'S INNOVATIVE BANKING USING THE PARALLELISM OF MARX, SCHUMPETER, AND CHRISTENSEN INNOVATION CONCEPTS

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Abstract: *Routine banking transactions have been practically simplified since the advent of financial technology. The application of ChatPay, AliPay, PayPal, ApplePay, etc. demonstrated a massive use of mobile phones on hand. The use of chat bots and AI replacing the function of bank tellers. Given the cybernetic innovation, the author asks the question, "what is really happening in the business world today?" The three gentlemen, Karl Marx, Joseph Schumpeter and Clayton Christensen theorized in 1867, 1942 and 2013, respectively, about wealth annihilation, creative destruction and disruptive innovation. By employing a descriptive method using secondary data from the BIS, AFIN, Asean fintech reports and scientific literature, including that of non-parametric statistics for interpretation, the study sought to answer three main questions; first, the interpretation of their theories; second, the effects of disruptive innovation, and third, the association of pseudo-CAML and the related FPIs. The study recommended that the Asean banking should continue with the sustainable banking innovations that would combat the development of fintech transactions in addition to its active Asean integration framework.*

Key terms: *MSC (Marx, Schumpeter and Christensen) parallelism, creative destruction, disruptive innovation, financial technology or fintech, pseudo-CAML (capital, assets, management, and liquidity), Asean Financial Innovation Network or AFIN, financial performance indicators or FPI, operating cost-income-ratio % or CIR%, artificial intelligence or AI, application programming interface or API.*

JEL: B14, G (2,14,15,18,21,34), O32.

Introduction

The MSC parallelism is fundamentally a series of concepts that have formed the basis of innovation management. Merriam Webster (2019) defined parallelism as "... the state of corresponding in some way, or resemblance with ...". It gave an example in a sentence as, "... There is a certain parallelism in the development of two technologies ..." – which the study applied it as the parallelism in wealth annihilation (Marx), creative destruction (Schumpeter) and disruptive innovation (Christensen). Christensen, C. et. al. (2018) explains Marx's concept of annihilation using the Schumpeterian concept of creative destruction by referring to it as destruction, in the worst form, or disruption, in a milder form. This disruption was further personified in the form of an innovation, the biggest challenge of which was identified as the mushrooming of fintech companies. The products of these fintech companies have indeed been disrupting the banks' products. For instance, banks customers can now use mobile phones to execute a banking transaction like making payments or transfers. They do not have to be in the premise of the bank to make payments or transfers. These transactions may be executed using an internet-based apparatus adopted by the modern banking. The modern banking practices are more efficient, more practical, and faster compared to that of the traditional banking. Refer to

Table 1 for the characteristics of the traditional versus modern banking practices.

Table 1. Comparison of Traditional versus Modern Banking Process

TRADITIONAL BANKS	MODERN BANKING	BENEFITS
Physical presence	Mobile communication	Easy access
Paperwork processing	Internet-based transactions	Speedy and practical
Time consuming	Instant done via mobile/internet	Increased transactions
Manpower dependent	Technology driven	Highly transparent
Cash & cheque transaction	Mobile and internet	Practical solution
Traditional remittances	Open GAFA*-based with APIs	Practical and expansive
Desk customer queries	Chatbots/AI for banking advices	Practical and innovative
In the bank premise banking	Omni-digital channel banking	More conveniences
Photo studio pictures	Biometric identification	Practical and faster
Teller payment/transfer	Cryptocurrencies with DLS	Faster and permanent record

*GAFA = Google, Amazon, Facebook, and Apple, particularly targeted to the millennials.

The managerial features of innovation focus on product, process and model of the business. If we have to exemplify it using the development of the Asean-5 banking industries, elaboration of what has occurred with the three components of innovation must be discussed.

Product Innovation

First, with regard to product innovation, a study conducted by Sikka, S. & Srinath, U.V. (2017) revealed the variety of products with technology-driven features; i.e. facilitating customer financial transactions, use of AI and data analytics, open banking APIs, variety of products as the results of partnership with fintech firms, digital payments expansion, microfinances, to mention some, that improve the innovative banking performance. Johne, F.A. & Harborne (1985), in response to the offering of these digital products, commented that product innovation was basically the performance of banker innovators. The presence of these innovators led to innovative banking performance. Unfortunately, these modern banking products are also offered by the mushrooming fintech companies nowadays. They had been disrupting the modern banking development since the 2000s. Ernest & Young (2018) reported in its Asean Fintech Census 2018 that these fintech companies' revenues mostly came from the digital payments, trading, and loan application. Ortiz, A. et. al. (2017) representing the BBVA Research further commented that the fintech firms did take advantage of the availability of the 182 million online population in the Asean region; which comprised of 93.4 million in Indonesia, 42.0 million in the Philippines, 21.4 million in Malaysia, 21.1 million in Thailand and 4.1 million in Singapore. Likewise, they also took advantage and developed even more the relatively low 63.9% bank accounts holders, 13.3% broadband users, and the 39.3% smartphone users, in the Asean-5 region. Refer to Figure 1 and Table 2.

