

Dissertation

How to do Dynamic Resource Allocation in the Generic Pharma Industry?

Guide

Prof. Sanjay Kallapur

Professor of Accounting

Indian School of Business

Other Dissertation Committee Members

Prof. Krishna Palepu

Ross Graham Walker Professor of Business Administration

Harvard Business School

Dr. Omkar Goswami

Founder and Chairperson

Corporate and Economic Research Group Advisory Private Limited

Submitted to Indian School of Business in partial fulfilment of the requirement of

Executive Fellow Program of Management (EFPM)

by

Saumen Chakraborty

Advisor, Dr. Reddy's Laboratories Ltd., and

Student of the EFPM, 2018 (Student Id – 111810004)

Indian School of Business

on

April 18, 2021

Executive Sponsor: GV Prasad, Co-Chairman & Managing Director,

Dr. Reddy's Laboratories Ltd.

This dissertation
is dedicated to
my late father Dr. Haripada Chakraborty, MA (Double), Ph D, D. Litt., who did not
consider me as fully educated without a Ph D,
my late mother Mrs. Uma Chakraborty, who always felt very proud as my mother for
any of my achievement
and
my wife/soulmate for last 33+ years, Mrs. Madhumita Chakraborty, who always
inspired me, remained my greatest critic, bonded the whole family together and
decided to opt for second post graduate degree during the period of my EFPM course,
reinforcing our family values of happy learning together.

Certificate of Originality

Declaration

This is to certify that Dissertation titled “**How to do dynamic resource allocation in the generic pharma industry?**” has been carried out by me while working with **Dr. Reddy’s Laboratories Limited, Hyderabad** and studying with the **Indian School of Business, Hyderabad** under the guidance of **Prof. Sanjay Kallapur** of the **Indian School of Business, Hyderabad**, **Prof. Krishna Palepu** of **Harvard Business School** and **Dr. Omkar Goswami, Cerg Advisory Private Limited** from January, 2020 to March, 2021.

Based on the professional work done by me, I am submitting this report in partial fulfilment for the requirement of the **EXECUTIVE FELLOW PROGRAM OF MANAGEMENT** of the Indian School of Business, Hyderabad.

I hereby declare that this EFPM dissertation is my original work, and it has been written by me in its entirety. I have duly acknowledged all the sources of information that have been used in this dissertation. This report has not been published and submitted for any degree to any other institute or university previously.

(Saumen Chakraborty)

Student Id – 111810004

Hyderabad

April 18, 2021

How to do Dynamic Resource Allocation in the Generic Pharma Industry?

Table of Contents

<u>ACKNOWLEDGEMENT</u>	<u>7</u>
<u>ABSTRACT</u>	<u>9</u>
<u>CHAPTER 1 – INTRODUCTION</u>	<u>10</u>
Scope of resource allocation	
Need for dynamic resource allocation	
Problems with current approach for resource allocation	
The role of the board	
The role of the CEO	
The role of the CFO	
What are the issues that prevent them from doing resource allocation?	
<u>CHAPTER 2 - LITERATURE REVIEW</u>	<u>15</u>
Resource allocation process – original to revised model	
Internal resource allocation – objectives, impediments and influencing factors	
External influence on resource allocation – three-dimensional framework	
Impact of CEO’s decision making	
Human capital and resource fluidity	
Resource allocation literature - conclusion	
The research gap and focus of my research contribution	
My own experience and relevant learnings	
<u>CHAPTER 3 – RESEARCH QUESTION AND METHODOLOGY</u>	<u>26</u>
Research question	
Methodology	

Table of Contents (Continued)

CHAPTER 4 - CASE STUDY OF RESOURCE ALLOCATION IN DR. REDDY'S LABORATORIES LTD. 28

Company profile, purpose and values
Factors of strategic importance for Dr. Reddy's
Analysis of past capital allocation across SBUs in Dr. Reddy's
Source of capital
Deployment of capital
Capital allocation to resource allocation in pursuit of strategy
The strategic initiatives by the company
 TOC implementation
 SDP implementation
Application of SDP and TOC in the renewed strategy
Renewed approach for resource allocation in pursuit of strategy
Application of SDP and TOC in resource allocation in pursuit of strategy
Decision for reallocation of resource to multiple categories across SBUs
Conclusions: Hypotheses and the hypothesised framework for dynamic resource allocation

CHAPTER 5 – INTERVIEW OF INDUSTRY LEADERS AND ASSOCIATES 47

Interviewee Comments on roles of boards, CEOs and CFOs
Comments on challenges faced by CEOs
Anecdotal success and failure stories
Conclusion: validating Hypothesis 1

CHAPTER 6 – ANALYSIS OF SURVEY AMONG THE SENIOR MANAGERS OF DR. REDDY'S 57

Quantitative Analysis
Qualitative Analysis
Conclusion

Table of Contents (Continued)

<u>CHAPTER 7 – INTERVIEW OF INDUSTRY LEADERS AND ASSOCIATES – CONTINUED</u>	<u>67</u>
Comments on the influence of purpose, vision and values on strategy	
Factors of strategic importance, priorities, culture, execution	
Resource allocation on capex	
Resource allocation on M&A	
Risk mitigation to strategy	
Comments on using TOC, SDP and other tools	
Conclusion: validating Hypothesis 2	
<u>CHAPTER 8 – IMPROVING THE DYNAMIC RESOURCE ALLOCATION FRAMEWORK</u>	<u>86</u>
Comments on the dynamic resource allocation framework	
Comments on the sources and deployment categories	
Conclusion: dynamic resource allocation framework and the toolkit	
<u>CHAPTER 9 – LIMITATION OF STUDY AND DIRECTION FOR FUTURE RESEARCH</u>	<u>97</u>
<u>CHAPTER 10 – OVERALL SUMMARY AND CONCLUSION</u>	<u>99</u>
<u>ANNEXURE 1 – INTRODUCTION TO SDP</u>	<u>105</u>
<u>ANNEXURE 2 – INTRODUCTION TO TOC</u>	<u>107</u>
<u>ANNEXURE 3 – RESOURCE ALLOCATION ON R&D</u>	<u>110</u>
<u>ANNEXURE 4 – RESOURCE ALLOCATION ON INCUBATION</u>	<u>113</u>
<u>ANNEXURE 5 – RESOURCE ALLOCATION ON ORGANIC EXPANSION</u>	<u>118</u>
<u>ANNEXURE 6 – RESOURCE ALLOCATION ON BRANDING AND MARKETING</u>	<u>121</u>
<u>ANNEXURE 7 – 1ST QUESTIONNAIRE ON SURVEY AMONG SENIOR MANAGERS OF DR. REDDY’S</u>	<u>123</u>
<u>ANNEXURE 8 – 2ND QUESTIONNAIRE/ INTERVIEW GUIDE FOR BOARD MEMBERS/CEOs/CFOs</u>	<u>125</u>
<u>ANNEXURE 9 – 3RD QUESTIONNAIRE/ INTERVIEW GUIDE FOR INDUSTRY EXPERTS</u>	<u>127</u>
<u>ANNEXURE 10 - WORKS CITED</u>	<u>128</u>

Acknowledgement

The writing of this report has been one of the most interesting academic challenges I had to face. Without the support, patience and guidance of the following people, this dissertation report would not have been completed. It is to them that I owe my deepest gratitude, and I would like to extend my sincere and heartfelt obligation for helping me in this endeavour.

I extend my gratitude to the Indian School of Business, Hyderabad and Dr. Reddy's Laboratories, Hyderabad, for giving me this opportunity and for providing me such a valuable venture to learn, understand and apply industry experience in academic pursuit. Firstly, I would like to express my sincere gratitude to **Prof. Sanjay Kallapur**, my dissertation guide, for the continuous support during the EFPM programme and related research, for his patience, motivation and immense knowledge. His articulate insights and guidance helped my dissertation extensively. I am also extremely thankful and pay my gratitude to my other dissertation committee members: **Prof. Krishna Palepu**, who kindly consented to spare his valuable time and accept me as his student outside Harvard Business School; and **Dr. Omkar Goswami**, an eminent economist, who also decided to spare his valuable time for my personal development. I cannot thank enough for the constant trust, and liberty my dissertation committee members gave me. I also express my sincere gratitude to Mr. **GV Prasad**, Co-chairman and Managing Director of Dr. Reddy's Laboratories Ltd, for the sponsorship of this course, permission to include Dr. Reddy's case study, his own comments and support for the completion of this dissertation.

My sincere thanks and appreciation go to a few of my colleagues of Dr. Reddy's Laboratories, especially Y Kiran, Seema Grover, B Phanimitra and Nishit Mittal, for supporting me and collaborating with me on part analysing and editing of the report with their understanding, knowledge and commitment to the highest standards. I thank Himanshu Gaur to create the required MS Form to help administer the survey among the senior managers of Dr. Reddy's. Special thanks to some of my peers in the management council: MV Ramana, P Yugandhar and Deepak Sapra, for their comments and all the two hundred and fifty-six respondent senior managers for participating in the survey.

I express my sincere gratitude to 36 eminent professionals from the global generic pharma industry, including past and present board members, CEOs, CFOs and industry experts, who kindly consented to be interviewed by me in pursuit of this dissertation. They have given me more time than I sought and provided great insight, knowledge and wisdom that forms the core of this dissertation.

I thank my colleague MV Narsimham for preparing me with the interviews by opting for the first drill and Harika Kolli, Naga Jyothi Kamma and Santhoshkumar K for their immense contribution towards the creation of the transcripts from the recorded interviews.

I thank all the professors and staff of the EFPM course and all other friends, including my EFPM cohorts, who supported each other during this enriched learning process. I also thank my former colleague Prof. Shiladitya Dasgupta for his help during the literature review.

Last but not least, I place a deep sense of gratitude to my family members who encouraged and supported me through the entire process of pursuing a late-life doctoral program. Madhumita (my wife), Saurya (son), Srija (daughter), Prerna (daughter-in-law), Aurko (son-in-law), and Ridhhaan (grandson) are a constant source of happiness and inspiration to me.

Any omission in this brief acknowledgement does not mean a lack of gratitude.

Thanking You,

Saumen Chakraborty

Hyderabad

April 18, 2021

Abstract

The research aims to create a comprehensive practical framework that can help practising CEOs, CFOs and board members to discharge their role in dynamic resource allocation more effectively – a framework that connects the source of funds to various deployment options, connects the purpose, vision and values of the organisation to its business strategy and provides a toolkit for dynamic reallocation across various business units and deployment options. The history of resource allocation decisions in Dr. Reddy's Laboratories Ltd. over the last two decades has been used as a case study in this research. While Dr. Reddy's has faced problems similar to those faced by other organisations in terms of doing resource allocation well, there has been a gradual evolution in this learning organisation. For a large part of its journey, the company has been relying, with reasonable success, on the strength of intuition and entrepreneurial instinct, refined by the learnings from past experiences to wade through these questions and arrive at decisions. The principles of TOC (Theory of Constraints) and SDP (Strategy Deployment Process) have played a fundamental role at Dr. Reddy's in guiding decisions and actions. While the case study gives the proof-of-concept, a survey among its senior managers establishes the influence of TOC and SDP in shaping resource allocation decision in the organisation. Qualitative research, based on interviews of thirty-six prominent professionals and experts in the generic pharma industry, further validates that tools like SDP and TOC are potentially useful for defining strategic priorities and resource allocation decision making. It also validates that the dynamic resource allocation framework (developed based on the case study of Dr. Reddy's Laboratories Ltd. and amended based on the analysis of responses from both quantitative survey and qualitative research) can be applicable to other generic pharma companies to realise their business strategy.

Keywords: Dynamic Resource Allocation, SDP, TOC, Generic Pharma Industry

Chapter 1: Introduction

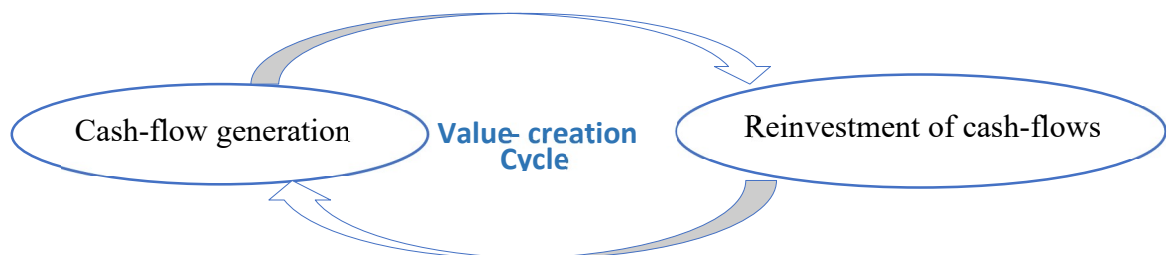
Scope of resource allocation

Optimal resource allocation is about the allocation of limited resources to multiple deployment alternatives to maximise long term shareholder value. Resources include both: (a) tangible, namely financial, technological, human and physical assets; and (b) intangible, comprising culture, reputation, brand equity and intellectual property assets.

Need for dynamic resource allocation

A commercial organisation's main objective is value creation for various stakeholders (shareholders, employees, business partners and society). Dynamic resource reallocation has been widely recognized as an important lever for shareholder value creation. According to a McKinsey study (*Birshan, Meakin, and Strovink, 2017*), companies that actively and regularly re-evaluate their resource allocations create more value and deliver higher shareholder returns. It suggests that after 15 years, a company that dynamically evaluates the performance of business units, acquires and divests assets, adjusts resource allocations based on each division's relative market opportunities will be worth on an average 40% more than a company that allocates capital consistently every year.

Businesses create value through a two-stage cycle involving (a) cash-flow generation from current business operations and (b) reinvestment of cash-flows into business for a further cash-flow generation. While execution focuses on the first part, resource allocation deals with the latter.



Problems with companies' current approach to resource allocation

While a lot of research has established the importance of dynamic resource allocation, there is little guidance in the form of a toolkit that can help CFOs and CEOs make the proper allocation decisions. Investment decisions are generally made on a piecemeal basis, i.e., on the merits of the specific investment proposal without reference to an overarching resource allocation theme/framework. Beyond the checklist of financial parameters like NPV, IRR and payback period, decisions are largely

driven by intuition, the record of past experiences and the credibility of the business leader placing the proposal.

Further, the resource allocation pattern continues to follow the established paradigm for decades, even though changes in the underlying business environment call for frequent reallocation. A review of the R&D investments made by the global pharmaceutical industry over the past few decades shows that R&D investments continued to increase despite a steady decline in R&D productivity. Similarly, the resource allocation to the world's largest pharmaceuticals market, the USA, has risen consistently, despite declining margins from this market and visible trends of better economic profits in emerging markets in the generic pharmaceutical industry. The prevalence of bias and attention to contemporary fads have characterised the pattern as well.

The role of the board

The board has a fiduciary role in monitoring management actions that have implications for an organisation's future. While it is the management's prerogative to draw the strategy, the board plays a critical role in setting priorities, establishing goals and overseeing the execution of the chosen strategy. To effectively monitor execution, the board should identify risks in the execution of strategy and ensure that the resource allocation is aligned to deliver the targeted strategic outcomes. Moreover, the board should agree with the management on specific lead indicators that could reasonably predict the future outcome and revisit the resource allocation, if required.

Board members are expected to bring certain industry or domain-specific expertise with an ability to challenge the management on its internal views with an outside-in perspective. In case of an external shock or significant changes in the competitive environment/industry dynamics, the board should encourage the management to revisit the strategy or explore opportunities outside the formulated strategy. Hence both strategy and resource allocation need regular tracking of the lead indicators and dynamic review.

However, the board should be careful not to breach the line between its fiduciary oversight responsibility and the executive managements' decision-making role. Boards should not direct decision making on resource allocation but should only be concerned about questioning management's proposals and tracking the measures that indicate whether the strategy implementation is succeeding or not.

The role of the CEO

The primary goal of a CEO is to create long-term shareholder value. The long-term value that a company creates for shareholders depends on how its CEO manages both the sources and the deployment of resources. It may sound simple, but it is what resource allocation is all about –

reinvesting resources in areas of a higher return. Good resource allocators are always on the lookout for opportunistic trade-offs to make, and when they find them, they move fast. Good resource allocators create an impact by reallocating resources from poor-performing areas onto high-potential businesses.

According to research by McKinsey (*Birshan, Meakin and Strovnik, 2017*), resource reallocation is one of the five bold strategic moves that best correlate with success. A 'bold move' is described as one that leads to a shift in resource allocation of at least 30 per cent more than the industry median. CEOs who make bold moves early in their tenure tend to outperform others, and the greater the number of bold moves, the higher is the chance of avoiding a decline in performance over a period. The research also shows that externally hired CEOs are more likely to implement bold moves than those promoted within the organisation. Despite empirical evidence showing that companies that reallocate more than 50% of their capital over 10 years create 50% more value than the rest, only a few companies reallocate capital regularly. Research from McKinsey's CEO database also shows a high correlation between the level of reallocation of capital and CEOs' performance. High performing CEOs use their resolve and institute an ongoing stage-gate process that monitors investments at a granular level and prompts them when to stop funding and when to continue, thereby ensuring that resources are swiftly reallocated to places where they deliver value instead of thinly distributing them across businesses.

Resource allocation entails centralized management of the cash produced by each business unit, even if those operate as individual businesses. An organisation considers three things as corporate-owned – cash, talent and reputation. The central pool of cash collectively generated by all business units gets reallocated to create the maximum value for the shareholders. CEO may move the money produced by mature businesses into growing ones or incubate longer-term plays. Amazon, for example, subsidizes its aggressive retail division, which loses money, with money from successful cash-making businesses like Amazon Web Services (AWS). To take these decisions more objectively and promptly, CEOs need a toolkit.

The role of the CFO

CFOs can perceive the big picture by holistically analysing external and internal data, including economic factors, market, competitors, investor expectations, and historical performance trends. With that ability, they can perform multiple scenario analysis to predict the impact of any strategic decision on future growth and profitability. They can effectively partner with the business to help them make better-informed decisions concerning resource allocation, spend and capital management.

A survey of many practising CFOs by McKinsey ('Are today's CFOs ready for tomorrow's demand?', 2016) highlights the importance of demonstrating capital discipline by translating an investor

mindset into daily management decision making. That could also mean adopting innovative finance processes: for example, moving away from a typical, annual capital-budgeting process toward a more agile one, with flexible budgets, quick decision making, and a performance-management system to match. A more investor-focused mindset could also help prevent activist investors' adverse actions, which less than one-third of CFOs say their companies are well prepared to manage.

If a CFO wants to work with an investor-focused mindset, he/she needs to comprehensively address the feasibility of an investment/ resource deployment proposal rather than just a financial evaluation to compute NPV/IRR. The following feasibility assessment from multiple angles could improve the probability of success:

1. The value proposition with market positioning of the final product/service based on a comprehensive analysis of the market potential, competitive, regulatory and environmental landscape.
2. Value Chain with choice of technology, capacity creation, vendor development and supply chain management to fulfil demand.
3. IP, regulatory and legal strategy.
4. Social, environmental and political implications.
5. Financial projections, including tax strategy.
6. Risks for execution and mitigation plans. And, finally
7. Capability gap assessment and remedial measures.

Hence, the board, the CEO, and the CFO have a clear role in resource allocation. Alignment across these three roles comes from defining and agreeing on a set of clearly articulated and measurable leading indicators. Financial outcomes are lagging indicators, and reviewing them does not lead to better performance except for the benefit of enriched learning from past success and failures. The leading indicators are derived from the processes that deliver key financial and customer targets and are usually associated with a set of assumptions made during the resource deployment. Hence tracking the metrics of lead-indicators and revisiting the validity of each assumption later would effectively ensure timely intervention and remedial measures in terms of both dynamic reallocation of resources and, at times, revisiting the strategy itself.

What prevents optimal resource allocation?

The specific issues that prevent the board, the CEO and the CFO from doing resource allocation well could be articulated as follows:

- Reliance on intuition, entrepreneurial instinct, past experiences of success and confidence placed in specific business leaders.
- Excessive focus on NPV/IRR as an evaluation tool for business case rather than a comprehensive feasibility assessment.
- Taking each decision on a piecemeal basis based on a specific proposal.

- Justifying past value destruction as ‘sunk cost’ and looking at the brighter side of the future on prospective investment – while it may be justified in some cases, it often leads to *throwing good money after bad*.
- Allocating resource on what is deemed to be ‘strategically important’ for the company even though consistent poor past delivery does not justify backing a wrong horse.
- Problems faced with the tools for dynamic reallocation with ongoing evaluation and monitoring (including measures for it):
 - ensuring the productivity of capex investments
 - the right trade-off between product availability and capital efficiency
 - divestment of idle assets as an active part of the resource allocation policy
 - improving the success rate of M&A allocations
 - channelizing M&A investments in the right spaces

These factors are the primary motivation for my research. As a practising CFO of a global organisation, I have experienced the resource allocation dilemma and hence wanted to bring my experience and insight in developing a practical framework (with toolkits) that can help my colleagues in the industry as well as help academicians in future research with more scientific rigour. There are some additional challenges, e.g., the right trade-off between short term profitability and long-term growth for R&D investment, the hard stop-loss limit for incubation businesses, the trade-off between depth and breadth in new market expansion, segregation between growth and maintenance for investment in branding and marketing, that I have not focused on in my research but included appropriately in the research to help set the direction for future research on this topic. However, before discussing the research questions and the appropriate research methodology more in detail, I review the works of literature on this subject in the next chapter.

Chapter 2 - Literature Review

Resource allocation process – original to the revised model

The pathbreaking research on resource allocation happened 50 years ago when Joseph L Bower from the Harvard Business School modelled the 'resource allocation process' (RAP) (*JL Bower, 1970*). He inferred resource allocation as a set of three basic processes acting over three phases influenced by an identified set of forces.

1. The cognitive process that shapes the economic and technical specifications is the 'definition'. This is a process by which the technical and economic characteristics of a proposed investment are determined, usually done at the functional managers' level as a response to a problem or an opportunity.
2. The largely socio-political process that determines the projects that eventually make it to the investment committee is called 'impetus'. This is a process by which general managers in the middle management evaluate, select and recommend a project for approval of the top management. Practically the decision on the project gets determined at this stage. A general manager's credibility based on past experience plays a critical role.
3. The process that involves the organisational and administrative forces that influence the first two processes of definition and impetus is the determination of 'structural context' (for example, the organisation structure, hierarchy, the way businesses are measured, the way performance is measured). These are levers that top management can manipulate to influence, indirectly, the type of strategic initiatives that are defined and selected.

Bower's work challenges the conventional theory, which says structure should be aligned to serve strategy. His research reports that in practice, structure shapes strategy. Each of these processes takes place in three phases (levels) – The 'initiating phase' (operating managers), the 'integrating phase' (general managers in the middle) and the 'corporate'.

Numerous studies were done on this topic over the next 35 years. They identified anomalies and added to the body of knowledge on resource allocation, leading to a few developments in theory, e.g., evolutionary theory (Nelson & Winter, 1982; Burgelman, 1983), capital market theory (Noda, 1996), resource dependence theory (Warnerfelt, 1984; Barney, 1991; Christensen, 1997), institutional theory (North, 1990; Sull, 1997), threat rigidity theory (Barton, 1992; Gilbert, 2001) and agency theory (Ross & Mitnick, 1970; Eisenmann, 2002).

Burgelman (2005) introduces the strategic context. Strategic context refers to an organisation's official strategy, which induces initiatives consistent with the strategy while discouraging autonomous strategic initiatives that fall outside an organisation's official strategy. At times autonomous strategic processes can affect corporate strategic thought and, in turn, can influence 'definition' and 'impetus'.

Burgelman solves this problem by introducing another process called 'strategic context determination' into RAP. In evolutionary terms, Burgelman refers to this process as an internal selection mechanism and observes that the top management's role in this process is limited to either rejecting an initiative or retroactively rationalizing the current strategic context. The overlaying processes of strategy and structural context determination thus set the corporate context. According to Burgelman, this corporate context is powerful enough to be equated to an ecological selection process and, hence, decide what types of internal ventures could succeed and what types could not.

Christensen (2005) introduces the role of customers in shaping resource allocation, highlighting the failure of the bottom-up process in adapting to disruptive innovation. He classified innovations as:

- Trajectory-sustaining, i.e. those which sustain the industry's rate of improvement in product performance.
- Trajectory-disrupting, i.e. those that disrupted or redefined that performance trajectory.

Through a case study of the disk drive industry, he observed that the leading firms in the industry led the adoption of 'sustaining' technologies but failed to adopt 'disrupting' technologies, regardless of the relative complexity of the change and the competency of the firm in embracing the change. The failure stemmed from the lack of support shown by the firms' most powerful customers – since the innovation did not meet the existing customers' current needs. Leading firms failed to anticipate the emergence of new markets or new customer segments with new needs. Thus, his research establishes that customer power/product market preferences play an important role in influencing resource allocation decisions.

Donald Sull (2005) introduces the role of top-down disinvestments and the role of capital markets in shaping resource allocation, highlighting the failure of the bottom-up process in disinvestment.

Through a case study of Firestone Tire and Rubber Company, he observed that the bottom-up resource allocation process that effectively generated investment proposals failed to produce necessary disinvestment. The reason could be found in the structural context:

- Performance measures and rewards not aligned with company objectives.
- Limited performance-linked pay, varying between 5% and 8%.
- 'Psychological contracts' for job security.
- Revenue growth rather than shareholder returns or profits as the key performance metric.
- No incentive for frontline employees and middle managers for disinvestment.

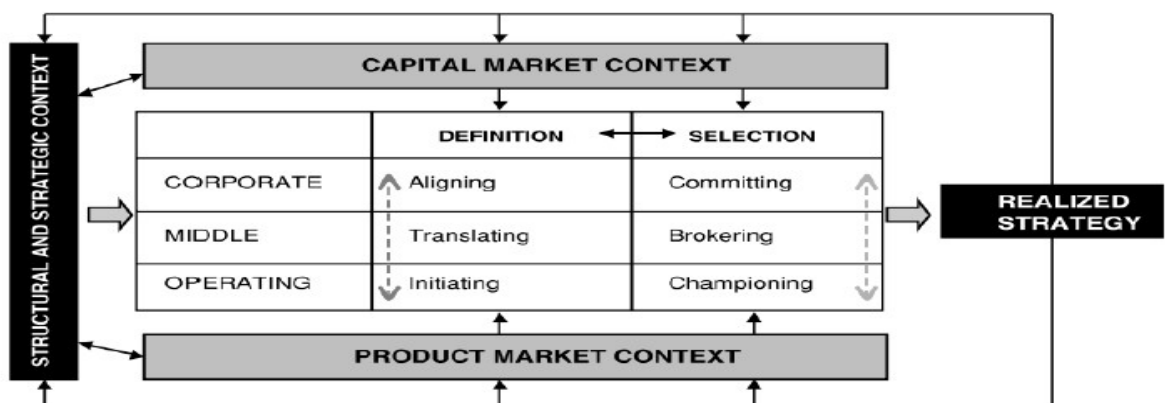
A top-down initiative led by an active CEO was necessary to define and implement the exit. Influential investors and lenders played a critical role in selecting and supporting the CEO, who led

the top-down process. His research thus establishes that capital markets (lenders and investors) influence resource allocation decisions.

Gilbert (2001) introduces the relevance of cognitive framing in shaping resource allocation. He argued that when the impetus for disruptive technology is built around the needs of customers in a firm's established markets, resources are denied to such technology. He did a case study research on the adoption of online media by the newspaper industry in the 1990s and observed that when online media was perceived as a threat to the print media's survival, the sense of crisis provided a new source of impetus. The RAP mechanism then ensured the allocation of resources to the new technology implying that the impetus for resource allocation can be created by framing a threat perception. However, the definition process arising out of threat perception became rigid and strategic plans were rigidly defined. As a result, desired strategic outcomes were not achieved despite active resource allocation. Thus, his research establishes that cognitive framing could influence resource allocation, and resource allocation is not the end of RAP; that realised strategy is the outcome of RAP.

Bower and Gilbert (2005) revisit the original RAP 1970 model with contribution from multiple scholars and incorporate the key learnings from subsequent research as follows:

- Identification of internal influencing forces as separate from the processes they shape.
- Recognition of external influencing forces like customers and capital markets.
- 'Realised strategy' as the firm-level outcome of the RAP.
- Acknowledgement of interactions not included in the original model, e.g. feedback loop from realised strategy back to the forces that shape the processes and to the processes themselves



Source: J. L. Bower and C.G. Gilbert (2005) - A revised model of resource allocation

Research on the resource allocation process from its original to revised model explains the bottom-up process, strategic and structural context, power of customers, innovation, product market and capital market, and the influence of cognitive framing. Overall, these studies provide conceptual

clarity. However, they do not provide a toolkit for practitioners to improve resource allocation in practice.

Internal resource allocation – objectives, impediments and influencing factors

Busenbark, Wiseman, Arrefelt and Woo (2017) write about the different objectives of capital allocation and the behavioural impediments to a successful capital allocation process.

The objectives of resource allocation have been broadly classified into three distinct areas – winner-picking, diversification and synergy:

- Winner-picking is about allocating resource proportionally to the highest prospect business units (weight adjusted for the underlying risk) (Arrefelt et al., 2015; Stein, 2002).
- Diversification refers to creating a portfolio of business units with uncorrelated income streams (Chatterjee and Wernerfelt, 1991; Hoskinsson, Harrison & Dubofsky, 1991).
- A synergy strategy would suggest that allocation decisions are driven by how the allocation of resource to one business unit enhances the prospects of other business units within a multi-divisional organisation (Bower, 1970; Williamson, 1975; Chandler, 1962).

The behavioural impediments to resource allocation have been broadly attributed to three different reasons: agency problems, behavioural biases and socio-political forces.

- Agency problem refers to conflicts of interest and may occur at two levels: (a) divisional managers distorting information to corporate managers, and (b) corporate managers acting opportunistically at the expense of shareholders.
- Behavioural biases refer to cognitive tendencies or limitations (for example, anchoring, insufficiently differentiating information, playing it safe or hedging, overgeneralizing, backwards-looking decision making) that may interfere with managers' abilities to identify the growth potential of business units and allocate resource efficiently.
- Socio-political forces refer to situations where managers use resource allocation as a tool to navigate the political and social elements of the organisation, often for their own benefit.

Bardolet, Brown and Lovallo (2017) find that the largest and smallest segments in multi-division SBUs got the highest allocation of resource in an organisation. They used Standard & Poor's COMPUSTAT Business and Segment files (FAS 131), 1989-2004 with 13,639 observations to test their hypotheses that relatively large business units wield higher political power and clout within the organisation and would attract a relatively larger allocation of resources. It is logically expected that a segment's future opportunities or/and recent performance would drive the resource allocation decision (Graham & Harvey, 2001). Cash-consuming small SBU with high growth prospect but low profitability needs cross-subsidisation from a large, self-sufficient and profitable but low growth

business. A cognitive approach would result in a more significant allocation to such smaller SBU, and the power/agency approach would favour a larger allocation to larger SBUs. Their research findings suggested that both the smallest and the largest SBUs were favoured, corporate moderated those outcomes based on the SBU's growth and profitability.

Vieregger, Larson and Anderson (2017) argue that there is a direct correlation between the changes in capital allocation and the top management team's composition based on the classic concepts of integration and differentiation from contingency theory (Lawrence and Lorsch, 1967).

- Integration is referred to as the unity of effort required by the organisation to combine sub-unit activities into a single coordinated organisational strategy. Integration encourages centralized decision making puts a significant emphasis on coordination and collaboration.
- Differentiation is referred to in terms of the unique objectives of the sub-units and how these may vary. Differentiation supports autonomous BUs and requires less coordination between sub-units. BU influence is strong with top management team structure based on differentiation.

Their research indicates that only a small amount of reallocation of resources year to year, implying that firms are not making bold, strategic changes to their capital allocation patterns.

Ahuja and Novelli (2017) focus on over-investment in research and development (R&D). They define R&D over-investment as investments in R&D activities that generate negative net present value (NPV), implying that the return from such investments would never cover the cost of capital. They argue that the specific characteristics of such R&D investments lead to overinvestment: (a) uncertainty, (b) boundary ambiguity, (c) feedback latency, (d) lumpiness, and (e) legitimacy.

Uncertainty makes it difficult to evaluate R&D investments, and the optimism bias of entrepreneurial instinct leads to overinvestment. Boundary ambiguity refers to vagueness and misperception of the absorptive capacity of a firm's R&D capability to explore related field beyond the current scope and focal product. Without a proper assessment of the appropriate breadth of R&D, the tendency to overreach and pursue an ecosystem of technology, gradually distant from a firm's focal business, also leads to overinvestment. The scarcity and latency of feedback on the results of an R&D investment due to prolonged and uncertain development time may lead to a firm overcommitting beyond the optimal level. Lumpiness in R&D investments, even to create a proof of concept, creates a further problem that gets compounded by feedback latency. Legitimacy is derived from the belief that R&D is key to long term growth and productivity, the source of some of the most visible value creation, breakthrough innovation and possible creative destruction. This legitimacy then gets combined with the signalling benefit – a visible indicator of the firm's long-term strategic orientation. Together they may lead to R&D overinvestment, especially in R&D intensive industry sector.

Souder and Bromiley (2017) argue that stock options' exercisability influences the relative allocation of resources between R&D and capital expenditure (capex). Stock options are supposed to encourage managers to make long term investments in R&D and capex – both of which can generate long-term returns. However, the effect of stock options on managerial decisions depends on managerial beliefs about how the stock markets react to firm behaviour. Consistent with empirical evidence, managers believe that stock prices increase in the short term from increased R&D, but not capex. This provides a plausible explanation of the study results, which shows that unexercisable stock options positively influence capex but not R&D, while exercisable stock options positively impact R&D but not capex. Also, they show a negative association between underwater options and capex; but no evidence of a corresponding positive relation with R&D.

External influence on resource allocation – three-dimensional framework

Sengul, Costa and Gimeno (2019) develop a descriptive framework of capital allocation within firms based on three dimensions – horizontal, vertical and external – constituting three pillars of influencing factors for capital allocation.

- The horizontal dimension implies competition for capital allocation among various investment alternatives and refers to the process of determination, comparison and selection among them, as well as the connections to non-financial resources and capabilities. All these aspects are deeply intertwined as the latter could be a substitute for capital allocation decisions. Investments in human capital and training can create a greater positive impact when combined with complementary investments in R&D, capex and advertising (Riley et al., 2017).
- The vertical dimension implies an effective organisation design contributing to optimize internal resource allocation and refers to the interaction of multiple levels of management in the process. Key components of this pillar are organisation structure, systems and processes and the delegation of decision-making authority, and these, too, are intertwined.
- The external dimension implies the influence of external factors in both availabilities of capital for allocation and deployment towards a specific use. While the actors include investors/investment community, analysts, intermediaries, customers and competitors, classified by the mechanism of interest, the authors chose the macro environment, the industry environment and the firm-specific environment as the three key components of this pillar. The macro-environment includes the economic and legal institutional development of a country that influence the access to the international capital market and the exogenous shocks such as financial crises or regulatory shifts. The industry environment influences the demand or opportunity for capital allocation as a result of the stage in the economic lifecycle of the industry or industry-specific opportunities and threats. The firm-specific environment refers to the ownership structure, influence of

investment analysts, a niche in the supply chain and specific competitive actions, including competitive interdependence.

These three dimensions help in framing the questions to explain how internal capital allocation decisions are taken in a firm:

- “How do firms determine and compare relevant investment alternatives and then select among them?” (horizontal)
- “How do multiple hierarchical levels of management interact to shape the capital allocation process?” (vertical)
- “How is capital allocation influenced and constrained by the external environment in which the firm is situated?” (external)

Sengul and Gimeno (2013) also suggest that financing choices and organisation design parameters along with capital allocation decision are endogenous to the competitive context.

Impact of CEO’s decision making

Thorndike, Jr (2012) singles out capital allocation as the most critical responsibility of a CEO. Using the case study of eight CEOs who excelled at resource allocation generating disproportionate returns, he brings out common traits and actions of successful CEOs – including personal leadership in allocation decisions, frequent acquisitions, stock repurchases and avoiding dividends.

He also focuses on the distribution of earnings to shareholders in the form of share repurchase as one of the avenues for capital deployment. He cites the one dollar test from Warren Buffet’s letter to the shareholders in 1984, which explains that companies should retain earnings only if they can generate a market value of at least one dollar for the shareholders for every one dollar of earnings retained. This is possible only if the reinvested capital earns a higher return rate than what is generally available to shareholders – a rephrase of the principle that return on invested capital should be greater than the cost of capital.

Bradley, Hirt and Smit (2018) base their research on economic profit generated by 2,393 listed firms throughout 2009-14. While explaining the games people play in strategy (hockey stick approach) and inadequate outside view, they suggested dynamic resource allocation, levers and bold moves that organisation can take to improve their economic profit substantially.

According to their research, the villain is the social side of strategy. The individual/institutional biases and group dynamic distort results with competing agendas and social games. Everyone aims at securing resources while deferring accountability. The strategy process is a sort of management ballet that is choreographed to get a ‘yes’ to the proposed strategy and approval of the resource requested. It is a ritual dance before you get to what really matters.

Beyond the influence of the endowment factors, e.g. size, industry and favourable debt/equity ratio, the prescribed levers and bold moves included (a) programmatic M&A (each less than 30% of market cap but together greater than 30% of market cap for over a decade), (b) reallocating at least 60% of capex among SBUs over a decade, (c) spending at least 1.7 times the industry median on capital spending to sales, and (d) spending higher than industry median on R&D to sales.

Strategy and human capital

Several other frameworks, theories and concepts are relevant to the theme of dynamic resource allocation.

- Strategy - 'Competitive strategy' (Porter, 1985) focus on competition for existing markets that was the focus of the business. It dealt with industry segmentation, cost competitiveness, product differentiation, entry barrier and unique positioning. Hamel and Prahalad (1990) focus on competition for resources and capabilities. The concept of 'strategic architecture' focus on core competencies, resources and organisational capabilities. The strategic architect provide direction for 'strategic innovation' (Markides, 1997) and leverage the process of building a 'learning organisation' (Garvin, 1993) out of the deployment of competitive strategy. Subsequently, looking beyond and being ready to compete for dreams, 'vision and ambitions' provide a new opportunity horizon and necessary energy and focus for purposive action (Bartlett and Ghoshal, 1994).
- Human capital - If we were looking for a sustainable competitive advantage (valuable, rare and inimitable) to add business value, then the priority of resources has shifted gradually from financial capital to technology to people. The changing view of strategic resources implies that scarce resource is human capital and not financial capital. It is only the human capital that could be leveraged for innovation and a new opportunity horizon. Human capital comprises intellectual capital (talent), social capital (developing relationships) and emotional capital (building commitment). While an organisation would do its best to increase human capital, it is also pertinent to note that the best talents find an avenue through start-ups with venture capital funding. The potential reward offered by such start-ups cannot be easily matched by a matured organisation, even with its best intent to differentiate with stock rewards and pay for performance.
- Factors of strategic importance - If an organisation needs to execute its strategy successfully, it needs to have sufficient clarity of the critical success factors for both short-term business results and build long-term resources and capabilities for sustainable performance. The business environment is dynamic with a consequential impact on strategy execution; hence one needs to articulate the factors of strategic importance in pursuance of its vision and strategy roadmap.

- Strategic risk framework - (Slywotzky & Drzik, 2005) talks about seven kinds of strategic risks that could potentially destroy a company: industry, customer, technology, competitor, brand, project and stagnation.
- Dynamic capabilities theory was first proposed by Teece, Pisano & Shuen (1997). The theory of absorptive capacity was first proposed by Cohen & Levinthal (1990) and later refined by Zahra & George (2002) as a variant of dynamic capability. Absorptive capacity theory talks about building intangible resources, primarily knowledge.
- Strategic agility framework (Doz & Kosonen, 2008; Fourné, 2014) has three pillars: leadership unity, strategic sensitivity, and resource fluidity.
- Resource fluidity essentially implies focusing on striking the right balance between tangible and intangible resources. Tangible resources are imitable and non-transferable. Intangible resources give an inimitable competitive advantage, and they are readily transferable. Organisational routines (evolutionary economic theory, Nelson & Winter, 1982) continuously build new core competencies.

Resource allocation literature - conclusion

Resource allocation is intricately linked to strategic management. “Strategy can be defined as the determination of the long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals” (Chandler, Jr., 1962). Despite its importance to strategic management, research on resource allocation is relatively limited. “A search of major management journals for strategic management research with resource allocation or closely related terms such as capital allocation, capital investment, and strategic investment, in the abstract, title or keywords yielded less than 50 articles that explicitly focus on studying resource allocation activity in firms.” (Maritan and Lee, 2017).

However, there has been some resurgence of late. “The resurgence of intra-firm capital allocation in strategy and management research spurred by the reconsideration of financial synergies as legitimate sources of value and by the emergence of the internal capital markets literature in finance, the topic of capital allocation within firms slowly started to regain traction with strategy and management scholars” (Sengul et al., 2019).

The literature on resource allocation focuses on correlation and causalities among various influencing factors that could impact internal resource allocation decisions. The topics addressed include the bottom-up process, strategic and structural context, power of the capital market, customers, innovation, overinvestments, behavioural factors and impediments, the influence of exercisability of stock options, internal competition, size and representation in the top team, the influence of external factors, the difference that CEOs can make with their bold moves, intangible resources primarily human capital and resource fluidity. The academic research helps us in conceptualisation and gives insights into estimating the impact of various factors influencing

internal resource allocation decision. This literature helps us identify the generic causes of resource allocation failures, such as poor strategy, poor governance, behavioural biases, organisational politics, and poor leadership. McKinsey research and HBR articles bring out the importance of proper resource allocation. However, while both types of studies are useful, we have not come across a comprehensive practical framework and toolkit that can assist practising CFOs (who struggle to predict the impact at the decision stage), CEOs (who need to provide more resource or cut the loss at the right time) and the boards (increasingly focussing on the dynamic reallocation of resources beyond just reviewing strategy).

The research gap – focus of my research contribution

As mentioned above, while reviewing the literature on resource allocation, I did not come across any comprehensive practical framework that can help practising CEOs, CFOs and board members to discharge their role in dynamic resource allocation more effectively – a framework that connects the source of funds to various deployment options; connects the purpose, vision and values of the organisation to its business strategy and provide options for dynamic reallocation across various business units and deployment options.

Ernest L. Boyer, in his book, *Scholarship Reconsidered - Priorities of the Professoriate* (1990), indicated that the work of a scholar also means stepping back from one's investigation, looking for connections and building bridges between theory and practice where both vitally interact, and one renews the other. He classified scholarship into four different brackets: (a) the scholarship of discovery; (b) the scholarship of integration; (c) the scholarship of application; and (d) the scholarship of teaching.

My goal is to contribute to the scholarship of integration and application by bringing in an interdisciplinary, interpretive and integrative theory-based perspective to the development of a practical framework for resource allocation.

My own experience and relevant learnings:

Besides the literature reviewed above, I have also drawn upon my 36 years of business understanding and multi-disciplinary expertise. These involved playing CXO roles in nine different functions, including HR, IT, finance, operations, quality, regulatory, legal, product development and facility/project management). Besides, I have had deep learnings in the following two areas:

- I was fortunate to learn the concept of the Theory of Constraints (TOC) from the proponent of the theory himself, Eli Goldratt, as we had engaged Goldratt Consulting for implementing a 'Viable Vision' Initiative in Dr. Reddy's, which I was entrusted to champion.

- During my career, I have implemented three alternative models for translating overall company goals to individual actions: (a) Balanced Scorecard (Robert Kaplan et al.), (b) Strategy and Tactics Tree (Goldratt), and (c) Strategy Deployment Process (SDP) based on the principles of Hoshin-Kanri, a Japanese management approach.

I experienced that all past successes guaranteed nothing for the future whenever there was a dynamic change in the competitive business environment. I realised that spotting discontinuities and moving with agility to grab the emerging opportunities created a differentiated level of growth and performance. I also realised that strategy implied both choosing specific options (space, priorities, moves etc.) and closing some options; lack of execution and resource allocation renders any strategy meaningless. My own experience of championing various strategic initiatives led me to believe that discipline and agility are two critical success factors for execution excellence beyond the right sponsorship. All these exemplify the importance of resource allocation to business strategy and the need for dynamic reallocation.

After identifying the literature gap and reflecting on my own experience and relevant learnings, the logical next steps for me are defining the research questions and selecting the appropriate research methodology. These are presented in the next chapter.

Chapter 3 - Research Questions and Methodology

Research questions

Drawing from the gap identified in the literature, my own experience and relevant learnings, I see an opportunity to formalise the use of TOC and SDP as practical tools for effective dynamic resource allocation. The 'principles of SDP' enable all the three critical steps in executing business strategy, i.e. defining strategic priorities and moves, creating alignment and accountability and mitigating the execution risk to strategy. The 'principles of TOC' enable prioritizations of moves and dynamic evaluation and reallocation.

Accordingly, I focus on the following **two research questions**:

1. How can the principles of SDP and TOC be used as a toolkit for guiding dynamic resource allocation in the pursuit of business strategy and, hence, be part of a practical framework that can help practising CEOs, CFOs and boards?
2. Is the proposed resource allocation framework applicable to other generic pharma companies to realise their business strategy?

Since there is no literature on the applicability of SDP and TOC in resource allocation, this research is an attempt to make a novel contribution to the theory of resource allocation in general with specific application to the generic pharma industry. The reason for limiting the applicability of the model to the generic pharmaceutical industry is to ensure that the factors influencing the resource allocation decision are limited to the specific nuances of the business model of this industry (which is a significant subset of the pharmaceutical industry).

Methodology

As such, the topic and research questions cannot be answered comprehensively by quantitative methods, so qualitative research was imperative for my research thesis.

"It is not possible to capture the complexity of the resource allocation process in a large-scale quantitative empirical study; however, careful analysis of particular aspects of organisational and managerial behaviour can inform our understanding of their influence on resource allocation." (Maritan and Lee, 2017)

Since I do not plan to begin with a prior hypothesis but plan to induce my hypothesis from the data analysis of a specific firm in the generic pharma industry, I rely on case study research as the most appropriate method for my research. I gather both systematic and anecdotal data and overlap data analysis with data collection. As a practitioner, I keep the simplicity of the overall perspective in mind and take precautions against any over-intensive use of empirical evidence that can render the potential theory overly complex.

To validate the framework in terms of its completeness and applicability in other firms within the generic pharmaceutical industry, I take a three-pronged approach, which is as follows:

- 1) I observe the history of resource allocation decisions in Dr. Reddy's Laboratories Ltd. over the last two decades (where I work) and analyse the above connections as a case study. The company has permitted me to use this case study for the dissertation without disclosing any confidential unpublished price sensitive information. While Dr. Reddy's has faced problems similar to those faced by other organisations in terms of consistently doing resource allocation optimally, there has been a gradual evolution in this learning organisation. This case study helps me in hypothesising a framework for dynamic resource allocation.
- 2) I survey the senior managers of Dr. Reddy's Laboratories Ltd. to find out the relationship between TOC/SDP and resource allocation as well as the relative influence of TOC and SDP in shaping such allocations.
- 3) I reach out to multiple CEOs, CFOs and other board members across the generic pharma companies as well as other experts, including consultants/investment bankers related to the generic pharma industry, to gather systematic and anecdotal data.

The data collection is done through one of the following based on the respondent's choice:

- a. Written response to an open-ended set of questions.
- b. Audio interview with a similar set of questions.
- c. Video interview with a similar set of questions.

The set of questions are different for the respondents belonging to a specific firm versus those who are industry-specific. In case a specific respondent does not have a prior understanding or experience of 'SDP' and/or 'TOC', I first explain the principles and then attempt to seek their views.

Since the response is expected to be beyond the description of fact, incidents and anecdotes and potentially include personal views, I get the questionnaires (a comprehensive list of questions with the flexibility to use selectively based on the flow of response and further exploration) approved by the ethics committee of ISB. There are three different sets of questionnaires, as follows:

- a. For senior managers of Dr. Reddy's.
- b. For CEOs, CFOs and board members of generic pharma companies.
- c. For industry experts, including investors/analysts and other intermediaries related to the generic pharma industry

Given this three-pronged approach, the first is the case study of resource allocation in Dr. Reddy's Laboratories Ltd., which is presented in the next chapter.

Chapter 4 - A case study of resource allocation in Dr. Reddy's Laboratories Ltd.

Company profile

Dr. Reddy's Laboratories Ltd. (BSE: 500124, NSE: DRREDDY, NYSE: RDY) — which I will refer to as either Dr. Reddy's or DRL — is an integrated pharmaceutical company committed to providing affordable and innovative medicines for healthier lives. Through its three businesses - pharmaceutical services and active ingredients (PSAI), global generics (GG) and proprietary products (PP) – DRL offers a portfolio of products and services, including APIs, custom pharmaceutical services, generics, biosimilars and differentiated formulations. The primary therapeutic areas of focus are gastrointestinal, cardiovascular, diabetology, oncology, pain management and dermatology. DRL operates in several markets across the globe. Its major markets include – USA, India, Russia and the CIS countries, China and Europe.

Purpose of the company

The purpose statement of DRL is articulated as “We provide accelerated access to innovative and affordable medicines because Good Health Can't Wait”. 'Can't Wait' reflects the commitment to act with speed to find innovative solutions that address the unmet needs of patients and to accelerate access to much-needed medicines for people around the world. In accordance with the purpose, DRL's belief is guided by two principles -- empathy and dynamism.

Company values

Values define the unflinching commitment, specify the boundaries of the behaviour and uphold the norms and beliefs. Through a set of well-articulated values (safety, quality, productivity, innovation, respect for individual, collaboration and teamwork, truth and integrity), DRL makes the following commitments -

1. Commitment to excellence.
2. Commitment to customers.
3. Commitment to employees.
4. Commitment to other stakeholders includes the government, society, environment and shareholders.

Factors of strategic importance for DRL-

1. Regulatory compliance and environment management

This is a big risk for a highly regulated generic pharmaceutical industry. Regulatory authorities across the world have considerably stepped up their resources to increase the intensity and rigour of investigations. The US food and drug administration (USFDA) collected additional charge

from manufacturers under a new generic drug users fee act. Consequently, the number of USFDA warning letters and other official actions has increased considerably over the past five years. Earlier, a good intent by the manufacturers to implement cGMP (current good manufacturing practice) would have been enough to pass the scrutiny. Today, new science and QbD (quality by design) based approach warrant that DRL should ensure mistake proofing at every stage of the operation, which requires a transformation of quality and compliance culture. Similarly, governments and customers are increasingly enforcing sustainability and environment-related norms. The chemical industry witnessed the closure of a large number of plants in China that led to DRL stepping up alternate vendor development. Irrespective of such external pressures, DRL's values make it imperative to focus on sustainability.

2. Strong organisation-wide quality and patient focus

The organisation is committed to establishing and maintaining quality standards that assure the safety and efficacy of all medicines marketed by it or by any of its partners. It is also committed to complying with all current national and international regulations, codes and standards applicable to the business. It aims to achieve this through a well-designed quality management system that emphasises the overarching responsibility of management, appropriate management of all resources deployed in manufacturing its products, and management of quality through the entire product life cycle and periodic reviews with continuous improvement. The patient's safety and well-being are at the core of the global quality system.

3. Speed of new product introduction and market response

Speed is given the highest priority after innovation. Time-to-market is the most critical parameter that defines success in the generic industry. The sooner a company is able to launch a generic drug (from the date of patent expiry), the greater the gains in market share. Hence, the ability to complete R&D projects on time is critical to the success of the company

4. Leveraging cutting-edge intellectual property (IP) management skills

At least one per cent of the total employees need to possess cutting-edge skill in intellectual property management. This helps in exploiting competitive advantage and protecting the company's rights as well. The critical mass of internal patent attorneys provides a sense of security.

5. An entrepreneurial and innovative culture

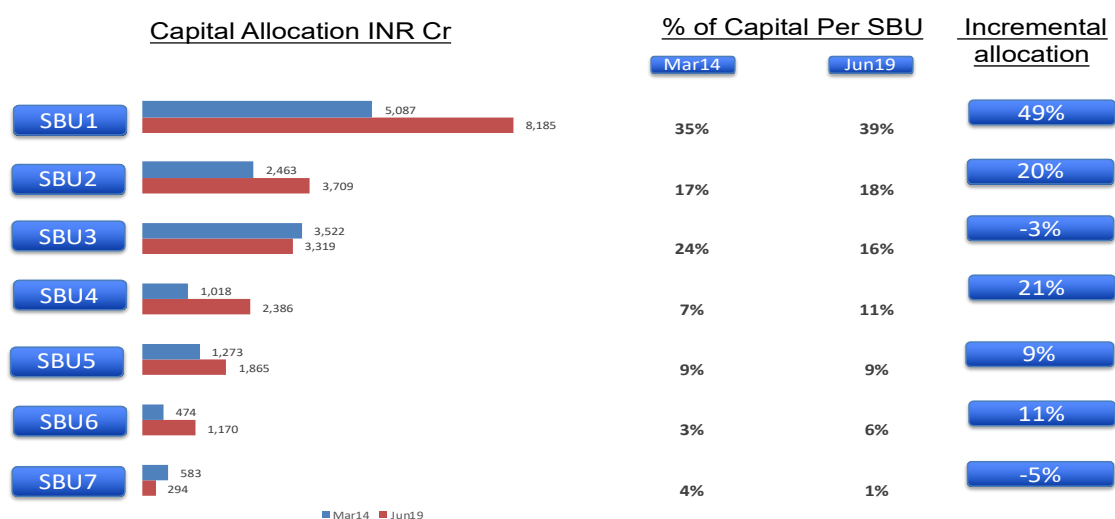
It strives to build an entrepreneurial culture that allows failure and provides space to grow. People should be prepared to take risks and not give up easily. The critical mass of research scientist opening new opportunity horizon should be available, and they would act as a source of

inspiration for young aspirants. As a part of the culture to promote innovation, people are encouraged to do more experiments and even fail, thereby having sufficient tolerance for mistakes and the cost of learning.

Analysis of capital allocation across SBUs in DRL

There was no articulated framework for capital allocation in DRL till 2018. By default, the primary criterion for capital allocation was the financial return as measured through NPV, IRR or payback period and the outcome reflected in the economic profit (return on capital employed – the cost of capital). The analysis of the past data on the allocation of capital across business units is given in Table 1, the ROCE is given in Chart 1, and economic profit is given in Table 2.

Table 1. Capital allocation over the last five years



The past capital allocation of the company was predominantly concentrated on SBU1 (with ~ 39% allocation) and SBU2 (with ~ 18%), followed by SBU3 (~ 16%). The incremental capital invested over the last five years has been even more skewed in favour of SBU1, with 49% of it being invested in SBU1. SBU1, SBU2 and SBU4 together have absorbed some 90% of the incremental capital invested over the last five years. This has also been driven by the acquisition of products in the SBU1 and SBU2 space, contributing to about 50% of the incremental capital. Capital allocation for incubation business (SBU2 and SBU4) included accumulated losses.

Chart 1: BU wise Five Years RoCE Trend



DRL faced sluggish growth and profit decline during FY2016 to FY2018 due to the impact of unmitigated regulatory compliance risks. This happened after an excellent run for DRL over the previous eight years. There has been a steady decline in RoCE from SBU1 – owing to both reductions in operating profits and an increase in acquisition investments. On the other hand, RoCE from SBU5 and SBU6 has increased significantly on healthy profit growth.

Table 2

Five Years (FY15 – FY19) Average Economic Profit

	SBU1	SBU2	SBU3	SBU4	SBU5	SBU6	SBU7	Testco
Capital Employed	6,861	3,349	3,509	1,645	1,473	1,037	402	18,300
PAT	1,322	-404	302	-238	434	256	-47	1,654
RoCE	19%	0%	9%	0%	29%	25%	-12%	9%
Cost of Capital	5.4%	16%	10%	16%	11%	10%	3%	10%
Economic Profit	14%	-16%	-1%	-16%	18%	15%	-15%	-1%

One Year (FY19) Economic Profit

	SBU1	SBU2	SBU3	SBU4	SBU5	SBU6	SBU7	Testco
Capital Employed	8,185	3,709	3,319	2,386	1,865	1,170	294	20,929
PAT	686	-243	541	-276	690	427	-30	1,847
RoCE	8%	0%	16%	0%	37%	37%	-10%	9%
Cost of Capital	5.40%	16%	10%	16%	11%	10%	3%	10%
Economic Profit	2.6%	-16%	6%	-16%	26%	27%	-13%	-1%

Figures in INR Crores

Overall, the company returned a negative economic profit over five years and one year (FY2019). However, the economic profit generated by SBU5 and SBU6 reflected a very healthy trend.

Source of capital

The company's sources of capital are equity, debt, internal cash accrual, and monetization of assets. After initial listing in Indian stock exchanges, the company raised about \$123 million in 2001 with its listing in NYSE through an IPO and another \$228 million through follow-on ADR in 2007. While DRL

is debt-free (at the net-debt level) as of 31st December 2019, it can borrow more than \$1 bn within its risk appetite guidelines to fund any deployment need. Cash from operations continues to be a regular source of funds for reinvestment in the business. Apart from the above, monetization of assets (plants, brands, IP assets, dossiers, territorial rights) in the form of divestment or out-licensing acts as a source of funds and as a lever for reallocation of capital based on changes in strategy and business environment.

Deployment of capital

- a) **R&D, innovation and technology** – This has been one primary area of deployment of capital. R&D expenditure, although being an investment for future growth, is charged off as a business expense in the year in which it is incurred. Hence it puts a strain on the near-term profitability of the company. To strike a balance between the needs of near-term profitability and long-term growth, DRL had, for a long time in the past, followed an allocation policy of 6% to 8% of sales for its R&D. However, in 2013, a hypothesis was put forward that the cap on R&D expense was probably arbitrary, it might be limiting the long-term growth potential of the company. Notwithstanding the impact on short-term profitability, the merit of R&D as a key lever of long-term growth was acknowledged, and it was decided to consider each new product development proposal as a business case similar to any other investment proposal. Post-2013, while the cap of 8% on R&D expense was removed, the company's CAGR of sales also declined considerably, leading to R&D expense as a percentage of sales shooting up to as high as 14% of sales in some quarters. Besides R&D, the company pursued disruptive or breakthrough innovation with new technology or intrapreneurial ideas. It set aside a portion of capital for the incubation of experimental/innovative ideas.
- b) **Capacity and infrastructure creation** – Many manufacturing companies face a trade-off between the risk of idle capacity and lost opportunities. In DRL, the capacity utilization was higher than 70% till 2008. As a result, it could not meet the growing market demand due to its inability to cope with production pressure. Consequently, it had to suffer lost opportunities for sales as well as penalties for failure-to-supply. After that, the organisation took aggressive capacity-building measures, spending more than Rs. 1000 crores annually. In the generic pharma industry, a few new products (specifically complex generics, new formulation types) require a dedicated manufacturing facility. Since the exhibit batches are required for filing a new product, the investment in such facilities has to be in place at the product development stage itself. Hence these investments carry the risk of product development failure as well.
- c) **Inorganic growth (M&A)** - DRL has done several acquisitions over the last two decades, the outcome of which has been a mix of success and failures. It had a history of a couple of profitable plant acquisitions and a few successful brand acquisitions. However, a few acquisitions were not successful. Notable among them was the Betapharm acquisition in Germany. The strategic rationale for that acquisition was sound. Germany was the third-

largest generics market in the world, and Betapharm was the fourth-largest player in that market. However, post-acquisition, many assumptions did not materialize, and the market rapidly changed from branded generics market (doctors being a significant influencer and the sales force/brand promotion being the differentiator) to becoming a tender driven market (with health insurance firms dictating terms with the lowest price bidding). As a result, the company had to write-down more than 75% of the value over a few years. Subsequently, it had a mix of success and failures in M&A but continued its focus on inorganic growth to supplement organic growth and, while doing so, sought to improve the integration process.

- d) **Organic expansion, including new business incubation and new markets** - DRL has been incubating two businesses viz. proprietary products and biologics. Each of the incubation businesses presents lucrative market potential, and there have been few initial success stories. However, these investments have not delivered the desired success as yet – and have failed to break-even after more than 15 years of incubation. Having already invested significant amounts, the cost-benefit ratio from incremental investments to the potential profits always seems a compelling proposition. With this perspective, the company pondered whether there should be a hard stop-loss limit on resource allocation to incubation businesses. DRL has also been gradually expanding its reach to multiple markets globally, selling APIs across the entire world and finished dosages to about 50 countries by 2008. After that, the company made a strategic choice favouring depth over breadth and decided to focus on countries with revenue crossing at least \$2 million for the formulations business. Following this decision, DRL continued to have a direct presence in approximately 20 countries. However, with a product portfolio concentrated on complex generics and hospital products which do not require a large field force but can be sold through supplies against tenders, DRL restarted expanding to multiple countries.
- e) **Return of capital to shareholders** – Since generics pharmaceuticals is an industry with relatively high operational risks (regulatory compliance, price controls/erosions, shelf life expiry etc.) DRL has always maintained conservative financial leverage, keeping the net debt-equity ratio to a maximum of 0.5. The only exception was immediately after the acquisition of Betapharm when the company's net debt/equity ratio shot up to 1.37. However, that phase was transitory as it did a follow-on ADR issue to raise equity capital, bringing down the net debt/equity ratio to 0.3. When it had surplus cash (negative leverage), it initiated a buy-back program. The dividend pay-out has been consistent at approximately Rs.400 crore over the last few years, including dividend distribution tax.

DRL kept allocating its capital in the past across SBUs with a more consistent and persistent outlook, irrespective of any shortfall in ROCE and economic profit generated by the respective SBUs. The need for dynamic capital allocation was increasingly being felt by both the management and the board. Given that the capital allocation decisions at this juncture could have a defining impact on the course of the company, it was critical to have a well-researched and well-debated capital

allocation framework that was dynamic enough to adapt to the changing business environment and organisational priorities.

Capital allocation to resource allocation in pursuit of the strategy

Resource allocation is not an end in itself. It is a mean for the successful execution of strategy. Hence resource allocation must dovetail into the strategy of the company. With this perspective, the board advised the management to develop a capital allocation framework as an integral part of the strategy and later expand the scope of capital allocation to resource allocation to include levers beyond financial capital like leadership development and capability building, including digital and analytics across the organisation. There have been considerable changes in the top management team over FY2018 and FY2019 (including hiring an expatriate as the COO, who has been subsequently promoted to CEO) followed by the new framework of strategy with three pillars:

- 1) Choosing specific spaces to target for leadership.
- 2) Operational excellence and continuous improvement.
- 3) Patient-centric product innovation.

As part of this strategy, the company has identified six key 'spaces' that would be the growth drivers for DRL. The incubation businesses were directed to focus their efforts on achieving self-sustainability. Accordingly, the propriety products business decided to move away from commercial operations in favour of out-licensing. The renewed strategy is in line with the company's purpose statement, shared values, and it takes into consideration the factors of strategic importance, including strategic risks.

The strategic initiatives by DRL

While the company has taken multiple strategic initiatives from time to time on each of the above areas, two of them stand out for their organisation-wide impact and specific contribution to delivering the strategy adopted at that time. The first is the TOC (Theory of Constraints)¹ implementation in 2008 under the umbrella of 'Viable Vision', and the second is the SDP (Strategy Deployment Process)² implementation in 2016.

TOC Implementation

DRL engaged Goldratt Institute, founded by Eli Goldratt (the exponent of the TOC), about the implementation of the viable vision program in DRL with the following objectives:

- Achieve 25% profitability by FY2012, up from a single-digit in FY2008.
- Achieve sales of \$4 billion within four years (approximately four times) with above profitability

• ¹ An Introduction to TOC is given in Annexure 1

• ² An Introduction to SDP is given in Annexure 2

The top management of DRL (approximately 50 persons) across BUs and geographies went through 10 days of an intensive workshop where, besides learning the TOC's insights, the strategy and tactics for achieving the above objectives were shared by Mickey Granot, then the CEO of Goldratt group. Despite the inherent simplicity of TOC, the team understood that implementation would be challenging as it assumed a different culture and management systems, including the redefinition of conventional measurements.

Besides growth and profitability, there was a considerable emphasis on stability. The fundamental tenets of the program were:

- Throughput (sales - totally variable cost) must grow (and continue to grow) much faster than operating expenses.
- Exhausting the company's resources and/or taking too high risks severely endangers the chance of reaching the viable vision.

The way (tactic) to achieve viable vision was described as:

- Build a decisive competitive edge and the capabilities to capitalise on it on big enough markets without exhausting the company's resources and without taking undue risk.

The underlying assumption to have a decisive competitive edge was to satisfy a client's significant needs to the extent that no significant competitor can, and to do so, two decisive competitive edges were agreed upon:

- By providing a 'partnership' to clients (i.e. retailers) that delivers superior inventory turns (better availability coupled with substantially reduced inventories) when all other parameters remain the same.
- By effectively introducing more and more (generic) drugs to the market at lower risk and investment route – substantially increasing the productivity of the R&D resources while significantly improving the ability to complete projects on time.

The tools deployed to achieve the above included a simplified drum-buffer-rope, critical chain project management techniques and all other relevant TOC principles by detailing strategy and tactics at various entity levels.

In its implementation timeframe (2008-2012), this strategic initiative met with a mix of successes and failures. Out of the stated objectives of profitability and sales, it could achieve 19% instead of 25% profitability and sales almost doubling instead of quadrupling over the four years.

The consumption-based replenishment model was well implemented in Russia but could not be replicated in India or the USA. The reason could be attributed to both the channel structure and the distributors' primary objectives (margin vs ROCE) and bargaining power.

The consumption-based replenishment model works very well to improve the inventory turn when the subsequent nodes are aggregated (which is the case in Russia, where the number of distributors is limited and one pharmacy buys from only one distributor). Several thousand distributors serve several lakh pharmacies in India, but any one pharmacy buys stock from multiple distributors. With such cross-selling, the algorithm for aggregation of nodes fails to deliver the desired effect. Further, India's traders put more emphasis on margin than on inventory turns (preferring discount/bonus offers over reduced working capital). The USA distributors are more consolidated, with three of them capturing more than 85% market share. Naturally, they have immense bargaining power, and they dictate the manufacturers to follow their optimised buying schedule, giving little importance to inventory turn while charging a hefty penalty for failure to supply.

The simplified drum-buffer-rope and the critical chain project management techniques served manufacturing and R&D quite well. The due-date-performance of new product development projects went up from 25% to above 80%.

A significant implication of TOC deployment was a reduction in the global footprint of finished dosages branded formulation business. The disproportionate supply chain and regulatory complexity to serve multiple countries with smaller volumes led to a serious discussion in the board on depth vs breadth. The principles of TOC led to this important resource allocation decision on exiting some existing small markets and criteria for expanding into new markets.

Although the 'Viable Vision' initiative formally ended in 2012, the company continued to follow some of the core principles of TOC as a part of its operating system and philosophy for strategy execution. DRL's finance function continues to follow the 'Throughput accounting system', and T-OE is still used as the primary metric or KPI for each business unit and profit centre. Due diligence is done to find whether a critically constraining resource (CCR) is getting de-bottlenecked, leading to better flow (task/material/cash) to take a capex decision.

SDP implementation

DRL engaged the Next Level Partner (a consulting organisation formed by some of the former top management personnel of Danaher Business Corporation) for initial training and later facilitating SDP implementation in 2016. The first workshop during the company's annual leadership summit in Boston, attended by around top 60 employees, also helped define its top-level X-matrix for both DRL and each of its SBUs.

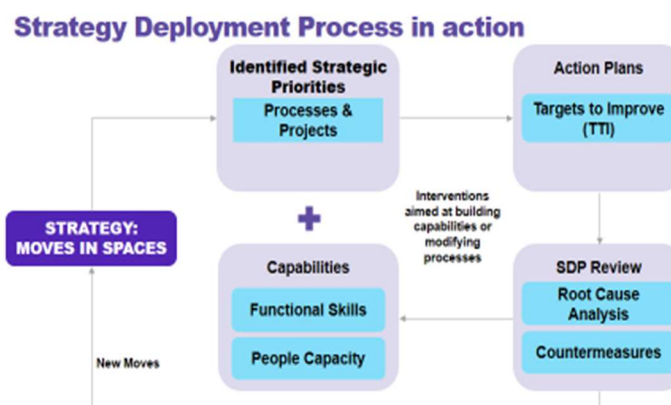
As per the X-matrix guidelines, the first dimension covered the breakthrough financial objectives of FY2020; the second dimension covered the annual goals of FY2017; the third dimension covered the top-level strategic priorities, and the fourth dimension covered the targets to improve as well as the

specific accountability. The top-level X-matrix for one such SBU - EM under the leadership of the SBU head MV Ramana was defined as follows:

EM Top Level "X" Matrix FY2017						Owner: MV Ramana	
•		Create & Execute Process to Ensure Timely Approval First Time Filing		•		C	
•		Develop & Implement New Market Entry & Scale Up Process			•	C	
	•	Create & Complete Implementation of Focus Brand Growth Process	•			C	
(B) EM - Achieve confirmed FTL filing pipeline \$ of \$245M	(B) EM - Achieve sales for existing brands of \$459 Mn	Top Level Strategic Priorities 2017 Annual Objectives Targets to Improve 2020 Financial Breakthrough Objectives		Increase focused brand growth (Exc. VZ) from 213 million USD to 228 million USD by FY17 and to 255 million USD by FY20	From 0 to 200 (value of \$190 mn in FY20) confident filings (in line with committed strategic plan) by March 31, 2017		
•	•	(B) EM - Achieve sales of \$916 Mn			From 0 to 15 new markets with right strategy and filings by March 31, 2017 that will enable us to achieve \$64 mn by FY20 from these new markets		
							Res

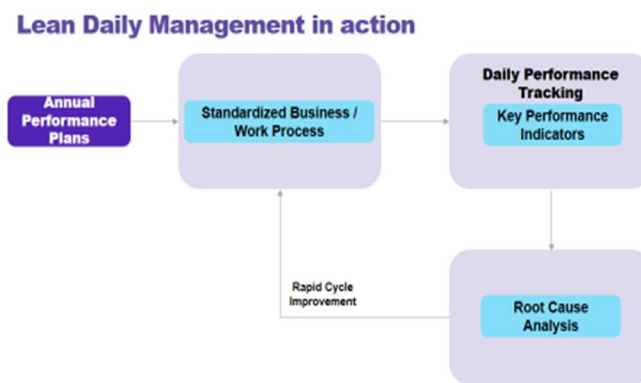
As may be seen from the above X-matrix, annual objectives for FY2017 included both KPIs, namely (a) the sale target for FY2017 and (b) what new first to launch (FTL) products pipeline needs to be advanced during FY2017 to achieve the FY2020 financial breakthrough objectives. The specific processes that needed to be improved/re-engineered during FY2017 to strengthen the delivery of both breakthrough and annual goals were identified and prioritised (row/column closer to the X-matrix centre, higher the priority). These were then highlighted as part of the top-level strategic priorities. The accountability and resource allocation to achieve them were defined in subsequent dimensions, finally resulting in each SBU/functions' action plans.

Accordingly, DRL adopted SDP for executing the strategy and ensure alignment towards a successful deployment. Initial hiccups were overcome by a strong commitment of the top management, continued education and action learning, and changing the review/governance process of SBUs/functions in alignment with SDP. The current Strategy Deployment Process in action with gradual evolution over the years is explained schematically and in detail as below:



The strategy gets renewed from time to time with a clear articulation of spaces where the company chose to focus and the specific moves that would enable a shift from the current state to the desired one. SDP helps DRL and each SBU/function define the top-level X-matrix that includes the top strategic priorities, eventually leading to action plans and measures (TTI) to track them. Reviews focus on root cause analysis and countermeasures for any problem or when any program's progress status is not on track. Specific interventions are then made to build both capabilities and capacities as are required in the modified process.

The SDP is also helping in mitigating the risks of execution to strategy and tracking the necessary KPIs daily, which is called lean daily management (LDM), which is bundled along with SDP. The top management focus is to ensure what is required to deliver long term goals and strategic priorities and track the targets to improve (TTI). The middle managers focus on KPIs that are essential to delivering the annual business plan.



The SDP/LDM implementation led to a substantial improvement from the way strategy was formulated, executed and tracked earlier in terms of focus, alignment, rigour, discipline and accountability. The result is evident in the financial turnaround explained later.

Application of SDP and TOC in the renewed strategy

Two of the strategic objectives - 'leadership in chosen spaces' and 'patient-centric product innovation' are supported by a set of concrete moves and strategic priorities along with some cross-functional processes. These are reviewed using the SDP and LDM approach to ensure proper focus, alignment, rigour, discipline, and accountability. The 'operation excellence and continuous improvement' initiatives are embedded within the culture of the organisation where everyone is encouraged to eliminate any waste and are refrained from committing excess. The cost improvement program is driven to realise each product's cost leadership (by improving process and reducing total variable costs) and productivity of operating expenses (doing more with less). The TOC continues to be part of the operating systems of DRL, where everyone gets driven to ensure that throughput (sales- totally variable cost) grows faster than operating expense.

Renewed approach for resource allocation in pursuit of strategy

DRL believes that all future resource allocation must be in alignment with the stated strategic moves, and it has identified the following guiding principles for resource allocation within its risk appetite:

- Resource allocation to follow strategy.
- Diversification to reduce the concentration of business.
- Optimize leverage for inorganic growth.
- Target RoCE of 25%.
- Target EBIDTA of 25%.

However, the following set of guidelines for risk appetite (as approved by the board) are followed by the finance team consistently over a long period and remain unchanged:

- Exposure to launch-at-risks and other business risks not to exceed 25% of EBIDTA.
- The company's net debt to be restricted to 50% of equity or two-times its EBIDTA, whichever is lesser.
- Hedging of foreign currency risk of cash flows is restricted to a maximum of 18 months for US exposures up to 50% of forecast, and 12 months for currencies in the emerging market up to 30% of forecast, while always ensuring that balance sheet exposures are appropriately hedged.

The strategic dilemma between focus and reach remained pertinent, particularly in the wake of regulatory and supply chain complexities to service multiple countries. The decision to expand to a new market is taken with due deliberation. In this context, the company decided to choose six strategic spaces - North America, India, Russia, China, global API and the global hospital business. Additional spaces could be exploited opportunistically, and the deprioritized countries could be cash cows or be later sold/exited.

DRL has made a conscious decision to allocate resources — without any specific financial upper bound — to augment its capability, both in leadership and digital and analytics, keeping in mind the need for the future. At least 10% weightage is given in the overall organisation scorecard and each SBU scorecard on these capability developments to create a transformational impact. Further, in today's world of rapid technological progress, new IT, including digital and analytics, are imperatives that can contribute to a significant competitive edge; hence, there have been appropriate resource allocations to pilot and scaling up such initiatives. DRL is also committed to a digital transformation plan where the objective is improving efficiency improvement and creating substantial value for its business partners and customers through platform technology. A recent example of exploiting the platform of digital P2P (procure to pay) to allow bill discounting to all business partners, based on their cash needs, eliminates the role of bank or any other financial intermediaries and further, makes the entire process instantly transparent, simple and seamless.

Application of SDP and TOC in resource allocation in pursuit of the strategy

- 1) R&D - Timely new product launch and timely filing for first to launch products are among the top strategic priorities and moves for each SBU as per the SDP. While the weighted deduction for income tax relief is no longer available, the resource allocation in this deployment category remains and will continue to remain the top priority given the strategic importance in this industry. A new normal of approximately 10% of sales for this category is emerging for DRL, and the R&D heads then need to prioritize projects within that resource constraint. Higher priority would naturally be given to the products whose estimated net present value of future profits is relatively higher. However, the project management (CCPM) principles of TOC provide due weightage to other factors, e.g. the capability of R&D scientists/ full-kit readiness before the start of the project and probability of success of R&D in the dynamic prioritization of the portfolio.

- 2) Capacity creation – Whenever a new product introduction requires a dedicated capacity, the risk appetite for such a decision is taken based on the strategic priority of the concerned SBU and the relative importance of that product in the overall new product portfolio as per the SDP. However, when capacity/infrastructure creation involves safety and quality, those decisions do not warrant any trade-off — given the strategic importance of both of them. TOC implies the creation of protective capacity and, hence, the company continues to expand the capacity of any plant whenever the utilization crosses 70% of the achievable capacity. Again, any single line or module's capacity is augmented by identifying the CCR and adding additional resource there.

Inorganic growth – DRL has a process of diligence and a stage-gate of CXO review before placing any non-binding offer. The first filter is the fit to strategy; after that comes the financial considerations with risk analysis. Synergy remains a critical component of the overall value of integration with the target; hence, its potential to create synergy is reviewed rigorously. Unlike Danaher, where the Danaher business system (the company's management operating system) is introduced in the acquired company to create a turnaround or higher value, DRL believed in the past in a two-way transfer of capabilities and learning from each other. However, most of those acquisitions were primarily to complement/augment organisational capabilities. The current focus of the business development/M&A in terms of sensing/targeting opportunities in the market place is in complete alignment with the X-matrix of the concerned SBUs, e.g. scouting for an entry vehicle for a new market entry for EM or increasing the breadth of the portfolio in unbranded generics or acquiring/in-licensing target brands in branded generics.

- 3) Organic expansion - Over the last two decades, the company has been consistently allocating significant resources (more than any other deployment categories in most years) for its organic expansion, including new businesses, new markets, marketing and

brand building. In recent years, however, the focus is on the productivity of such resource allocation, accountability for the respective owner (of the strategic priority/move) to deliver TTI as per SDP and rigour/discipline of the review to make a necessary course correction. The current and future estimate of T-OE against the investment made serves as the significant KPI to track.

- 4) Capability – Resource allocation for leadership development and capability enhancement, including digital and analytics, has helped the organisation improve safety, quality, and productivity in the shop floor, laboratories, and sales force practices. These capabilities have been integral to both TOC and SDP implementation. These have the distinct potential to create a decisive competitive edge — and the company’s effective response to the crisis of Covid-19 seems to have effectively proved its capability mettle.
- 5) Return to shareholders - Resource allocation in this category is consistent with the TOC principle of continually adding more value to all stakeholders. To provide sufficient confidence to shareholders on continuing value creation, the company has even introduced a bonus debenture in addition to an annual dividend. The board regularly tracks the trend of total return to shareholders.

The principles of TOC and SDP have become part of the DNA of the company. The concepts of CCR, Throughput, X-matrix etc., have merged into the senior leadership’s vocabulary. Some examples of senior leadership comments on these topics are given below. These demonstrate the commitment of the management team to the principles of TOC and SDP:

“The viable vision initiative was based on the 'Theory of Constraints' and pushed the management thinking at DRL to make sound financial decisions based on throughput, inventory, and operating expense, and the way we could increase throughput by increasing flow through the constraints. This led to a throughput-based accounting system and changes in the way we allocate resources to infrastructure and capacity building, and market initiatives. The SDP principle, coupled with the lean daily management initiatives, helped DRL connect long-term strategy to execution plans. By developing a strategy and subsequent project, communication and accountability plans, Dr Reddy's developed a roadmap to focus resources with the right projects at the right time with the right metrics and resources. The SDP principle has helped in resource allocations to critical R&D and operations projects, such as the cost improvement programs that lead to an increase in throughput and the viability of products in the marketplace throughout their life cycle.”

-Deepak Sapra, CEO, Pharmaceutical Services and Active Ingredients Business

“TOC: Identifying critically constrained resource and resolving issues either through OE (operational excellence) initiatives/CCR specific investments really helped in optimizing capital spend on existing facilities/areas for extra capacity. Based [on] experiential learning, we could

use the concepts of TOC in categorizing the overall portfolio into runners, repeaters and strangers in APO implementation.

SDP: Our biggest issue is converting strategy into execution. SDP framework gave us the power to convert strategy in to clear actions and track them (green/red) with countermeasures. It clearly helps in capital allocation based on execution priorities.”

-P Yugandhar, Global Head of Supply Chain Management

“The TOC approach has helped us to bring complete alignment across manufacturing and supply chain teams, minimize the inventory holding cost, thereby ensuring higher return on capital employed by reducing the cash-to-cash cycle time. It also helped identify the real constraints on the manufacturing shop floor, [and] so it could generate higher throughput by eliminating the constraints. This also helped to prioritize capital allocation.

The benefits of SDP implementation include aligning action plans and spends as per the sources of growth, better use of lead and lag indicators, and correlating success/failure of campaigns to brand outcome, data-driven/evidence-based marketing, better utilization of resources, identification of capability gaps (e.g. in-sighting) and making brands future-ready. This is to make sure the future growth strategies are thought through and acted upon well in time. This will allow a much greater degree of cross-functional alignment to deliver on the future growth of the brands.”

-M V Ramana, CEO of Emergent Markets and India Business

“DRL was always known for pioneering ideas and initiatives. However, the execution system was generally weak and was unable to handle the scale. In order to bring greater focus to effective execution and continuous improvement, we embarked on several initiatives, the prominent of them being TOC and the Strategy Deployment Process. TOC helped us organise our supply chain and also an algorithmic approach to improvement and capacity planning. Thus it influenced how we allocate capital to create capacities. The SDP is a process by which we brought rigour to our execution system. The SDP, coupled with a well-established Daily Management System ensures that while daily and regular performance KPIs were achieved, we enhance our capabilities to deliver more at a lower cost and other aspects of competitiveness. In effect, it elevated the capacity of our daily management system through focussed projects and action plans to deliver more. The SDP and LDM system together drive performance and continuous improvement over the last several years resulting in higher profitability and thus making capital available for inorganic moves and additional initiatives in research and capacity creation.”

-G V Prasad, Co-Chairman and Managing Director

The decision for reallocation of resource to multiple categories across SBUs

Following the principles of SDP, the senior management focus is gradually more on the creation of the right capability and capacity, portfolio creation and customer lock-in for future years, while the

middle and operating managers focus on the KPIs for the year with LDM. Following the principles of TOC, the organisation is continuously exploring new decisive competitive edge, identifying the bottlenecks in the execution of all processes and taking swift measures to augment the critically constraining resources in order to improve flow, agility and turnaround time of the processes.

Today, an investment or allocation decision is no longer based on judgment, and potential bias in the pitch made by the SBU heads. Instead, it is based on the focus and alignment to strategy. The resource allocation decisions are no longer uniform across categories for a specific SBU and similarly not uniform across SBUs for a specific deployment category. Though it was decided to prune down the overall capital allocation of SBU2 and SBU4, both SBUs have been allocated enough resources for R&D and Innovation as the potential driver for future growth. Despite the company's overall focus on M&A, the strategic intent is reflected in the prioritization of resource allocation on M&A across SBUs.

Table 3: Reallocation of resource to multiple categories across SBUs

Deployment	SBU 1	SBU 2	SBU 3	SBU 4	SBU 5	SBU 6	SBU 7	Total
R&D / innovation	√	√	√√	√	√√	√√	√	√√
Fixed assets - capacity creation	\$	X	√√	X	√√	√√	√	√
Inorganic growth	√	X	√	X	√√	√√	√	√√
Organic growth - brand building/ marketing/new markets	\$	X	√√	X	√√	√√	√	√
Leadership and capability development								√√
Buy-back/dividend								\$
Total	\$/√	X	√√	X	√√	√√	√	

Symbol	Options for deployment	Description
√√	Seed	Allocate substantial capital for investment in new businesses/ markets and bolt-on additions to existing businesses
√	Nurture	Grow existing businesses with incremental investments to support growth
\$	Harvest	Milk existing cash-cows with minimal investments
X	Prune	Take resources away through divestments and reallocate them to other businesses

In line with the strategy, DRL has formulated the above capital allocation decisions to invest more in SBU3, SBU5 and SBU6, prune down on SBU2 and SBU4, continue to nurture/harvest SBU1 and nurture SBU7 for growth. While the impact of any strategic change will take some years to emerge, the green shoots of a turnaround are visible from the company's financial results since FY2019. In the financial results of FY2020, DRL reported its highest ever sales and EBIDTA and a strong free cash flow, thereby turning net cash surplus. The revenues for FY2020 stood at Rs.17,460 crore and grew by around 13% over the previous year. The EBIDTA for the year was Rs. 4,643 crores, or around 26.6% of revenue and grew by approximately 36% over the previous year.

The shift from capital to resource allocation is now amply evident in the senior management's focus on capability building in pursuit of the strategic priorities and moves chosen by each SBU. That has become a new common vocabulary, consistent with the principle of SDP. The management reviews are primarily focused on the processes, SDP initiatives and latest estimate of financials for the future, while the analytics and dashboard track KPIs and financial performance. Earlier, a significant part of the quarterly management review was spent on analysing the previous quarter's financial performance. Over the past two years, a major part of both monthly and quarterly management review has been spent on discussing possible management decisions and actions to create a better future for the company.

The business environment continues to remain very dynamic. The recent Covid-19 pandemic has created both short-term opportunities for the generic pharma industry and an imminent threat of a global economic recession. There is a new normal emerging with substantive digital transformation and the way the company interacts with customers, doctors, distributors, business partners and its employees. Market share expansion, cost control and cash preservation have become critical priorities in this challenging time. In a dynamic response to the potential threat of the liquidity crisis, the treasury function is now busy shoring up the company's cash reserves by increasing bank borrowings and preparing for issuing a commercial paper for the first time for DRL.

Conclusions, Hypotheses and the hypothesised framework

At every stage through its evolution journey, DRL has been confronted with the resource allocation dilemma of profitability versus investment for growth, availability versus efficiency for capex investments, the balance of marketing investments between 'growth' and 'maintenance' investments, the stop-loss limit for incubation businesses and selection of 'spaces' for inorganic growth. For the initial phases of its journey, the company relied, with reasonable success, on the strength of intuition and the entrepreneurial instinct of the management and the promoters, refined by the learnings from past experiences to arrive at decisions. After TOC and SDP became ingrained with the senior management of DRL, the resource allocation process in DRL has been guided by these two tools — not only in allocation but also in actions that should follow from such allocations.

These two tools have brought in the required discipline and objectivity in resource allocation decisions. It was not an easy decision for adopting the new strategy where the selection of the chosen spaces implied de-focusing on certain space that was close to the founder's dream and legacy. De-focusing on the proprietary products space was one of the toughest decision that the DRL board took in 2019. SDP principles helped in taking such pragmatic and potentially value-creating strategic decisions. The board actively participated in challenging and co-creating the strategy along with the new governance model in line with SDP/LDM. The operating system that was institutionalised post implementation of TOC enforced data-driven decision making on both

capex and R&D projects. The tools like CCR, full-kitting helped in eliminating behavioural biases to a large extent and shaped the current practice of dynamic portfolio management. The cross-functional processes that were taken as the strategic priority in the top-level X-matrix of DRL, e.g., selection to launch, integrated business planning and compliance monitoring, have aligned the senior management team to focus on their improvement in an integrated way beyond silo interest. The other strategic priority of digital transformation, and to enhance leadership and capability development, resulted in some changes in leadership and overall focus of DRL on cost leadership and competitive edge. All these helped in reducing organisation politics and improving leadership. In accordance with the above changes in DRL consequent to the deployment of TOC and SDP, we can infer that the tools have helped improve all the five causes of failures in optimal resource allocation identified in the literature review.

This case study gives the proof-of-concept that SDP and TOC can be formally developed as tools for dynamic resource allocation. This also, in conjunction with the insights from various literatures reviewed earlier, helps me to postulate various hypotheses and a framework for dynamic resource allocation as follows:

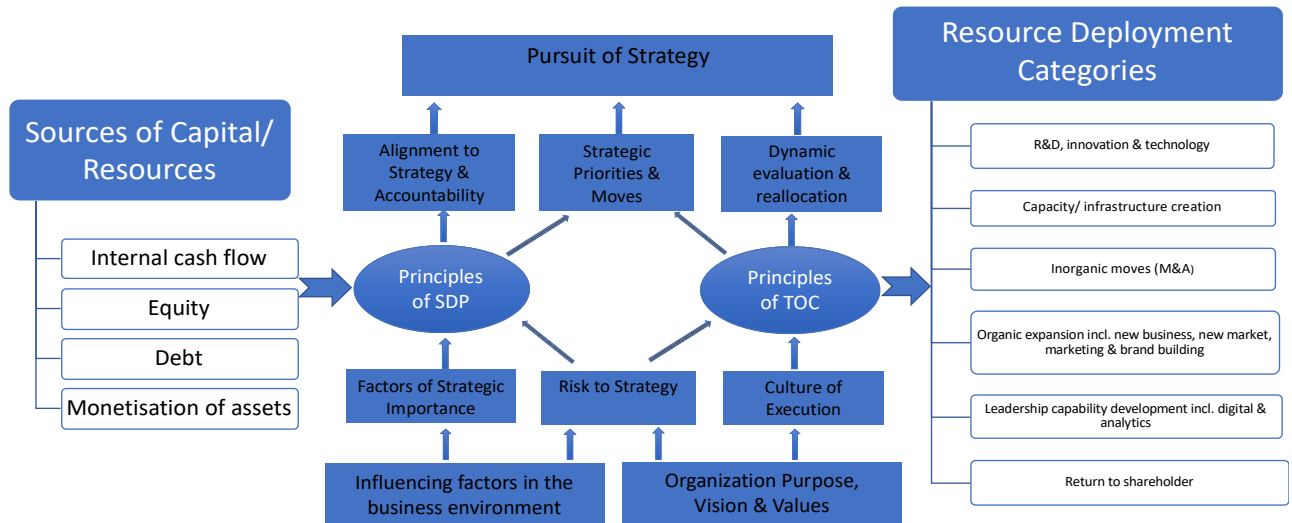
Hypothesis 1

The resource allocation challenges that DRL encountered are common across the generic pharma industry. The causes of resource allocation failures are poor strategy, poor governance, behavioural biases, organisational politics, and poor leadership.

Hypothesis 2

The tools that DRL used (TOC and SDP) mitigate resource allocation challenges through a more disciplined approach. Such tools are needed to define strategic priorities and moves, create alignment and accountability, dynamic evaluation and reallocation, and mitigate the execution risk to strategy.

Hypothesised Resource Allocation Framework



In order to validate the above hypotheses and improve the hypothesised framework further, I relied on the other two approaches of my research methodology that is presented in the following chapters.

Chapter 5: Interview of industry leaders and associates – part 1

I interviewed 36 prominent professionals, chosen from various categories as intended, with a diverse background across the globe, and all are/were associated with the generic pharmaceutical industry. The interviewees comprised of CEOs, CFOs, board members, analysts/investors and industry experts as follows:

1. Eight are or have been CEOs – of which two have also been CFOs in the past, and three are currently serving as members of the board
2. Nine have been CFOs – of which two are currently CEOs, and one is a member of the board
3. Twelve are directors of Board – of which three have been CEOs, and one has been a CFO in the pharmaceutical industry in the past, with the rest being Chairman/CEOs/CFOs of companies from other industries
4. Six are equity analysts/investors covering the generic pharmaceutical industry
5. Seven are industry experts from other domains, e.g., consultants, auditors and investments bankers

The interviews were conducted along the line of the designed questionnaire to collect qualitative data for validating the hypotheses and seek an answer to the research questions. Apart from one response received in writing and one interviewee who did not want to be recorded, all other interviews were recorded either in video or in audio mode with their consent. In this chapter, I focus on the essence of their comments on role, challenges and anecdotal stories from their experience of success and failures that are relevant for validating Hypothesis 1.

a. Comments on the role of the board, CEOs and CFOs

- i. A board member with previous CEO experience opines that the CFO very well serves a CEO in terms of being a trusted financial adviser and someone who is a good challenger. Most CEOs have outsized ambition and vision for their companies with very different mindsets regarding the resources they need to deploy towards that vision and how the relative merits stack up. The CFO is the conscience keeper in terms of challenging those assumptions, and therefore they work together for a comprehensive plan, which they present to the board. The board then plays two roles: firstly, it is validation from an informed position, and secondly, it is to raise appropriate challenges. According to another board member, the CEO's role is that of a team leader and, more importantly, a cheerleader for the team; he protects that team from everybody else to a large extent and makes sure that they get ample space to execute the strategies of the organisation.
- ii. A CEO who was a CFO in the past reflects that he is obsessed with growth and thinks about what will build a long term, sustainable and scalable business which is differentiated from its

competitors. The CFO role required him to be balanced because as the CEOs and the promoters take the entrepreneurial mindset, the CFO has to provide the necessary checks and balances. Another CEO with similar background believes that the CFO is the person who has the best ability to pick up the inefficiencies in the business. While the CEO focuses on market valuation, the CFO needs to have an eye on the returns from business.

- iii. Professional CEOs envisage the CEO's job as two-pronged – to frame a strategy and execute it. The job of the board, according to them, is to approve the strategy and follow up on the execution of it. However, when the CEOs are also the promoters of the company, they have personal stakes in the business. The vision for the company comes from the promoter, depending on where he/she would like to take the company to. The professional CEO's role becomes so much more important in guiding the vision because there is then the separation between the investor and the CEO.
- iv. The CFOs are more circumspect. One commented that as a CFO, he might not have digested all the logic for clinical trials; e.g., why so many subjects? Beyond domain understanding, he keeps asking the right set of questions to continuously learn. Another explained that a CFO serves his/her role by putting a measurement system and allocating capital for both fixed assets and working capital, measurement of resources effectiveness, launch on approval, air to sea ratio of freight, planning to delivery and taking a global picture rather than BU/geography interests, not duplicating resource to business/market opportunities.

b. Comments on the challenges faced by CEOs in dynamic resource allocation

i. Riding favourite hobby horses

Dominant owners or very charismatic senior managers can push companies to believe in their dreams. There were many examples when it was successful; equally, however, there have been many failures. Calibrated dreams in alignment with the values, vision and mission of the company, along with the ability to take tough calls and deal with changes, produce win/win outcome. Teva invested about US\$2 billion per year in R&D for specialty products for a decade without launching a single product out of the US\$20 billion investment. Yet, nobody dared to suggest a reconsideration of the investment in specialty as it was politically incorrect. Similar stories are found in other organisations too. **Promoter CEOs like riding their favourite hobby horses.** They generally like to keep funding these hobby horses, believing at every point that they are very close to success. A professional in the team might have a different view, but if he is overruled with an argument in favour of a stronger strategic perspective, he gives his heart to it and goes with the decision. It is not uncommon to have situations where the argument of a 'strategic priority' overrides what financials and instincts could predicate. As one board member summed it, objectivity and avoiding emotional attachments to any business are the key to overcoming this trap.

ii. The pressure of the near-term target

In order to develop complex generic products like Glatiramer or Doxorubicin, at least 50 or 60 batches were attempted before one got it right. One has to be very careful with the reviews. The CEO has to pull up people when they are being lackadaisical or are not working hard enough, but one needs to have the ability to wait eight to 10 years for an outcome. Often, people do not have the patience — being driven by short-term goals with short-term revenue targets to meet. One cannot get the clutter of near-term pressure in order to succeed. The thing which prevents resource allocation well is short term considerations. A series of short-term fixes may detract from the longer-term objectives of the company. One CEO admitted that, despite denial by many CEOs, share prices do make a big difference. **The conflict between where capital is being allocated versus what markets reward is a big issue is more so for professional CEOs than promoter CEOs.** The high multiples traded in India versus the western world puts additional pressure on the CEO.

One of the investors interviewed also admitted that the financial world is guilty of forcing companies down the path of short-termism. Markets expect results and returns in a short time frame, thereby collapsing the investment horizon to a year or two, which makes it difficult for companies to take long-term decisions. This is also the reason why some investors gravitate towards family-owned companies because families have a longer time horizon. The obsession with near term targets is there with some senior managers and some board members as well.

iii. Lack of tools and governance

In order to have efficient dynamic resource allocation, governance should be strong, and decision making should be data-based, factual and objective. There are multiple teams involved, and an idea if not properly controlled can become silo-based and very accusatory. Mismanagement or siphoning off of public money is quite widespread, and therefore institutions should have strong governance, internal audit, robust finance function, and the chairman of the board should have the ability to control and ensure transparency of the fiduciary transaction. There is a fundamental difference between ownership and the profession. Most organisations do not have the tools to look at resource allocation. If the capital allocation is based on this year's P&L, one will end up making the wrong capital application. The environment changes so fast that what was true 10 years back may not be valid for the next 10 years. So historical data may not be the best reflection of what might happen in the future. **The absence of clear-cut written guidelines (which can also provide for exception procedures) is coming in the way of structured resource allocation in the most logical and rational manner.** The way to handle this issue is to list down various assumptions and their sensitivity. The major risk factors in resource allocation are documented as a future reference point.

iv. Inertia and legacy

Inertia is the main issue. The shift in allocation requires a shift in the capital and the way people spend their time, and the way an organisation has to adapt to such changes. Typically, it is easier to look at incremental capital or marginal capital than it is to reallocate strategies. But from a strategy point of view, experience shows that unless one can reallocate existing stock of capital, merely focusing on incremental redeployment will not be enough. It is often that legacy matters a lot to management teams and CEOs. The unwillingness to disturb legacy or the perception that one may be disturbing a legacy is another critical reason why people tend to be cautious about a significant shift in capitals, even when it becomes apparent that market forces have shifted materially to merit redeployment of capital, absorb sunk cost and shift the balance of the portfolio. The matter of legacy can be quite powerful and constraining in some organisations. One feels an obligation to the founder to maintain certain aspects of the business, regardless of whether they are good businesses. This may be a controversial view, but that's the only reason; passion or a kind of pavement beyond the economic reason governs the decision. **The key issue is grappling with 'if it is not broken, do not fix it'. There is a comfort zone with what worked well in the past.** Everyone has biases as a result of experience and training, and it takes a lot of effort to get out of the comfort zone. One is getting good returns; therefore, it continues to expand in that place where it is functioning, and it happens all the time.

v. Biases and lack of alignment

One of the reasons for ineffective resource allocation decision is the lack of clarity and alignment behind the strategy. Sagent had the triple E strategy- Expand, Excel, Execute. Concordia had the DELIVER strategy- D was driving growth in Europe, the R was restructuring the debt. That was the way the **CEO drove alignment and accountability to strategy and the allocation of resources.** Quite often, learning from the past is lost with the people who took past decisions. Organisational knowledge needs to be recited to remind decision-makers about what went wrong in the past and learn from that experience. Bias is bound to come, and this can make a decision partially wrong or even awfully wrong when it creeps in. How does one prevent bias? One of the things often experimented with for a very large acquisition was to get a private equity partner even though the organisation could arrange the full capital. The idea is to eliminate bias because private equity partner is looking only from the financial return. Very few cases are where the management itself comes to the floor to talk about their failures.

c. **Some anecdotal success and failure stories**

i. Long gestation period

Where the possibility to make large gains in the future exists, a generic company makes a certain plan as to what it should be doing and starts then allocating money and people into various disciplines in the organisation, such as manufacturing, R&D, sales, and marketing, IP

litigation. With the generic/ API pharmaceutical industry, one starts making investments along with initiating a plan of product development for an eventual gain that may be realised several years later. So, along the way, if the initial planning misfires, the allocated resources do not really pay the gains that were predicted. A promoter CEO points out that each product has to possess a unique selling point in order to get selected - for example, **being in the first wave of launch or the ability to take a risky patent position, avoided by many**. Sometimes the bio studies work, sometimes these do not. Sometimes the team delivers, sometimes it does not, or sometimes the competition delivers much before the anticipated date. He says, "We do not believe in a basket strategy. The general conventional wisdom of what they call basket, we just sort of completely disagree with that philosophy. It needs a long gestation period, but the return is also very good because of the difficulties involved."

ii. **Investment in biosimilar business**

Cipla exited the biosimilar business. After investing about Rs.180 to Rs.200 crore and building a large team, their CEO felt it is better not to have their own development or manufacturing but rather leverage their market presence to sell other companies' biosimilar products. He believes it was the right decision in hindsight, citing the example of DRL, which is yet to make a meaningful profit out of its biosimilar investments. One of the DRL board members lamented not having the right partner as the reason for their failure in biologics since they could not afford to do everything on their own. Biocon, on the other hand, has made success in biosimilar **forging strong partnerships**. Their CEO recalled how they decided to go ahead and take the risk in an industry that was still evolving then because they believed that there would be a substantial unmet need for patient's health care systems to bring down the cost of treatment and providing access to patients who do not currently have access to these lifesaving drugs. Aurobindo is a late entrant to the biosimilar, but their CFO feels very confident about the potential success while admitting the risk associated with the investment.

iii. **Differentiated strategy**

Valeant's was a high capital-intensive strategy. It was buying off-patent brands and life cycle for large pharma company brands. It was cutting all investments behind those brands, be it marketing investments or R&D investments and it was pricing those assets so that they milked value over volume. The volume that they lost was much less than the value they created by taking that significant pricing. That strategy worked for many years until 2015/2016, when pricing came under the US presidential campaign's attention. That whole business model blew up and could not be executed. They changed their strategy from a US focus of branded acquisitions to a high-value generic pharmaceutical player in Europe. Divis is extremely focused on a small area. **There is a competitive advantage around that by way of a better process, better productivity, lower costs, gaining scale, gaining market share to the extent that they virtually now dominate that space**. Aurobindo acquired less profitable, somewhat struggling businesses and over time, made a success by making more acquisitions

in the same geography and by cutting costs in either SG&A or by moving production back to India. Sagent is largely described as a virtual company. They have done a very good job on how they think about resource allocation, investing resources in where they have a strategic advantage and for all commodity areas, they outsource. They have very little manufacturing in house. They control the IP in the dossier, they control the method and the process development, but they believe that manufacturing is a commodity and thus have limited their investments in manufacturing to a bare minimum. Similarly, for API, for many elements of development, they have not invested themselves but partnered to be able to get to the pipeline. But when it comes to the US, they have invested heavily in controlling the sales and marketing relationships to compete there. A past CEO reflected, “It is a bit of a contrarian strategy, interesting to showcase compared to the typical asset-heavy model that most Indian companies follow, which is owning investments in manufacturing, backward integration into API, heavy R&D investments and then marketing in the front-end. **Sagent is not a small company by any means, but it was an interesting asset-light model to think about**”.

iv. **Quality and regulatory compliance**

An industry expert shared that the CEOs of at least five companies have told him that their **most important job was to handle quality control and USFDA**. One board member emphasised that investing heavily in quality and manufacturing has enabled them to overcome an existential threat to their business. Another board member cautioned that, in certain businesses, returns come early, and risk comes later on – citing an example where they have allocated capital to a business which subsequently turned out to be high risk, and so the profits that have come through in the early years got wiped out subsequently.

v. **Alliance**

Teva was great in acquisition, and they grew very fast leveraging that strength. A past CEO of Teva recalled how, at a certain point, he reached the conclusion that developing alliances is a good alternative to just making acquisitions. Teva’s first alliance was with Proctor & Gamble on OTC products. **The idea was to combine Teva’s expertise in producing, developing and registering medicine all over the world with P&G’s expertise in branding**. It worked well for a few years because the OTC business is driven by branding.

vi. **Trying to Do everything**

The ex-CEO of Teva recalled how he was convinced that the company could not be into generics, specialty and innovation at the same time. These are not just different business models but different DNAs. Hence these businesses have to be run as different organisations. He recommended acquiring a specialty company and building the innovation business through this company instead of having a division for innovation and specialty pharma within the generics company. However, he could not convince the board. Another industry expert also pointed out that **‘peanut buttering’ is the cause of failure in resource allocation in a lot**

of the Indian pharmaceutical generic companies that are promoter led. They want to have their fingers in every pie – leading to an extremely fragmented way of allocating resources. As a result, they are fragmented across technology areas, product areas and markets and thus lack focus.

vii. Expansive decisions

An experienced CFO in the pharmaceutical industry commented that he comes across capital allocation or resource allocation problems all the time in terms of the R&D spends, litigation, the capital allocation for fixed assets, setting up/extension of a new plant or an M&A exercise itself. He recalls how they bought a company that was into opioids and narcotic substances, and just after they bought it, the market changed with new legislation brought in for prescriptions relating to narcotics. The kind of latitude given to doctors to prescribe opioids came down. The value proposition might not necessarily be extremely compelling when it comes to an acute therapy asset. They needed to go down the path where there are incremental benefits, but there were cheaper substitutes, especially when it comes to acute therapy. This was a learning and **big learning at that because these were all pretty expensive allocations** and expensive propositions.

One investor questioned the justification of Lupin's acquisition of Gavis - paying US\$1 billion for US\$100 million sales and for 80 unapproved ANDAs when companies usually spend US\$200 – US\$500 million in research to create fantastic products. He says, 'Natco, which was a small company with very low profit and a tiny balance sheet, went down to reverse engineer and make huge profits. In every decade, there are inflection points and opportunities. Biocon got it right with their biosimilars'. Zydus Cadila's resource allocation for transdermal business has not met the original expectations because of the delayed approval of products. This regulatory risk was considered but unfortunately went wrong in a fair estimate of such regulatory delays and related challenges.

viii. Cautious optimism

An industry expert cautioned against companies building excess capacity and ending up with an unabsorbed cost. He felt that in a commodity game, it is better to be at under capacity. A CEO also spoke about how he always maintained capacity less than the demand. Another CEO commented on a failure of his past organisation, "The company they built had the main goal of investing in attractive brains in the United States. This was in a nutraceutical, not in the pharmaceutical space and in this process, they lost significant money and led the entire company to a loss". An analyst reflected on the impact of such decisions on the valuation of the company. Some of the companies investing much in R&D and which are investing a lot in building capabilities and capex are not getting value. He said, "Lupin or Glenmark spends a lot on R&D. But if you look at the valuation, it is quite low; and in fact, companies which do not spend on R&D have gone up in valuation. The market is telling us that historically the capital or resource allocation decisions that the companies have made were not correct. It is taking a lot of time, and there are more failures than successes and therefore if you decide

to spend money on something new, the market tends to punish". **Most of the generic companies who have gone for acquisitions in unrelated areas have failed**, or success is still quite delayed. Those who have done acquisitions or resource allocation within their domain expertise have been more successful, and the success has been rather quick. A CFO said that there could be times when the strategy is not very clearly defined in terms of product segments or geography. Then one could end up with an opportunistic deployment, which becomes a little bit of a lottery. If it works, people tend to be forgiven regardless of whether it was not in line with the strategy. But when it does not work, it becomes obvious that opportunistic acquisitions in geographies where the balance in the portfolio and risk get distorted have been typical failures. It also represents the failures of oversight on the part of the board.

ix. **Clean sheet thinking/ early trend spotters**

An industry expert felt that the resource allocation for any year is largely a reflection of what happened in the previous year. **There is very little clean sheet thinking that happens.** It is primarily an extrapolation of how resources have been allocated in the past, which exposes an inability to manage resource allocation in a dynamic stage-gate fashion. This is particularly true when you are entering new areas and higher risk areas. Healthcare is more convoluted and complex than just saying we bring good stuff from India. US worked because India's low cost was a game-changer and the US being an oligopoly that it was held by an attack, and India was early in the generics market. The learning curve of the Indian generic companies being early in the US coupled with some acquisitions which then got them the base capability made a huge difference. In the early 90s, Sun Pharma identified a huge opportunity in India in chronic, and they allocated resources towards that and then stuck with it. They actually did quite well. They are the early trend spotters. A past CFO and current CEO commented that Sun Pharma's success could be attributed to the productivity of the India sales force, quality of people and portfolio, product quality, marketing investment, and management process. Sun's acquisition of Ranbaxy changed the company's business mix from being US-centric to a global one and allowed the reallocation of resource for higher productivity. The failure experienced by Sun Pharma in the US specialty is primarily an expectation mismatch that was not delivered completely. The street expected a generic like behaviour, but it takes time to build a brand business to peak only from year five onwards. This is coupled with overestimated/ underestimated resource requirement sometimes. However, the long-term thesis of the specialty business potential in the USA is intact as per their CEO. Some of the companies in India have done well by identifying their representatives who can go and sell anything to anyone. So, it is a bit like having 5000 entrepreneurs without really having the old performance management theme. It is a very entrepreneurial, highly focused approach and counterintuitive. Extending the concept of clean sheet thinking, a CEO gave the example of his decision to invest heavily in digital.

x. **Pull out**

People make a mistake to use the same mindset towards how they manage their resources and the inability to pull out. The companies that ultimately create a lot of shareholder value have dynamic management of the portfolio. **They are quite quick to enter with high resources and quite quick to exit, and that dynamism of entry and exit is difficult in many companies.** They take a long to enter, and they take extremely long to exit. Lupin's pull out of Japan and DRL pull-out from specialty are good examples. These are 'tough, decisive choices' in the words of an industry expert. Zydus Cadila's acquisition of Aten brand and German Remedies Limited were very successful, but their acquisition of a company in Japan was not — and they exited that market after a few years. The decision to be in a market or exit one should be dispassionate.

xi. **R&D portfolio decision**

An industry expert pointed out the decline in R&D productivity and the increase in filing costs per product. Companies have been overestimating the productivity of their own investments with a very long gestation period on the assets. According to another industry expert, the number one problem in the generic pharmaceutical industry is pipeline mistakes. He shared an example of how a generic company had made a bunch of R&D decisions on the basis of very incorrect data. There is a bias at the level of the portfolio. There is an overestimation of the portfolio's value, which means that too much money is spent on too many products. This in turn, means that they are going to be disappointed in terms of the return over time. Generally, well-managed companies are those where senior management pays disproportionate attention to the pipeline, knows where the gems are, and manages it tactically.

He recalled a story when he was sitting with George Barrett (head of Teva US) and Israel Markov (head of Teva Global) called. Given the hour at which he was calling, it was late for him in Israel, and they were sitting in Pennsylvania, and he just wanted to discuss a specific pipeline product. This is how companies can manage their pipeline well when senior management has attention to the pipeline. **It is considered as strategic pipeline, but it is important that the management needs to make the day-to-day decision.**

xii. **Sustainability**

One investor with a longer-term horizon brought **sustainability as a key theme for investment decisions.** He noted that DRL has been very good at reporting with many environmental metrics, health and safety metrics far ahead of the peer group. Measurement is a very important first step to solve any problem. Safety, for instance, is also a challenge in emerging markets. He says, "The cost of life in emerging markets is far lower than the cost of life in the developed market. The other question was, how do we build recycling infrastructure? Whether your packaging is recycled or not is not a source of competitive advantage. One that stood out in terms of approach to packaging and being ahead of the

curve was a Brazilian company called Natura. We fully realise that not everybody could be obsessed with all aspects of sustainability. We all give different weightage to certain things compared to others, and that reflects on how you run your business which is fine and acceptable for us. As long as you have that attitude to constantly improve and challenge yourself on each aspect, that is a good start”.

Conclusion

The response from the industry leaders and associates on the role and challenges faced by the industry coupled with anecdotes of success/failure stories support Hypothesis 1 that the resource allocation challenges that DRL encountered are common across the industry. The generic pharma industry has its own nuances like long gestation period, quality and regulatory compliance, the emergence of biosimilars and the critical importance of R&D portfolio decisions that are adequately reflected in the responses. The earlier literature review indicates that the generic causes of resource allocation failures are poor strategy, poor governance, behavioural biases, organisational politics, and poor leadership. The poor strategy is reflected in the anecdotal stories highlighting ‘doing everything/ peanut buttering’, ‘inability to pull-out fast’, ‘lack of clean-sheet thinking/ early trend spotting’ and ‘lack of differentiated strategy’. Lack of proper tools and governance is evidenced in the responses, along with the need for sustainability. Behavioural biases are substantiated underneath ‘riding favourite hobby horses’ and ‘bias and lack of alignment’. The stories of ‘inertia and legacy’ and ‘pressure of near-term target’ explain organisational politics. Poor leadership is evidenced in ‘expansive decision’, ‘cautious optimism’, and taking ‘R&D portfolio decisions’. So the interview responses from the industry leaders and associates provide enough evidence to support the insights drawn from the literature. These responses have a close resemblance to the insightful learnings from the DRL case study. Together they not only validate Hypothesis 1 but also highlight the need for some sort of systematic tools to deal with the problem. That leads to Hypothesis 2. The DRL case study illustrated how it used TOC and SDP to mitigate the challenges in resource allocation. Since the voice captured in the case study is limited to the top management, I surveyed the senior managers to find out how they felt about the application of TOC and SDP in the resource allocation decisions and the effectiveness of dynamic resource allocation in the pursuit of DRL’s business strategy. The analysis of the survey response is presented in the next chapter.

Chapter 6 - Analysis of responses to survey among the senior managers of DRL

The survey was sent to multiple participants across the organisation by around 256 people joining in with consent (260 opened the survey; however, four declined to participate). While all 256 responded to the multiple-choice questions, 168 responded to the open-ended question on any thoughts or suggestions on how to do dynamic resource allocation (DRA) to deliver the business strategy of DRL.

The distribution of respondents across role bands and tenure of service, as well as the representation in terms of respondents, are as follows:

Role Band	Tenure of Service (in Years)				Total	% of the universe
	0-4	4-8	8-12	>12		
Red	4	2	1	1	8	67%
Orange	13	4	3	2	22	73%
Yellow	19	11	15	47	92	59%
Green	27	31	35	41	134	39%
Total	63	48	54	91	256	48%

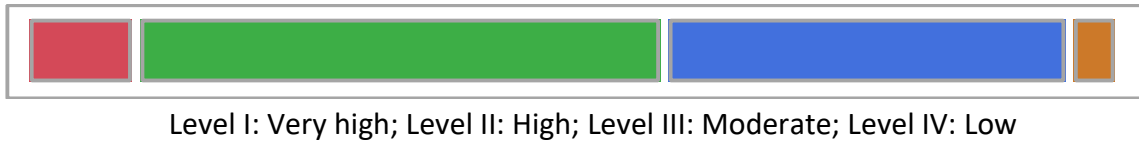
The red band represents the top management (President/ Executive Vice Presidents) in the management council (MC), and the orange band represents residual top management (Exec./Senior Vice Presidents). The yellow band represents the senior management (Vice Presidents/ Senior Directors), and the green band represents the senior level of the middle management group (Directors). The yellow and above band constitutes less than 1% of the overall workforce of DRL globally. Inclusive of the green band, the senior managers (Directors and above) represent some 2.2% of around 24,000 employees. The number of respondents to this survey is approximately 48% of that population, signifying a decent sample size.

The respondents indicated a high level of understanding of the following five topics:

Topics	Level I	Level II	Level III	Level IV
Theory of Constraints (TOC)				
Strategy Deployment Process (SDP)				
Strategy				
Resource allocation				
Dr. Reddy's business strategy				

Level I: Very confident to implement/drive; Level II: Confident to implement/drive;
 Level III: Not confident/need to learn more; Level IV: Not aware/cannot comment

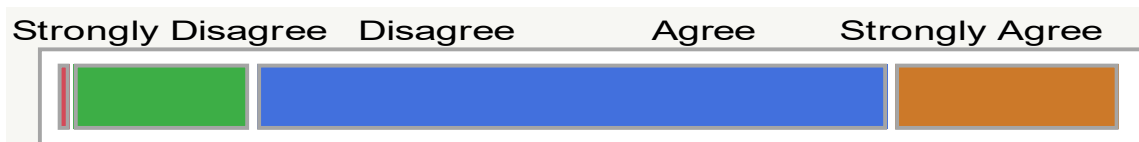
The effectiveness of DRL resource allocation to strategy is also considered high by respondents.



1. Understanding the overall pattern of responses

1.1 On the question of whether overall the **Theory of Constraints (TOC) influences resource allocation in DRL: 82% agree, including 22% strongly agree** – only 1% strongly disagree

Figure 1.1: TOC significantly influences resource allocation in DRL



In terms of the applicability of the tool (TOC) in resource allocation decision across various categories of deployment majority of respondents agree on capex, capability development (leadership, digital), organic expansion and R&D as follows:

- 72% agree with its applicability in capex – 10% disagree; others do not know.
- 60% agree with its applicability in capability development – 16% disagree; others do not know.
- 57% agree with its applicability in organic expansion – 11% disagree; others do not know.
- 57% agree with its applicability in R&D – 16% disagree; others do not know.
- 49% agree with its applicability in shareholder return – 9% disagree; others do not know.
- 27% agree with its applicability in M&A – 17% disagree; others do not know.

1.2 On the question of whether overall the Strategy Deployment Process (SDP) influences resource allocation in DRL: 79% agree, including 22% strongly agree – only 3% strongly disagree

Figure 1.2: SDP significantly influences resource allocation in DRL



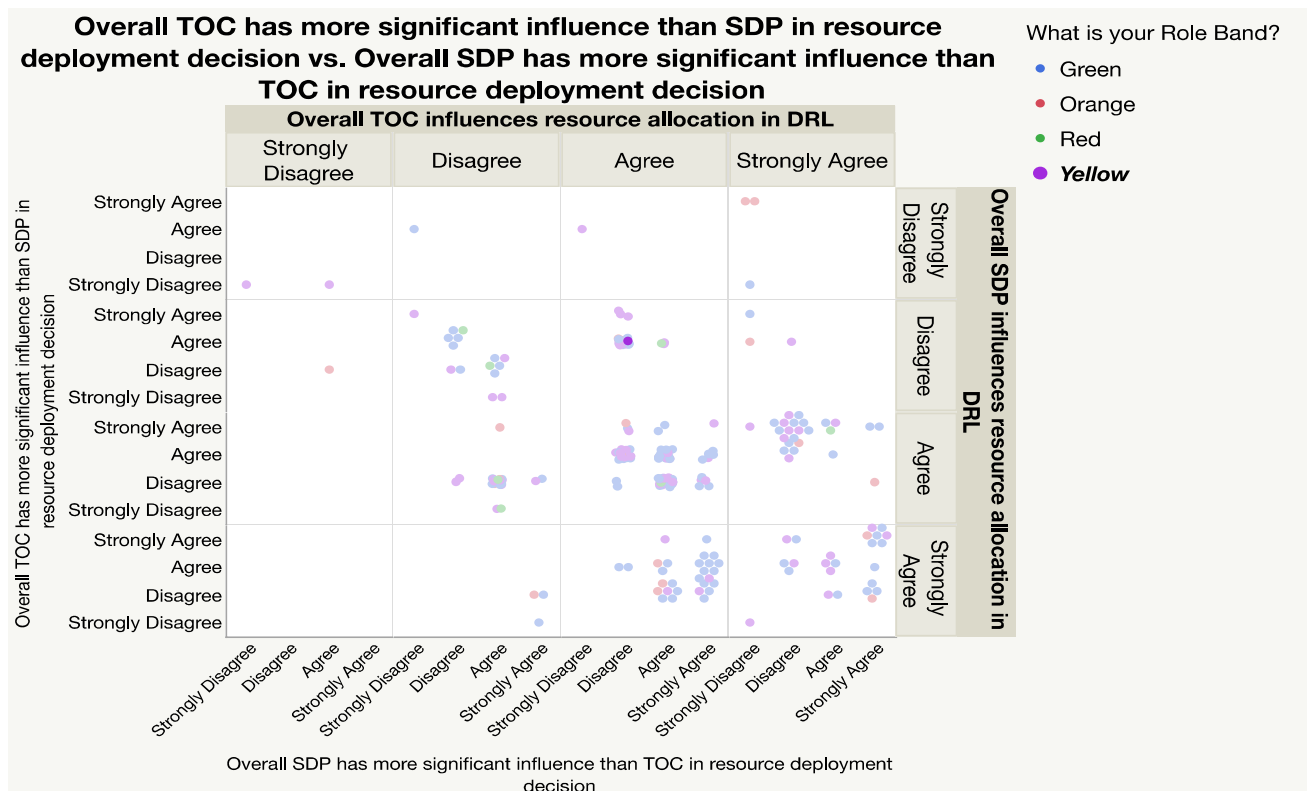
In terms of the applicability of the tool (SDP) in resource allocation decision across various categories of deployment majority of respondents agree on capability development (leadership, digital), capex, R&D and organic expansion as follows:

- 69% agree with its applicability in capability development – 17% disagree; others do not know.
- 65% agree with its applicability in capex – 18% disagrees; others do not know
- 64% agrees with its applicability in R&D – 15% disagree; others do not know.
- 59% agree with its applicability in organic expansion – 11% disagree; others do not know.
- 47% agree with its applicability in shareholder return – 11% disagree; others do not know.
- 25% agree with its applicability in M&A – 20% disagree; others do not know.

Observation: Four primary categories are marked as highly applicable across both the tools for the deployment of resource: **capital expenditure, capability development, organic expansion and R&D.**

1.3 On the question of whether overall SDP has more influences than TOC on resource allocation decisions in DRL or vice versa, there has been an unclear response. In both cases, ~60% agree (with 17% strongly agree) and ~4% strongly disagree. Fifty respondents have chosen to give the same response to both of these questions. However, most of them consistently chosen the same answer for the previous two questions as well.

Figure 1.3: Relative importance of SDP and TOC over resource allocation in DRL



Other observations: If we consider only the red, orange and yellow band responses – 61% agree/strongly agree that TOC is better versus 53% to agree/strongly agree that SDP is a better tool, though red band employees (management council) prefer SDP over TOC. Manufacturing and quality

teams seem to prefer TOC over SDP, with almost 70% mentioning it better. R&D teams seem to prefer SDP over TOC (73% agree/strongly agree), followed by sales and marketing teams (65%). Analysing the responses by the 'tenure with DRL' yielded no major insights, with the distribution being equal across yes and no for both the tools. Minor bias is observed in the 4-8 year tenured employees who seem to be preferring SDP over TOC (65%) – possibly attributable to the higher familiarity of SDP over the last 5-6 years in the organisation.

2. Understanding the correlation/effect of other parameters

In order to find the correlation among multiple parameters (covered in the questionnaire), I assigned an appropriate numerical value to multiple choices for each category of response as follows:

Strongly Disagree:	-3	Level I :	10
Disagree:	-1	Level II :	7
Agree :	+1	Level III:	4
Strongly Agree:	+3	Level IV:	1

Other fields like role band, service tenure, work area and comments were also assigned numerical values as follows:

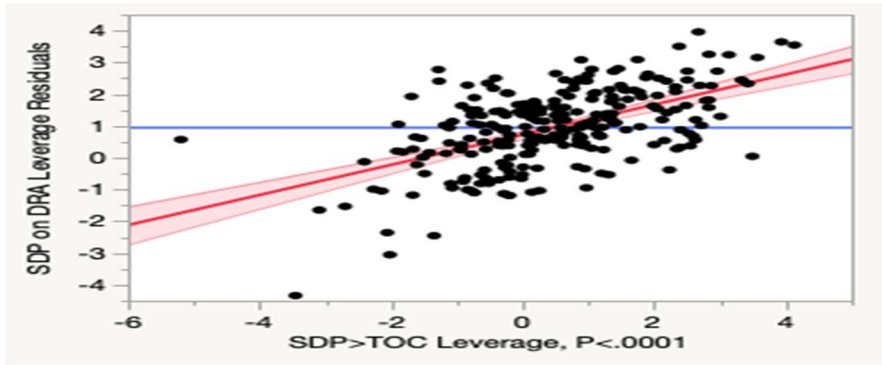
Role band:	Red -8; Orange -7; Yellow-6; Green-5
Service tenure:	0-4 years – 2; 4-8 years – 6; 8-12 years – 10; >12 years -16
Work Area:	Manufacturing/Quality -100; R&D -200; Sales/Marketing -300; Others -400
Comments:	No response -0; Any response -1

With the above numerical assignments, the correlation probability computed by JMP software is reproduced below:

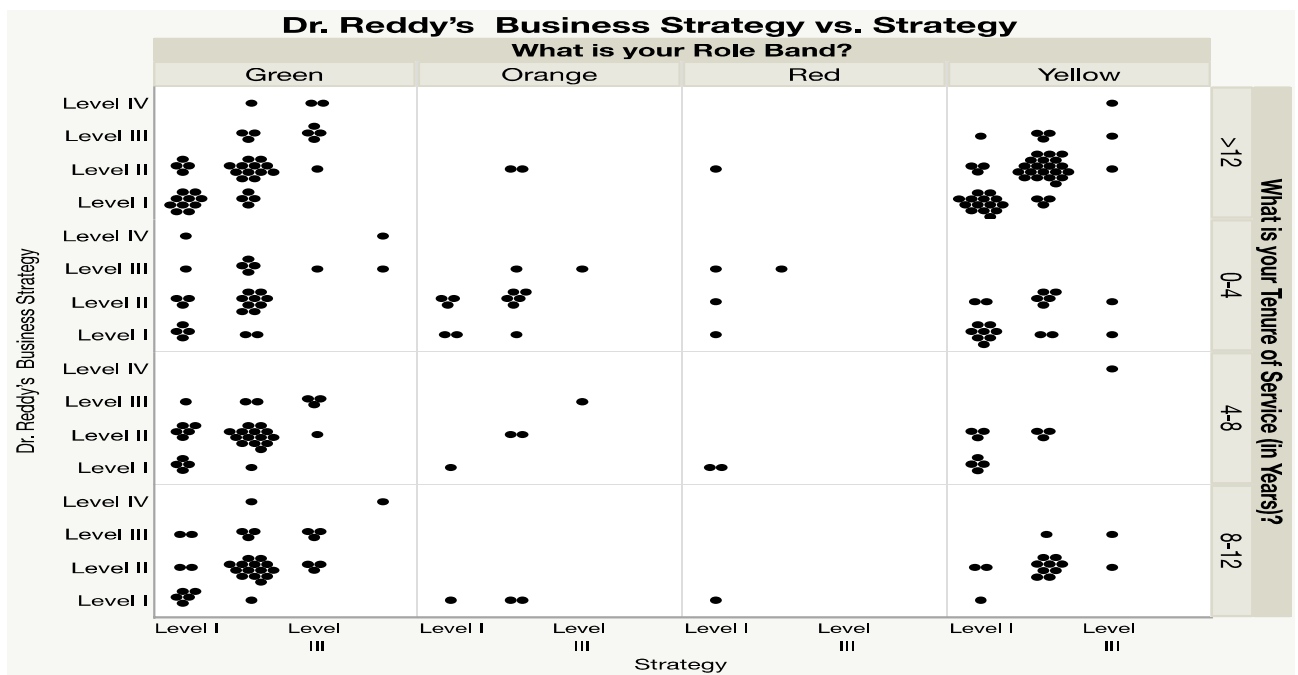
Correlation Probability														
	SDP on DRA	Strategy strength	Service tenure	Comments	Work Area	RA Strength	Effectiveness of DRL	DRA Role Band	DRL Strategy	Strength TOC on DRA	SDP Strength	TOC Strength	TOC>SDP	SDP>TOC
SDP on DRA	<.0001	0.8628	0.3027	0.0556	0.9509	0.0176	<.0001	0.0072	0.1249	<.0001	0.0085	0.3931	0.9329	<.0001
Strategy strength	0.8628	<.0001	0.5707	0.1751	0.5471	<.0001	0.0012	0.0052	<.0001	0.2223	<.0001	0.0051	0.7252	0.1745
Service tenure	0.3027	0.5707	<.0001	0.9176	0.0012	0.6273	0.6501	0.0449	0.8163	0.2420	0.5667	0.0037	0.9485	0.1816
Comments	0.0556	0.1751	0.9176	<.0001	0.2382	0.0592	0.4028	0.0012	0.1330	0.7917	0.0033	0.0089	0.2692	0.0504
Work Area	0.9509	0.5471	0.0012	0.2382	<.0001	0.1045	0.5706	0.0909	0.3757	0.4399	0.8267	0.8936	0.3777	0.0427
RA Strength	0.0176	<.0001	0.6273	0.0592	0.1045	<.0001	<.0001	0.2030	<.0001	0.0007	<.0001	<.0001	0.5138	0.0178
Effectiveness of DRL	<.0001	0.0012	0.6501	0.4028	0.5706	<.0001	<.0001	0.7260	<.0001	<.0001	0.0071	0.0082	0.0694	0.0001
Role Band	0.0072	0.0052	0.0449	0.0012	0.0909	0.2030	0.7260	<.0001	0.0070	0.1717	0.9886	0.4622	0.8351	0.0225
DRL Strategy	0.1249	<.0001	0.8163	0.1330	0.3757	<.0001	<.0001	0.0070	<.0001	0.4837	<.0001	0.1033	0.6560	0.0003
Strength TOC on DRA	<.0001	0.2223	0.2420	0.7917	0.4399	0.0007	<.0001	0.1717	<.0001	0.4837	<.0001	0.9166	0.0001	0.3053
SDP Strength	0.0085	<.0001	0.5667	0.0033	0.8267	<.0001	0.0071	0.9886	<.0001	0.9166	<.0001	0.0001	0.4116	0.0059
TOC Strength	0.3931	0.0051	0.0037	0.0089	0.8936	<.0001	0.0082	0.4622	0.1033	0.0001	0.0001	<.0001	<.0001	0.2496
TOC>SDP	0.9329	0.7252	0.9485	0.2692	0.3777	0.5138	0.0694	0.8351	0.6560	<.0001	0.4116	<.0001	<.0001	<.0001
SDP>TOC	<.0001	0.1745	0.1816	0.0504	0.0427	0.0178	0.0001	0.0225	0.0003	0.3053	0.0059	0.2496	<.0001	<.0001

The effectiveness score of DRL'S resource allocation to strategy has a higher correlation with the influence of both SDP and TRC on resource allocation decisions, understanding of DRL's strategy, resource allocation, strategy, SDP, TOC and whether SDP has higher influence than TOC. Role band, tenure of service and work area do not significantly influence that score. A higher correlation is evident in the leverage plots. One example is given below:

SDP>TOC Leverage Plot



Understanding of strategy correlates well with understanding DRL'S strategy, resource allocation and SDP. However, it is surprising to find that some persons, even in the red band and the yellow band did not understand DRL'S strategy well enough.



To analyse the effect of various other parameters on the scores on both the overall TOC influence on DRA and the overall SDP Influence on DRA, I applied the fit model through JMP software; correlating scores on other parameters and obtained the following summary of fit:

Effect summary of fit for overall TOC influence on DRA

RSquare = 0.46

Source	LogWor	PValue
TOC>SDP	15.117	0.00000
SDP on DRA	8.372	0.00000
SDP>TOC	2.698	0.00200
RA strength	1.552	0.02804
Effectiveness of DRL'S DRA	1.067	0.08580
Service tenure	0.958	0.11022
SDP strength	0.843	0.14340
Role band	0.709	0.19542
Strategy strength	0.625	0.23732
TOC strength	0.595	0.25394
DRL'S strategy strength	0.470	0.33920
Work area	0.309	0.49090

Effect summary of fit for overall SDP influence on DRA

RSquare = 0.51

Source	LogWorth	PValue
SDP>TOC	20.385	0.00000
TOC on DRA	8.372	0.00000
Effectiveness of DRL'S DRA	4.117	0.00008
Strategy strength	1.469	0.03398
SDP strength	1.210	0.06167
TOC>SDP	0.780	0.16579
Work area	0.650	0.22381
DRL'S strategy strength	0.523	0.29974
RA strength	0.196	0.63638
Role band	0.193	0.64161
Service tenure	0.068	0.85497
TOC strength	0.030	0.93266

Observations: Predictably, the respondents indicating positive response on overall TOC influence on resource allocation have also indicated positively on TOC having higher influence than SDP, but **surprisingly** the higher level of understanding TOC did not correlate well with overall TOC influence on resource allocation. Rather there is a high correlation with the response on overall SDP influence on resource allocation. Similarly, the respondents indicating positive response on overall SDP influence on resource allocation have also indicated positively on SDP having higher influence than TOC. Still, surprisingly there is a high correlation with the response on overall TOC influence on

resource allocation. **The effectiveness of dynamic resource allocation and understanding of strategy** as topics elicited a significant positive response to the overall influence of SDP on resource allocation decisions. There is a high correlation with the understanding of SDP as well. The role band, tenure of service and work area did not significantly influence the responses on both tools.

3. Qualitative analysis of the open-ended question on thoughts/suggestions

I used natural language programming (NLP) techniques and a manual analysis of qualitative feedback to find insights. The NLP technique involved topic modelling¹ and text summarization² in extracting insights from the responses. 168 DRA responses paragraphs read and interpreted from 30 pages of the word document and 66,305 tokens analysed. Sentiment analysis is presented below:

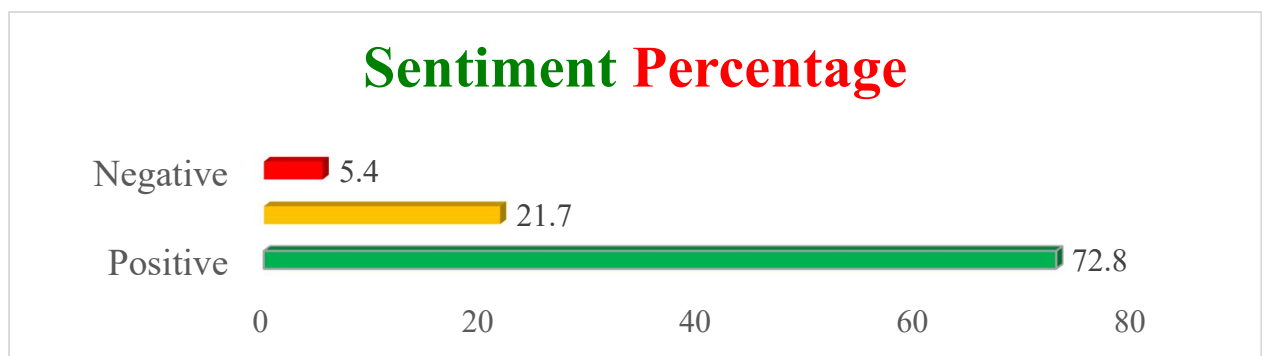


fig. 3.1 Sentiments in responses

The above bar chart signifies that most employees have positive views of dynamic resource allocation at DRL. Around 20% of them have neutral views, and approximately 5% of people have shared negative views.



Positive Words



Negative Words

¹Topic modelling is a machine learning technique that automatically analyses text data to determine cluster words for a set of documents. A document typically concerns multiple topics in different proportions. A topic model captures this intuition in a mathematical framework and extracts the “abstract” topics from text documents.

²Text summarization is a shortened piece of text which accurately captures and conveys the most important and relevant information contained in the document. The intention is to create a coherent and fluent summary having only the main points outlined in the document.

The above two word clouds show the positive and negative words in all the comments. The size of the words is directly proportional to their number of occurrences. Reviewing the words and some sentences around negative words, it is observed that most of them fall in the category of anger, caution, trust and fear. Addressing these emotions and doubling down on the positive words, can help the organisation drive change management.

4. Themes emerging from the survey responses

The responses to the open-ended question on thoughts or suggestions on how to do dynamic resource allocation to deliver the business strategy of DRL were analysed. Both SDP and TOC as tools for dynamic resource allocation decisions have featured in 56 out of 168 responses. Overall, four themes emerge from AI-driven topic modelling and text mining that can be classified as

- Dynamic resource allocation.
- SDP and TOC as tools for dynamic resource allocation decision.
- Principles of implementation.
- Critical success factors and risks.

The themes have been analysed, and the solution recommendations that the survey participants have discussed fall into four categories:

- Improving the awareness of the system and its capabilities across functions and processes.
- Codifying the principles of execution into simple rules and operating models.
- Focusing on communicating the business impact and alignment to strategy.
- Sustained discipline to execute resource allocation according to these systems over time.

Theme 1: Dynamic resource allocation

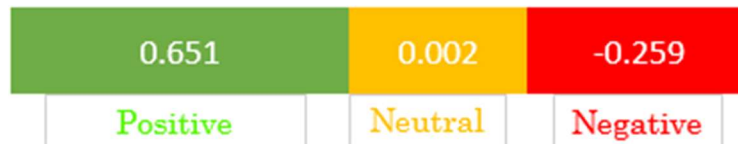
- 43 out of 168 (25.6%) comments fall Under this topic.
- Sentiment score of such comments:



Dynamic resource allocation is considered critical in the generic pharmaceutical industry, given the complexity and dynamic nature of business as well as the focus on the success of new product development.

Theme 2: SDP and TOC as tools for dynamic resource allocation decision

- 56 out of 168 (33.3 %) comments fall under this topic.
- Sentiment score of the Comments:



Respondent feedback talks about their understanding of TOC and SDP as management systems for strategy execution. Most of them view TOC as a project planning and execution model (with resource planning, loading and utilization monitoring) and SDP as the system that helps convert strategy into executable projects with clear accountability. The underlying need to systematically map out process flows and use structured approaches to resource planning and allocation has been discussed.

Theme 3: Principles of implementation

- 32 out of 168 (19.0 %) comments fall under this topic.
- Sentiment score of the comments:



Respondents mentioned some principles for implementing these systems as a part of this topic. For instance, the need to take capital allocation at a company level vs business units, creating an integrated business planning process that holistically addresses plant capacity, and manpower planning have been discussed. Suggestions are given about resource allocation to incubation businesses where there is a need for iterative experimentation culture with minimal investments.

Theme 4: Critical success factors and risks

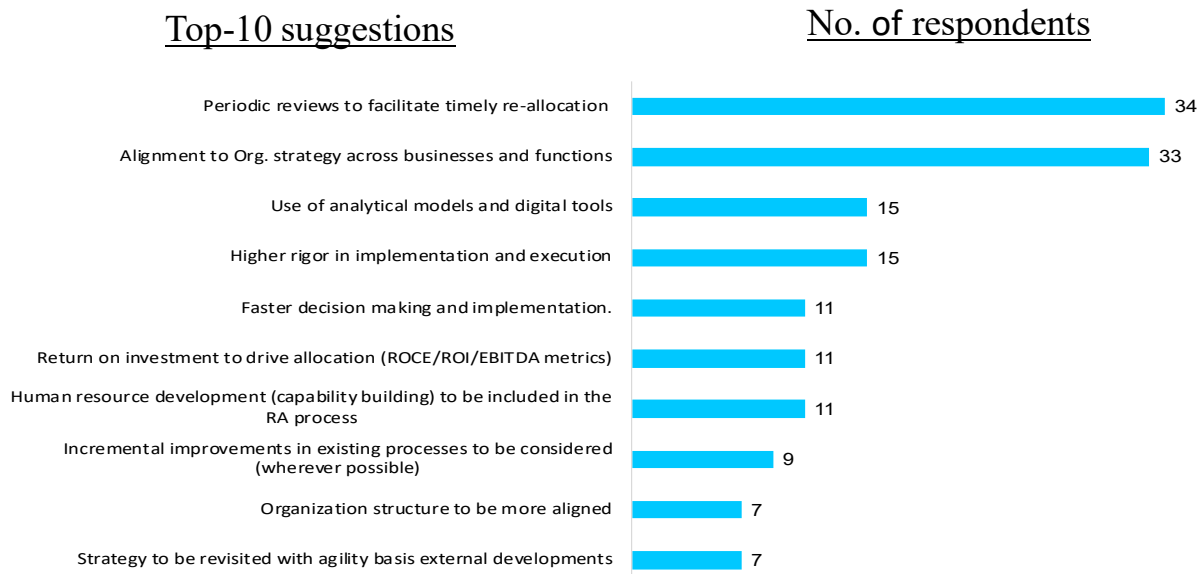
- 28 out of 168 (16.7 %) comments fall under this topic.
- Sentiment score of the comments:



Respondents discussed the risks and associated critical success factors to make these systems successful in the long run. A strong KPI framework, structured monitoring and governance processes, and strong metrics-driven decisions on resource allocation to remove subjectivity are mentioned.

5. Other suggestions for improvement

Beyond the above four themes, the top 10 suggestions for improvement are identified below:



Conclusions

The key decisions around capital expenditure and long term investments are expected by the teams to be driven by objective measurement and metrics-driven decisions (to continue or discontinue/reduce resource allocation). The organisation's belief, as measured in qualitative feedback, is of cautious optimism with the suggestions leading to effective execution as per the systems of choice (SDP and/or TOC) with a strong review mechanism and rapid/objective decision. In conclusion, both quantitative and qualitative feedback from the respondents indicates the need for a strong management system using the tools of SDP and TOC to make resource allocation decisions. Top management prefers SDP over TOC while TOC fares slightly better than SDP in areas of operations (such as manufacturing and quality). **The results reconfirm that the principles of SDP and TOC are used as a toolkit for guiding dynamic resource allocation in the pursuit of DRL's business strategy.**

The logical next step for me to validate Hypothesis 2 is to analyse again the response from the interview of industry leaders and associates to draw any insights from how they felt about strategy, execution, culture, capex, M&A and risk mitigation factors in the generic pharma industry, using TOC and SDP as tools for dynamic resource allocation, and their views on any other tools that they may be using. This analysis is presented in the next chapter.

Chapter 7: Interview of industry leaders and associates – continued

a. Comments on the influence of purpose, vision and values on strategy

- i. An investor asserts that **healthcare globally needs to become more affordable and more accessible to a large section of society**. Healthcare companies have to balance this idea of their obligations toward the society with profit motive because they are providing an essential service/ product. Of course, making sustainable profits is important to reinvest and improve technology and improve access.
- ii. An analyst says that some companies strike a balance between the right leadership, the right culture, doing the right thing, and getting the right results. These companies are very compliant, but at the same time very driven, and have a right meritocracy within the company.
- iii. Another investor reflected that he was very pleased with the industry because they knew that their products had to be consumed by patients. Therefore, they have to have an excellent quality standard. He had particular praise for the IT industry and the generic drug industry because these were the only two industries that made a name for India in the western world. Almost 30% of all the capsules that an American citizen consumed was made in India. The reason why life expectancy in India continuously rose over the period from 1990 to 2020 is that most of the medicines in India have become cheaper, and the availability of all those medicines has also improved over the last 30 years.

b. Comments on the factors emanating out of the business environment of the generic pharmaceutical industry

i. Competitive intensity/ pricing environment

A CEO summarises that the growth story of the generic industry hinges on patent expiries, and that makes the sector relatively more predictable. However, there are uncertainties on the pace of genericization, which will determine how long prices will hold and how crowded and competitive the space can get. A board member feels that while deciding on resource allocation, a dynamic assessment of the external environment is extremely important because one individual company's ability to influence the overall sectoral trends is going to be extremely limited. If the pricing environment or the competitive environment is extremely adverse, then no amount of cost competitiveness can help you there. Some members of the management team inherently may not be capable of having a long-term view because they may be limited by their view of their careers. **Somebody at the board level or the senior leadership level must focus on the importance of having a long-term view.**

An industry expert says that to a large extent, the US, being the largest and the most attractive market, continues to be the focus of most of the global generic players; and that the opportunity here really comes from the strategy that is adopted for which segments they want to focus on based on attractiveness and competition. Another industry expert adds that the degree to which the market is fragmented or consolidated drives much of the pricing behaviour. The next factor is the entry barriers that define the ability to develop, deliver and commercialize a product with the required regulatory standards.

ii. **Portfolio of complex/differentiated product with cost leadership**

An industry expert says that in generics, portfolio selection is the key. The patent landscape, the degree of competition, and particularly the pricing levels significantly impact how a portfolio is selected. An analyst believes that companies either need to differentiate or they need to be ahead of others to build a superior business even if their execution is on par with others. There are few companies like IPCA, which is completely backwards integrated and they can be the last man standing in a particular molecule or even companies like **Divis, which optimized or identified new processes that are more cost-efficient and over time they have become the cost leader and are the dominant player in several molecules.** A company like Aurobindo gets its cost leadership from the massive scale they have built up, although not much of differentiation so far, but they have been quite successful, and they have been very disciplined about capital allocation. They have not made any wrong acquisitions thus far.

A CEO says that it is important to start thinking about product development five to six years before the launch; otherwise, it would jeopardise the opportunity to market. This necessitates resource allocation for five to six years in advance. The complexity of the generics business has increased substantially in the last few years, thanks to regulatory changes and the R_x to OTC variability frequently rising. Nevertheless, opportunities exist in both generics and branded generics space. A board member laments that while biosimilars are important for the future, we cannot keep investing there without any certainty of results. So, it might be better to find a partner or some other model where we can still be in that space without having to invest beyond our appetite.

iii. **Product quality/reliability/availability with supply reliability**

An investor says, “You cannot put a number on how important it is to maintain manufacturing quality”. A CFO highlights the importance of high service levels in the generic business to ensure that not a single order is missed. This requires adequate availability of inventory at all times. The maximum resource allocation in the entire company, hence, goes into inventory. An industry expert explains, “On the operational efficiency, the myth is that you need to own the company to ensure supply reliability”. Commenting on productivity, another industry expert reminds us that operational excellence is so key in a business with

falling prices, and the next frontier of productivity improvement will come through digital adoption.

iv. Macroeconomic healthcare spends indicators

An industry expert feels that most Indian generic companies tend to be more oriented towards the USA, and of course, they also tend to be strong in their home market. He observes that the macroeconomic healthcare spend indicators is one of the influencing factors. For most companies, 50% to 60% of their sales comes from pure generics, and 40% to 50% will come from what is called branded generics. If the regulations get changed in the market in a way that the doctors can only write the molecule and not the brand, then overnight, a branded generic company can vanish.

v. Geopolitical factors

An industry expert sees geopolitical factors increasing, determining how supply chains will get reconfigured, creating a bias towards in-sourcing. It will have implications because this industry has considerable trade across countries, and there are significant interdependencies in this business between players.

vi. Disruptive factors

An industry expert points out that Covid has accelerated digital disruptions. With patients not being able to see doctors, digital adoption has shown a substantial increase. He says, "You will see the evolution of health ecosystems going forward, such as what we are seeing in China and elsewhere. Technology will be all-pervasive in the way companies connect with physicians and with patients and how operations are streamlined to increase productivity".

vii. Picking the winner

An industry expert shares his perspective, "You need to make a big move in resource allocation. You look at 50 opportunities, and you rank them among growth margin and your ability to win, and then you are done. You say what's in the top right corner that you are going to get. I think that is far too simplistic, but you know it is a good first frame. I believe it takes about two to three years to build the market share due to marketing efforts if you have a good product. Some people who can spend properly are very gifted people, very gifted because they do not commit wasteful spending and have a nose at where the future is. Cutting costs is looking in the rear-view mirror. 90% of the company's profitability is in areas where there is no competition or less competition. You might get smart people, and then you could have a culture that unleashes them. All the data that I have seen indicates no evidence of the scale of picking winners". A CEO asserted that Japan and China market for them was developed over a few years by investing money, people, capability and relationships.

c. Comments on strategic priorities and culture that define alignment and accountability

i. Measurement/ KPIs

A board member says, “If you can articulate what you wish to do, within what time frame you wish to do it and the rewards and accountability associated with that, people will always do what is going to get measured”. He reiterates that capital, whether human or financial, will always be scarce, and hence prioritisation will be necessary. Investors will be willing to live with a meagre return on investment in the short run if they can foresee disproportionate rewards later. Another board member adds that most organisations of scale would do well to put some KPI’s and metrics in place to track whether that execution is happening and then create a culture of periodic review to check if there are any bottlenecks to implementation. There is a distinction between critical to survival and nice for value creation. Some things need to get fixed right now because it is critical and urgent, and some things are important to get right because they will create value in the medium to long term. These should ideally be handled by two different sets of people, both equally talented.

ii. Prioritisation

Citing the example of biologics, a CFO admits that in recent times as the investment on the projects and the risk has increased many folds, prioritisation has become more relevant. A board member prescribes keeping a certain slack in resources, which can be taken up by something unplanned but important. A CEO tries to distribute priorities among the leadership in such a way that everybody has one priority associated with him, so he cannot deprioritize it. Another CFO explains that the priorities and moves are decided based on a 5-year rolling business plan. The alignment comes from a strict review mechanism for agreed-upon goals and revising the goals/targets if the external circumstances change much beyond the control, like the Covid-19 pandemic. Another CFO adds that new businesses and existing business need to be nurtured parallelly to see a sustained jump in the company's overall performance. An industry expert complains that the biggest failure in the corporate world is that they spend a lot more time and resources on businesses that are not growing and not profitable instead of loading up on growing pockets.

iii. Collaborative growth mindset

A board member feels that the more alignment and accountability is sideways in an organisation, the better. The CEO will feel proud to have a team where if one guy falters, the other guy picks him up and carries him so that their team does not suffer. An industry expert cherishes leadership, culture, agility, willingness to learn and keep an open mind. She feels that this requires an influx of new blood and people within the organisation who embrace change and like to be challenged. The weakest companies have insufficient churn in their people and have cultures where they want to stick with and preserve the status quo. According to another industry expert, in most Indian companies in the pharma space, the

single largest shareholder, also the company's chief operating manager, ensures that incentives between value creation and the strategy are well aligned.

d. Comments on challenges in execution of strategy and culture of execution excellence

I. Tone at the top

Culture is nothing but the tone at the top. Different respondents have cited different priorities set by top management. Emphasising the importance of agility, a CFO narrated that once the chairman decides on a project/product, the top management quickly gathers to assess the availability of the product, ability to manufacture and any other constraints, and if there are no issues, they promptly get onto execution. A board member says that three things are critical at the top – a vision, conviction to put money and resources on the vision and the discipline to cut losses if it does not work. Another CEO lists execution excellence, a shared vocabulary, a culture of accountability and commitment and the ability to convince the people on the company's strategy as the key ingredients of management and leadership.

II. Culture of enablement

A past CEO believes that an enabling environment or culture is needed for people to perform. He believes that every individual wants to perform and contribute to the organisation's objectives. It is the primary responsibility of leadership to create an enabling environment for people to thrive. A board member enlists **three important components of success – the best technology, the best people and an empowering culture that gives people space and the liberty to make mistakes and learn from them.** The problem, according to him, is that we judge people too often and too quickly. So, any organisation that can stretch that fabric a little bit will most probably have the best result in the longer term. Another board member separates the issue into culture and capability. From a capability perspective, you have to make the right choices, and you have to have the right set of talent on board. A culture where people are secure and can ask questions, and have an open dialogue is vital to make the right allocation decisions.

III. Rigour/discipline

A CEO emphasises the importance of having a good execution plan. He recalled how it took one year after the finalisation of the strategy to put together an execution plan and how stressful it was. Another CEO emphasises periodic reviews on the progress of execution. An analyst points out that in some of the projects in pharma, particularly those with a long gestation period, a decision to go/ no-go takes time to come through. It may get a lot delayed, and a lot of investments might have happened till that point in time. The commitments already made push people continue investing, hoping that things will turn out, painting it all in one brush.

e. **Comments on capex productivity, divestment, the trade-off between availability and efficiency**

i. **Tracking the original assumption behind capex justifications**

An ex-CEO who is now serving on the board felt that identifying the right metric for productivity measurement is the starting point for ensuring productivity for any kind of investment – whether it is in infrastructure or people. For example, in the case of capex for capacity expansion, a simple metric would be the output generated against the output that was expected. Similarly, for resources allocated to safety, a reduction in lost time injury (LTI) could be the right metric. Another CEO believes in cognitive decision-making and suggests closer scrutiny of the capex proposal's market assumptions to ensure that the assumptions are reasonable and not overly aggressive.

A board member believes that ensuring productivity depends on defining milestones and sketch the journey and road maps intelligently. It can happen through continuously creating insights and a rigorous tracking mechanism and transparency. Another board member felt that it requires taking a longer-term view, setting the right expectations on productivity standards, the quantum of expenditure, the benefits to be realised and in which part of the organisation. Another CFO recollected how a legendary Indian entrepreneur successfully monitored capital allocation and capital productivity by **insisting on a half-yearly presentation on what was promised versus what was delivered in the last two years, then using the learning to plan a course correction framework over the next three-to-five-year period.**

ii. **Creating a protective surplus capacity to ensure the availability**

An equity investor asserts that in an industry where margins are very high, it is better to have slightly excess capacity than to lose out on an important product's sales. It will be embarrassing, for example, to say that we could not sell a critical product like Copaxone because we did not have enough capacity to make it. Another analyst highlighted the dilemma of maintaining a buffer between creating excess capacity and keeping excess inventory of critical products. Most companies chose the latter. Another board member gave an example of how a company decided to build capacity and even start manufacturing a vaccine even before completing trials. Sometimes, **companies defy conventional wisdom and build at-risk inventory to maximise a special opportunity.** An industry expert observed that some redundancy in capacity helps in building resilience and agility.

iii. **Redundancy – the contra view**

There has also been some view expressed against having excess capacity depending on the circumstance. In an analyst's opinion, while the reliability of supply is extremely critical in the pharma industry, it does not fetch a premium from the customers. Hence, companies need to be more realistic in building redundancies. It has to be based on a cost-benefit analysis. A CEO-turned- board member points out that the relevance of supply assurance will

depend on the dynamics of each market and the importance of customer satisfaction in that market. In markets and industries **where customer satisfaction drives sales, it makes sense to invest in surplus capacity**. However, in a tender-driven market, like in the European pharma market, for example, where the only price wins the deal, it may not be worth investing in excess capacity to ensure the customer's reliability.

I had a very interesting conversation with a veteran CFO that went as follows. He asked me how we keep the service level. My response – “Whether you are producing for stocking or producing for demand is a question of the kind of service levels that you would like to keep. We categorize all our products into three buckets. One we call runner, second is a repeater, and third is stranger. We have three kinds of strategy in terms of capacity creation and inventory creation for each of these buckets. For a runner, by and large, you like to have a very dedicated module. So here, the production will be 24/7 round a year. For the repeaters and strangers, and more particularly for strangers, the change-over-time reduction is a crucial part, and that's why we focus a lot on ensuring how quickly we can do a changeover. But again, as a matter of principle, here we put the protective capacity. So, we measure the OEE, and as soon as we reach a particular level, we immediately trigger a capacity creation. But as we follow the TOC approach, we look at the critically constrained resource. It is a dynamic process, and we are still students in that’.

A past CFO and current board member felt that in the generic pharma space, the issue of availability is more on Inventory and not so much on capacity since capacity can be outsourced as well. He believes there are enough companies in the world to manufacture and hence **not worth risking idle asset creation, particularly when the development outcome is uncertain**.

iv. Creating flex to ensure availability beyond surplus capacity

A CFO viewed that it is important to have some flexibility in capacity to meet the demand surges and opportunities when competitors run out of stock. It is not easy to accurately forecast demand for every single SKU. **The increasing prevalence of failure-to-supply penalties in customer contracts is also tilting the risk-reward balance further towards ensuring availability**. “One of the ideas that we are contemplating with is that even in the R&D stage when you are developing a product, can you take a platform view of development? Validating multiple types of products with various specifications on a particular line and vice versa will give you that flexibility”, he said.

This view was supported by another CFO-turned-CEO who believes the inability to supply to the market as a crime, and thus advocates keep buffer inventory. He said, “Gross contribution/margin of the product is a key factor for such decision”.

v. Contrary view to focus on capital efficiency

An industry expert cautions against the risk of overcapacity crippling the industry. He believes that it is time companies shift focus towards return on capital and capital yield. An

entrepreneur CEO highlights the need to have a good Plan B since all investments are made in anticipation of certain favourable events that may not materialize, e.g., a set-back in patent litigation can delay a new product launch by two years. There must be a plan to counter the fixed cost committed for two years in anticipation of an immediate launch in such cases.

vi. **Creating a partnership to share risk and reward**

An ex-CEO who is now a board member recommends partnerships with other firms as a viable alternative to investing in building their own capabilities. In particular, in the R&D development cycle, it is difficult to evaluate the investment's merits, keeping in mind the amount of capital required to take the product to market vis-à-vis the return on the capital invested. However, this strategic choice also depends on the core competency of the company. **Some companies are good at making fruitful partnerships, while some companies excel in building in-house capabilities.** This approach found support with another board member, who felt that, in this industry, the uncertainty in getting a product approval makes it very risky to proactively build capacities and hence contracting out becomes a very good mitigant. Although he is quick to warn that IP sensitivity might sometimes pose a hurdle in outsourcing in this industry.

vii. **A modular approach to build capacity incrementally and network consolidation**

The long gestation period of four to five years for new capacity creation makes it necessary to start investing in capacity even before a product gets approval. However, that puts the company at risk of high operating costs if the product fails to get approval or if there is a delay. A CEO suggested a modular approach to build capacity as a solution to this dilemma. "We create the shell where we start with a small line, and then we create multiple suites, do not necessarily equip each suite and then as and when we make progress, we start triggering those", he recommends.

An industry expert also has a similar view but speaks about consolidation as well. He termed the prevalent approach to building assets as reactive. Companies start thinking about adding additional capacity only after reaching a certain threshold of capacity utilization. And at that stage, new assets have to be built from scratch. Instead, if the modularization of assets is thought through upfront, then the initial construction could be done in a way that facilitates adding suites to the asset as and when the requirement kicks in. He also blames the tax incentives with SEZs for companies diversifying their cost bases across several locations and the process of sacrificing asset efficiencies. With the end of such tax incentives now, he recommends a serious look at the consolidation of the manufacturing network.

viii. **Early divestment of idle, unwanted asset gets the best value**

An investor reminds that the humility of accepting a mistake and the discipline to exit from an investment that is not yielding the desired results is the key to limit losses from idle capacities. The earlier that such decisions are taken, the better is the value that can be

derived out of divestment. However, this is easier said than done. There is a natural bias of pushing the problem and putting good money after earlier bad investments. To overcome this bias, an industry expert says it is better to err on the side of divesting assets and locking the losses.

ix. Timing of capex, fast completion of projects and fit with overall business model make a huge difference

A CFO contemplated, “A large part of our businesses is branded where capacity can be repurposed. But off late as we are entering into complex products, that is a sort of an area to invest and tighten our capital allocation”. Another CFO felt that the delay in completing projects due to the complexities involved in getting approvals comes in the way of getting the desired yield or returns. Further, the non-linear nature of demand forecasting and the volatility of demand and supply requires optimal resilience to make money. He gave the example of Covid vaccines where large capacities of hundreds of millions of doses are being created even before the drugs' efficacy is established.

One analyst commented that whether capacities are built in anticipation of demand is a function of the business model and could be different in different companies, e.g., Divis claims that they start putting up capex only after a customer confirms an order. On the other hand, Dishman Pharma believes in putting up capacities first and then showcasing them to potential customers to get business. The risk is very high for non-fungible dedicated assets, say for an inhaler or a biosimilar facility. For such projects, he recommends having shared facilities with two or three players to spread the risk.

Another analyst recommends diversification as a risk mitigation tool – both diversification of markets and dosage forms. He also believes that a bit of overcapacity is acceptable because, in this industry, it is very common to encounter sudden and unexpected opportunities. A favourable IP outcome for generics on Vascepa is a good example, where generic players were caught off-guard without supplies being ready. He believes that one such opportunity can pay for almost five years of excess capacity.

f. Comments on M&A

i. Size of the acquisition matter, easier to digest smaller/adjacent acquisitions

Most people interviewed strongly advocated smaller acquisitions that are easy to digest and simpler to integrate and suggested more caution for large acquisitions. An industry expert gave a thumb-rule of 30% of the company a cap for the size of the acquisition. He recommended regular and intense acquisitions adding approximately 6% revenue growth annually so that in 10 years, M&A would contribute more than 60% of the company's revenue. A board member voiced his opinion against sink-or-swim kind of acquisitions that take the company down if it goes wrong. Making digestible acquisitions with the capability to integrate them are the two critical things for a successful M&A. That, coupled with the right payment strategy and followed by monitoring as you go along and taking hard calls,

where required, will deliver the right results. Another board member who was a past CEO in the industry believes the **choice between organic and inorganic growth is not driven by industry dynamics but is a more company-specific strategy**. In the case of inorganic growth, it should be closely knit to the company's current capabilities or competence. It should be more focused on value enhancement for targets beyond a certain size to the company and the shareholders. Acquisitions should support the profitability and sustenance of business over a long period and should not be done merely for the sake of being global.

ii. **Build capability to make serial/ programmatic acquisitions**

An industry expert believes that building M&A capability is no different from any other operations skill like supply chain capability or manufacturing capability. **The most value-creating strategy is a serial/programmatic M&A strategy**. Serial M&A strategy provides a better shot at success because some of the acquisitions are bound to fail while some will perform moderately, and some will do very well. A wider portfolio will average out the performance and likely give a good result on an average. Besides, regular M&A activity will also build the muscle and capability for acquisition and integration within the organisation. An ideal target should be to buy 10 to 15% of the market cap every year. A CFO follows the practices that include better preparation and understanding at the due diligence stage, integration through the management team and outside consultants, if necessary, post-acquisition evaluation and comparing the actual results with the projections. Capability building for M&A is thus very essential and summed up well by a past CEO who makes a cryptic comment, "You would not put a sailboat captain in an aeroplane cockpit to fly a plane".

iii. **Strategic fit and complementary capability to build synergy is a prerequisite**

One of the CEOs focused on acquiring complementary skills through M&A, looking for technology, capabilities, business model, regions or customers complementary to the company's business. He also advised circumspection while evaluating the potential and not fall into the trap of overpaying. Cultural integration, according to him, is the biggest challenge in M&A. A board member adds that clarity on strategic intent and having the execution muscle to integrate and extract value are key foundational skills that determine the success of M&A. Another board member views the M&A target in two parts – one is a search for new products in markets where they have a great branding and distribution network, and the other is a search for new markets for products that have been successful in existing markets.

An industry expert feels that one should look for value creation through M&A – either to the acquirer's ability to improve the value of the asset or through cost efficiency or by adding value to the targets pipeline of products. It should give access to a technology or a portfolio that can be scaled up faster by the acquirer with its global reach. According to another industry expert, the success of M&A allocations will depend on having an overarching strategy that fits with these allocations and evidence synergies resulting in cost savings and

a plan to integrate the business in a reasonably timely fashion without losing the value from the acquisition. This value is often in human capital, so a mechanism to retain people and key people is essential. Alignment to the strategy was brought in as a key success factor by another industry expert. The objective of the acquisition should be very clear – whether it adds skills and competency in a therapeutic area where the company wants to get into or whether it gives access to a new customer or new channel base, which the company is not currently strong at.

iv. **The risk associated with M&A will be there; one need to plan for failure**

An entrepreneur CEO, while admitting to being in the minority, prefers to have ambitious expectations upfront. He would not venture into inorganic growth with modest expectations of 15 -20% return on capital but would instead look for assets that would potentially earn 40 – 60% return on capital, even if the risk of failure is very high. He rationalises, “I might not even lose sleep on the fact that I have lost 100% of some investment, but I just can go home and say **I threw 100, if I had succeeded, I would have got 1000, but I lost 100**”. A professional CEO believes that Inorganic growth's success lies in the assessment of the risk and not the opportunities. Every acquisition will through up some negative surprises, and hence it is important to diversify the risk instead of putting all eggs in one basket. An analyst points to the bias for the deal that the manager who is pitching for the deal will have in estimating the synergies. He brings out the risk of dynamics of information arbitrage between the seller and the buyer regarding the business and the competitive desire to grow by multiple buyers as the factors that lure managers into making aggressive assumptions around the cash-flows and the potential for cost-savings from the target. Another analyst cautions against getting too excited with financial models and always spare a thought to the reasons why the seller is selling. Sometimes, it can give insights that are not apparent. Thus, the CEO's ability to understand the risk, independent of what is presented to him, becomes more important in decision making.

External investors like companies to first invest internally through R&D. The free cash flow should be reinvested productively to grow. M&A should be something that is only done once in a while when there is an extremely strategic need or an expensive gap. If a company is making acquisitions all the time for strategic gaps, there is something wrong with its core business. So, **M&A should be an exception, not the rule.**

A board member questions if companies give enough attention to cultural integration issues in a cross-border acquisition, including language barriers and a work-place environment. Another board member bats for organic growth even though he attributes his success and reputation to successful M&A transactions. A CFO reminds that in most cases, companies end up buying turnover and not create value because most assets are fully priced. Another CFO agrees and believes that a CFO should develop a habit of saying ‘no’ to M&A and should insist on paying the right prices.

v. **Distressed assets well-managed post integration can create disproportionate value**

A past CFO and current CEO cites the example of Sun Pharma's acquisition of Taro to highlight how buying undervalued assets and unlocking value through cost synergy, and revenue maximization can give very good ROI. Taro was acquired for \$375 mn, and it generated cash above \$3 bn. Acceleration to get market reach, larger footprint and market position are key strategic considerations for Sun's M&A strategy. An analyst also spoke in support of acquiring distressed assets reminding that companies ultimately have to find avenues to deploy cash and resources.

vi. **A reverse merger can create value through tax, trademark and leadership leverage**

A CFO, who worked in Watson earlier, spoke about the history of the acquisition of the organisation, "In September 2007 Paul joined as the CEO. The company had revenues of 1.2 billion dollars, with the stock price trading at 23 dollars. In 2009, he bought Arrow Pharmaceuticals and got a footprint in Europe. Then in 2010, he wanted to expand the footprint to the Asia Pacific. They acquired a company called Ascent. Then in 2011, came the big acquisition of Actavis and the company name got changed to Actavis because Actavis name trademark was registered all over the world. It also gave a tax advantage through a reverse merger. With the Actavis acquisition, Watson almost moved to about four to five billion dollars. Paul did not want to just keep on adding things. He asked all unwanted sites to be divested, including India, Thailand and Singapore. And then, somewhere in 2014-15, he felt that the generics space is getting into serious trouble. He bought Forest Labs and then bought Allergan and got the team name changed to Allergan, where he created Actavis as a generic arm and Forest and Allergan as a brand specialty. Then, revenues are more than 8 to 9 billion dollars. The recipe for this success is that he could identify strategic growth markets to penetrate and grow. He had identified a robust management team with a lot of freedom as well as accountability. He surprised the entire company when he brought Brent Sonders from Forest. He made him the CEO with the rationale that he is looking to build this company into a specialty company for the future since the road ahead for generics seems to be bleak'.

vii. **A real merger option exists for professionally managed, like-minded companies**

A board member thinks that professionally managed companies should be open to all avenues of growth, including mergers with like-minded companies. This might be a little difficult with two companies being managed by promoters since, in a merged entity, one group of promoters have to give up control. However, this option, he believes, will become more relevant in years to come, even in the Indian context.

viii. **Companies with past success stories of M&A can still commit blunders in judgment**

An investor cautions that past success in M&A does not assure success in future acquisitions. Giving multiple examples, he starts with the story of **Teva – an industry leader with access to the smartest people, the best bankers and lawyers to support them, but still got into a series of failed acquisitions**. Similarly, he criticized Sun Pharma's acquisition of Ranbaxy as a

poor decision despite Sun's reputation as an astute capital allocator after its success with the Taro acquisition. On the same lines, after a series of good acquisitions in the 50 – 100 mn dollars range, Lupin ran out of luck when it came to a large acquisition like Gavis and could not replicate its success. He also thinks that there should be some accountability placed on someone when acquisition fails. There could be exceptions where the failure could be attributed to post-acquisition execution lapses or unexpected change in the environment. But otherwise, people signing off on deals of the size of 25% of the company's net worth must face the consequences if it does not work. As a corollary, they should also be rewarded handsomely if it does succeed.

g. Comments on mitigating the execution risk to strategy

i. ERM framework

A CFO describes an established enterprise risk management process whereby they analyse all risks, including strategic, operational, compliance, finance, IT, environment-health-safety for every business and have a monthly review of the same. A board member comments that a very strong risk management process throughout the company along with board oversight of risk is essential for every company. However, sometimes this can lead to a situation of risk-aversion that can paralyze the system; hence, **maintaining that balance between risk and endeavour is also important**. An analyst points out that the right person for the right job, proper motivation, right incentives and total alignment of interest are critical, along with empowerment and enablement of the employees. He also emphasises having suitable trainers, the value system and the whole ecosystem of the organisation. An industry expert explains the framework first as the complexity of the product market portfolio, second as the intense cross-functional nature and third as the dynamic nature of the business because of regulation, entry or exit of players.

ii. Risk ownership

A CFO advocated the splitting of risk-ownership between members of the top management. For example, as CFO, he owns the risks related to pricing, currency, costs and capital. His head of manufacturing owns risks for the capacity shortage. The CEO personally champions some of the strategic and higher-order risks. They get together to take stock of all these risks every quarter. A detailed mitigation plan is rolled out, and they are tracked through a dashboard. Inability to capture the growth in some of the branded and unbranded markets is one of the risks. They compare the organisation's growth relative to peers and the market - breaking it into pricing/volume, new launches. The risks linked to capabilities, the longer-term risks or bigger horizon risks are tracked with little less frequency, but they are tracked more intensely because those risks can fundamentally alter the competitiveness itself of the company. A CEO summarised his focus areas with two acronyms- COPE and COLO; the cost of poor execution and cost of lost opportunity. He believes in fixing accountability through people. If he offers too much support to senior leaders, then the accountability gets shifted to him. A promoter CEO prefers to keep it simple. He reviews only the high-value stuff while

the rest of the matters where the economic value is small is left to his team to review. This enables quick decision making and the right focus.

iii. **Tolerance for failure**

Tolerance for failure is an important prerequisite for entrepreneurial success. There could be a scenario where the estimated probability of successful execution and outcome of a specific strategy is only 20%, but if one can pull it off, the magnitude of benefits is very high. An entrepreneurial CEO would take that bet. One promoter CEO endorses that the ability to take a punch on your face is an important qualification for risk-taking.

iv. **Risk mitigation process**

A CEO prescribes six mitigation measures:

1. close monitoring of execution
2. a mechanism of forecasting the latest estimate of performance periodically, which can give advance visibility if things are not on track so that remedial actions can be put in place
3. create a strong bonding with people that can create a commitment to go beyond the call of duty and also to help each other
4. right incentive mechanism that channelizes the behaviour and actions of people in the right direction
5. a good finance and analytics system that can monitor performance and give insights for action daily, and finally,
6. a strong compliance system that is reassuring and that allows the CEO to focus on business

A board member emphasises contingency planning. The resource allocation plan should set the key milestones against which the progress will be evaluated. That will help in quickly identifying if the risk mitigation plan did not work and enable the company to cut losses and move on. Another board member highlights concentration as a key risk, and the obvious mitigation is in diversification to the extent possible without losing focus on profitability.

A culture where people are encouraged to speak out about difficult issues without the fear of the messenger being shot goes a long way in identifying risks early and being able to plan mitigation. An industry expert suggests that mitigation should be focused on preparing alternatives in the system, building redundancies and establishing processes and controls that would give early warning signals on risk. A CFO relies on a monthly review of business performance and annual strategy exercise for rolling a 5-year business plan for mitigating execution risk. Another CFO hails the ability of Indians to quickly adapt to change, which gives most large Indian companies the ability to foresee risk and take a calibrated approach

in terms of mitigations. He adds that people on the shop floor should be encouraged to speak up for failures.

v. Risk mitigation outcome

An analyst attributes execution risk to people, culture and processes. Execution risk could be in product selection, development timelines, output, and cost-effectiveness. A CFO uses the example of the timely filing of a dossier in the US to illustrate the criticality of execution. Being first-to-file gives a windfall. A delay of even one day places the company in the second tier with other filers. A delay of 6 months can take away the entire cream of the market. He also felt that while digital tools can help track progress, there is no substitute for more constant reviews. Another industry expert adds that late entrants in the industry may not reap a lot of benefits but can still spoil the party for everyone in the market.

h. Comments on using TOC as a tool for dynamic resource allocation

i. I was positively surprised to find that many of the respondents were quite familiar with the principles of TOC and most of them felt that it could be used quite effectively for dynamic resource allocation decision, specifically in capex, R&D and other projects as well as in sales and marketing. A summary of the responses is as follows:

A CFO vouches for TOC as a very powerful tool for resource allocation. It can be used to improve total productivity in manufacturing, R&D and even in product costing. A CEO exclaims that the Theory of Constraints is a great mechanism for locating bottlenecks so that efforts are focussed on debottlenecking them. Another CFO recounted his experience when they were growing in a couple of geographies at a very fast pace. He realised that the organisation could not deliver the orders for a particular set of products because some of the technical challenges became quite overwhelming. He applied the TOC principles to find whether the constraint was in manufacturing or packing or regulatory or quality or something else. He believed that capacity challenges could be addressed very well with TOC. A board member explains that TOC is an important tool to debottleneck and support execution. The ability to anticipate and solve the problem in advance for potential constraint and critical constraint is very important. Another board member opined that we should extract the maximum value out of the resources that we already have before throwing in more money, people and resources, because that can be counterproductive at times. TOC helps in maximising the value of resources. Another board member goes a step ahead and attributes technology and digital disruption in India to the application of the Theory of Constraints.

Another CEO, sharing his experience with TOC, exclaimed that they could unlock an enormous amount of capacity by identifying bottlenecks and critically constrained resources. Once the bottlenecks are addressed, they shift somewhere else. So, it is a continuous process of improving efficiency. He believes TOC could be the most significant lever for reducing

capital employed and an increase in future returns. However, he feels that 'constraint' thinking in markets is more difficult because marketing teams are tuned to think from a growth perspective and not from an efficiency perspective, and thinking of constraint is considered an anti-thesis to 'growth mindset'. An industry expert opines that TOC can bring in the alignment of management thinking. It is repeatable and is easy to understand. Another CFO feels that TOC can be used for DRA. The thinking process is useful for de-risking a high-risk project using the elements of constraints in the analysis.

II. While being appreciative of some of the concepts of TOC, a few respondents were equally critical of some limitations. Their responses were as follows:

An industry expert argues that there are some aspects of TOC which are powerful but some aspects which do not necessarily look at the total cost of the entire value chain. It tends to place too much emphasis on availability while impacting the manufacturing OE (operating expenses), and one needs to be able to strike that balance. After working on a paper on TOC, he concluded that 80% of TOC is similar to what people are doing without explicitly calling it TOC – it is a different way of presenting, and the remaining 20% pertains to the nuances. He further emphasised the criticality of investment in technology and digital tools to do things in a structured, systematic and objective manner. He gave several examples of use-cases of analytics in the supply chain, R&D, marketing, and samples cost reduction. According to him, while dynamic resource allocation using TOC is a good concept, it will take a lot of effort if it is manual and not system-driven. Another industry expert felt that TOC does not generate resource allocation inputs and cannot be deployed for decision-making purposes. A board member feels that such tools can be applied simultaneously rather than exclusively. He suggests testing it with another tool just to bring out if it gives a different result, and if does, then it is important to find a rational explanation that will require a more detailed study.

III. A few of them were not familiar with the concept but felt that they might have used them indirectly without specifically calling it out as such.

While admitting to being unfamiliar with the concept, a promoter CEO conjectures that they might be following the principles indirectly somewhere in the system. A CFO also had similar views – that everybody is practising the Theory of Constraints in some manner, without calling it so. He believes that the concept of identifying constraints and debottlenecking would come to manufacturing guys naturally by virtue of their experience and knowledge.

A board member gives her perspective on how to make the best use of a critical human resource, assuming that there is only one such resource and hence a critical constraining resource. One school of thought is to use such a resource across business units in an attempt to maximise the value from the person in the organisation. However, she recommends finding out the best area where he/she can create the maximum impact and let him/her make a big difference in that area. She says, "So resource allocation then becomes an issue

of both where you potentially can have the maximum return and where you, based on your current capabilities, are confident that you will be very likely to have the best results”.

IV. A few were familiar, but they have not used the concepts so far. They intend to use it now, as evident from their responses below:

A CFO admitted that the Theory of Constraints had not been historically applied in his organisation, given the luxury of good internal accruals from the business. However, with an increase in the size and number of businesses, he believes the time has come to use this tool. Another CEO was contemplating the use of the TOC instead of the Balanced Scorecard for strategy deployment. He recollects when the business had no velocity and could trace the reason for a high weightage to compliance at the cost of velocity in the business scorecards. They had used the Balanced Scorecard to set right the anomaly, but he believes TOC could be a good alternative.

V. One respondent, however, feels that TOC may not help in resource allocation in the pharma industry.

He quips that it is not so much of a constraint as the volatility in demand itself, which is a pain in this industry.

i. Comments on using SDP as a tool for dynamic resource allocation

Many of the respondents were not familiar with SDP, and their organisations did not adopt the principles of hoshin kanri in the past. After understanding the concept, as explained by me, they felt that it could be effective.

According to one CEO, SDP itself is about monitoring the moves, and it is about making sure that we adequately look at the capability we need to obtain to make these moves happen. So, by having defined those capabilities, the next step is to allocate resources for building or acquiring these capabilities, which are normally done through a budget process or a capex approval process or any other process to facilitate decision-making for resource allocation.

Another CEO alludes to it, “Over time we have been able to put a good cadence of layered accountability in the multiple parts of the value chain that exist in the company in terms of deployment”.

A board member emphasises the importance of both SDP and TOC. He says, “TOC is a tool to get it. SDP is a tool to lay down priorities. TOC will help SDP in what it needs to do”.

j. Comments on using any other tool for dynamic resource allocation

The Balanced Scorecard is the most widely known tool for cascading strategy. AI and EVA were also mentioned in specific responses as below, however deployment of all such tools was similar to SDP and TOC.

A CFO describes how his organisation uses the Balanced Scorecard for the rollout of strategy. Their scorecard splits all the goals for all businesses into five areas - financial performance, market performance, operations, quality/safety and talent. The company has an evolving set of strategic priorities, and once a particular strategic priority is delivered, it gets part of the routine business model. Some strategic initiatives are run as projects, and overtime, those are embedded in the routine business processes themselves. There are three decisions choices for every initiative – accelerate, pause or divest. The company’s purpose defines the end goal. “There could be multiple flight paths to deliver the purpose, and all these flight paths emerge when we discuss it”, he adds. The way he explained the adoption of the Balanced Scorecard in his organisation appeared very close to the SDP way of defining strategic priorities and linking all actions ultimately to the purpose of the company.

A past CEO explained how they run a very clear program of continuous improvement utilizing multiple tools. For example, if a machine has a high downtime, they would do a root-cause analysis to determine the reason before replacing the machine. Again, the way he explained that program of continuous improvement appeared to apply the principles of TOC.

A board member says that strategic capital allocation is harder to capture in a scorecard while financial outcomes are usually easier to capture; so, it is necessary, but it would not be sufficient. It is important to have a top-down discipline for capital allocation, which will make tough calls on resources available to certain businesses, and then those businesses, in turn, need to have measurement tools, performance tracking and an aligned incentive system. He thinks **all versions of Japanese or western models or Balanced Scorecards can be effective depending on the culture**. Another board member adds that companies need to put down metrics for performance and review them periodically. It does not matter which tool is used as long as some system is in place to capture the metrics. Another CFO explains that while capital rationing requires that money should flow where the yield is the highest, there is a lot of subjectivity and human judgement involved in the assessment. It is never going to be pure mathematics but rather a mixture of risk perceptions, perceptions of ability and personal choice.

A board member alludes that the Balanced Scorecard has been a common tool, focusing on financial returns and internal processes, HR, and operations. Another board member claims to have used AI as a tool with the help of external experts and consultants to see how directionally the market is shaping up and how the rest of the market is strategizing based on current data. Another board member reiterates that he has always been a great votary for using the Balanced Scorecard not just for the performance metrics decisions for the next year or the next budget but actually to take it to the next level of deciding on resource allocation. He considers it an excellent tool for resource allocation. Another board member suggests economic value add (EVA) among other tools for resource allocation.

All the above responses indicate that TOC and SDP are only a subset of possible other available tools. The point is not to pick a particular tool, but organisations need some sort of management system to put discipline into the resource allocation process. While the results from the survey among the senior managers of DRL reconfirms that the principles of SDP and TOC are used as a toolkit for guiding dynamic resource allocation in the pursuit of DRL's business strategy, the above responses from the industry leaders and associate together validate the Hypothesis 2 that such tools are needed for defining strategic priorities and moves, creating alignment and accountability, dynamic evaluation and reallocation, and mitigating the execution risk to strategy. This helps me to affirm both the research questions as follows:

1. The principles of SDP and TOC can be used as a toolkit for guiding dynamic resource allocation in the pursuit of business strategy and hence be part of a practical framework that can help practising CEOs, CFOs and boards.
2. The dynamic resource allocation framework (developed based on DRL's case study and amended based on the analysis of responses from both quantitative survey and qualitative research) can be applicable to other generic pharma companies to realise their business strategy.

With both hypotheses getting validated from the three-pronged approach of my research methodology, I utilised the valued responses from the industry leaders and associates to improve the hypothesised framework further, and that is presented in the next chapter.

Chapter 8: Improving the hypothesised dynamic resource allocation framework

a. Comments on dynamic resource allocation framework

i. Governance and review framework

The review is a very important aspect of the framework. There should be a periodic review consistently to find out whether the results are in the right direction. A past CEO alludes that reallocating resources, in essence is a review process at predetermined times. The most important area for constantly reviewing resource allocation in the generic pharma industry is R&D Investments. The stage-gate process in the development cycle helps to review and decide whether to terminate or accelerate at every stage. Another CEO agrees that sometimes even after deciding to allocate money to a particular opportunity, if a bigger opportunity comes up in the middle of the year, then the allocation plan should be flexible enough to consider a change in allocation given the change in dynamics. A board member thinks that in the current environment, it is imperative that systems, procedures and governance standards are always reviewed so that they measure up to the current needs. One CFO commented that there could be different ways of dynamic allocation. One option is to decide the fixed or sustainable level of resource allocation to any category or SBU and then allocate balance resources based on ROCE. Another option is to review and reassess the ROCE of every SBU periodically but take actions every third year to reallocate the resources to different SBUs.

ii. Strategy deployment and execution

A CEO feels that the framework needs to align people on the language and tools that help to find out the specific need to change the resource allocation, how does one make those decisions, how fast it can be implemented and how to monitor that it is successful. So, building this governance is critical for any company. **He would like to use the SDP framework for resource allocation, following up on strategy and capability building.** A board member considers capital allocation as one of the most tangible outcomes of a successful strategy exercise. Strategic intent and business purpose must play a primary role with capital allocation, and proof of the pudding is whether the strategic exercise will reflect in the organisation's execution intent.

iii. Dynamic management of resources

One CFO explains that while it is important to minimize costs and optimize capital investment with the outcome, all these can go for a toss if resources are not dynamically managed. A board member comments that the key levers in the organisation that produce the greatest benefits must be found and tracked. A CEO, though, expects that companies will be a little reluctant to be dynamic with resource allocation in the current uncertain circumstance because everybody is looking for certainty at this point. He feels that dynamic

allocation, in a true sense, should involve the reallocation of 30% to 40% of the capital. Anything lesser, say five to 15% of capital reallocated, does not create any lasting difference. He quips, “Either you are pregnant, or you are not pregnant. You cannot be half pregnant.” He recommends tracking four metrics: business metric, financial metric, leadership and talent metric.

iv. **Dynamic management of risk**

In the generic pharma industry, very rarely do things turn out as planned. A product may not get delivered in time due to unforeseen issues in development, technology transfer, regulatory approval etc. There are probable issues of the size of the market, the risk that some other company will get approval earlier and therefore impacting pricing and market share. Those are all risks that get assessed in deciding where to allocate capital for R&D, and these risks are pretty complex and profound. According to an industry expert, there are many imponderables at the product level, which then become even more complex at a market or a product-market level. So, in the generic industry, it is a given that you have to be dynamic in your resource allocation because things change. A board member adds that in the context of R & D and product development, it would be pretty dynamic to have the discipline to exit or limit downside at the right time. Another board member also advocates being flexible enough to change the direction of efforts and the priorities within the portfolio when situations change. An analyst comments that the environment is not static because competition and customers are evolving, implying that there is always a new risk and a new opportunity; one may have to pull back certain things and push harder on certain things. He opines that the recency bias generates a lot of pressure from investors, owners, the ecosystem, press, and media to stick to the flavour-of-the-month sort of recipe. Dynamic modelling should not ignore factors outside the industry - the political developments in key markets, the digital revolution and online sales. A board member says that dynamic resource allocation is required because it brings in certain systematic thinking. The Covid like situation is one that requires dynamic resource allocation.

v. **The pitfall for dynamic resource allocation**

A board member feels that dynamic resource allocation can have many pitfalls. He says that one needs a broad five-to-10-year history of the changes in the marketplace. The concept of the annual plan is not static. The annual plan is dynamic. Best ideas are produced if there is a sense of threat and discomfort in the marketplace and competition. A CEO believes in sticking to a five-year strategic plan till the end of the tenor as he believes that frequent changes in strategy bring only confusion. Another board member cautions against chasing dynamism for the sake of it. **Once a commitment is made, be it in people allocation or financial allocation or innovation pipeline or getting into a new business, there should be clear milestones set when it is reviewed.** And if those milestones are not reached, then it is better to fail fast than fail big. This is the great mantra that the start-up ecosystem has taught us – “it is OK to fail but fail fast”.

An analyst points out that the prevalence of high fixed costs in the pharma industry makes dynamic resource allocation far more difficult as compared to industries where variable cost is high. New opportunities are easier to adopt but to scrap existing projects and allocate the same resources to those opportunities is difficult. Pulling out a resource from one project to another disturbs the entire team.

vi. **Decision criteria**

A CFO distinguishes between sustenance capex, growth capex and regulatory capex. An analyst recommends striking a balance between earning bread today and investing for tomorrow, citing that most successful companies manage to balance how much cash they generate, how much they pay to shareholders, and how much they invest in the future. Another CFO highlights the importance of having a very structured and quite accurate costing system in place. A board member advises to watch out for incremental returns from incremental investment. After a stage, every incremental investment will bring down the existing return. **Every investment has to be looked at periodically for whether it has reached the threshold of declining returns.** An industry expert feels that a past performance record brings in a credibility factor to future projections. If the company has demonstrated the ability to achieve what it set out for in the past, investors will have more comfort to bet on it. Size also plays a big role in the company's ability to absorb failures. A small company can kill itself with an expensive mistake, while a large company might be able to withstand it. Leadership resource allocation is a big component of resource allocation. Confidence in the talent available in the company plays a significant role in putting money behind an opportunity.

"The criteria around how one will reallocate resources needs to be very clearly defined and understood by not just the top management, but by people across the functions", explains another industry expert. A past CFO cites the example of Sun pharma which has a mid-range planning horizon, rolling three years with an annual refresh. Decision criteria include market scanning, SWOT analysis, competencies and aspirations. Another analyst reminds that traditionally, in many pharma company's decisions on resource allocation have been promoter led and that has, to an extent, resulted in giving a longer rope and not making dynamic changes as they ought to take, although he quickly points out that he sees things changing now. In his view, the most critical element is risk mitigation. He cited examples of Lupin, DRL and Cipla moving away from specialty while Sun is the only company that is still committed to specialty. Getting the resource allocation discipline itself will create a lot of value in his view.

b. Comments on various sources of resources

The sources of resources extend beyond internal cash flow, equity, debt and monetisation of assets to include the followings:

- Partnership/commercial arrangements with other entities (including customers, vendors, R&D partners, venture capitalist).
- Discounting receivable purchase programs.
- Negative working capital.
- The untapped potential of people.

Partnership/commercial arrangements with other entities (including customers, vendors, R&D partners, venture capitalist) along with monetisation of assets/discounting receivable purchase program

Many companies are exploiting commercial arrangement with other parties and monetising assets to generate funds for redeployment. However, if a company out-licenses itself in the initial stage itself for value realization, it may not realise the full potential of a product. Discounting receivable purchase programs and liquidating dormant assets – intellectual property of the non-core areas is adopted as a source of fund in many companies. Biocon started in 1978 as an enzyme business. It was the largest enzymes company in India. But they divested that business completely to invest in biosimilars. Cipla was doing quite well in the animal health business, but it divested that globally to focus on three priority areas. It also completely truncated biosimilar programs and decided to invest in digital space instead. **In this new collaborative world today, it is not necessary for a company to do everything on its own.** There are multiple levels of partnerships. Some have leverage in operating a low-cost base of manufacturing output or people costs, and in other cases, you just have unique access to a marketplace. One board member said that there are a lot of options how one constructs the procurement contracts, sales contracts, how one sets up the production capacity, whether one makes all the investments or rent some of the infrastructures, whether one does all the R & D in-house or could develop partnerships with other companies. However, one investor cautions that to a large extent, partnerships are not easy; there has to be a cultural fit. A sell-side analyst felt that partnering is the best option because it brings in more discipline, and since other players also have the skin in the game, they will also ensure that controls are in place.

Negative working capital

An independent director and past CEO suggests an alternate mode of source by moving towards negative working capital. He asserts that he has done that very successfully.

The untapped potential of people

A board member and past CEO prescribes, “The biggest source of funds is the untapped potential of the people you have for which you have already paid. People do not realise that

and hire more people instead of fully leveraging the potential of the people already in the organisation". An industry expert believes that some of the best R&D people are under-appreciated because they are young — and some of them might be 10 times better than the current people running the R&D organisation. **Having a differential talent method is also a resource allocation agenda.** The productivity difference between the best and the worst is 1,000 times, and it makes a huge difference. Another board member and CEO adds that although he feels equally passionate about human capital allocation, companies have to be completely objective about their assessment of people. They may be best friends, and they may have been the best manager in the past. But if circumstances change and if they are not up to the current requirements, companies need to be ruthless in moving on.

One can argue that partnership/commercial arrangements with other entities, discounting receivable purchase programs, and negative working capital get broadly covered in the first source, i.e., internal cash flow. However, given the intent where internal cash flow primarily comes out of operations, I feel there is merit in calling out these three separately and sharpen the first one as internal cash flow from operation only. So, the framework could be amended with eight possible Sources:

1. Internal cash flow from the operation.
2. Equity.
3. Debt.
4. Monetization of assets.
5. Partnership/commercial arrangements with other entities.
6. Discounting receivable purchase programs.
7. Negative working capital.
8. The untapped potential of people.

c. Comments on various deployment categories of resources

While the six deployment categories (R&D, innovation and technology, capacity/ infrastructure creation, inorganic moves, organic expansion including new business, new market, marketing and brand building, leadership capability development including digital and analytics, and return to shareholders) were endorsed by all the respondents, there were some specific suggestions to distinguish 'digitalisation and leveraging analytics' from 'leadership and capability development' and to include one additional category of deployment with the recent focus on ESG (environmental, social and governance). The ESG factors are a subset of non-financial performance indicators that include ethical, sustainability and governance metrics, including carbon footprint, greenhouse gas emission, deforestation, biodiversity, tax strategy, board processes, safety and health.

Some of the comments received on ESG are as follows:

- Companies have become very conscious in terms of their contribution towards the carbon footprint related matter. Safety is not taken seriously by many people in the subcontinent, including India. Unless you force it, it is very difficult. Safety, health and environment are

extremely important. People used to look at the Dow Jones sustainability index to assess organisations' ESG score, but now they have gone beyond that.

- Investors have matured a lot on the ESG front, which would have been evident in interactions with the ESG fund.
- In terms of capex, we have categories like debottlenecking capex, cost-saving capex, capacity expansion capex, greenfield project capex and statutory/EHS related/admin capex. The last category is not required to have any payback period.
- We had brought the whole concept of sustainability into the centre of strategy in many of our companies. How do you conserve biodiversity, water resources?
- The other area was on the environment side in terms of carbon count, renewal energy, green chemistry and sustainable environment.
- There is an umbrella of social protection in India that you do not see in other parts of the world.

The endorsements of some of the deployment categories from the interviewee were as follows:

i. **Organic expansion including new business, new market, marketing and brand building**

A CEO says that resources should be allocated to areas where the impact generates the company's desired future value. For example, in markets where brand strength is important, R&D or manufacturing may not be critical differentiators. But if there are markets where differentiation in a product creates opportunity, then investing in R&D becomes very important. A CFO says that in terms of the order of magnitude, what comes on top is capital expenditure, then comes acquisitions, working capital, research and development, digital and automation, investments in go-to-market initiatives, patient education initiatives, some of the commercial campaigns. Another CFO cites the example of their investments into digital start-ups like Wealthy Therapeutics in India, Brandmed in South Africa and the recent acquisition of a stake in a company called Goapptiv that has extensive reach in rural markets of India where from a risk or economic standpoint, the cost of detailing will be very different. He feels that while conventionally, it may not be appropriate to invest through detailing there, through this firm, they can access a significant amount of access to the doctor community in that region.

ii. **R&D, innovation and technology**

A past CEO says that the most rewarding resource allocation is the most challenging one. For example, if being first-to-file is to be make-or-break for a product, resources should be deployed to accelerate the pace of development. So, there could be two parallel groups developing the same product instead of one. If the group that develops first could meet the first-to-file target, then the second group's expenses can easily get covered. A CFO says, "The nuances for a particular therapy area could be manifold. For example, within the Injectables space, there are at least nine types of complex injectables and each requires investments of a different kind. Similarly, when it comes to inhalers, there are investments in the drug as

well as the device and the huge chunk of patents around it and litigation. So, each is a resource allocation gauging the risk associated and calibrating the benefits coming from it”.

iii. Leadership and capability development

A board member believes that management bandwidth is a key aspect of resource allocation. An industry expert points out that misalignment among the management team is a massive issue, with politics and interpersonal dynamics impacting the motivation of people in the team. Hence investing in sorting that out gives a massive payoff. Another industry expert adds that there is no way a generic company can perform long term without investing dramatically in leadership capabilities. A CEO confidently claims that **his company's biggest resource is the top 100 leaders of the organisation**. If their energy goes to the right things, then output comes on its own because these are all capable people. It is very difficult because the talent you want to attract may not necessarily be the talent that wants to come and work with an organisation. Another CEO opines that there is a relatively small portion of the human capital, primarily the leadership in the company, in which any organisation has to invest.

iv. Digitalisation and leveraging analytics

An industry expert speaks about digital technology and analytics having a great future in optimising the manufacturing network. Every organisation wants productivity improvement, and to a large extent, process automation, enhancement of applications and speed is possible only with continuous investment in IT. A contrarian view from an industry expert is that there is no strategic benefit from investments in digital when it pertains to the generic industry. So, it should be looked at as a pure ROI or productivity investment. A CEO, on the other hand, is very emphatic that investment in digital capabilities is a must today; more and more investment will be into the platform, into robotics, into a piece of equipment that can do things faster, capital that allows you to increase your level of engineering primarily.

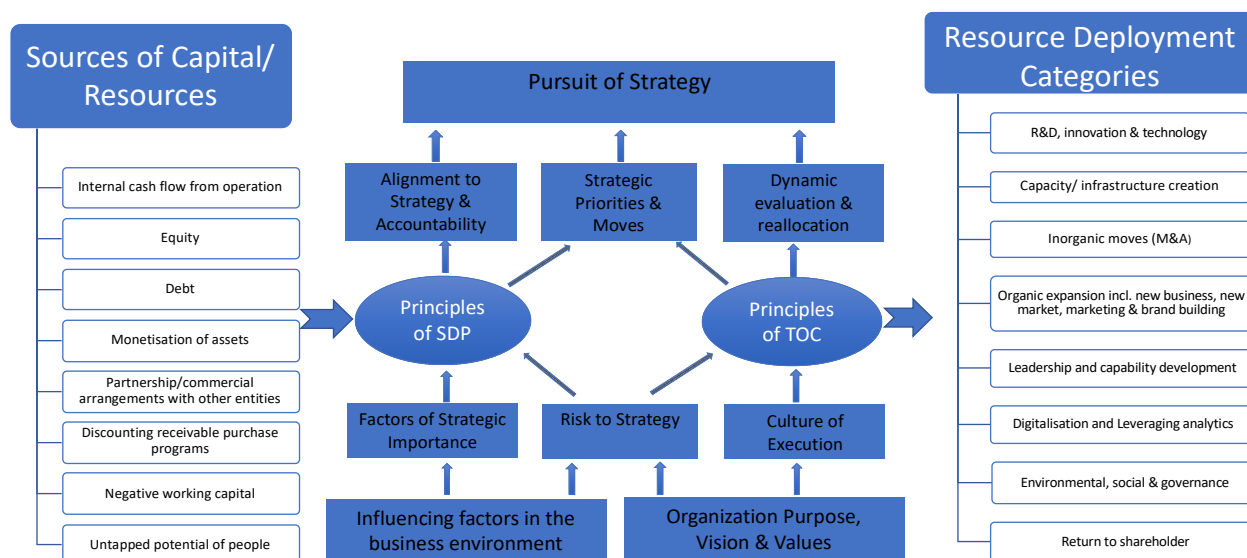
With the above justifications, the framework could be amended with the outcome of eight possible **deployment** categories as follows:

1. R&D, innovation and technology.
2. Capacity/ infrastructure creation.
3. Inorganic moves (M&A).
4. Organic expansion, including new business, new market, marketing and brand building.
5. Leadership and capability development.
6. Digitalisation and leveraging analytics.
7. Environmental, social and governance.
8. Return to shareholders.

d. Conclusion: dynamic resource allocation framework and the toolkit

Based on the above comments from the industry leaders and associates on the framework, sources and deployment categories, the improved framework for dynamic resource allocation for generic pharma companies is accordingly presented as follows:

Dynamic Resource Allocation Framework



A toolkit explaining each element of the framework is provided below to guide the respective role players in applying the framework in their organisation for dynamic resource allocation.

<u>Toolkit for dynamic resource allocation</u>	
<u>Elements of the framework</u>	<u>Guide for applying the tools</u>
Influencing factors in the business environment	These indicate the nuances of the generic pharma industry and include competitive intensity/ pricing environment, portfolio of complex/differentiated product with cost leadership, product quality/reliability/availability with supply reliability, macro-economic healthcare spending indicators, geopolitical factors etc.
Organisation purpose, vision and values	Purpose defines the reason for existence; vision defines long-term aspirations, and values define the unflinching commitment, specify the boundaries of the behaviour and uphold the norms and beliefs.

Factors of strategic importance	These would be firm-specific. It may include regulatory compliance and environmental management, strong organisation-wide quality and patient focus, speed of new product introduction and market response, leveraging cutting edge IPM skill, an entrepreneurial and innovative culture etc., for a firm in the generic pharma industry.
Risk to strategy	This includes establishing an enterprise risk management process, splitting risk-ownership between members of the top management, defining risk appetite and tolerance for failure, focusing on risk mitigation process with a contingency plan and tracking the risk mitigation outcome.
Culture of execution	This connotes the tone at the top, a culture of enablement, rigour of accountability and discipline. Walking the talk is essential for authentic leadership that lays a foundation for the culture. Leaders spending time on the shop floor, R&D labs and the market, sensing, observations and facilitative interactions with the operating level of staff are key ingredients of the culture.
Principles of SDP	SDP is a systematic approach to the management of change in critical business processes leading to a sustainable breakthrough performance by the most optimal use of time, money and resources of the organisation. This includes both SDP & LDM to ensure focus, alignment, accountability, rigour and discipline. It starts with the top management consensus on the top-level x-matrix of the organisation with a 5-step approach: long-term breakthrough financial objectives, how far to achieve during the next financial year, what are the key/top priority strategic processes that need improvement/ re-engineering to strengthen the delivery of both and allocating accountable resources to each such priority with measurement criteria. Value stream mapping of these processes helps in formulating action plans and defining metrics (TTIs and KPIs) to track progress. The key element of progress review includes root cause analysis and countermeasures. All lean tools, including continuous improvement, problem-solving, visual controls and leader standard work are part of LDM that effectively ensures delivery of KPIs with the above approach. The strategic priorities with improved process become LDM in the following year, and new priority emerge out of any new strategic moves. Organisations that adopt SDP will have their executives and senior management focusing disproportionately on creating the future of the organisation while the middle management and operating level deliver the annual plan and objectives.

Principles of TOC	<p>TOC encompasses the principles of flow, bottleneck, visibility, focus and continuous improvement. Flow principles include improving flow (or equivalently lead time) as the primary objective, preventing over-production, abolishing any local efficiencies and institutionalising a focusing process to balance the flow. The principles help the organisations scan across their end to end apparently complex processes and identify simple levers that would profoundly impact overall process outcome. The focus is on global optima instead of local optimisation that, in most cases, comes in conflict with the achievement of overall organisational objectives. The focus is also on the identification of critically constraining resource (CCR) that interrupts the flow (task/material/cash) and debottlenecking that constraint. Hence the investment is made only on the improvement of CCR and not on anything else. Important to note is that once a CCR is debottlenecked, some other resource becomes the CCR limiting the rate of the flow. Hence it is the dynamic allocation of resource that has the best impact on improving overall profit. The other principle of TOC is ‘throughput accounting’, where throughput (T) is defined as incremental profit generated by producing and selling one more unit of sale, equivalent to sales minus totally variable cost. Whatever component of cost/expense that is not totally variable is clubbed under Operating Expense (OE). All investments and inventories are clubbed under investments (I). Throughput accounting is done with simple metrics of T, OE and I, including formula, e.g. T-OE, T/OE, (T-OE)/I, $\Delta(T)-\Delta(OE)$ etc. Throughput accounting becomes more effective than conventional costing whenever an organisation has internal constraints to cater to potential demands in the marketplace. The techniques, e.g., simplified drum-buffer-rope, critical chain project management, improve the overall system’s productivity. There are various lead indicators, e.g., load factors, full kit readiness, buffer penetration, besides various derivatives of T, OE and I. Those can be effectively used by management and board as measures to track the progress of strategy implementation. Full-kitting ensures uninterrupted flow when an activity starts, and buffers act as a shock absorber for any unforeseen events and fluctuations in the external environment.</p>
Alignment to strategy and accountability	<p>This is a direct outcome of the SDP X-matrix. Each resource is held accountable for KPIs and TTIs described in the action plan in alignment with the strategic priorities emerging out of long-term breakthrough financial objectives and the annual business plan.</p>

Strategic priorities and moves	Strategic priorities are specific processes that need to be improved/reengineered to strengthen the delivery of both long-term financial breakthrough and annual objectives. Moves are the specific actions required to shift from the current state to the desired state in the chosen spaces, where the company need to focus. Timely new product launch and timely filing for first to launch products could be among the top strategic priorities and moves in the generic pharma industry.
Dynamic evaluation and reallocation	The review is a very important aspect of the framework. There should be a periodic review consistently to determine whether the results are in the right direction, or the organisation needs to change resource allocation. This includes decisions criteria, how fast it can be implemented and how to monitor that it is successful. Leadership resource is a big component of dynamic evaluation and reallocation.

While the qualitative research findings establish the applicability of the framework to other firms in the generic pharma industry, there is an obvious limitation of this study and scope for further research, which is presented in the next chapter.

Chapter 9: Limitation of the study and direction for future research

The entire framework has been developed, keeping the nuances of the generic pharmaceutical industry in focus specifically. However, the applicability of the framework could be tested beyond the industry, and that could be taken up for subsequent research.

Further, the CFOs, CEOs and the boards have been facing some dilemmas in making the right trade-off decisions between short-term profitability and R&D spending for long-term growth. The responses that I gathered from the eminent professionals could be broadly categorized as

- a) R&D is most critical for the generics pharma industry,
- b) preference for short term profitability,
- c) commitment to focus on long term growth through R&D,
- d) balance both with pragmatism,
- e) R&D productivity and continuous improvement through learnings,
- f) avoid capitalization and fix accountability
- g) narratives to market with credibility makes all the difference.

The detailed analyses of the responses are given in annexure – 1. Any research scholar can build on the above analysis and conduct further research with a well-framed question on this important topic.

I have experienced organisations struggling with the deployment consideration for experimentation/ incubation of new ideas/ businesses and wondered whether any hard stop-loss limits should have been fixed for it. I also gathered responses from the select interviewees on this topic. The responses can be broadly summarised as follows:

- a) encourage wide space and create a conducive culture for experimentation/incubation of new ideas,
- b) create milestones for tracking progress,
- c) give a long rope; we are not PE firms
- d) be ruthless to kill once an idea is proven to be unviable
- e) create boundaries and be strict in allocating money to incubation business,
- f) have a clear owner with accountability while allocating money to incubation business,
- g) investors support companies who earn credibility with proven success,
- h) pick the right space for innovation, and
- i) have a contrarian view on innovation.

The detailed analyses of the responses are given in annexure – 2. This could be another interesting topic for further research.

Similarly, the dilemma between depth and breath for organic expansion is another issue bothering the CFOs, CEOs and the boards. A summary of the responses to this dilemma (covered in detail in annexure – 3) is as follows:

- a) focus is critically important to support depth,
- b) the geographical spread is important to get maximum value for a product and
- c) it is a dynamic decision based on strategic intent, risks and opportunities.

Any researcher interested to pursue further on this topic of critical interest to any organisation would benefit from this analysis. I also attempted to get some perspectives from the respondents on how to evaluate ROI for branding and marketing, separately for growing the brand versus maintaining the brand. The responses are broadly summarized as follows:

- a) evaluation requires data an expertise
- b) brand spend is justified by superior margin and growth,
- c) growth and maintenance are two sides of the same coin,
- d) very difficult to compute yield due to multiple factors for growth and
- e) potential for vast improvement,

Details are given in annexure – 4. This would require further intensive research while framing the right set of questions.

The above summarises the limitation of the study and the direction of the future research, and I present the overall summary and conclusions from this research in the next and final chapter.

Chapter 10: Overall summary and conclusion

The main objective of the research was to create a framework for dynamic resource allocation in the generic pharmaceutical industry. There is an established need for defining strategic priorities, creation of alignment and accountability and dynamic evaluation and reallocation of resources while mitigating the execution risk to strategy. The board, the CEO and the CFO of the organisations have clear roles in resource allocation. Yet, several issues prevent them from doing resource allocation well. Some of these include (i) reliance on intuition, (ii) entrepreneurial instinct, (iii) past experiences of success and confidence placed in specific business leaders, (iv) allocating resource for what is deemed to be 'strategically important' despite consistently poor past delivery, and (v) problems faced with the tools for dynamic reallocation with ongoing evaluation and monitoring.

As a practising CFO of a global organisation, I have experienced the resource allocation dilemma for several decisions related to capex, M&A, R&D, incubations, branding and organic expansions.

The literature on resource allocation establishes correlation and causalities among various influencing factors that could impact the decision on internal resource allocation. However, we do not come across a comprehensive practical framework and toolkit that can assist practising CFOs, CEOs and the boards. Hence, I wanted to bring my experience and insight into developing a practical framework (with toolkits) that can help my colleagues in the industry as well as academicians in future research.

The history of resource allocation decisions in Dr. Reddy's Laboratories Ltd. — where I worked over the last two decades — has been used as a case study in this research. While DRL has faced problems similar to those faced by other organisations in consistently doing good resource allocation, there has been a gradual evolution in this learning organisation.

For a large part of its journey, the company was relying, with reasonable success, on the strength of intuition and the entrepreneurial instinct of the management and the promoters, refined by the learnings from past experiences to arrive at decisions. While the company has taken multiple strategic initiatives from time to time in each of the above areas, two of them stand out for their organisation-wide impact and specific contribution to delivering the strategy adopted at that time.

The first is TOC implementation in 2008 under the umbrella of 'viable vision', and the second is SDP implementation in 2016. Although the 'viable vision' initiative ended in 2012, the company continued to follow some of the core principles of TOC as a part of its operating system and philosophy for strategy execution. Strategic objectives are reviewed using SDP and LDM approach to ensure proper focus, alignment, rigour, discipline and accountability.

Earlier, there was no articulated framework for capital allocation in DRL. By default, the primary criterion for capital allocation was the financial return as measured through NPV, IRR or payback period.

DRL invested significant resources for its organic expansion and made several acquisitions over the last two decades — the outcomes have been a mix of success and failures. After SDP implementation, strategic objectives are supported by a set of concrete moves and strategic priorities along with some cross-functional processes. Timely new product launch and timely filing for first to launch products are among the top strategic priorities and moves for each SBU as per the SDP. Whenever a new product introduction requires a dedicated capacity, the risk appetite for such a decision is now taken based on the strategic priority of the concerned SBU and the relative importance of that product in the overall new product portfolio as per SDP.

The company has made a conscious decision to allocate resources to augment its capability, both in leadership and in digital and analytics, keeping in mind the need for the future without a specific financial consideration. At least 10% weightage is given in the overall organisation scorecard and each SBU scorecard on these capability developments to create a transformational impact. The current focus is on the productivity of such resource allocation, accountability for the respective priority/move owner to deliver TTI as per SDP, rigour/discipline of the review to make a necessary course correction, tracking the latest estimates of T-OE. The current focus of the business development/M&A in terms of sensing/targeting opportunities in the marketplace is in complete alignment with the X-matrix of the concerned SBUs, e.g. scouting for an entry vehicle for a new market entry for EM or increasing the breadth of the portfolio in unbranded generics or acquiring/in-licensing target brands in branded generics.

The principles of TOC and SDP have become part of the DNA of DRL. The concepts of CCR, throughput, X-matrix etc., have become a part of the senior leadership vocabulary. Following the principles of SDP, the senior management focus is more on the creation of the right capability and capacity, portfolio creation and customer lock-in for future years, while the middle and operating managers focus on the KPIs for the year with LDM. Following the principles of TOC, the organisation is continuously exploring a new decisive competitive edge, identifying the bottlenecks in the execution of all processes and taking swift measures to augment the critically constraining resources to improve flow, agility and turnaround time of the processes.

Looking at the current resource allocation process in DRL, one can realise that the principles of TOC and SDP imbibed by the company have played a fundamental role in guiding decisions and translating decisions into actions.

While the case study gives the proof-of-concept, a survey among its senior managers — in which a sample of some 48% of the total population of the top four role bands of the company responded

— establishes the influence of TOC and SDP in shaping resource allocation decision. It proves that the applicability of these tools for resource allocation is comprehended by the senior leadership and percolates down the line across role bands.

The respondents indicated a high level of understanding on five topics of TOC, SDP, strategy, resource allocation and Dr. Reddy's business strategy. The effectiveness of resource allocation to the strategy was also considered high by respondents. **Approximately 80% of respondents agree (including 22% strongly agree) with both TOC and SDP influencing overall resource allocation decisions.**

On sentiment analysis, 73% of the respondents have used positive words in their description of these processes/tools; and 22% used neutral words. Exploring the negative sentiments (5%) yielded ideas that involve caution and the anxiety associated with execution. Overall themes emerging from AI-driven topic modelling and text mining can be classified as:

1. **Dynamic resource allocation** – this is considered critical in the generic pharmaceutical industry, given the complexity and dynamic nature of business and the focus on the success of new product development.
2. **SDP and TOC as tools for dynamic resource allocation decision** - respondent feedback talks about their understanding of TOC and SDP as management systems for strategy execution. Most of them view TOC as a project planning and execution model (with resource planning, loading and utilization monitoring) and SDP as the system that helps convert strategy into executable projects with clear accountability.
3. **Principles of implementation** - respondents mentioned some principles for implementing these systems as a part of this topic. For instance, the need to take capital allocation at a company level versus business units, creating an integrated business planning process that holistically addresses plant capacity and manpower planning have been discussed.
4. **Critical success factors and risks** - respondents discussed the risks and associated critical success factors to make these systems successful in the long run. A strong KPI framework, structured monitoring and governance processes, and strong metrics-driven decisions on resource allocation to remove subjectivity are mentioned.

While SDP and TOC as tools for dynamic resource allocation decision were firmly established specifically in DRL through the case study as well as quantitative and qualitative analysis of the survey among its senior managers, the applicability of it across other firms in the generic pharma industry was required to be ascertained.

Qualitative research based on the interview of 36 prominent professionals and experts in the generic pharma industry revealed that while various factors play a role in resource allocation decisions, **tools like SDP and TOC can be of great help in defining strategic priorities, creating**

alignment and accountability, forcing dynamic evaluation and reallocation and mitigating risks to strategy.

As an outcome of the interviews, various other sources of resources like partnership/commercial arrangements with other entities (including customers, vendors, R&D partners, venture capitalists), discounting receivable purchase programs, negative working capital and untapped potential of people were identified beyond posited ones — namely, internal cash flow from operations, equity, debt and monetization of assets. Insights from these interviews also led to focusing on leveraging digital and analytics as a separate category of deployment from leadership and capability development and including environmental, social and governance as another category.

The research validates the factors of strategic importance like competitive intensity, cost leadership, geopolitical factors backed by the foundation of purpose, vision and values of an organisation, a growth mindset, execution culture and prioritisation drive the dynamic resource allocation process towards realization of business strategy.

A look at the history of resource allocation decisions across the generic pharmaceutical industry throws up a mixed bag of wins and losses. Investments in the pharmaceutical industry typically have a long gestation period and are very sensitive to time-to-market. Companies that realised that they were late to market or did not have full in-house capabilities have exited from their investments despite the sunk initial costs.

An example is biosimilars — where a company like Cipla, after making initial investments, decided that it is better not to develop their own manufacturing or development capabilities but to leverage their market presence to sell products of other companies. Biocon, on the other hand, tasted success through strong partnerships at an early stage. Valeant's strategy of buying off-patent brands and milking them with high pricing was successful for a few years till pharmaceutical pricing came under political focus in the US. Divis focused on its core strengths and built a competitive advantage. Aurobindo successfully acquired loss-making and struggling companies and turned them around through cost efficiencies. Teva specialised in growing through acquisitions and alliances. However, their recent acquisitions went wrong despite their expertise.

None of the above companies would have used SDP or TOC as the designated tools for resource allocation. However, a pattern is visible when the companies either make a course correction or focus on dynamic resource allocation, as they encounter success and failures. Sun Pharma, for example, created great value out of the Taro acquisition that was in alignment with their approach of buying undervalued assets, unlocking value through cost synergy and revenue maximisation. The similar approach taken for Ranbaxy acquisition has not thus far created the desired value. However, that has helped Sun pharma get accelerated market reach, larger global footprint and market position. Their continued commitment to the specialty space in the USA is not based on a mere

conviction but a periodic check whether the long-term thesis of the business potential is intact. They were not influenced by the expectation mismatch between generics and specialty. They shaped their internal strategy and kept the discipline and agility of the execution necessary to realise the strategy. So, while some other tools might have been used by these companies in their resource allocation process, leading to their current and potential success, the principles embraced by those tools would have been quite similar to that of SDP and TOC.

The common thread across all the respondents on improving the capex productivity was linked to scrutinizing the initial assumptions with a rigorous tracking mechanism throughout the life of the project to compare the actual outcomes against the initial assumptions.

There were mixed opinions on maintaining reserve capacity to ensure the availability of products at all times. While some respondents felt that the high margins in the industry justify keeping excess inventory to avoid losing sales, some also cautioned that where supply assurance does not fetch any price premium, it may not matter as much. Similarly, on capex, there were arguments in favour of having a reserve capacity to benefit from unplanned opportunities and also against excess capacity crippling capital yield in the industry.

In line with the principles of SDP and TOC, the effective solution emerges from categorising all products into three buckets: runner, repeater and stranger, and executing different capacity and inventory creation strategies for each of these buckets: (a) dedicated modules for runners, (b) focusing on the change-over-time reduction for repeaters/strangers, and (c) having protective capacity by triggering capacity creation at 70% capacity utilisation, specifically focusing on the critically constrained resource. Further, a modular approach to building capacity in which modules could be added to the plant, depending on demand, came out as a viable solution. There was, however, unanimity on the need for the active and timely divestment of idle assets.

M&A is the major target of resource allocation. Companies need to invest in building capability in making successful acquisitions, similar to any other capabilities. **Companies that make programmatic serial acquisitions of small value targets have shown greater success since some of the acquisitions are bound to fail.** A diversified base of investments gives better risk-adjusted results. Adjacency and strategic fit are critical criteria for success in M&A, as the ability to create synergy in an acquisition is a function of the targets adjacency and strategic fit with the existing business. In some cases, distressed assets create an opportunity for disproportionate value creation if managed well. Companies should also be open to mergers with like-minded companies with complementary strengths.

In conclusion, evidence is consistent with both the hypotheses. However, it is important to note that TOC and SDP are only a subset of possible other tools that are available. The point is not to pick a particular tool but to realise that organisations need some sort of management system to put

discipline into the resource allocation process. While the DRL case explains the usage of these tools and the results from the survey among the senior managers of DRL reconfirms that these tools are used for guiding dynamic resource allocation in the pursuit of DRL's business strategy, the responses from the industry leaders and associate also validate that such tools are needed for defining strategic priorities and moves, creating alignment and accountability, dynamic evaluation and reallocation, and mitigating the execution risk to strategy.

Looking at the DRL case, where the board took very critical decisions, for example, a) reduction in the global footprint in the finished dosage branded formulation after debating depth vs breadth consequent to the deployment of TOC, and b) de-focusing on the proprietary products space consequent to the adoption of the new strategy and governance framework of SDP/LDM; we can infer that TOC and SDP caused better resource allocation decisions in the board.

The history of resource allocation decisions across the generic pharma industry highlights the need for a disciplined, dynamic resource allocation process. SDP and TOC, as specific tools, may not be necessary. But various companies have used Balanced Scorecards or used other tools that adopted similar principles of SDP and TOC, which have helped them to ensure discipline and overcome the common causes of failures. Accordingly, SDP and TOC, or similar tools, lead to effective resource allocation. As explained in the framework, there are various other factors, for example, various factors of strategic importance, inherent risk to strategy and culture of execution, that have a profound effect on effective resource allocation in pursuit of strategy. Hence mere deployment of these tools will not guarantee effective resource allocation. We can only infer that these tools are useful for practising managers to take effective resource allocation decisions.

The research helped in improving the hypothesised dynamic resource allocation framework along with a toolkit that can be applicable to other generic pharma companies to realise their business strategy. **While this research is limited to the applicability in the generic pharma industry, further research can help us understand the broader applicability. The focus of this research was on dynamic resource allocation to strategy whereas appropriate strategy formulation for this industry would have been a broader theme that I did not focus on.**

Annexure I: Introduction to SDP – ‘Hoshin Kanri’

SDP stands for the Strategy Deployment Process. The concept is adopted from ‘Hoshin Kanri’, a Japanese approach to deploying overall company objectives – translating them to everyone’s actions, creating the necessary alignment.

Hoshin kanri was adopted by the Japanese corporations earlier as a well-disciplined, integrated and systematic approach to implementing strategies. The winners of the Japanese Deming prize attributed their business success to Hoshin Kanri. Several US companies, including P&G, HP, Xerox, Danaher, later adopted hoshin kanri in their organisations as an organising framework for strategy management.

It is concerned with four primary tasks. First, it focuses on an organisation’s attention on corporate direction by setting a vital few strategic priorities annually. Secondly, it aligns these with local plans and programmes. Thirdly, it integrates them with daily management, and finally, it provides for a structured review of their progress. Thus, it is focus – alignment – integration – review (FAIR) (Witcher, 1999). Hoshin is a valuable addition to the arena of strategic change management. It encompasses many traditional approaches to strategic analysis and the formulation of the organisation’s strategic response to that analysis. Hoshin brings value to this management arena in the degree to which it supports implementation and formulation. It is potent in creating alignment to ensure that the whole organisation is working towards the same strategic goals. (Zairi, Mohamed & Erskine, 2014)

Like any other strategy deployment tool, in the overall scheme of constructs from the core purpose (why we exist?), values (what’s important to us?), vision (what we want to be?) and strategy (our game plan), the deployment process lies at heart, translating above gradually to strategic priorities (what are the priorities?), execution excellence (what we must improve?) and empowered individuals with clear objectives (what I need to do?). If the process is rightly implemented, it will lead to strategic outcomes with satisfied shareholders, delighted customers, efficient and effective processes, and a motivated and prepared workforce. It focuses on clarity of goals (what we must do well in order to implement our strategy?) and measures (how strategic success is measured and tracked?) in the form of KPIs (key performance indicators).

This approach was developed further by Danaher Business Corporation as part of their Danaher business system (Harvard case study on Danaher). SDP has the following five in-built essence – focus, alignment, rigour, discipline and accountability. **SDP is a systematic approach to managing change in critical business processes, leading to a sustainable breakthrough performance by the most optimal use of time, money, and organisation resources.** SDP is used to clarify vision and align and focus resources throughout the organisation and build a sustainable competitive advantage.

What stands out for SDP is the focus on future years with equal emphasis on defining strategic priorities (clearly articulating what, how, who and when) and the resources/ capabilities required to be enhanced to deliver the future. Organisations that adopt SDP will have their executives and senior management focusing disproportionately on creating the future of the organisation while the middle management and operating level deliver the annual plan and objectives.

The X-matrix is at the core of hoshin kanri/ SDP. One can easily connect the dots among the four dimensions of the X-matrix. The X-matrix is built through a 5 Step thought process as follows:

- Step 1 – What? Long term breakthrough financial objectives
- Step 2 – How far during the year of planning? (annual objectives)
- Step 3 – How? Key strategic priorities (annual improvement priorities)
- Step 4 – Who? Resource deployment
- Step 5 – How much and when? Measures (metrics – target to improve)



Strategic priorities are then cascaded as many times as necessary to the point of impact where a clear action plan emerges for the person responsible. The top-level X-matrix are cascaded to 2nd and subsequent levels by simply defining the second dimension of the top level as the first dimension of the 2nd level X-matrix. Thereby the fourth dimension of the 2nd level would focus on specific targets to improve, and it is here the enhancement need for resources/capabilities surface and provided due attention. It is important to note that relative priority among various strategic priorities can be established by putting the top priority at the starting row, followed by the next priority. Hence, in case of any potential conflict, the concerned resource can get easily prioritised. SDP principles can be effectively used to decipher the strategic priorities and moves and ensure effective alignment and accountability. Also, the effective review of SDP provides ample impetus to mitigate the execution risk to strategy.

Annexure 2: Introduction to TOC

TOC stands for the 'Theory of Constraints'. The proponent of TOC is Dr. Eli W Goldratt (1984, 'The Goal'; 1990, 'Theory of Constraints'). The tools of TOC are all common sense and deeply rooted in various Japanese management principles of flow, bottleneck, visibility, focus and continuous improvement. The 'constraints' in TOC could be a misnomer as it identifies the 'leverage' points. Dr. Goldratt could have easily described it as the 'Theory of Leverages'.

The foundation of the Theory of Constraints are as follows:

- Four flow principles
 1. Improving flow (or equivalently lead time) is the primary objective
 2. Prevent overproduction
 3. Local efficiencies must be abolished
 4. A focusing process to balance the flow must be in place
- Three assumptions to constraint management
 1. Every system has a goal and a set of necessary assumptions that must be satisfied to achieve the goal
 2. Any system is more than just the sum of its parts
 3. Very few variables limit the performance of the system at any given time
- Five key focusing steps
 1. Identify the system's constraint(s)
 2. Exploit the system's constraint
 3. Subordinate everything else to the action taken in Step 2
 4. Elevate the system's constraint(s)
 5. Warning!! If the constraint is broken, repeat Steps 1-4, focusing on the new constraint
- Three unique measures
 1. Throughput (T)
 2. Operating expense (OE)
 3. Investment (I)

The Strategy & Tactic (S&T) tree is an integral element of TOC implementation. It is designed in the form of a logical tree that dramatically improves communication and synchronisation across the organisation. A strategy is defined as 'what', and a tactic is 'how'. Instead of the conventional view of the strategy being at the top level and tactic at the operational level, S&T tree branches out to various levels of strategy & tactics as a tree structure. Apart from defining 'what' and 'how', the three most important 'why' questions, e.g. 'why what?', 'why how will deliver what?' and 'why how will require further detailing in order to mitigate the risk of achieving what?' are also defined as part of the S&T tree structure as 'necessary', 'parallel' and 'sufficiency' assumptions.

STRATEGY & TACTIC TREE ELEMENTS

- Why is what I'm responsible for really needed by the organization to improve vis-à-vis its goal?
- What am I/are we responsible for accomplishing?
- Why will this action/activity achieve it?
- How do I/we accomplish it?
- Why is accomplishing this at risk without providing another level of details for my subordinates?



S&T Tree explains all relevant assumptions and clarifies 'what' need to be done and 'how' that need to be done at every level of the organisation until the last level 'how' becomes the standard operating procedure (SOP) of a process. The concerned person responsible for the process gets a complete understanding of how that process's outcome helps in achieving the overall organisation strategy.

The underlying principles of TOC are based on the solid foundation of natural science, statistics, flow and human psychology. The principles help the organisations scan across their end to end apparently complex processes and identify simple levers that would profoundly impact overall process outcome. The focus is on global optima instead of local optimisation that comes in conflict with the achievement of overall organisational objectives. The focus is on identifying critically constraining resource (CCR) that interrupts the flow (task/material/cash) and debottlenecking that constraint. Hence the investment is made only on the improvement of CCR and not on anything else. It is important to note that once a CCR is debottlenecked, some other resource becomes the CCR limiting the flow rate. Hence it is the dynamic allocation of resource that has the best impact on improving overall profit. The other principle of TOC is 'throughput accounting' (Goldratt, 1990, 'The Haystack Syndrome'; Thomas Corbett, 1998, 'Throughput Accounting'). Throughput (T) is defined as incremental profit generated by producing and selling one more unit of sale, equivalent to sales minus totally variable cost. Whatever component of cost/expense is not totally variable is clubbed under operating expense (OE). All investments and inventories are clubbed under investments (I). Throughput accounting is done with simple metrics of T, OE and I, including formula, e.g. $T-OE$, T/OE , $(T-OE)/I$, $\Delta(T)-\Delta(OE)$ etc.

Throughput accounting becomes more effective than conventional costing whenever an organisation has internal constraints to cater to potential demands in the marketplace. In

conventional costing, an organisation would prioritise a product in its product mix based on its contribution. In throughput accounting, the organisation would prioritise based on throughput per hour of CCR utilisation. Product 'A' with 80% contribution would be prioritised over product 'B' with a 60% contribution per conventional costing. However, suppose both product 'A' and product 'B' use the same CCR and product 'B' can be produced twice the quantity compared to product 'A' per hour of CCR utilisation. In that case, it makes perfect sense to prioritise product 'B' since the overall contribution per hour will be more, given the demand potential in the marketplace. Thus, these principles of TOC help in deciding dynamic resource allocation whereby the organisation's profit can be maximised along with the best return on investment. The profitability also improves if $\frac{\Delta(T)}{T}$ is greater than $\frac{\Delta(OE)}{OE}$. With the focus to limit $\Delta(OE)$ to generate $\Delta(T)$, the organisation gradually eliminates waste/excess.

Hence the TOC cannot be interpreted as a mere tool for planning and implementation. It is best interpreted as an operating system of an organisation that can deploy some of the techniques, e.g., simplified drum-buffer-rope (Schrageheim, Dettmer & Patterson, 2009, 'Supply Chain Management at Warp Speed'; Cohen, 2008, 'Ever Improve'), critical chain project management (Goldratt, 1997, 'Critical Chain') in order to improve the overall system's productivity. There are various lead indicators, e.g. load factors, full kit readiness, buffer penetration. Besides, multiple derivatives of T, OE & I can be effectively used by the management and board to track strategy implementation progress. (Goldratt, 1994, "It's Not Luck"; Goldratt, Schrageheim & Ptak, 2000, 'Necessary but Not Sufficient')

Annexure - 3

What is the right trade-off between short term profitability and long-term growth in R&D?

i. R&D is most critical for the generics pharma industry

A board member pointed out that R&D is at the heart of any pharma company because, without R&D, there will not be enough new products to replace the vacuum created by the declining growth of older generic products. Another board member with a background in science and R&D proclaimed to have a tendency to think about the future rather than the operations today. As a chief scientist, he expected his company to churn out five NDA a year through research. The quality of the NDAs is determined by how many of those get approved and when. So, in summary, quantity, quality and time are essential. A CFO claimed that his organisation gives a lot of importance to long-term benefits, and hence they also invest in new chemical entities (NCEs) and new biological entities (NBEs). However, at an overall level, they have maintained R&D spend at 7-8% of total revenues.

ii. Preference for short term profitability

A CEO confessed that his preference in R&D is to bring those products or bring the features of the product that will give more value in a relatively short time. He prefers that way because value creation in the short-term will enable the company to put more into R & D and more risk into the future. A board member also concurred, 'I cannot put 100% of my money allocated for R&D into a project which will give me an answer 25 years later'. If there are projects that will give 25% IRR but 10 years later, then the stress on the balance sheet in the next three years should also be carefully examined.

iii. Commitment to focus on long term growth through R&D

A CFO said he does not want to show improved profitability by cutting future growth avenues. However, it is difficult because the accountability on one year budget is far greater than accountability over the five-year budget. By the time one cross five years, the management teams would have changed. However, there is no point in pursuing projects unless the probability of making those projects successful is very high for the organisation. A CEO felt that an organisation with robust core capabilities would be better off investing for the long term. A board member reminded that in order to move in a different direction that will start giving strategic benefits five or 10 years from today, one has to be prepared for allocating certain resources today, next year and the year after with a definite purpose in mind.

Another CFO said that they ignore the sunk costs and look at only the future and keep reviewing it once in three months or six months. Secondly, strategic considerations also play a role. For example, companies might bet on inhalations as they are complex and will have limited competition or on biosimilars as medicine of the future. Another board member recalled how they had taken an incremental allocation every year to ensure that the company's pipeline continues to be robust. There have been times when the allocation was moderated for short term results when the operating performance was under stress. Most generic companies are owned by value

investors who put a constraint that the company needs to generate enough cash. An industry expert theorised that if the pipeline has value, then cash flows do not really matter for investors.

iv. Balance both with pragmatism

A board member suggested taking a portfolio view across the business. Business units can be divided into three parts - parts of the business that have a track record of generating predictable cash flow, those that are generating some level of visible cash flow, and those that require investing in innovation with an uncertain outcome. A company cannot invest in the third bucket if it is not doing well in the first and second. In an innovation-led industry like pharma, the third bucket will be important provided the company has process discipline around the deployment of capital. Investors will typically support it to a greater extent.

Another board member said that while it is important to allocate resources to long-term goals, it must be done within the constraint of short-term survival. After meeting some basic thresholds in the short term, companies would have the freedom to allocate resources for the long term. A past CEO confessed that a CEO could not afford to miss shareholder expectations constantly. So, **the prioritisation of long-term versus short-term depends on the alignment with shareholder expectations**. He added that there were some years where he did sacrifice the long term because he needed to deliver in the shorter term, and there were years where he had the luxury of investing in the long term because the shorter-term expectations were being met.

v. R&D productivity and continuous improvement through learnings

A CFO said that the biggest problem in terms of R & D is productivity. A board member compared R&D productivity with homoeopathic medicine, advising that it requires a consistent effort over a long period to show some results. An analyst commented that he would evaluate the success rate in R&D in terms of its IRR versus the risk involved. An investor said that 100% perfection is a mirage in R&D productivity. As long as there is this continuous loop of learning and improvement in the new product development, that should be fine. An industry expert pointed out that a large part of success in this industry depends on the portfolio combined with operational efficiency and a good quality portfolio comes only through investments in R&D. Hence the critical question is what is the ratio of make-versus-buy in R&D.

Another industry expert stated that one needs to be also smart enough to see where the benefits in R&D are coming from and which projects/ which molecules are worth investing resources in, and the need to redirect resources. A smarter in-licensing/ out-licensing strategy will help as companies get into more NCE based R&D development. The decision on the right stage to stop and out-license the molecule to a big pharma becomes a critical one. An analyst shared his view on some companies that have delivered slightly higher returns with lower R&D spends. It is hard to say whether it was because of the culture or better execution, or it could be a result of investing only for the short-term while other companies might be investing for a longer time horizon.

vi. Avoid capitalisation and fix accountability

An investor cautioned that they would be apprehensive if companies start capitalising on R&D expenditure. It's better to expense everything because once people get used to the fact that you are expensing your R&D, it becomes ingrained in their thinking. The most transparent approach, according to him, is to assume the worst-case scenario and expense R&D expenditure, even though we think it will be productive. A CFO responded that for a going concern that continuously invests in the R&D, the decision to write off the R&D or capitalise R & D is to be taken as a one-for-all policy. Another investor commented that there is no accountability for the scientists and the R&D department most of the time. Due to the long gestation period, often the people who have spent the money are not there in the organisation to answer when the results do not come. A past CEO suggested emphatically that the head of R&D should never be a scientist because scientists tend to fall in love with their projects. As a result, even when they know that the project is not going to be successful and they cannot meet the time target, they continue to do it because of their love and passion for what they are doing. Therefore, R&D should always be led by someone who knows how to make decisions with no emotions and to kill projects if they are not getting there.

vii. Narratives to market with credibility makes all the difference

An entrepreneur CEO said that he would love to tell the investors candidly that the company may not grow in the two years but realises that this kind of candour for a public company can work against it as it can severely impact the stock price. However, he believes that as long as the expectations are not set unrealistic and truthful about what we communicate, eventually, people will understand. An investor opines that the credibility of the promoter is crucial.

An industry expert argued that R&D productivity is a very amorphous area. Unlike sales productivity, which can be measured more efficiently, most companies are trying to learn how to measure R&D productivity. The narrative needs to come out clearly. Consistency and delivery against a story are the right part of R&D allocation. Credibility is in how the company had performed in the past when it had made similar promises. Success in getting approvals in the past will make the story credible, and people will not question allocation in the present.

An analyst was more optimistic. He felt that people are hungry for ideas. The patience horizon for investors has increased from, say, one year in the past to about five years now – provided that they like the story. It is better to have a five-year narrative and telling the street periodically what is going right and what is going wrong and what are the changes to the narrative. He gave the example of companies in China with assets in Phase-1 and Phase-2 stage, but their market cap is still in billions of dollars. Somehow there is a belief. It would be fascinating to see that change happening where Indian companies are looked upon as someone who can deliver. They can create value either by delivering or by bringing down the risk. Pharma companies have a lot of free cash flow. So, to that extent, there is an ability to invest. The only thing is it must be invested, and allocation is done in a more prudent manner coupled with good communication around it. Investors are willing to look at new stories provided the narrative is set right.

Annexure - 4

Deployment consideration for experimentation/ incubation of new ideas/ businesses and any hard stop-loss limit for it

i. Encourage white space and create a conducive culture for experimentation/incubation of new ideas

A promoter CEO said that they allocate about 10% of capital for trying experiments - unrelated experiments but adjacent to their core strength – e.g., agrochemicals, hospitals, R&D companies involved in drug research. This gives them a chance to see if the segments are interesting enough for expansion in the future. But they do not want to run these businesses because they do not have enough wherewithal or bandwidth. They invest a small amount of money to get a small stake in the investee companies, usually between 1% to 10%. They do not ask for a board seat but only observer status. This arrangement allows them to get close to the management so that they can ask inquisitive questions about the business and enhance their learning that would form the basis for the next set of decisions.

A board member emphasised that white spaces basically give people some respite from their everyday task where they have got much more metrics-driven performance targets. He recalled that he was very fortunate personally because the firm always gave him white spaces. Another board member pointed out that most of the major blockbusters had a near-death experience at some stage in time. The first effective antidepressant Prozac would have died so many times. So, on the one hand, you can say you have to kill projects. On the other hand, almost all big projects being near there. So, it requires judgment to distinguish between the two. Although it is important to set out criteria to enable an objective decision, at the end of the day, these decisions are subjective, albeit based on a framework of objectivity. We cannot eliminate the element of subjectivity or judgment. We can only enhance objectivity.

A CEO gives the example of oral insulin development, which they have been working since the last 17 years but have not killed it. They now call it hobby capital and are putting up minimal capital. They allocate five to 10% of their budget in taking these steps because some of these bets if they pay off, could be really big. Even if they do not pay off, they look at the learning value from it and not just ROI. When you are big, the cost of failure could be higher, whereas the cost of failure when you are small is not that high. **Not experimenting and not thinking out of the box will shut the doors to entering into more exciting businesses and opportunities.** It is better to take some calculated steps that might go wrong than not making mistakes at all. Mistakes can be corrected, but if we become too much risk-averse, then out-of-box thinking will stop coming.

An industry expert refers to the age-old 3M example where all employees were allowed to spend 10% of their time pursuing topics of their passion. He thinks to a large extent; companies should do the same. Another industry expert said that the single biggest question that his boss always asked him was to list out 10 experiments that he was running. He would not ask about how much was delivered last week or what the P/L was, but he would certainly ask about the experiments, and the follow-up question would be on which experiments are failing. He believed that you are

not pushing the boundaries hard enough if you are not failing. If you want people to come up with ideas, you have to create an environment where people can have a certain percentage of time allocated to do whatever they want to do. But to promote such a culture requires a lot of patience. A board member quipped that chances of failing in innovation maybe 70 to 80%, but the 20% that succeed would give great returns.

ii. Create milestones for tracking progress

In the view of a past CEO, the new opportunities will keep coming, whether in terms of competency in the line of business or new products or new technologies etc. He prefers to continue to be patient with a new idea that he is exploring now and would give himself around seven years because it takes around five to seven years for a business idea in this business to germinate.

A current CEO added that every time we are moving to the next phase, based on information whether the concepts still apply or not, we need to continue forward if there is a real underground reason to believe that this is still achievable. A board member emphasised that in today's world, it is not feasible to wait till the end of five years or so to know whether it succeeds. Suppose the project is expected to accomplish its full potential in seven years. In that case, there have to be certain milestones decided for every year; for example, one product getting into the clinical trials stage. If that milestone is not met, then a relook at the confidence of reaching the endpoint of success is warranted.

iii. Be ruthless to kill

A board member warns against putting good money after bad. He recommends being ruthless when it comes to putting more money into something, which is not worked here because either the original assumptions were wrong, or the execution was done wrong. He draws lessons from how a start-up investor will decide at what stage he will pull out money and shut it down.

An industry expert is a proponent of the fail-fast logic. Clear milestones must be decided while investing in innovation, and at every stage-gate, one should ask the question if there is logic to continue the investment. Around five to 10% of the R&D budget should be allocated towards innovation with clear milestones and a clear stage-gate process. He also lamented that almost every pharma CEO in India has one or two pet projects that have been running for between five and seven years without clear visibility of how long these projects will be pursued. He said, "To put it bluntly, most pharma companies and most pharma CEOs have been very wedded to some of their pet projects, and the investor community has not displayed enough activism to call out some of this". A CFO explained that a few products were endorsed with a very clear direction and milestones and the amount of money to be spent. If those milestones are not met, then the products should be dropped. The decision to kill a project should be taken swiftly instead of prolonging it.

iv. Give longer rope; we are not PE firms

A board member pointed out that companies, particularly in the pharma space, cannot emulate PE firm since they need to have a longer time horizon, unlike PE firm. However, in terms of their

performance orientation, objectivity and ruthlessness, there might be something to learn from them - although, in ruthlessness, not all PE firms rank the same.

A current CEO blamed human beings' tendency to look at the incremental investment to reward ratio for the inability of organisations to pull the plug from loss-making investments. Sunk cost tends to be disregarded in the continue-or-kill decision. Hence at every stage-gate, potential reward looks attractive compared to incremental investment.

A CFO clarified that there is no specified threshold, but in general, about 10% of profits after tax is made available for incubation of innovative ideas. This does not include NCE/NBE investments. Another CFO admitted that some allocation of capital does happen towards 'hobby horses'. Investment in NCE was one of them. But there were also investments in brand building and API. It is largely a function of the fortunes of the company. When things are good, companies are liberal in allocating some monies and do not mind writing it off, but when things are not so good, such discretionary spending is cut down. The philosophy of the decision-maker and his view on entrepreneurial risk-taking ability, and his vision for the future determine the extent.

v. Create boundaries and be strict in allocating money to incubation business

The board has to find a mechanism to articulate the boundaries for investments in the incubation business. The process itself must bring discipline and accountability. For example, there could be some research process with well laid down protocols for getting research for determining stop loss and for determining viability before ideas are tested.

A CFO felt that funding for exploratory or incubation areas in an existing business is quite easy because the business head takes ownership, and there could be enough money generated by the business to be ploughed back into an incubation idea. So, from a corporate perspective, there is no additional infusion. Some businesses have been successful concerning the spend and outcomes, while in many businesses, there were learnings from the failure of the asset or the molecule. But there is also an enterprise-level margin expansion target, which ensures that there are stringent limits on allocating money to incubation business.

vi. Have a clear owner with accountability while allocating money to incubation business

A past CEO narrated a story about how he wanted managers to take full-time ownership of their businesses. He selected a person who has never run a business before, and he made him general manager of a business segment. The person was a little apprehensive because of his lack of experience. But the CEO told him that he had the passion, knowledge, drive and interest, and he should own this business. His mandate will be to break-even within a certain period. The CEO will be a financial partner. But he will no longer fund it after the time allotted for breaking even. An analyst commented that there must be proper boundaries and restrictions, and answerability.

A past CFO said that, where measurement is simple and more financially oriented, hard stop loss is applied. And where opportunity exists and not missed yet, pursuing an investment option is taken.

vii. Investors support companies who earn credibility with proven success

An investor pointed out that credibility and a proven track record with innovation make a difference in winning the investors' trust. For example, a new-age company like Amazon or Alphabet can convince investors on a project with might take 10 or 20 years to generate returns, but a brick-and-mortar company like Ford may not get away with such a proposal.

An analyst observed that, in general, Indian companies have underinvested in innovation in India. Genuine venture capital is not easily available in India. Another analyst asserted that incubation capital is available, but there must be a hard-stop. How much the hard stop-loss limit depends on the company's expectations and what they want to make out of it ultimately. The CEO hat plays a vital role here more than the R&D hat. Another investor questioned every company's logic indiscreetly following the path of incubation and experimenting without assessing its capabilities and its ability to maintain discipline in investment. He lamented that it is become fashionable in the last 10 years to have a small incubation fund to experiment with new ideas or back new companies. It might be worth considering if the time and money are better spent focusing on what the company is good at internally. The concept of an incubator fund is suited more to fast, innovation-driven high-tech companies.

An industry expert opined that at least five to 10% of the capital allocation should go into incubation, and that percentage will change depending on the stage. Investment in the early stages will be less, but once a proof-of-concept is established and the potential for success is visible, it will attract more money.

A past CFO and current board member commented that how much to feed versus how to stop losses is a continuing discussion. He recalls over the last two years that they have killed projects that did not look promising anymore and have done that ruthlessly, but they have also nurtured those where they still feel there is potential.

viii. Picking the suitable space for innovation

Referring to the pipeline of products, an industry expert complemented the pharma industry for doing a great job in the innovative side of bringing new products. But a lot of new products are high priced, low population products. Almost every person needs to use cardio-vascular products at some point in time. The new products that have been launched in the last decade are focused on immunology, cancer products or rare diseases. These are products which are small volume, high price. The difficulty for a generic company to invest in a new area is that the generic mentality is around doing things in a very efficient manner; that is the key model of the industry. His advice to generic companies is to pick their battles, play to win, invest enough and have some degrees of patience. In any innovative area, you will need to pay for the pivot a few times before you are successful. The solution might be in making something that might have a residual value even if it fails. Instead of thinking about income generation, companies should think about asset regenerating and building assets that have some value. The rules of the US market have created high entry barriers in the biosimilar space. As a result, incumbents have an advantage in protecting

their market share. Investment in a chemical plant might look like a safer bet than a biologics plant, but there is overcapacity in chemicals. Hence salvage value of a chemical plant is much lower than the salvage value of a biological plant.

Another industry expert advised that once a company chose to get into innovation in a particular area, it must be in it for the long haul. He said, "I will move a few products right into continuous manufacturing; something as dramatic as fundamentally changing the manufacturing technology calls for a big leap of faith. Continuous manufacturing will reduce the cost of production by 40% and workforce by 40 to 50%, and it will enable automation. So, unless they dramatically look at a different technology, which will drive down cost, that thing itself will not be sustainable".

An analyst warned that we get constantly tempted by new ideas and new concepts that keep grabbing our attention in the world that we are living in. However, while putting money behind entrepreneurial ideas, we should be careful not to be carried away by the latest fad. But instead, pick something that is aligned to the core business.

Another industry expert explained the considerations for picking the space for innovation; firstly, from experiment to business, it takes a lot of time, 10 to 15 years and hence for a large company, the pay-off has to be really big to matter. It does not make sense of investing in small projects with such a large gestation period. Secondly, a great venture capitalist spends against uncertainty, not stop loss. The questions that he will ask are what is the next level of uncertainty we need to resolve, how much money is that and how much money does it unlock if we unlock the uncertainty. Further, one can never pick winners but can pick a segment, a certain disease area, an unmet need. Once you pick the segment, it would be prudent to commit money into a few different things in the segment; for example, in the vaccine race for Covid, individual companies that are working on one or two vaccines would have been better of collaborating and having cross-holdings in each-other's vaccines. That would have spread the risk across.

ix. A contrarian view on innovation

A past CEO had a contrary view., He believed that the whole idea of having incubations departments with vice-president heading is flawed and misplaced in a commercial organisation. If it has been viewed as a wealthy entrepreneur's philanthropic activity, then it is a different game. But for a company, which has a goal of creating shareholder wealth has to don a rigorous conservative financial attitude. Spending money on incubation and experimentation contradicts traditional financial wisdom. An industry expert felt that collaborations and partnerships are other ways to bring innovation forward. She does not believe in hard stops or any absolute measures on many business decisions other than ethical ones. Nevertheless, there should always be a mechanism for reviewing the situation and deciding whether to slow investment or disinvest.

Annexure – 5

The dilemma between depth & breath for organic expansion

i. Focus is critically important to support depth

A CEO who believed in focus said that he would prefer 10 countries that will sell a lot to 50 countries that will sell little even if both amount to the same revenue. A product like an injectable that can be sold in the same manner to every hospital owner would make the geographic spread irrelevant. A CFO recounted his experience facing endless issues in the back end when the global footprint of the organisation became very high. They exited from several markets where the cumulative revenue and profit contribution to the company did not justify the complexity of the back-end. That simplified the operations a lot, and then they picked a few markets to become dominant based upon the attractiveness and the addressable size of those markets. This prevented them from burning a lot of money endlessly in entering these new markets.

A past CEO preferred to limit the company's global reach to areas where he can create a critical mass and focus his efforts there. He felt that the hassle of dealing with different regimes, different currencies, and auditing, not to mention FCPA issues, does not justify spreading into too many countries. The complexity was worth it only if the company has a competitive advantage in a country to get a big number.

A CFO said that his strategy would be to enter a new market, conquer that market, but at the same time become stronger there, become very rooted. An industry expert shared that this is an example where there are more failure stories than success stories. He pointed out that the entire industry is fundamentally US and India focused industry with some exceptions by and large. He recommends an approach where a company could identify two or three markets where it could build an India-like position over the next 10/20 years, during which it becomes a local face in those markets. Another board member felt that companies should enter into new markets with the aim of at least becoming an influencer and play a major role in those markets.

ii. The geographical spread is important to get maximum value for a product

In the opinion of a board member, if any geography is critical for long term success, then there must be a game plan for the geography together with a timeline on how quickly you want to get there. He does not mind-expanding to new markets even though there will be initial hiccups in terms of the regulatory and supply chain complexity. It is consistent with his longer-term vision for the company. A past CEO also commented that the decision to spread geographically to widen reach would be based on the potential to create future value. A CFO brushed off the challenges of geographical complexity. Being registered in 155 countries over the last 20 – 25 years, his company had developed enough competency in regulatory compliance for every market.

An industry expert pointed out that the generics business model is all about scale and cost optimization, and therefore it requires presence in more markets. However, the choice of markets becomes highly critical. **While he would not recommend entering into all markets indiscreetly, he also warned that over-dependence on one market is itself fraught with risks.**

iii. It is a dynamic decision based on strategic intent, risks and opportunity

A board member stressed the need to be dynamic because, ultimately, execution and momentum will have a much bigger impact on what actually happened than the strategic intent. Whether to support a trend or to constrain it becomes a judgment call which the board should be ready to stand behind the management. For example, given the geopolitical risk in China, should a company still seek to exploit opportunities in China, even if there is potential to grow double the rate?

Another board member emphasised that the organisation is expected to generate learnings if the strategy does not work and institutionalize that learning. Then they should use the relevant data analytics tools to predict which circumstances the strategy works, and if it does not work, then what is the alternate solution.

A CEO highlighted the difficulty in taking exit decisions in markets that are highly profitable but have a limited scope for growth. He gave the example of his company operating in some markets where nobody else does and where the ROIC is higher than any other market in the world. Should he take the painful decision to exit such markets because it does not allow him to grow bigger?

A board member commented that merely planting your flag in 50 countries with very little scale does not get enough return on the capital deployed. So, typically, most businesses find that it is important to have depth and scale and leadership in that market when it comes to the retail consumer. But in a B2B business, it is possible to be in a lot more geographies. Because those can be done a bit more opportunistically, and the investment is not as high as in retail. So, the right strategy could be to select a few markets, say India and the US, to go very deep into; while other markets rather be serviced through distributors or hospital chains or very limited partnerships.

An investor felt that if the company can handle an additional country and take it to a certain level that can add to the bottom line, it makes sense expanding. However, most companies failed to scale up in new markets (e.g., Africa and other emerging markets) and had to shrink them. The same happened with therapeutic areas as well. Companies just expanded their business to so many therapeutic areas. Then they realise that they cannot make a success of all the therapeutic areas. Then they consolidated into the therapeutic areas where they can succeed.

An analyst commented that the breadth model had worked very well for the API companies because the economics of scale works very well in the breadth model. For formulation companies,

it has been mostly the depth model which has worked. Another analyst added that the size of the market makes a difference. A market like China makes a lot of sense because in a 100 billion market, even getting a small pie is worth spending money and effort against going to Madagascar or Mongolia, where we would not get your ROI even in the best case. Another board member explained that the strategy depends on the company's strengths, weaknesses, opportunities, and threats. For example, Cipla chose to go to Africa because there was no competition there, instead of doing what the rest are doing. It was a great potential - a poor country having huge demand with acceptable margins.

An investor pointed out the fallacy of chasing large markets. Since they attract more players, they are often too competitive and difficult to win. On the other hand, a small market might still be attractive if one has the right strategy. An industry expert opined that the value proposition of the generics business is quite clear, which is quality medicines at low-cost, and that translates in almost every market. Thus, at the macro level, the value proposition is market agnostic to a large part. The question remains whether an additional dollar spent in the US can give you better returns than, let us say, an extra dollar spent in building a new market in the Philippines.

Another industry expert added that it is important to time phase entry into a new market depending on the company's own position perspective rather than just based on what competition is doing because incremental cost and return could be attractive at that point in time. The decision criteria would be the regulatory environment, the likely changes and competitive environment, your ability to source from India, whether you need to invest to cater to that market or your existing plants and regulatory approvals would suffice, and the scale of that business.

Another industry expert argued that at this stage, there is no brand-new market left. Every market has local players. Most drugs are available from an incumbent player. So, market-entry means displacing an incumbent or buying an incumbent unless you have differentiated products. So, it becomes a question of having a portfolio that will naturally create a space in this market; otherwise, it will be a competition to displace an incumbent.

The political sensitivity of healthcare as a sector in every country makes it more difficult for a new entrant since incumbents are likely to have better ties with the decision-makers. Lastly, an analyst opined that the beauty of pharma is that it is a very micro business. There are so many areas where you can develop this strength. Then if you can capitalize on a few handfuls, it creates a lot of value.

Annexure - 6

Evaluating ROI for branding & marketing - growth vs maintains

i. Need data and expertise to evaluate

A CEO confessed that measuring ROI on branding is something that is relatively weak in his company. He felt that there is no need to invest too much because the brands would have already garnered a certain level of recognition, appreciation, value, etc. Therefore, the need for money is only to create a new audience, new activity and new recognition so that the brand is renewed with new features. The finance and marketing teams need to be able to measure loyalty and to be able to know which of their customers are loyal and which are not, and that requires data and expertise of the marketing people. A CFO explained his dilemma; the qualitative and subjective feedback was very interesting, encouraging and supportive. But when they started measuring objectively whether the campaign led to an increase in the numbers in the state where it was run, the results were mixed. A very objective, fully attributable return model is possible for some campaigns but not for all. A board member said companies could not keep spending on brands without monitoring the impact. There are metrics that can help in monitoring the impact of brand spends.

ii. Brand spend is justified by superior margin and growth

A board member prescribed the relative margin from a brand as the right metric for measuring brand effectiveness. In his view, all brand spend is justified by a superior margin. A CEO, on the other hand, preferred growth as the metric for yield from marketing. An analyst commented that there are many factors that determine investing in brands. The most important factor is the competitive edge. If a company has an edge over the competition, it must invest in its brand to grow bigger. Another factor is market growth. If the market is growing, then there is no choice but to invest. The quantum of investment is a function of the expectation of market share gains. In a growing market, it is always easier to grow market share. The competition is not that guarded because they are also growing. So, the spends should be more for growth brands. An industry expert advised zero-based budgeting for marketing spends every year.

iii. Growth and maintenance are two sides of the same coin

A board member emphasised that Covid-19 has shown that trust is going to be a very important thing going forward. He believes that brand maintenance and brand building are not two separate things. Building a brand has no use if we cannot maintain it.

An industry expert shared her perspective that brand building and brand maintenance should not be segregated. Some investments for growth will be required in order to keep pace with market changes and dynamics for business as usual, particularly given the rapid change in the

environment. Given the pandemic, for example, digital marketing will now be the norm in many situations, and brands will need to be built on multiple platforms accessing multiple stakeholders. Another industry expert was of a similar view that the two aspects could not be separated because the best way to maintain a brand is to expand it or at least continue to refresh it. If it is not refreshed, at some point, it is going to wear down. A CFO clarified that growth or maintenance is just a function of whether it is for new products or existing products.

iv. Very difficult to compute yield due to multiple factors for growth

A board member felt that it is very difficult to ascertain the yield from a particular advertisement or marketing investment because the eventual returns are a function of the marketing yield and a host of other factors like the product quality, availability, supply-chain efficiency etc. A CFO confessed that no sophisticated model is being monitored for this purpose and that they only look at the overall business and the returns relative to the overall spend that they do.

v. Potential for a vast improvement

An industry expert who has done some analysis of the spending and prescription generation for a couple of players felt that this is an undermanaged area. After studying where the prescriptions are being generated and the level of prescription support in those areas, they concluded that the bulk of the spending is happening in areas where it does not make any difference. Similarly, nobody has any clue on the ideal mix between sampling cost and promotion cost.

A CFO said that it really depends on the size of the market, the growth associated with a particular size for that particular product, and the intensity of competition. You need to have a certain number of cash cows in the business to ensure a minimum base level of performance and then there can be the extra fodder to nurture certain brands. So, a good allocation mechanism is one where certain product is maintained to make sure that they generate the cash to put into newer products which will turn into cash cows later.

An analyst observed a trend of companies intensely increasing the number of sales forces over the last two years because they think that adding numbers will deliver more value.

Annexure 7: 1st Questionnaire on Resource Allocation to Strategy

For senior managers of Dr. Reddy's Laboratories Ltd.

(please tick your response in the appropriate circle)

- 1) Dr. Reddy's implemented the viable vision initiative in 2008. The underlying principles of the initiative is based on the 'Theory of Constraints' (TOC). A few processes and metrics e.g. full-kitting, identifying critically constraining resource (CCR), throughput (T), operating expense (OE), T-OE etc. are continued to be followed in the organisation as part of TOC principles. Do you think that TOC has helped the organisation in resource deployment decisions in the following categories?

Categories	Yes	No	Do not Know
a. R&D, Innovation & Technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Capacity/ Infrastructure creation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Inorganic Moves (M&A)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Organic Expansion incl. new business, new market, marketing & brand building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Leadership Capability development incl. Digital & Analytics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Return to Shareholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 2) Dr. Reddy's implemented strategy deployment process (SDP) since 2016. The underlying principles of the initiative is based on the Hoshin Kahnri and continuous improvement. A few processes and metrics e.g. lean daily management (LDM), strategic priorities, target to improve (TTI) etc. are followed in the organisation as part of SDP/LDM. Do you think that SDP has helped the organisation in resource deployment decisions in the following categories?

Categories	Yes	No	Do not Know
a. R&D, Innovation & Technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Capacity/ Infrastructure creation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Inorganic Moves (M&A)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Organic Expansion incl. new business, new market, marketing & brand building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Leadership Capability development incl. Digital & Analytics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Return to Shareholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 3) Please indicate your agreement/disagreement with the following statements?

Statement	Stongly		Strongly	
	Agree	Agree	Disagree	Disagree
a. Overall SDP influences resource allocation in DRL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Overall TOC influences resource allocation in DRL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Overall TOC has more significant influence than SDP in resource deployment decision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Overall SDP has more significant influence than TOC in resource deployment decision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1st Questionnaire on Resource Allocation to Strategy (Continued)
For senior managers of Dr. Reddy's Laboratories Ltd.
(please tick your response in the appropriate circle)

4) Please indicate your level of understanding/ assessment of effectiveness on the following? (Level of understanding - Level I: Very confident to implement/drive; Level II: Confident to implement/drive; Level III: Not confident/need to learn more; Level IV: Not aware/cannot comment; Assessment of effectiveness – Level I: Very high; Level II: High; Level III: Moderate; Level IV: Low)

Subject elements	Level I	Level II	Level III	Level IV
a. Theory of Constraints (TOC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Strategy Deployment Process (SDP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Resource allocation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Dr. Reddy's business strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Effectiveness of DRL resource allocation to strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5) Please indicate about your Role Band, Tenure of Service and Area of work

- a. Role Band – Red Orange Yellow Green
- b. Tenure of Service 0-4 years 4-8 years 8-12 years >12years
- c. Area of Work R&D Mfg/Qlty Sales/Mktg Others

6) Please write any thoughts or suggestions on how to do dynamic resource allocation to deliver the business strategy of Dr. Reddy's Laboratories Ltd.

Annexure 8: 2nd Questionnaire on Resource Allocation to Strategy

For CEOs, CFOs and board members of a generic pharma company

A. With relation to the introduction (and also warming up for the main questions) -

1. What role do you play in deciding allocation of resource to deliver the business strategy of your organisation and how do you play that role? Would you like to give some success stories and if applicable, one failure story?
2. What are the issues that prevent you from doing resource allocation well? How did you try to overcome such issues? Can you please cite any specific example?
3. How critical is 'dynamic resource allocation' in your context? Do you have any framework for that? If so, can you please describe the framework with its elements and interconnection among them?

B. With relation to the posits-

4. What are the various sources of cash/fund for resource deployment that you may have used in your organisation in the past and potentially use in the future?
Nudging question: Monetisation of assets, divestment etc.
5. What are the various categories of deployment of resources across various business units in your organisation?
Nudging question: Creation of intangible resource, e.g., IP, digital platform etc.
6. What are the various factors which influence decision making, organisation culture, execution excellence and consequently delivery of business strategy in your organisation?
7. What are the various options for dynamic resource allocation in a deployment category/SBU in your organisation?
Nudging question: augment, reduce etc.
8. How do you decide strategic priorities and moves in your organisation?
9. How do you create alignment to your business strategy and consequently accountability for each person responsible to deliver business strategy?
10. How do you mitigate the execution risk to your business strategy?
11. How do you prioritise among the various strategic priorities?
12. How do you dynamically evaluate and reallocate resources?

2nd Questionnaire on Resource Allocation to Strategy
(Continued)

13. Have you ever deployed the ‘Theory of Constraints’ in your organisation? If yes, please describe your experience with TOC and its applicability in ‘resource allocation’ decision.
- Nudging questions:
- i. Applicability in resource allocation
 - ii. Possible response for questions 11 to 12
- C. With relation to the problems faced by the board, CEOs and CFOs in considerations in the search for deployment options:
14. What kind of trade-off do you take between short term profitability and long-term growth in allocating resource to R&D?
15. How do you take decisions to expand to a new market in view of the strategic dilemma between focus and reach particularly in the wake of regulatory and supply chain complexities to service multiple countries?
16. What is the mechanism your organisation adopted to segregate between investments for ‘growth’ and for ‘maintenance’ in marketing and brand building, including monitoring of the yields on such Investments?
17. How much portion of capital does your organisation set aside for incubation of experimental/innovative ideas?
18. Do you apply a hard stop-loss limit on resource allocation to incubation businesses? If yes, how do you decide that?
- D. Problems faced by the board, CEOs and CFOs in considerations with the tools for dynamic reallocation along with ongoing evaluation and monitoring:
19. How do you ensure the productivity of capex Investments? Do you use any specific tool?
20. How do you improve the success-rate of your M&A? Any specific strategic/tactical considerations?
- E. Anything else the interviewee may like to add

Annexure 9: 3rd Questionnaire on Resource Allocation to Strategy

For industry experts including investors, analysts, consultants and other intermediaries related to the generic pharma industry

1. In your experience with various companies belonging to this industry, what are the factors in the business environment that you have observed influencing the business strategy and/or execution in any individual company?
2. What are the common mistakes that you have observed in resource allocation in this industry?
3. What are some of the good examples of dynamic resource allocation to deliver business strategy in the generic pharma industry?
4. What is the right trade-off between short term profitability and long-term growth in allocating resource to R&D?
5. How should the decision to expand to a new market be taken with due deliberation and the space selection managed dynamically in view of the strategic dilemma between focus and reach? (remains pertinent particularly in the wake of regulatory and supply chain complexities to service multiple countries)
6. What should be the mechanism to segregate between investments for ‘growth’ and for ‘maintenance’ in marketing and brand building, including monitoring of the yields on such investments?
7. How much portion of capital should a company set aside for incubation of experimental/innovative ideas?
8. Should there be a hard stop-loss limit on resource allocation to incubation businesses?
9. How does a company ensure the productivity of capex investments? What is the right trade-off between availability and efficiency? Should divestment of idle assets be recognised as an active part of resource allocation policy?
10. How does a company improve the success-rate of its M&A allocations? Can a resource allocation framework channelise the M&A investments in the right spaces?
11. Anything else the interviewee may like to add

Annexure 10: Works Cited

1. Ahuja, Gautam and Novelli, Elena, 2017. 'Activity Overinvestment: The Case of R&D', *Journal of Management*, Vol. 43 No. 8: 2456-2468
2. Anand, Bharat, David J. Collis, and Sophie Hood, February 2008 (Revised November 2015). "Danaher Corporation." Harvard Business School Case 708-445,
3. Arrfelt, M., Wiseman, R.M., Mcknamara, G., and Hult, G.T.M., 2015. 'Examining a key corporate role: The influence of capital allocation competency on business unit performance', *Strategic Management Journal*, 36: 1017-1034
4. Bardolet, D., Brown, A. and Lovallo, D., 2017. 'The effects of Relative Size, Profitability, and Growth on Corporate Capital Allocations', *Journal of Management*, Vol. 43 No. 8: 2469-2496
5. Bartlett, Christopher and Ghoshal, Sumantra, 1994. 'Beyond the M-form: Toward a managerial theory of the firm', *Strategic Management Journal*, 14(S2): 23-46
6. Bower J.L., 1970. 'Managing the Resource Allocation Process', Harvard Business School Press
7. Bower, J.L. and Gilbert, C.G., 2005. 'From Resource Allocation to Strategy', Oxford University Press
8. Boyer, Ernest L., 1990. 'Scholarship Reconsidered - priorities of the professoriate'
9. Buffet, Warren 1984. 'letter to shareholder', Berkshire Hathaway annual reports
10. Burgelman, R.A., 1983. 'A Model of the Interaction of Strategic Behaviour, Corporate Context, and the Concept of Strategy', *Academy of Management Review*, 8: 61-70
11. Burgelman, Robert A., 2005. 'The Role of Strategy Making in Organisational Evolution', 'From Resource Allocation to Strategy', Oxford University Press:409-426
12. Busenbark, J.R., Wiseman, R.M., Arrefelt, M. and Woo, H., 2017. 'A review of the Internal Capital Allocation Literature: Piecing together the Capital Allocation Puzzle', *Journal of Management*, Vol. 43 No. 8: 2430-2455
13. Chandler A.D., Jr. 1962. 'Strategy and Structure – Definition of Business Strategy includes allocation of resources', MIT Press
14. Chatterjee, S. and Wernerfelt, B. 1991. 'The link between resources and type of diversification: Theory & evidence', *Strategic Management Journal*, 12: 33-48
15. Chris Bradley, Martin Hirt and Sven Smit, 2018. "Strategy beyond the hockey stick. People, probabilities, and big moves to beat the odds", Mckinsey & Company
16. Christensen, C.M., 1997. 'The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail', Harvard Business School Press
17. Cohen, O., 2008, 'Ever Improve'
18. Cohen, W.M. and Levinthal, D.A., 1990. 'Absorptive Capacity: A new perspective on learning and innovation', *Administrative Science Quarterly*
19. Doz, Y. and Kosonen, M., 2008. 'The dynamics of Strategic Agility: Nokia's rollercoaster experience', *California Management Review*
20. Eisenmann, T.R., 2002. 'The Effects of CEO Equity Ownership and Diversification on Risk Taking', *Strategic Management Journal* 23: 513-534

Works Cited (Continued)

21. Eisenmann, T.R. and Bower, J.L., 2005. 'The Entrepreneurial M-Form: A Case Study of Strategic Integration in a Global Media Company', 'From Resource Allocation to Strategy', Oxford University Press:307-329
22. Fourne, S.P.L., Jansen J.J.P. and Mom, T.J.M., 2014. 'Strategic Agility in MNEs: Managing Tensions to Capture Opportunities across Emerging and Established Markets', California Management Review
23. Garvin, David A., 1993. 'Building a learning organisation', Harvard Business Review 71: 78-91
24. Gilbert, C.G. and Christensen, C.M., 2005. 'Anomaly-Seeking Research: Thirty Years of Theory Development in Resource Allocation Theory', 'From Resource Allocation to Strategy', Oxford University Press:71-92
25. Gilbert, C.G., 2001. 'A Dilemma in Response: Examining the Newspaper Industry's Response to the Internet.', The Academy of Management Best Paper Proceedings Series.
26. Goldratt, E.M., 1984. 'The Goal'
27. Goldratt, E.M., 1990. 'The Haystack Syndrome'
28. Goldratt, E.M., 1990. 'Theory of Constraints'
29. Goldratt, E.M., 1994. "It's Not Luck"
30. Goldratt, E.M., 1997. 'Critical Chain'
31. Goldratt, E.M., Schragenheim, E. and Ptak, 2000. 'Necessary but Not Sufficient'
32. Graham J.R. and Harvey, C.R., 2001. 'The Theory and practice of Corporate Finance', Journal of Financial Economics.', Vol. 60 : 187-243
33. Gratton, Lynda, 2000. 'Living Strategy: Putting People at the Heart of Corporate Purpose', Financial Times Prentice Hall
34. Hamel, G. and Prahalad, C.K., 1990. 'The core competence of the corporation', Harvard Business Review
35. Hoskinsson, R.E., Harrison, J.S. and Dubofsky, D.A., 1991. 'Capital Market evaluation of M-form implementation and diversification strategy.', Strategic Management Journal, 14: 215-235
36. Kaplan, Robert and Norton, D.P., 1996. 'The Balanced Scorecard: Translating Strategy into Action', Harvard Business School Press
37. Kuemmerle, Walter 2005. 'The Process of International Expansion: Comparing Established Firms and Entrepreneurial Start-ups', 'From Resource Allocation to Strategy', Oxford University Press:176-206
38. Lawrence, P.R., Lorsch, J.W., (1967): Organisation and Environment: Managing Differentiation and Integration. Boston, Massachusetts: Harvard University
39. Levinthal, Daniel A., 2005. 'Comments on the Resource Allocation Process', 'From Resource allocation to Strategy', Oxford University Press:403-408
40. Maritan, Catherine A. and Lee, Gwendolyn K., 2017. 'Resource Allocation and Strategy', