RESILIENCE THROUGH STRATEGY

INVESTMENT DECISIONS AND DYNAMIC CAPABILITIES IN CAPITAL-INTENSIVE SECTORS

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AGENDA

- Overview
- Introduction
- Literature Review
- The Resilience Theoretical Framework for Capital Intensive Sector
- Research Question and Methodology
- Empirical and Case Study Methods
- Research Results
- Discussion of Results and Research Implications
- Conclusions

OVERVIEW

Research Focus

- Investigates investment policy as a unique resource (RBV)
- Explores business model innovation as a dynamic capability

Methodology

- Comprehensive statistical analysis using panel regression (318 telcos worldwide) and DiD methods
- Case studies of operators in three countries (USA, Thailand, Russia)

Theoretical Framework

- Proposes resilience framework for capital-intensive sector
- Extends Resource Based View and Dynamic Capability theories

Key Findings

- Leading investments(*) in core infrastructure lead to better firm performance
- Business model innovation is a powerful factor of resilience but cannot substitute investments in core
- Quick adjustments during crisis in investment or business model innovation does not lead to gains in market position.

(*) By leading investment strategy authors understand dominant share of investment in a period or that an operator is ahead in investment share compared to its competitors

INTRODUCTION

Telecommunications – traditional capital-intensive sector

- 15-25% of revenues allocated to annual capital expenditures
- With digitalization telecom players face dilemma whether to invest more in innovative business models or focus on core infrastructure

The pandemic - widespread disruptions across industries

- Lockdown measures upended established practices

Multidirectional trends in telecommunications

- Explosive growth in broadband subscriptions
- Inadequacy of mobile phones for video communications
- Increased demand for landline services
- Stagnation of small and medium businesses

Strain on fixed and mobile networks

- Need for additional investments in network capacity and coverage

How to achieve resiliency in a crisis

- Freeze or accelerate investments in core infrastructure
- Pivot or accelerate investments in innovative business models

LITERATURE REVIEW: RESILIENCE THEORETICAL FRAMEWORK: ECONOMIC RESILIENCE

Economic Resilience Defined

- Ability to absorb economic shocks
- Recover critical functionality
- Sustain competitive advantage

Static vs. Dynamic Resilience

- Static: Maintain operational stability during a shock
- Dynamic: Efficient use of resources for recovery and growth

Strategic Investments and Dynamic Capabilities

- Resource-Based View (RBV)
- Business Model Innovation (BMI)

Focus on Telecommunications Sector

- Leveraging resources and capabilities

LITERATURE REVIEW: RESILIENCE TIIEORETICAL FRAMEWORK: RESOURCE-BASED VIEW (RBV)

Resource-Based View (RBV) Concept

- Firms achieve competitive advantage through unique resources
- Resources must be valuable, rare, inimitable, and non-substitutable (VRIN)

Key Resources in Telecommunications

- Investment capital
- Technological assets
- Skilled human capital
- Efficient organizational processes

Strategic Management for Resilience

- Enables firms to withstand disruptions
- Maintains competitive edge

Limitations of Traditional Investment Theories

LITERATURE REVIEW: RESILIENCE TIHEORETICAL FRAMEWORK: DYNAMIC CAPABILITIES THEORY

Dynamic Capabilities Theory (Teece 2010)

- Extends RBV by focusing on firm's adaptability
- Three core processes: sensing, seizing, transforming

Importance of Business Model Innovation (BMI)

- Allows firms to adjust and reinvent business models
- Helps confront challenges effectively

Telecommunications Industry Challenges

- Exploring new revenue streams
- Fending off aggressive new entrants

Two Primary Business Models (Friedrich and Meakin 2017)

- Focus on digital core
- Digital eco-system model

THE RESILIENCE THEORETICAL FRAMEWORK FOR CAPITAL INTENSIVE SECTOR

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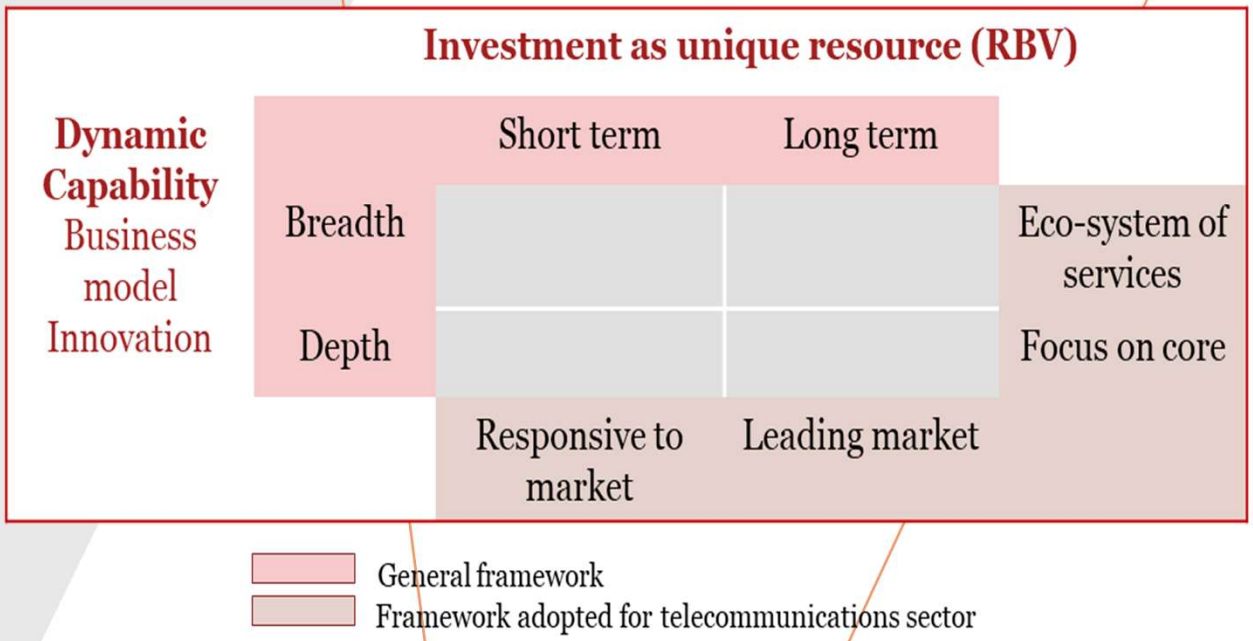


RESEARCH QUESTION AND METHODOLOGY

Strategic Decisions During Crisis

- Invest aggressively to capture market share or maintain steady approach
- Expand with innovative business models or focus on core services

Data Analysis Steps

- Empirical analysis of capital investments' impact on market share from 2012 to 2022
- Case study analysis of operators with different business models in three countries

Hypotheses

- H1: Market share contingent on investment proportion
- H2: Operators that rapidly adopted investment share policy in response to crisis demonstrated better economic resilience
- H3: Operators that invested in innovative business models demonstrated better economic resilience after the shock

EMPIRICAL METHOD

- Panel Data Analysis
  - Data from 2012 to 2022 on financial performance and market position
  - Includes revenue, subscriber base, capital expenditures, and EBITDA margin
- Calculated Attributes
  - Subscriber market share for each operator
  - Share of capital expenditure to total telecom capital expenditure
- Panel Regression Analysis
  - Impact of capital investment shares on market and financial performance
  - Uses Stata software
- DiD Regression Analysis
  - Evaluates dependency of market share on investment policy during high stringency lockdowns
- Controls:
  - unobserved heterogeneity using operator, country, and time fixed effects (differences in management, regulatory environments, and global trends
  - Clustered standard errors at the operator level for robust estimates.
  - 4G and 5G adoption, varying by country and time. A visual inspection of pre-treatment parallel trends

(1) $MS\_subs(it)=\beta 0+\beta i*Share\_capex(it) +\alpha i+\epsilon it$

(2) $MS\_subs(it)=\beta 0+\beta 1 * after\_covid + \beta 2 * Stringency90 + \beta 3 * (TreatedByLock90) + \beta i*Share\_capex(it) +\alpha i+\epsilon it$

Variable Name	Variable Description
MS_subs	%, market share by subscribers (dependent variable) in a country in a quarter t
Share_capex	%, share of capital investments (independent variables) for each operator in a country in a quarter t
Subs	#, number of subscribers of an operator in a quarter t
Revenue	$, revenue of an operator in a quarter t
Rev_Share	$, market share by revenue in a quarter t
CAPEX	$, capital expenditure of an operator in a quarter t
TreatedByLock90	interaction term after_covid * Stringency90

RESEARCH RESULTS: EMPIRICAL EVIDENCE

- Key Regression Model (1)
  - Dependency of operator market share on capital expenditure share
  - 35% of market share variability "explained" by operator investment share
- Models 2,3,4
  - Ensuring result consistency
  - Investment share significant predictor of revenue market share
  - Overall investment significant for subscriber base
- DiD Analysis for Hypothesis 2
  - Model 5: No significant dependency between lockdowns and subscriber market share
  - Models 6,7: Analysis for capex leaders and laggards
- Lockdowns' Impact
  - No significant impact on operators' market share

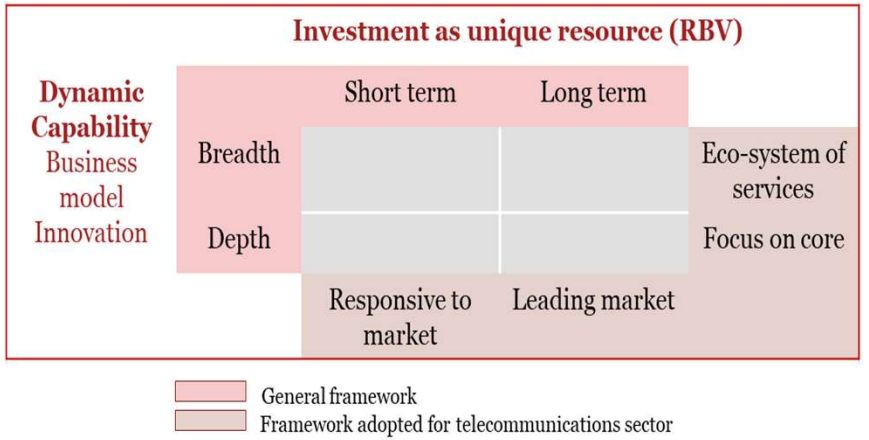
	Data set – 8456 observations, 318 operators, quarterly from 2012Q1 to 2022Q2						
N	Dependent	Indep/Covariates	R Sq	Coeff	Std Err	t	p
1	MS_subs	Share_capex	0.35	0.037	0.0097	3.84	0.000
		CAPEX	0.01	1.71e-11	8.54e-12	2.00	0.046
2	Subs	Share_capex	0.002	3612043	1985604	1.82	0.07
		CAPEX	0.63	0.0174	0.0065	2.67	0.008
3	Rev_Share	Share_capex	0.5595	.1947682	.0234271	8.31	0.000
		CAPEX	0.0053	3.21e-11	1.47e-11	2.18	0.030
4	Revenue	Share_capex	0.003	2.21e+08	1.33e+08	1.66	0.10
		CAPEX	0.84	1.05	0.56	1.87	0.063

N	Dependent variable	Interaction variable	Coeff	Std Err	t	p
DiD regressions to test the lockdown with Stringency > 90 impact on operators' market share						
5	MS_subs	TreatedByLock90	- 0.001	0.006	- 0.16	0.871
DiD regression to test the lockdown with Stringency > 90 impact on market share for leaders in capital investments						
6	MS_subs	TreatedByLock90	0.0017	0.0084	- 0.15	0.18
DiD regression to test the lockdown with Stringency > 90 impact on market share for underinvestors						
7	MS_subs	TreatedByLock90	-0.0093	0.0084	- 1.11	0.27

CASE STUDY METHOD

- Analysis of case studies – telecommunications operators in three countries (USA, Thailand, and Russia)
- Each country has 3-4 major players (minor are not taken into account)
- Each operator is analyzed by Investment policy (investment as a unique resource by RBV) and Business Model Innovation strategy as dynamic capability
- The aim
  - 1) validate the hypotheses proposed in the empirical part;
  - 2) delve deeper into the impact of business model strategies on operators' market positions over the medium term.
- Hypothesis 3 is tested based on the qualitative analysis of case studies from three countries with operators demonstrating different strategies according to the theoretical framework (Fig. 1).
- This research **clusters operators** based on criteria such as the count of non-core services and the increase in revenue share from such services

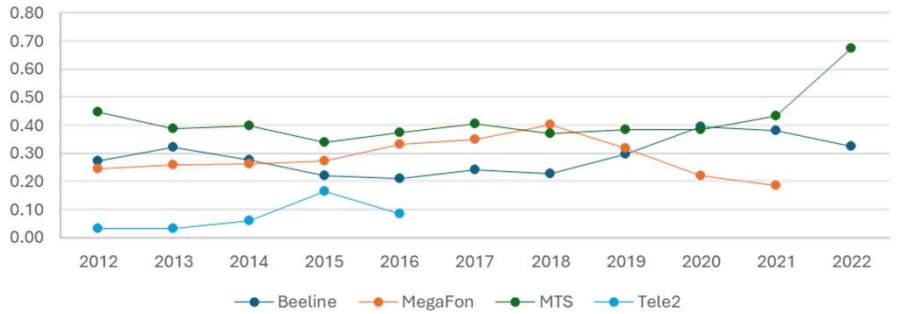
THE RESILIENCE THEORETICAL FRAMEWORK FOR CAPITAL INTENSIVE SECTOR.



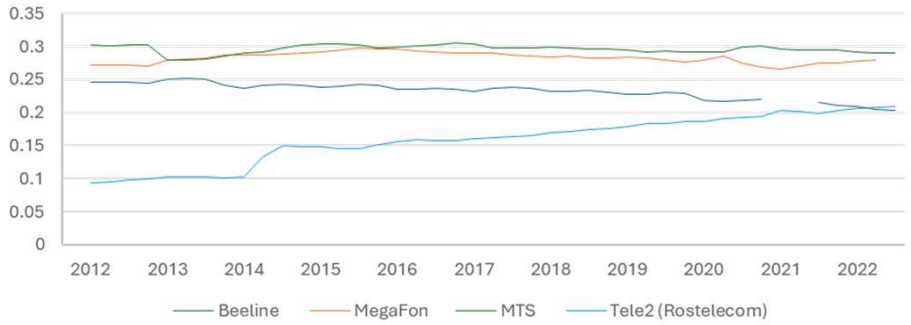
CASE STUDY EVIDENCE: RUSSIA

- Tele2
  - Mobile arm of Rostelecom since 2014
  - Core infrastructure investment strategy
  - Leading in prioritized key regions and core services
- MTS
  - Largest private operator
  - Developed an **ecosystem of adjacent services**
  - Continued **leading investments** in core mobile services
- MegaFon
  - **Steady investment** in mobile network infrastructure
  - Targeted youth segment and data services speed
- Beeline
  - Insufficient investments compared to competition in network infrastructure
  - **Customer experience strategic model** through non-core services

Annual share of investments, %

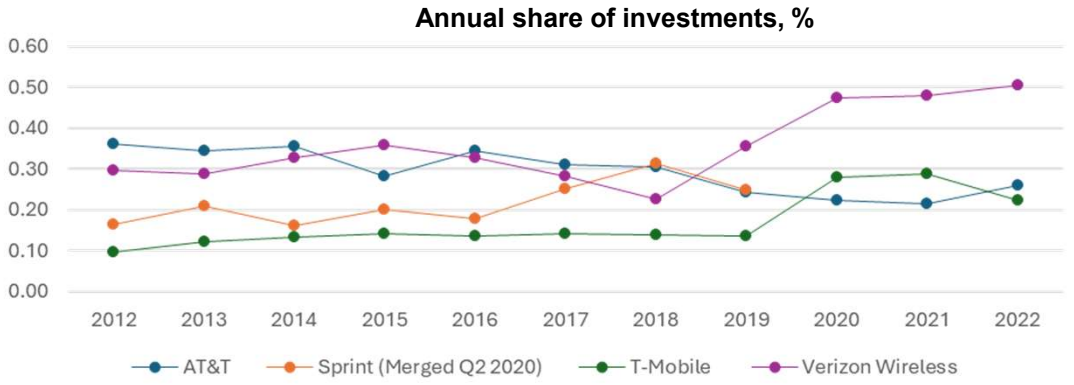


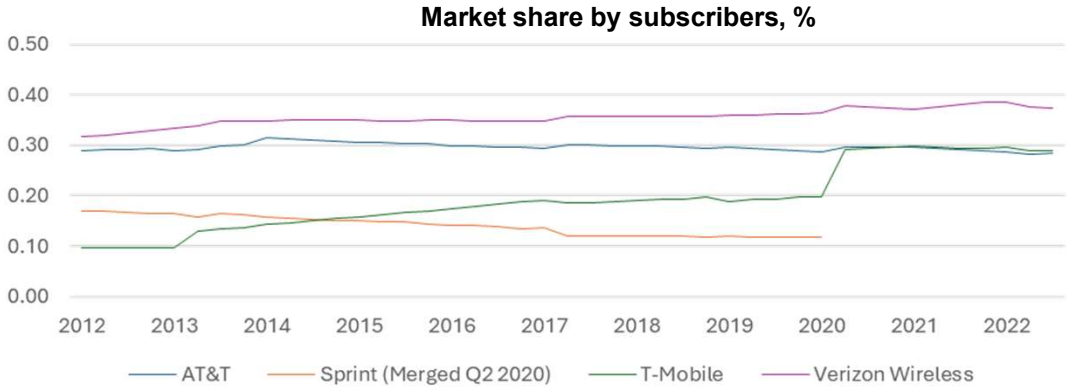
Market share by subscribers, %



CASE STUDY EVIDENCE: USA

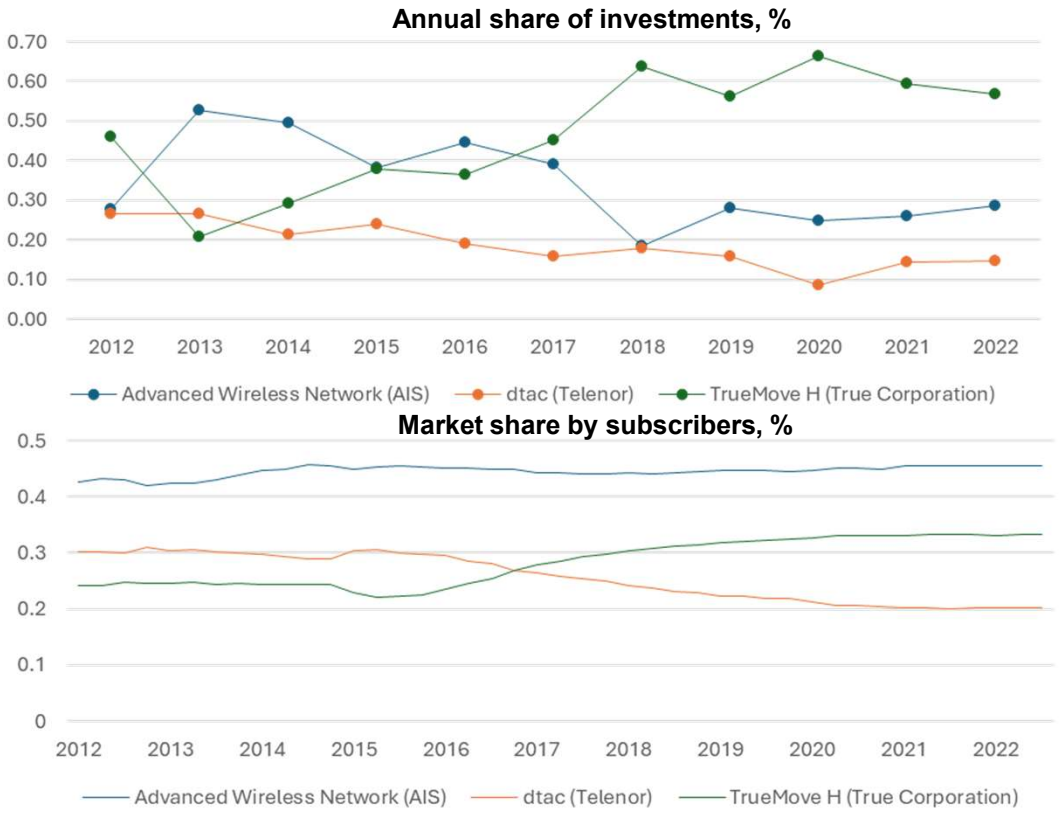
- AT&T and Verizon Strategies
  - **Leading investments in core service**
  - Significant investments in **eco-system strategies**
  - Device innovation and 4-5G technology investments
  - Bundles, exclusive content, and adjacent service offerings
  - Verizon and AT&T had similar investment levels until 2018
- T-Mobile's Strategy
  - Focus on **leading** investments in core services with 4G and 5G in **specific areas**
  - Affordable core wireless services with transparent pricing
  - Acquired Sprint in 2020, nearly surpassing AT&T in mobile subscriber base





CASE STUDY EVIDENCE: THAILAND

- AIS
  - Largest mobile operator in Thailand – **leading investments**
  - Premium pricing and high-quality services
  - Comprehensive **ecosystem business model**
- TrueMove
  - **Leading investments** in core next technology - 5G coverage launched in 2020
  - Strong partnerships and **broader ecosystem:** IoT, content and media, fixed-mobile bundles, and payment services
- DTAC
  - **Focus on infrastructure but lack of investments**
  - Transitioned from mass voice to mass data
  - Affordable 3G and 4G broadband services

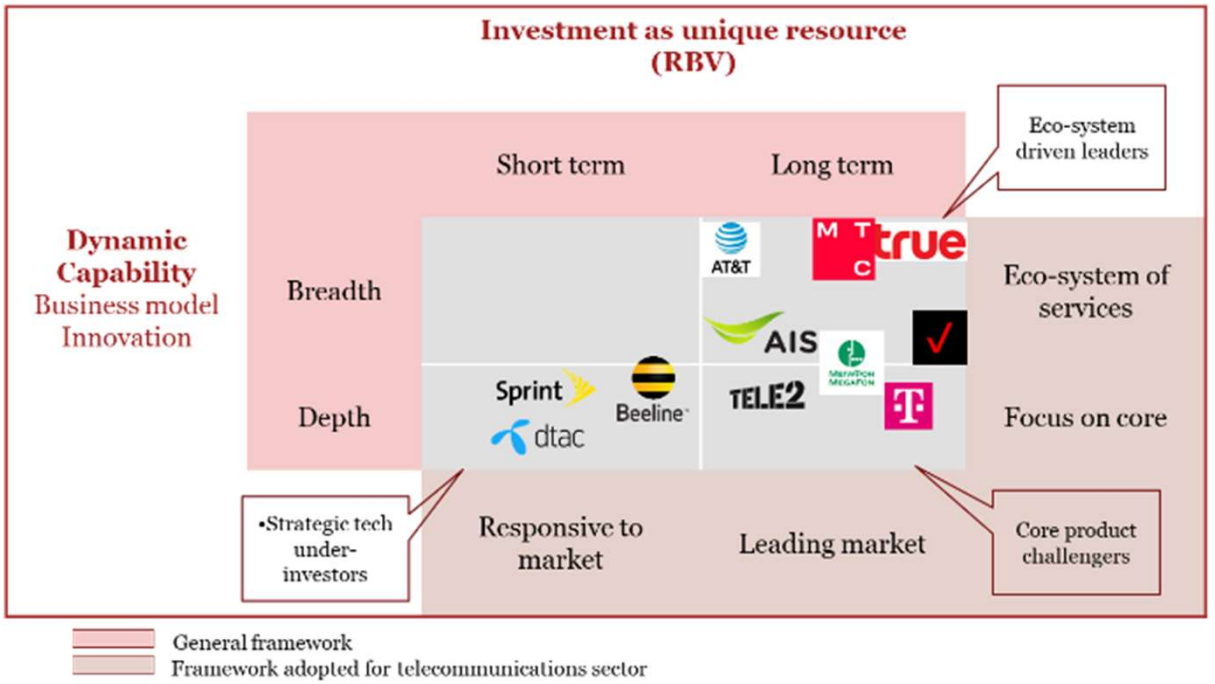


DISCUSSION OF RESULTS AND RESEARCH IMPLICATIONS

KEY FINDINGS

- Investment Strategies and Market Share
  - Sustained, multi-year investments enhance market share and resilience
  - Short-term investment fluctuations have little impact on long-term market positions
- Importance of Leading Investment Levels
  - Maintaining leading investment levels is crucial for resilience
  - Aligned with Keynesian and Neoclassical investment strategies
- Dynamic Capabilities and Resilience
  - Dynamic capabilities based on BMI enhance resilience
  - BMI as dynamic capability cannot substitute investments as unique resource

CLUSTERS OF TELECOM OPERATORS BASED ON THE RESILIENCE THEORETICAL FRAMEWORK



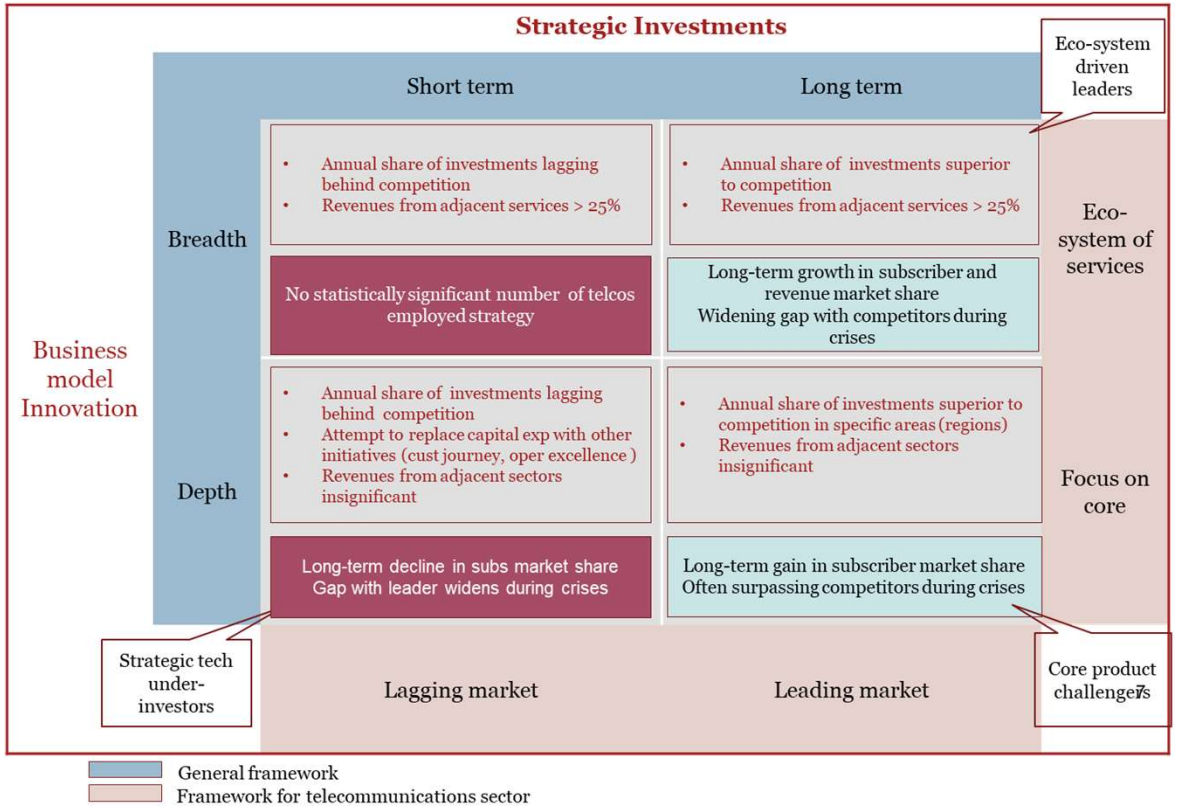
RESILIENCE FRAMEWORK FOR CAPITAL INTENSIVE SECTOR: STRATEGIC INVESTMENTS VS BUSINESS MODEL INNOVATIONS

Successful strategies: Long-term market and revenue share improvement

- Eco-system Driven Leaders: Companies that prioritize sustained, long-term investments while expanding into new business models and services.
- Core Product Challengers: Firms that focus on optimizing internal operations and make strong investments in core services and/or specific regions

Challenging strategies: long term market share decline

- Strategic Tech Under-Investors: Companies that cut back on core infrastructure investments, focusing instead on customer and operational improvements.
- Expansion-First Companies: Businesses that prioritize expanding into adjacent sectors over investing in core infrastructure.



CONCLUSIONS

Research Focus

- Key factors of economic resilience in capital intensive sectors
- Example: Telecommunications industry

Theoretical Framework

- Capital intensive resilience framework is an extension of resource-based view and dynamic capabilities theories

Findings

- Leading investments as a primary resilience factor
- Dynamic capability based on innovation in business model is secondary

Practical Value

- Guidance for top management in capital-intensive sectors
- Strategies for faster recovery from economic shocks