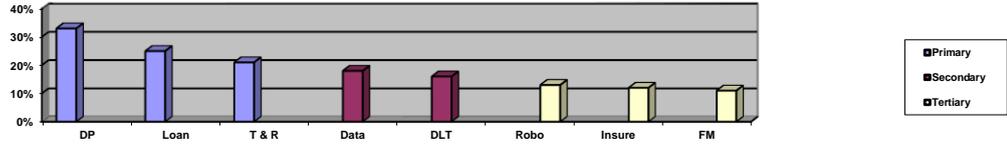


Figure 1. Asean Fintech Companies' Transactions in Percent (2018)

(DP or digital payment=33%, Loan application=25%, T&R or transfers&remittances=21%, Data analytics=18%, Blockchain DLT=16%, Robo advisory=13%, InsureTech=12%, FM or funds management=11%)

Process Innovation

Second, the new process of doing banking transactions had been tremendously simplified from going to the banks' premises and dealing with their employees, to a few clique in the mobile phones or computers at home. This process seemed to be much simpler and practical. An American public marketing research company, eMarketer, illustrated how the process innovation by means of mobile banking had been founded in China. Mobile payment users had grown from 173.1 million in 2015 to 508.6 million in 2018. The 2018 number alone represented a large 78.5% share of that of the Asean countries' mobile payment users. However, in overall terms the numbers of these Chinese users represented a portion of 30.8% and 22.0% from that of the US and Germany, respectively. Refer to Figure 2.

The swift pace of mobile payments adoption in China

By 2021, eMarketer projects that 79.3% of smartphone users in China will be tapping, scanning and swiping at the point of sale. By comparison, it will be 30.8% of users in the U.S. and 22% in Germany.

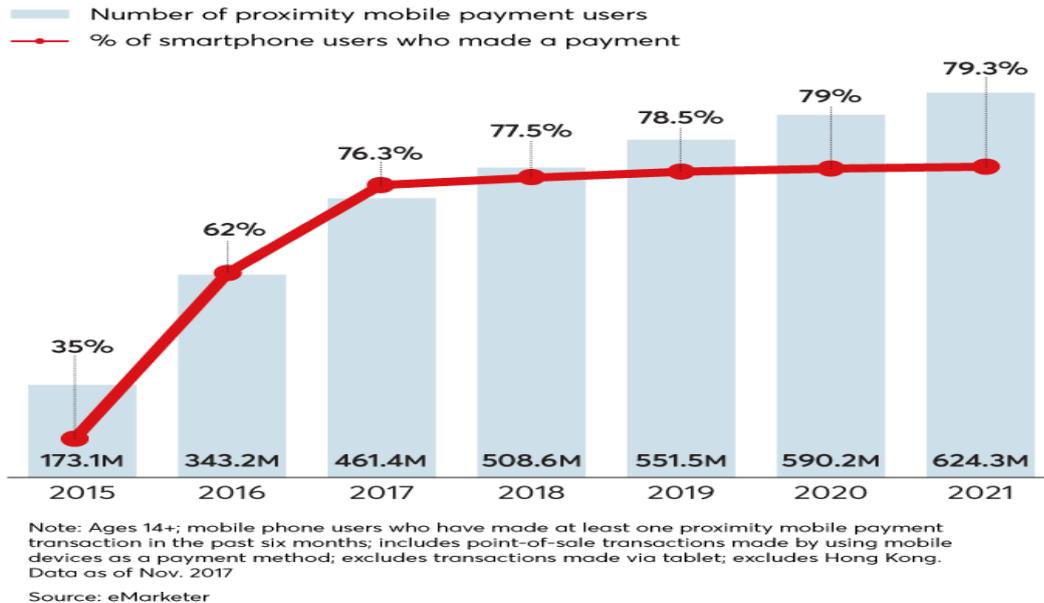


Figure 2. Illustrative Mobile Payments Adoption in China

Source: eMarketer open source image

This process innovation had been taking place since the 2000s, not by the banking industries, but by the disruptors of banking industries, which was the mushrooming fintech startup companies all over the world, and Asean region was of no exception.

Business Model Innovation

Third, with regard to business model innovation, Marous, J. (2019) categorized the models into five trends; i.e. the one segment services, open banking expansion, phygital delivery, AI-driven banking, and payments everywhere. He was supported by Efma-Infosys Finacle (2016), which emphasized the model innovation application in the retail banking sector. The three highest perceptions of this marketing research company’s survey were the use of open banking APIs, advanced analytics using AI and machine learning, and conversational interfaces like what Bank of America’s Erica chatbot reported by Gupta, A. (2019). Refer to Figure 2.

