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Tackling technology disruption in the financial sector: Are the current Singapore government incentives and labour force preparations adequate?

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Tackling technology disruption in the financial sector:

**Are the current Singapore government incentives and
labour force preparations adequate?**

27 Oct 2016

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Tackling technology disruption in the financial sector: Are the current Singapore government incentives and labour force preparations adequate?

AGENDA	Duration
1. Motivation and Definition	5
2. Impact of Fintech on Banking	5
3. Singapore as a Case study	20
4. Discussant	15
5. QnA led by Chairperson	15

1. Motivation for this paper

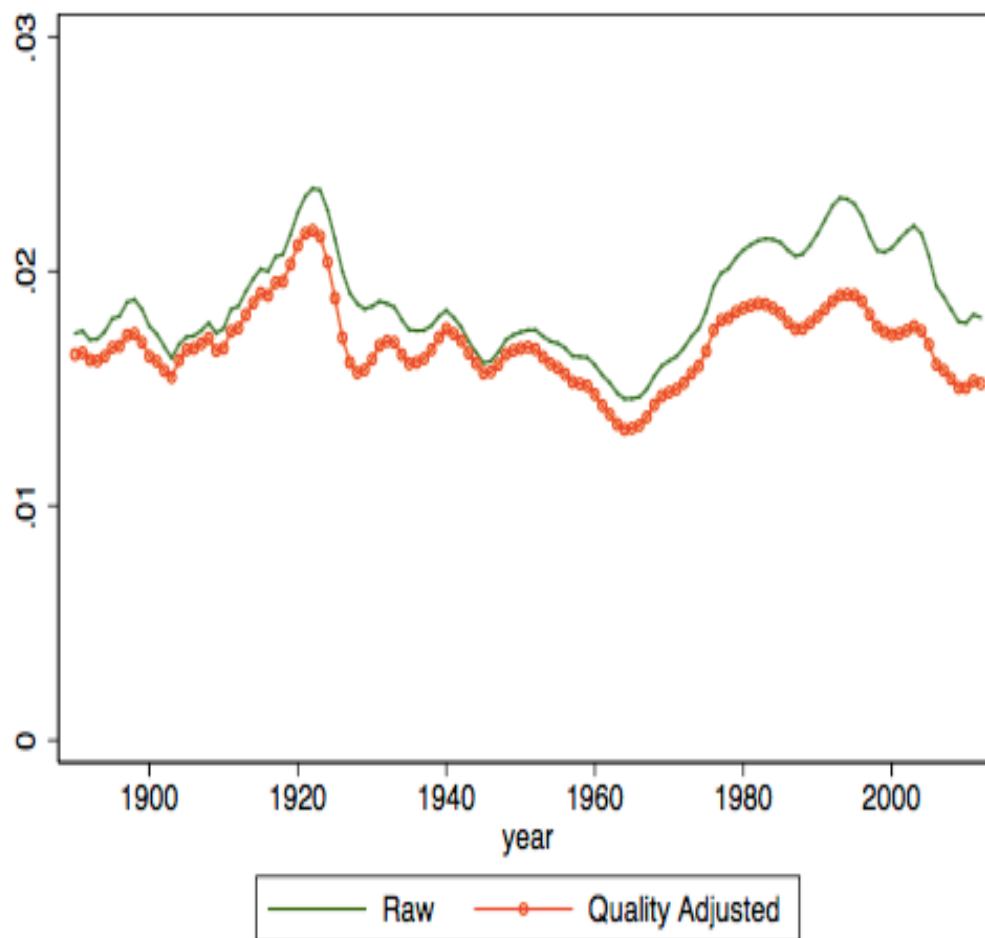
Haddad, C., & Hornuf, L. (2016). The emergence of the global fintech market: economic and technological determinants

1. Technology, capital markets, mobile telephone subscriptions
2. Labour force
3. Financial system

Active policies can influence the emergence of this new sector.

Philippon, T. (2015). Has the US finance industry become less efficient? On the theory and measurement of financial intermediation. *American Economic Review*, 105(4), 1408-1438.

Figure 3: Unit Cost of Financial Intermediation



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Importance

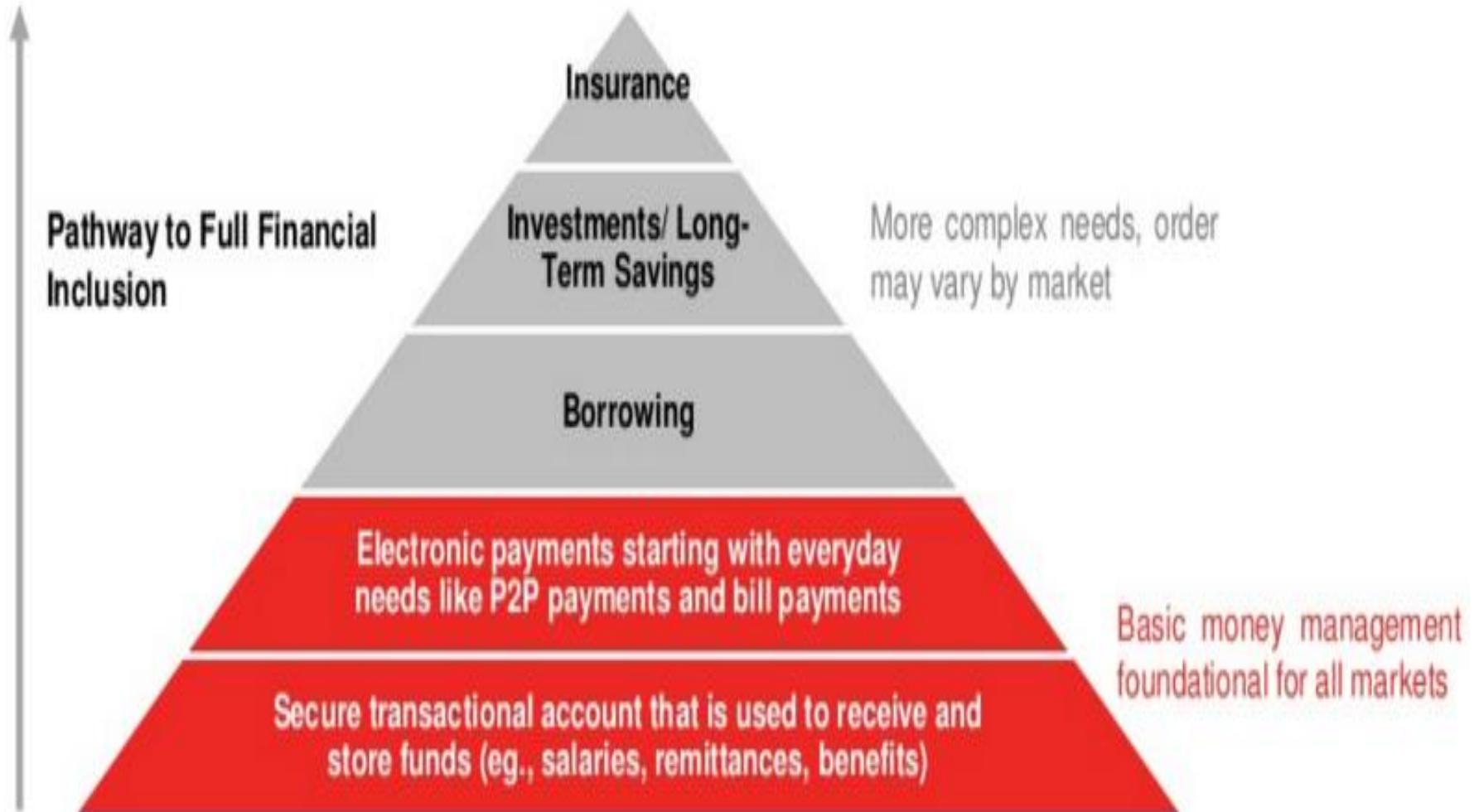
Practice perspective: In Singapore context

1. Local banks (business model is being disrupted by fintech)
2. MAS Regulator (trade off between efficiency and safety)
3. Local SMEs (access to alternative finance)

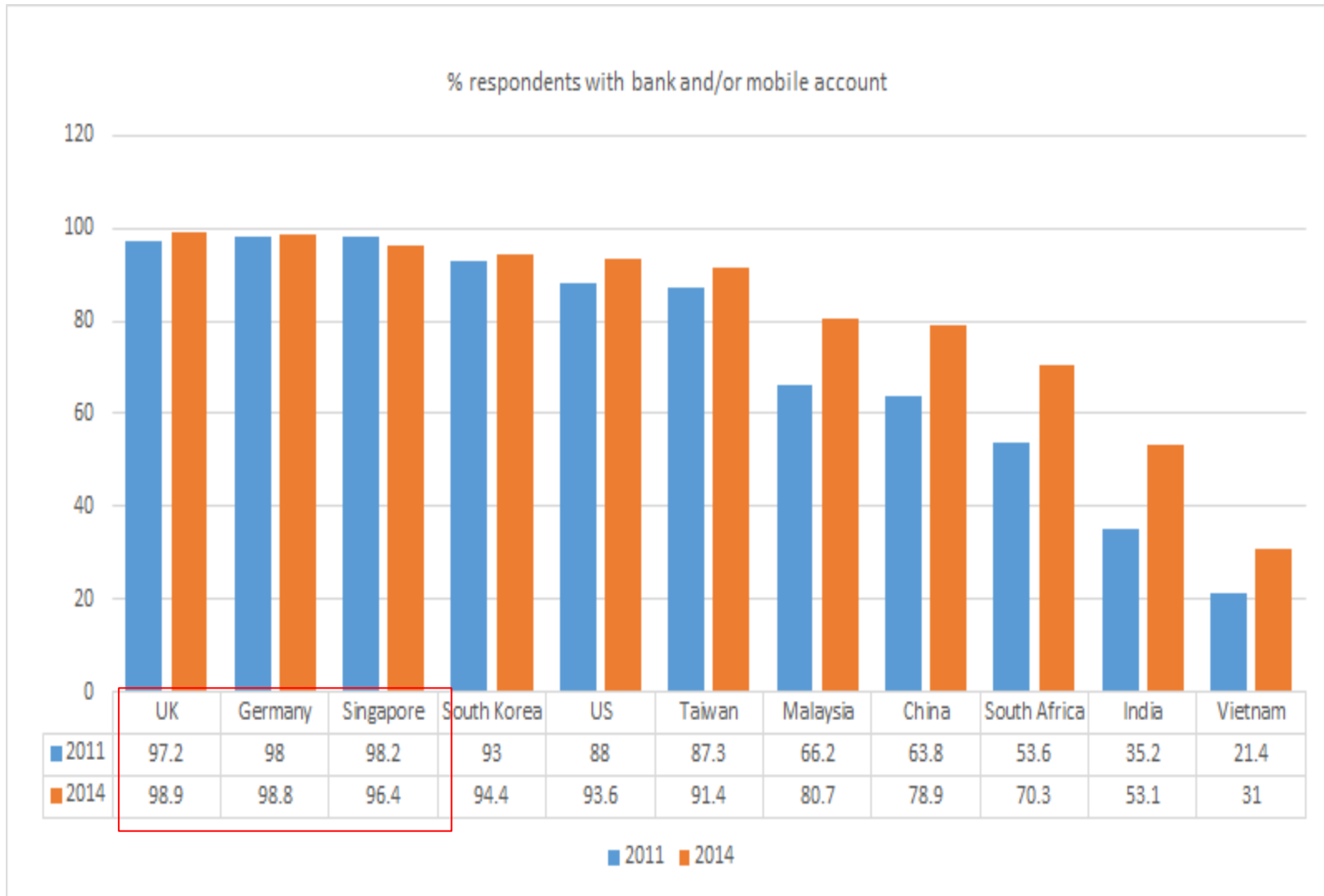
Research perspective: efficiency of banking sector to meet financing needs of SMEs

Definition

Hierarchy of Consumer Financial Needs

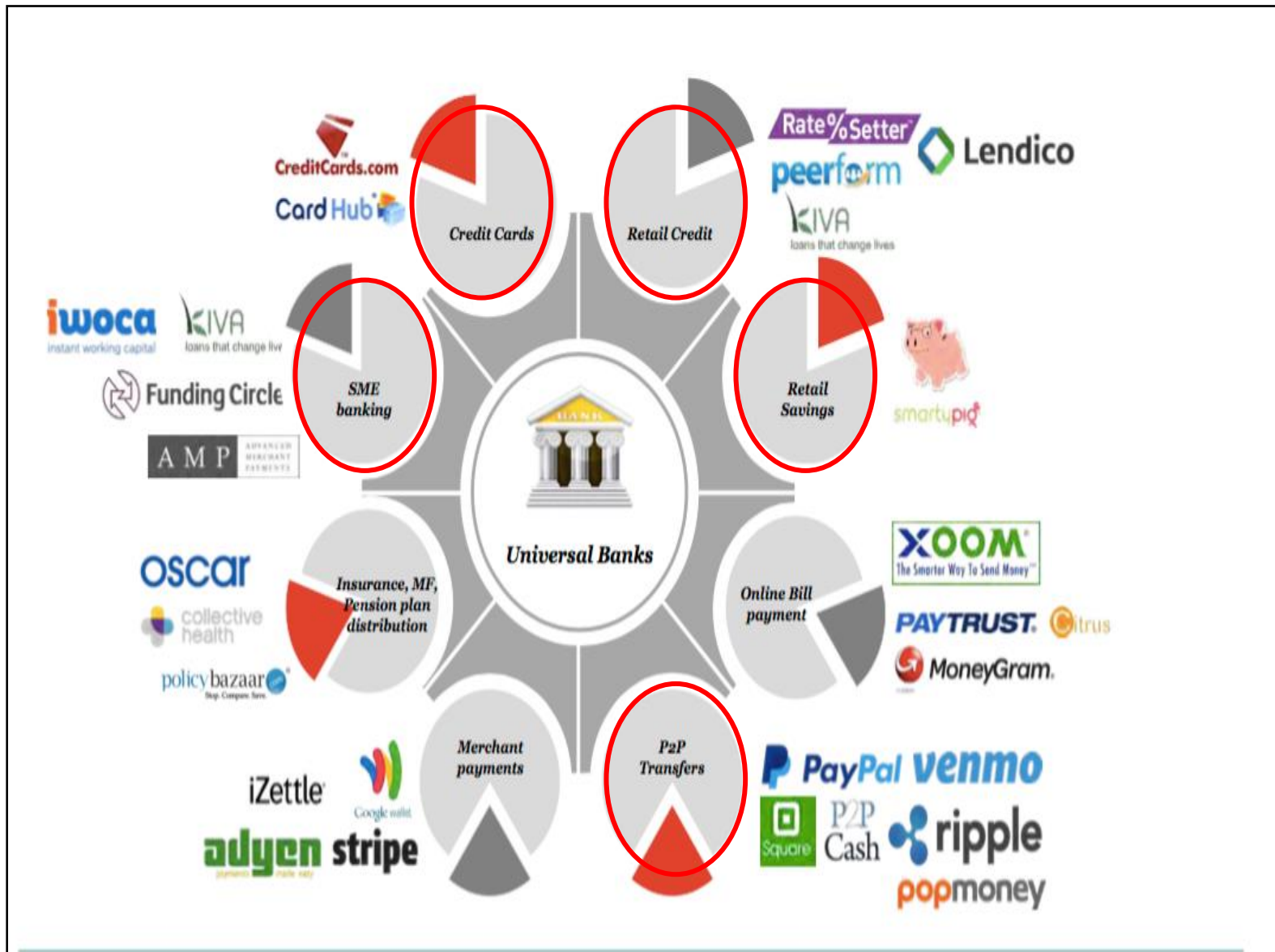


Financial Inclusion



Source: World Bank

Fintechs - Examples

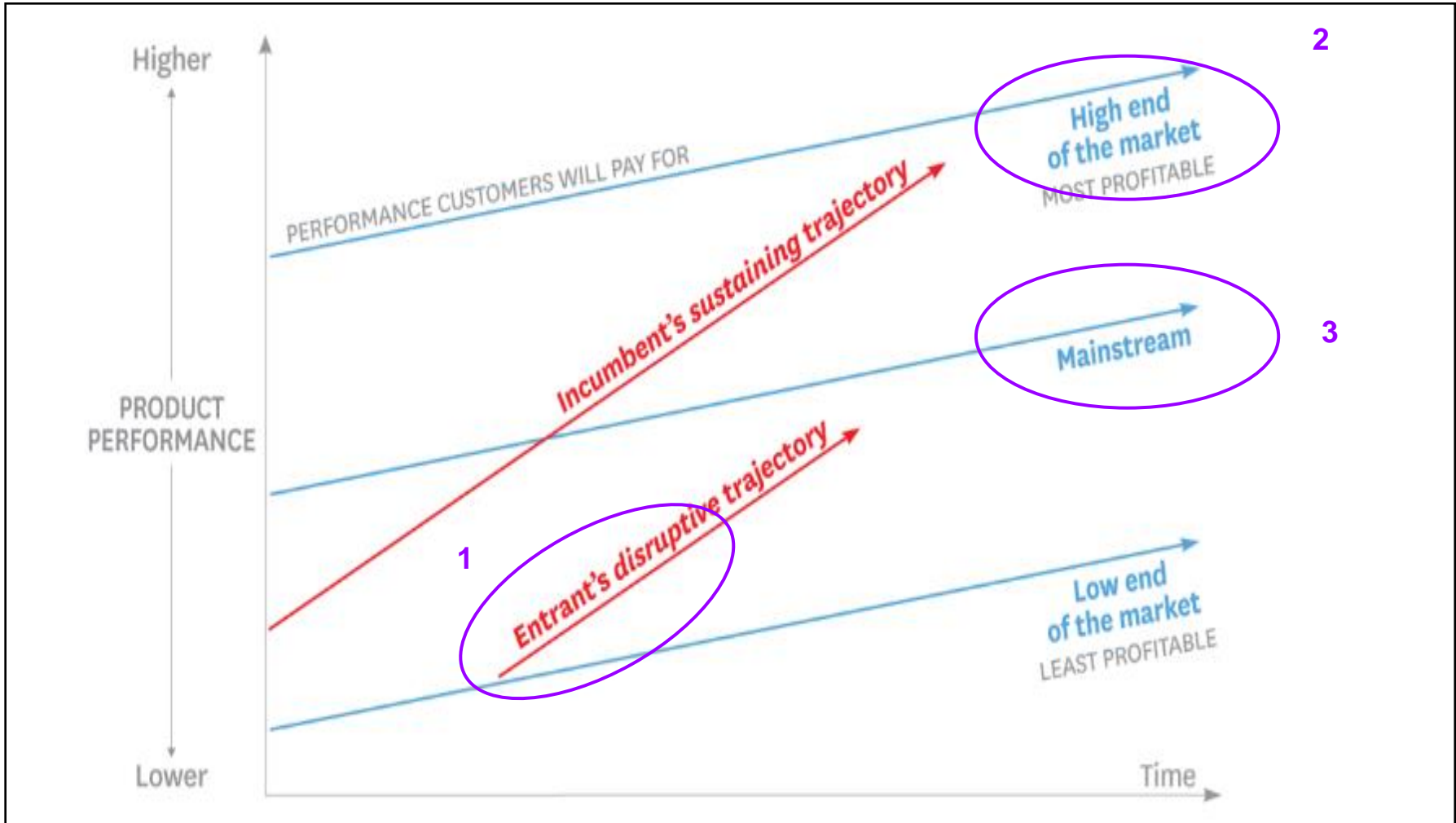


2. Impact on Bank and Banking

- (1) consumer finance,
- (2) mortgages,
- (3) lending to small and medium-sized enterprises (SMEs),
- (4) retail payments, and
- (5) wealth management,

which constitutes 10% to 40% of bank revenues

Disruptive Innovation (Christensen, 2015)



SOURCE CLAYTON M. CHRISTENSEN, MICHAEL RAYNOR, AND RORY MCDONALD
FROM "WHAT IS DISRUPTIVE INNOVATION?" DECEMBER 2015

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Innovation, Uncertainty, Risk Management

Bank for International Settlements report (2011)

“innovation carries financial institutions into uncharted waters. It changes the profile of risk and, as a departure from established practice, it makes that risk harder to assess. And the more radical the innovation, the higher the attendant uncertainty. It is no coincidence that banking crises often follow on the heels of rapid financial deregulation [...] for rewards are very often front-loaded while the risks do not crystallise until much later. Hence, solid risk management is a prerequisite if banks (and the rest of us) are to benefit from financial innovation.”

Banks' Responses

Examples

1. Hackathons, incubators, and accelerators
2. Automated instant decisions
3. Fees and charges (for low-margin services)

3. Singapore as a Case Study

Ageing population / limitations to land, manpower - productivity and innovation

Activist demand-side policy instruments to stimulate innovation in financial services

MAS response

Tradeoff in decisions: incentives (regulatory sandboxes) and regulation

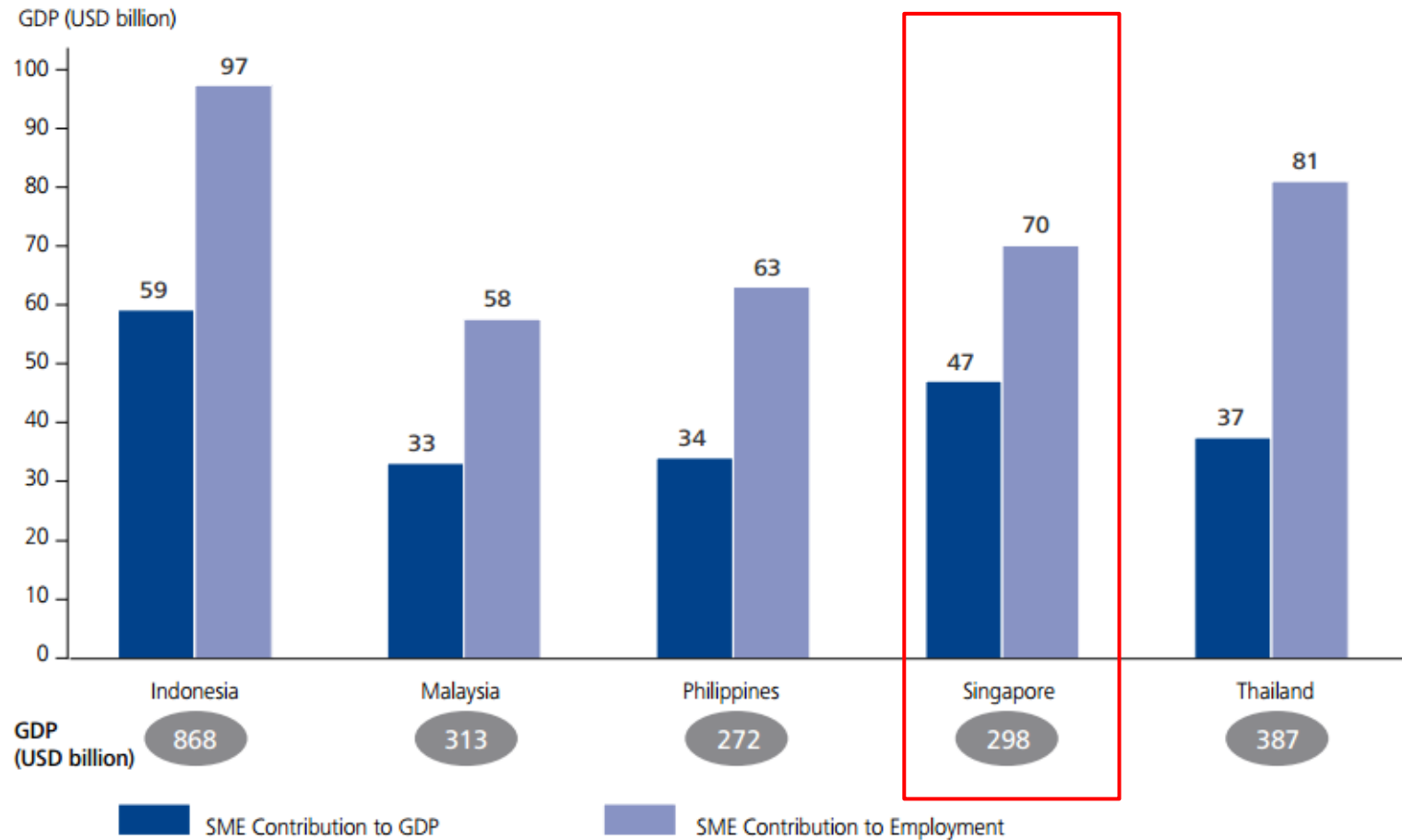
Or, regulation to run alongside innovation

Brunner and Gorfine (2014)

Rules-based Regulatory Regimes	
Potential Positives	Potential Negatives
Certainty and predictability, including with respect to future enforcement	Check-the-box forms of compliance that strategically evade the underlying purpose of the regulation ¹³
Clear communication of steps for compliance	High internal costs of compliance
Ensures specific behavior	Deterrence with respect to innovation
Uniform treatment of regulated entities	Frequent disconnect between the purpose of the regulation and the actual regulatory outcomes
	Obsolescence

Principles-based Regulatory Regimes	
Potential Positives	Potential Negatives
Executive-level management involvement in incorporating regulatory principles into business models	Uncertainty and the risk of unpredictable post hoc application or arbitrage
Flexibility and innovation in the face of "rapidly changing environments" ¹⁴	Concerns over fairness/bias in application
Speed in the regulatory process	Inadequate deterrence of specific problematic behavior or activities
The centrality of guidance and evolving norms/best practices	Over-reliance on current norms and practices

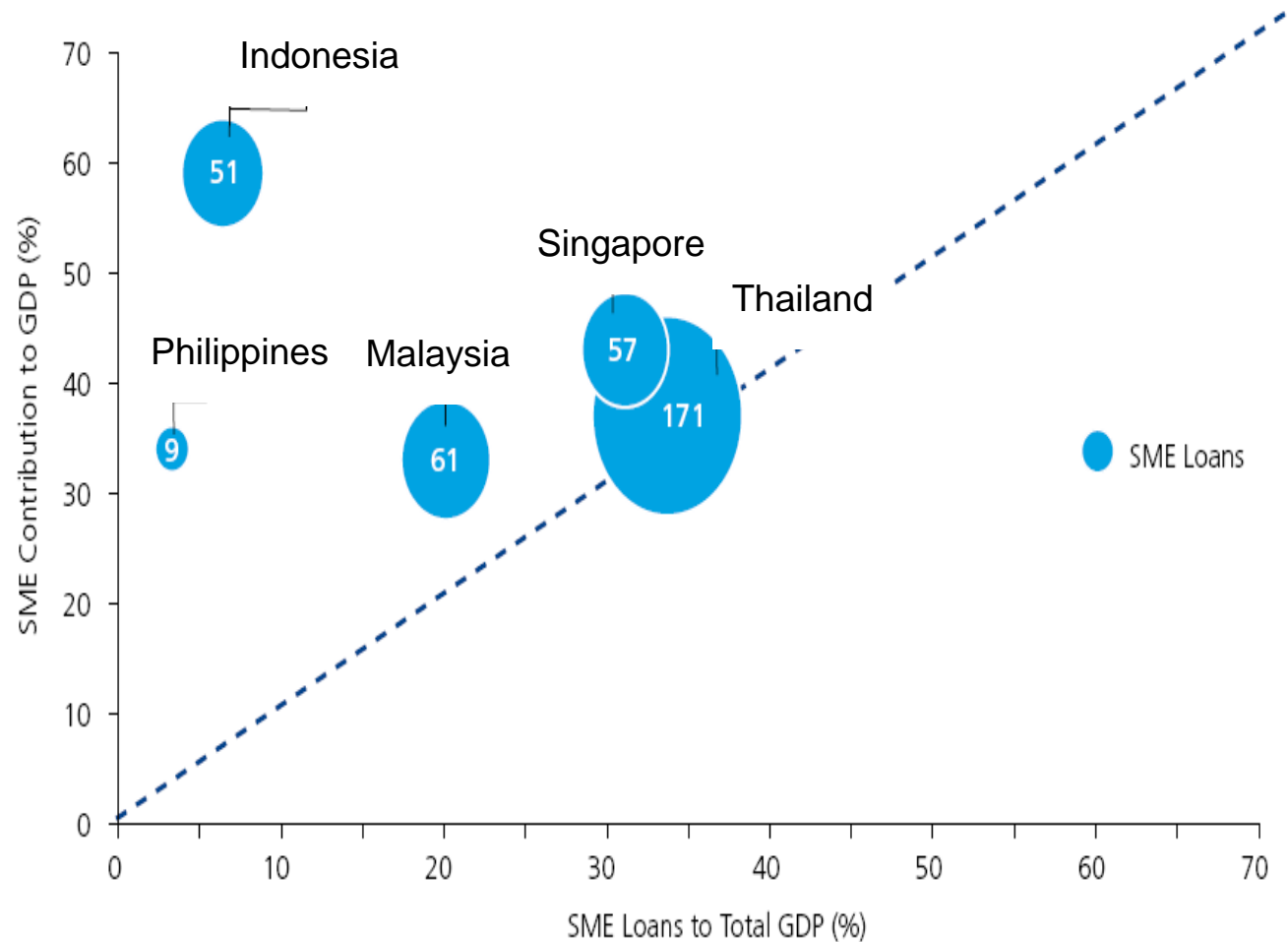
SME Contribution to GDP and Employment (%)



Note: Data from 2013 except for Indonesia (2012)

Source: Asia SME Finance Monitor 2013; SME Corporation Malaysia; Department of Statistics Malaysia; Indonesia Ministry of Cooperatives and SMEs; Thailand Office of SME Promotion SME White Paper 2014; APEC Policy Support Unit; Singapore Department of Statistics; DP Information Group

SME Loans-to-GDP vs SME Contribution to GDP (USD billion¹, 2014²)



Note: ¹ March 08, 2015 exchange rate used: 1 USD = 3.6 MYR, 1 USD = 44.31 PHP 1 USD = 12,747 IDR, 1 USD = 33 THB, 1 USD = 1.36 SGD

² GDP figures from 2013

Source: Asia SME Finance Monitor 2013, Bank Negara Malaysia, SME Corporation, Securities Commission Malaysia, Bank Indonesia, Bank of Thailand, MAS, Bangko Sentral ng Philipinas, World Bank, Deloitte Analysis

	<u>Bank loans are expensive</u>	<u>Collateral</u>
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2010:	32%	17%
2011:	36%	16%
2012:	39%	22%
2013:	46%	25%
2014:	47%	24%
2015:	56%	23%

More members in 2015 survey by Singapore Business Federation SBF are reporting that bank loans are more expensive, and they need more collateral for same financing, as compared to 6 years ago

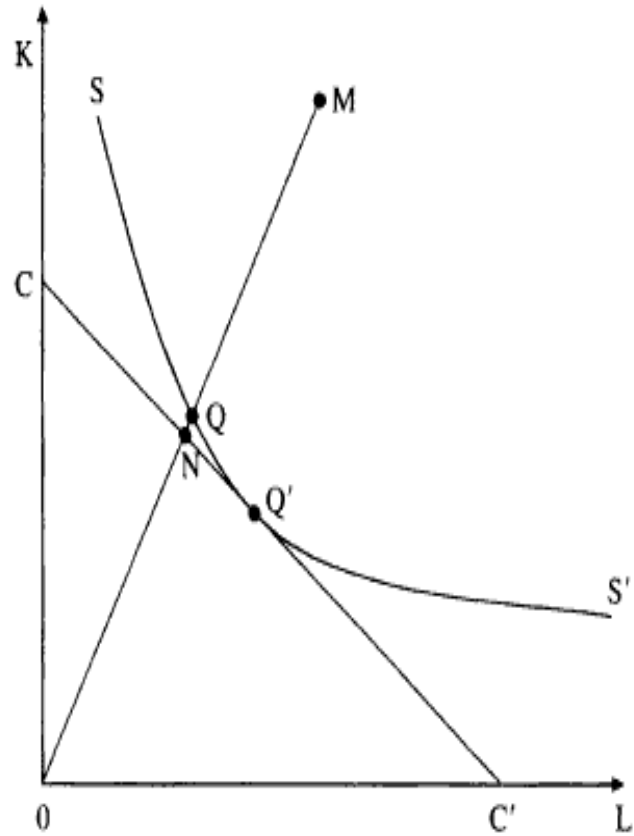
Research question: Measure the extent inefficiency in Singapore banks has decreased, to affirm validity of deregulation in the banking sector

Technical and Allocative Efficiency

Chen, T.Y. (2001). An estimation of X-inefficiency in Taiwan banks. *Applied Financial Economics*, 11, 237-242

Table 2. Efficiency scores estimated by the DEA model (# Oa model with data year 1997)

Name of banks	Theta	Iota	Difference
Old-established banks	0.7107	0.6973	0.0135
1. Taiwan	1	1	0.0000
2. First	0.7856	0.7818	0.0038
3. Hua-Nan	0.7878	0.7866	0.0012
4. Chang-Hua	0.7372	0.7341	0.0031
5. Overseas Chinese	0.6628	0.6474	0.0154
6. Shanghai	0.8051	0.8051	0.0000
7. Taipei	0.8050	0.8013	0.0037
8. United World Chinese	1	1	0.0000
9. Kaohsiung	0.7624	0.7358	0.0266
10. International China	1	1	0.0000
11. Taiwan Province	0.8001	0.7875	0.0126
12. Taipei City	0.6994	0.6986	0.0008
13. Hsinchu City	0.7049	0.6845	0.0204
14. Taichung City	0.7271	0.6794	0.0477
15. Tainan City	0.6132	0.5855	0.0277
16. Kaohsiung City	0.4939	0.4919	0.0020
17. Hualien City	0.4346	0.4285	0.0061
18. Taitung City	0.9743	0.9032	0.0711
Newly-established banks	0.8426	0.8082	0.0344
19. Grand	0.9351	0.8484	0.0867
20. Dah-An	0.8589	0.7817	0.0772
21. Union	0.8508	0.8305	0.0203



Rank	Country	Score
1	Finland	7.67
2	Greece	7.50
3	Norway	7.27
4	Denmark	7.13
5	Netherlands	7.05
6	Philippines	7.00
7	Australia	6.75
8	Israel	6.70
9	Iceland	6.69
10	Ireland	6.68
11	Malaysia	6.66
12	Switzerland	6.64
13	Canada	6.63
14	Spain	6.55
15	Russia	6.52
30	Taiwan	5.66
31	United Kingdom	5.62
32	Singapore	5.54
33	Czech Republic	5.53
34	Slovak Republic	5.53
35	Latvia	5.52

Source: IMD World Competitiveness Yearbook in 2015

Conclusion

What lessons can Singapore learn from developed countries and what are the challenges that lie ahead?

1. Rules-based versus principles-based regulatory regime
2. Alternative source of funding for SMEs
3. Singapore be open to diverse global talent and expertise

Challenges: achieving socially efficient outcomes in a dynamic environment (technology, innovation, competition)

Thank you