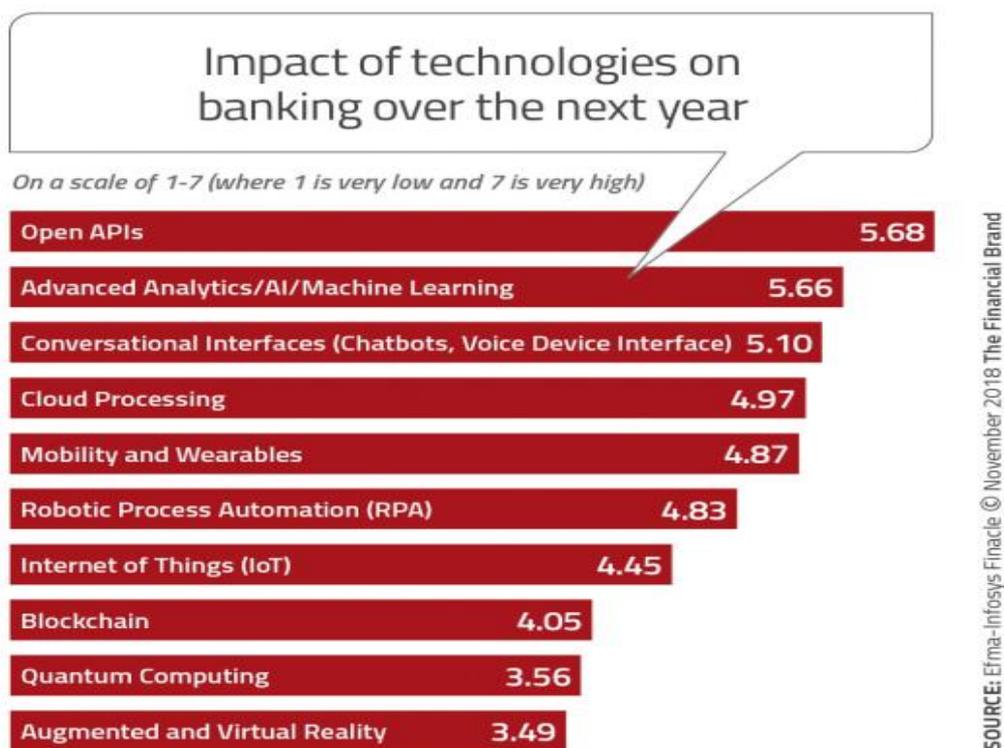


Figure 2. Illustrative Process Innovation by Efma-Infosys Finacle, 2018 (Financial Brand)

Another form of model innovation, KPMG (2012) introduced a new set of banking model which focuses on cost efficiency. It comprises of three important sustainable cost measures, i.e. straight-through processing, first time resolution, and self-service channels. Straight-through processing is basically an automated electronic payment system used by banks allowing the payment initiation to the final settlement process. While first time resolution must be addressed at the first customer’s call to attend to his needs, the same way self-service channels must be facilitated in any e-banking transactions.

Pseudo-Caml Compliance Application

Bank of International Settlement or BIS is the ultimate supervisor of the world banking system's financial soundness, which among others is measured in terms of the CAMELS ratios. The ratios are comprised of capital adequacy ratio or CAR for C, assets quality for A, the quality of banking managerial decision for M, earning capacity for E, liquidity capacity for L and sensitivity for S. Pseudo-CAMELS or the resemblance of CAMELS in this study refers to a modified acronym of pseudo-CAML with a slight modification on the formula.

First, the capital adequacy ratio or CAR is measured in terms of portion of bank's capital total assets without deriving their weighted-risk components. C is computed as follows:

$$C = SE/TA \text{ (Formula 1)}$$

SE = Stockholders' equity,
TA = Total assets

Second, the quality of bank's assets is measured in terms of the portion of earning assets after the non-performing loans. A is computed as follows:

$$A = EA - NPL \text{ (Formula 2)}$$

EA = Earning assets, which are comprised of loans and investment in securities,
NPL = Non-performing loan or the allowance of impaired loans

Third, the quality of managerial decision making is measured in terms of the portion of net profitability earned by the bank out of the EA total amount. M is computed as follows:

$$M = NI/EA \text{ (Formula 3)}$$

NI = Net income earned by the bank, and EA as described above.

Fourth, the liquidity position of the bank is measured in terms of total EAs over the bank's deposits. It is computed as follows:

$$L = EA/D \text{ (Formula 4), where}$$

D = Total deposits
EA as described above.

Total deposits are comprised of that from checking, savings and time, with a special deposit called certificate of deposits. The mechanism of raising certificate deposit is similar to that of raising funds through a commercial paper facility.

M S C Parallelism Framework

Based on the MSC parallelism theories, the conceptual framework of the study is presented for further analysis.

MSC Parallelism Theoretical Framework

MSC parallelism theories were mainly derived by the three economists as that shown in Figure 3. Karl Marx had coined the word wealth accumulation (W_{Accum}) and wealth annihilation (W_{Annih}) in the same way Joseph Schumpeter had for entrepreneurship (E) and creative destruction (CD), and Clayton Christensen had for sustainable innovation (SI) and disruptive innovation (DI). In short, the MSC parallelism is symbolically depicted as:

- W_{Accum} → E → SI
- W_{Annih} → CD → DI

<p>WEALTH ACCUMULATION (W_{Accum}) MKT. CAP./GDP (Increasing)</p>	 Marx	<p>WEALTH ANNIHILATION (W_{Annih}) MKT. CAP./GDP (Decreasing)</p>
<p>ENTREPRENEURSHIP (E) 1. Sustainable ROA 2. Steady growth of NIM 3. Continuous CIR% reduction</p>	 Schumpeter	<p>CREATIVE DESTRUCTION (CD) 1. Declining ROA 2. Fluctuating growth of NIM 3. Decreasing CIR%</p>
<p>SUSTAINABLE INNOVATION (SI) Entrepreneurship through sustainable innovation or innovative banking.</p>	 Christensen	<p>DISRUPTIVE INNOVATION (DI) Creative destruction due to disruptive innovation and less R&Ds.</p>

Figure 3. MSC Parallelism Toward Innovation and Its Financial Performance Indicators (FPIs)

Khan, E.M. (2015) elaborated the Schumpeterian vision that was learned during the US Great Depression and Cold War period that “.. *change was essential for growth, which had triggered market and product development*” when creative destruction was originally contextualized. McCraw, T.K. (2007) mentioned Joseph Schumpeter as a prophet who said that “..*creative destruction is the driving force of capitalism.*” He was reinforced by Landstrom, H. (2005) who commented that “..*entrepreneur is the key figure due to his ability model as a creative organizer and whose role is to develop innovations and initiate new activities.*”

Conceptual Framework

The conceptual framework of the study was analyzed from the financial perspectives on how the Asean-5 banking had behaved in the midst of innovation challenges, which the MSC parallelism had coined as wealth annihilation, creative destruction and disruptive innovation. As mentioned earlier the word annihilation semantically refers to destruction, in a worst form, or disruption, in a milder form, which by the founder was coined disruptive innovation. In the

context of this study, the biggest challenge is the rapid growth of fintech companies. The conceptual framework is shown on Figure 4.

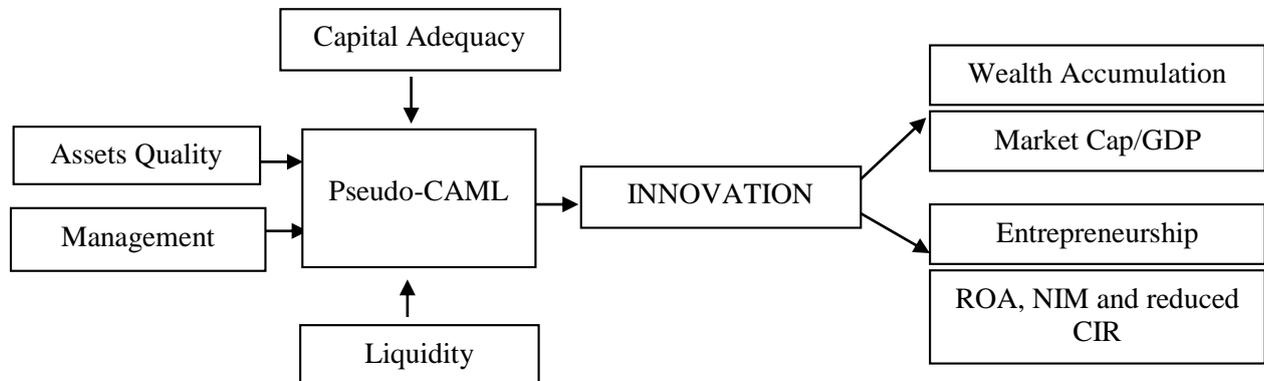


Figure 4. **Conceptual Framework of Pseudo-CAML and the FPIs of the MSC Parallelism**

Lardic, S. & Terraza, V. (2019) focused on ROA and ROE as the main banking performance indicators, which the study strived to test as dependent variables from those of level of liquidity, leverage and operation. And ROA seemed to be the strongest indicator that included bank leverage as risk factor. While Bikker, J.A. (2010) more specifically argued that the best FPI for a bank was its efficiency to compete, which was measured in terms of gross NIM, ROA, and CIR% reduction, which sustainable innovation or innovative banking could achieve. Gada, D. (2018), a financial adviser, shared clients' experience for using smartphones as an easier way to deal with the banks without any queuing in their premises, as well as allowing seamless online shopping, transfers, and investments. He also shared the benefits of other fintech transactions using chatbots and artificial intelligence (AI) for fraud detection, not to mention the omni-channel banking, biometric uses, and blockchains for digital transactions, which the Asean banking is currently further exploring. Some examples of disruptors and disruptees in the banking transactions are presented on Table 1.

Research Problem, Questions and Methodology

Based on the *objective* of how people conceptualize sustainable vs disruptive innovation, the process of combatting disruptive innovation and developing sustainable innovation leads to how innovative banking should take place in the Asean-5 region. Therefore, the main *problem* of the study focused on how MSC parallelism interpreted innovation and further evaluated the impacts of disruptive innovation on the Asean banking. The study specifically sought to answer the following research *questions*:

1. How did the MSC parallelism on innovative banking development significantly differ in terms of its Marxian concept on wealth accumulation/annihilation and Schumpeterian concept on entrepreneurship/creative destruction?
2. How did the rapid growth in fintech companies, a disruptive innovation, affect the Asean-5 largest listed banks' business during the past decade (2008-2018)?

3. How did the pseudo-CAML indicators related to market cap/GDP%, ROA, NIM, and operating CIR% of the 5 listed Asean banks?

In the framework of answering the research questions the study used a descriptive method. Secondary data were gathered from the annual reports of the selected 5 largest listed Asean banks, AFIN, EY Asean Fintech Census 2018, and other Asean agencies on fintech publication. Interviews with the selected largest listed banks were also conducted for secondary data validity purposes. The first research question answered the differences of the FPIs performance using Kruskal Wallis rank order. While the second research question was answered using a simple observation from the secondary data. And the third research question revealed the association between the pseudo-CAML indicators and the FPIs performance using Spearman rank order. Arnaboldi, F. & Rossignoli, B. (2015) reinforced these FPIs interaction with operating cost reduction and market capitalization enhancement as financial innovation challenges in financial economics.

Results and Discussion

The result of the study discussed three main questions, namely, interpretation of the MSC parallelism, impacts of disruptive innovation on the Asean-5 listed banks' business, and the Asean-5 listed bank performance in innovative banking.

1st QUESTION – INTERPRETATION OF MSC PARALLELISM

In order to test the null hypothesis that “*The MSC parallelism on innovative banking development didn't significantly differ in terms of its Marxian concept on wealth accumulation/annihilation and Schumpeterian concept on entrepreneurship/creative destruction*” – the differences of the four FPIs were derived using Kruskal Wallis non-parametric statistical method. The near to significant differences seemed to be market cap/GDP % and ROA % as their H value (df = 4) = 8.400 and 7.792, respectively, even though they didn't on an absolute basis, was how the pattern of MSC parallelism differed, WAccum → E → SI and WAnnih → CD → DI, was interpreted.

The MSC parallelism fundamentally focuses on how capitalism interacts with entrepreneurship. Drucker, P.F. (1985) clearly emphasized that innovation and entrepreneurship are both a continuous process, and it is not appropriate to separate the two, which Schumpeter, J.A. (2003) clearly pointed out. He also argued that due to the evolutionary process, entrepreneurship with the continuous R & D undertakings, would generate new products and create new market. The old one was destroyed and the new one came up. This was how creative destruction concept was created. Elliott, J.E. (1980) then synthesized the Marxian economic vision with regard to disruptive innovation and Schumpeterian economic vision on creative destruction. As explained in the methodology, MSC parallelism, regardless of whether it was for sustainability or disruption, was measured in terms of the related FPIs; i.e. market cap/GDP% in Marx's wealth accumulation and the Schumpeter's entrepreneurship indicators, the ROA%, NIM% and reduction of CIR%. This section particularly attempted to interpret the MSC parallelism to lead to the answer of the research question.

Table 2. Kruskal Wallis Differences of the Asean-5 Selected Listed Banks' FPIs

FINANCIAL PERFORMANCE	Singapore	Malaysia	Thailand	Philippines	Indonesia
Market cap/GDP % (df=4)	5.7	1.4	0.8	0.833	0.867
Observed H or $X^2 = 8.400^*$					
CIR % (df=4)	0.667	-1.6	-0.2	-0.033	-0.133
Observed H or $X^2 = 1.392^*$					
ROA % (df=4)	4.333	3.9	4.433	2	9.1
Observed H or $X^2 = 7.792^*$					
NIM% (df=4)	58	58	56.8	65.733	72.267
Observed H or $X^2 = 1.242^*$					

**Critical H (df = 4) = 9.490.*

In this Asean-5 illustration, parallelism demonstrated two patterns. First, how innovative banking may turn into higher FPIs, i.e. banking development in Singapore and Indonesia led to higher market cap/GDP and ROA at the rate of 5.7% and 9.1%, respectively. Second, how innovative banking led toward reduced operating CIR% as demonstrated by listed banks in Malaysia (CIR% = -1.600%), Thailand (CIR% = -0.200%), Indonesia (CIR% = -0.133%) and the Philippines (CIR% = -0.033), which surprisingly Singapore was not included (CIR% = +0.667%). Refer to Table 2.

2ND QUESTION – IMPACTS OF DISRUPTIVE INNOVATION

The application of the MSC parallelism obviously gave rise to the sustainable and disruptive nature of innovation, which this section focused more on the latter. The total 1191 fintech companies in the Asean-5 region had invested some USD 332 billion as of 2018, in spite of the relatively smaller gross revenues of USD 1.7 billion to USD 2.6 billion per year. This was of course of no comparison with the selected Asean-5 listed banks' total loans and deposits accumulation of USD 5,253 billion as of 2018 with a total interest income of USD 71.6 billion as of 2018. The effects of disruptive innovation, posed by the rapid growth of fintech companies in the Asean-5 region, were still considered insignificant compared to that of the listed banks' contribution to the banking sector. The disruption coverage only showed an insignificant rate of 1.5%, even though Indonesia and the Philippines indicated a higher rate at 3.0% and 1.7%, respectively. The more number of fintech firms in Indonesia after Singapore might have been a reason for the higher disruption rate, because Indonesia had 49% banked population with 416 million mobile subscriptions, 130 million active social media users and 143 million internet penetration; particularly with the implementation of the National Payment Gateway, P2P lending services, etc. The overall low online population of 181 million or representing some 39.7% from the total 455 million in the Asean-5 region supported the facts that broadband capacity and Smartphone users were considered low at 12% and 42%, respectively. Beside Indonesia, Thailand with USD 0.1 billion transactions per fintech firm, seemed to be moved by giant companies like the 500 Startups (raising USD 33 million), Golden Gate Venture (raising USD 28 million), Cyber Agent Venture (raising USD 150 million), East Ventures (a Singaporean-based venture raising USD 28 million), and SBI Holding (a Japanese-based firm raising USD 26 million) as reported by National News Bureau of Thailand (2019). Refer to Table 3.

Table 3. Asean Banking System's vs FinTech's Transactions as of 2018

DESCRIPTION	Indonesia	Thailand	Singapore	Malaysia	Philippines	Total
Asean-5 population (M)	258	62	5	30	100	455
Asean-5 Listed Banks:						
A-Banks' deposits (USD-B)	354	421	458	460	245	1938
B-Banks' loans (USD-B)	721	761	1013	648	172	3315
C-Total deposits & loans (USD-B)	1075	1182	1471	1108	417	5253
Asean-5 Fintech Companies:						
D-Number of fintech firms	262	128	490	196	115	1191
E-Fintech investments (USD-B)	26	12	141	75	78	332
F-Total transactions (USD-B)	32	13	12	11	7	75
Level of digital adoption:						
On line population (M)	93	21	4	21	42	181
Bank account holders %	36	78	96	81	28	64
Broadband capacity %	13	9	26	10	4	12
Smartphone users %	39	38	85	35	15	42
Fintech disruptive effects:						
F/C-Disruption coverage %	3.00%	1.10%	0.80%	1.00%	1.70%	1.50%
F/D-Transaction/firm (USD-B)	0.12	0.1	0.02	0.06	0.06	0.07
E/D-Investments/firm (USD-B)	0.1	0.09	0.29	0.38	0.68	0.31

Source: Association of Fintech Innovation Network (AFIN) and Bank of International Settlements (BIS)

3RD QUESTION – PSEUDO-CAML and INNOVATIVE BANKING

The null hypothesis that pseudo-CAML didn't have any degree of association with the Marxian and Schumpeterian FPIs was analyzed in Table 4. First, ROA% and NIM% didn't apparently seem to be affected by the pseudo-CAML as all observed Rs were all within the two-tail range (Sig. = 0.05), leaving the market cap/GDP% and reduced CIR% as those being associated with the pseudo-CAML. Second, market cap/GDP% seemed to associate with pseudo-CAR and pseudo-Assets quality as Rs = -0.671 and Rs = 0.580, respectively. The latter was strongly encouraging to learn that quality banking assets could indeed lead to improved market cap/GDP%. Third, the reduction of CIR% seemed to inversely associate with pseudo-management decision and pseudo-Liquidity as Rs = -0.756 and Rs = -0.499, respectively, in spite of their inverse relationship.

As a reinforcement to the MSC parallelism, Costa Laurenco, I. et. al. (2012) clearly evaluated market capitalization to reflect the sustainability performance of a bank. He was supported by Laton, M.Z. et. al. (2015), who empirically analyzed how innovation bore the fruits of improved efficiency in terms of cost savings. The two measures of the Marxian and Schumpeterian thoughts were taken as performance indicators of innovative banking.

Table 4. Spearman Association Between Pseudo-CAR, and (Mkt.Cap/GDP, CIR, ROA and NIM)

VARIABLE	Statistics	Pseudo C.A.M.L.	Mkt.Cap/GDP%	CIR%	ROA%	NIM%
Pseudo-Capital adequacy	Rs*	1	-0.671	-0.309	0.367	0.179
	Sig. (2 tail)	-	0.05	0.05	0.05	0.05
	N	-	15	15	15	15
Pseudo-Assets	Rs*	1	0.58	0.209	-0.379	-0.086
	Sig. (2 tail)	-	0.05	0.05	0.05	0.05
	N	-	15	15	15	15
Pseudo-Management	Rs*	1	-0.334	-0.756	0.362	0.351
	Sig. (2 tail)	-	0.05	0.05	0.05	0.05
	N	-	15	15	15	15
Pseudo-Liquidity	Rs*	1	-0.073	-0.499	0.009	-0.023
	Sig. (2 tail)	-	0.05	0.05	0.05	0.05
	N	-	15	15	15	15

*Critical Rs (df = 14) = 0.456 at a two-tail position.

Summary of Findings, Conclusion and Recommendations

Summary of Findings

1. The pattern of MSC parallelism, WAccum → E → SI and WAnnih → CD → DI, was interpreted using the FPIs differences of market cap/GDP conceptualized by the Marxian concept on wealth accumulation, and the ROA, NIM and CIR% reduction conceptualized by the Schumpeterian concept of entrepreneurship.
2. The near to significant differences seemed to be market cap/GDP % and ROA % among the Asean-5 selected listed banks as their H value (df = 4) = 8.400 and 7.792, respectively, even though they didn't differ on an absolute basis.
3. The effects of disruptive innovation by the rapid growth of fintech companies were still considered insignificant. The relatively smaller gross revenues of USD 1.7 billion of the fintech companies compared to the USD 71.6 billion per year of the listed banks as of 2018 was of no comparison.
4. Market cap/GDP% seemed to associate with pseudo-Capital adequacy and pseudo-Assets quality as Rs = -0.671 and Rs = 0.580, respectively, in spite of the inverse nature of the former.
5. The reduction of CIR% seemed to inversely associate with pseudo-management decision and pseudo-Liquidity as Rs = -0.756 and Rs = -0.499, respectively, in spite of their inverse relationship.

Implications

1. The Asean banking industries must always observe the implication of larger transactions rendered by those fintech companies in the future, because they are definitely disruptive in nature.
2. The Asean banking industries must always be alert to overcome future problem of laying off employees as CIR% would tend to reduce with the increased level of innovative banking.
3. Learning from the model may assist Asean banking industries to combat these disruptive innovations posed by the fintech companies.

Conclusion

On the basis of the findings of the study, it concluded that the Asean-5 largest listed banks had indeed performed better toward innovative banking within the scope of Marx-Schumpeter-Christensen parallelism, particularly, the market capitalization in proportion to the country's GDP and the capacity to reduce operating cost in terms of the CIR%.

Recommendation

The conclusion led the study to recommend that both strategic components implied by the MSC parallelism, the aggressive sustainable innovation and fintech-adoption innovative banking, to be implemented by the Asean-5 banks in particular and the other Asean countries in general, with the following plans of action:

1. Closer tie up between the Asean Financial Innovation Network or AFIN, Asean central banking industries, Asean Bankers Association, and the EU/US/Singapore/Japan central banks for developing rules and regulations on sustainable innovative banking that combat those disruptive ones.
2. Still in the spirit of cooperation, it is a high time now for the Asean central banks to enhance the effectiveness of regulatory sandbox system for issuing regulations on Asean Financial Inclusion Programs.
3. By virtue of a closer interaction with the Asean Banking Integration Framework or ABIF, formation of mentoring programs to assist the other Asean countries' banking system to formulate, implement and develop innovative banking practices, must be in place.

References

- Arnaboldi, F. & Rossignoli, B. (2015). Financial innovation in banking: From Bank Risk, Governance and Regulation. Springer Link, p. 127. Retrieved from: https://link.springer.com/chapter/10.1057/9781137530943_5.
- Bikker, J.A. (2010). Measuring Performance of Banks: An Assessment. Holland, Journal of Applied Business & Economics, 11 (4), p. 144. Retrieved from: <http://digitalcommons.www.na-businesspress.com/JABE/BikkerWeb.pdf>.
- Christensen, C. et. al. (2015). What is disruptive innovation? US, Harvard Business Review, 93 (12), p. 44. Retrieved from: <https://www.hbs.edu/faculty/Pages/item.aspx?num=50233>.
- Costa Laurencio, I. et. al. (2012). How does the market value corporate sustainability performance? Journal of Business Ethics, 108 (4), p. 420. Retrieved from: <https://link.springer.com/article/10.1007%2Fs10551-011-1102-8>
- Drucker, P.F. (1985). Innovation and Entrepreneurship: Practice and Principles. SSRN Publication, posted on 2009. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1496169.
- Efma-Infosys Finacle (2016). Efma-Infosys Finacle release innovation in retail banking study. Efma open-source publication. Retrieved from: <https://www.efma.com/article/detail/26144>
- Elliott, J.E. (1980). Marx and Schumpeter on Capitalism's Creative Destruction: A Comparative Restatement. The Quarterly Journal of Economics, 95 (1), pp. 45-68. Retrieved from: <https://academic.oup.com/qje/article-abstract/95/1/45/1898245?redirectedFrom=fulltext>.
- Ernest & Young (2018). Asean Fintech Companies Census 2018. Singapore, EYGM, Ltd. Retrieved from: [https://www.ey.com/Publication/vwLUAssets/EY-asean-fintech-census-2018/\\$FILE/EY-asean-fintech-census-2018.pdf](https://www.ey.com/Publication/vwLUAssets/EY-asean-fintech-census-2018/$FILE/EY-asean-fintech-census-2018.pdf)
- Gada, D. (2018). Five ways FinTech is disrupting financial services industry. Finextra open-source article. Retrieved from: <https://www.finextra.com/blogposting/15105/five-ways-fintech-is-disrupting-the-financial-services-industry>.
- Gupta, A. (2019). One Million People Are Now Using Erica. WBR Insights. Retrieved from: <https://netfinance.wbresearch.com/bank-of-america-ai-powered-chatbot-strategy-ty-u>.
- Johne, F.A. & Harborne (1985). How Large Commercial Banks Manage Product Innovation. International Journal of Bank Marketing, 3 (1), pp. 21. Retrieved from: <https://www.emerald.com/insight/content/doi/10.1108/eb010750/full/html>.
- Khan, E.M. (2015). Schumpeter, Entrepreneurship, and Creative Destruction. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2558433

- KPMG (2012). Optimizing Banking Operating Model. Switzerland, KPMG International Cooperative. Retrieved from: [https://home.kpmg/content/dam/kpmg/pdf/2014/07/Optimizing-Banking-Operation- Models.pdf](https://home.kpmg/content/dam/kpmg/pdf/2014/07/Optimizing-Banking-Operation-Models.pdf)
- Landstrom, H. (2005). Pioneers in Entrepreneurship and Business Research. US, Springer publication. Retrieved from: <http://213.55.83.214:8181/Management/01310.pdf>.
- Lardic, S. & Terraza, V. (2019). Financial Ratios Analysis in Determination of Bank Performance in the German Banking Sector. Germany, International Journal of Economic & Financial Issues, 9 (3), pp. 23-25. Retrieved from: www.econjournals.com.
- Laton, M.Z. et. al. (2015). Innovation & Organizational Cost Saving: A Cas from Malaysia Innovation Projects. Malaysia, Mediterranean Journal of Social Sciences, 6 (5-S2), p. 499. Retrieved from: <https://www.researchgate.net/publication/281561249>.
- Marous, J. (2019). Five Innovation Trends That Will Define Banking 2019. The Financial Brand – open source publication. Retrieved from: <https://thefinancialbrand.com/77869/innovation-trends-banking-ai-api-personalization-payments/>.
- McCraw, T.K. (2007). Prophet of Innovation. US, Harvard University Press. Retrieved from: <http://www.hup.harvard.edu/catalog.php?isbn=9780674034815>
- Merriam-Webster Dictionary (1828). Retrieved from: <https://www.merriam-webster.com/>.
- National News Bureau of Thailand (2019). Top News. Retrieved from: <http://thainews.prd.go.th/en/http://thainews.prd.go.th/en/>.
- Ortiz, A. (2017). Fintech in Emerging Asean: Trends and Prospects. BBVA Research Asia, Inc. Retrieved from: <https://www.bbvaresearch.com/wp-content/uploads/2017/07/June-2017-ASEAN-Fintech-Trends1.pdf>.
- Schumpeter, J.A. (2003). Capitalism, Socialism and Democracy. UK, Taylor & Francis e-Library, pp. 82-83. Retrieved from: <https://eet.pixelonline.org/files/etranslation/original/Schumpeter,%20Capitalism,%20Socialism%20and%20Democracy.pdf> .
- Sikka, S. & Srinath, U.V. (2017). Innovation in Banking Products and Services. IOSR Journal of Business Management, 4 (4), pp. 22-25.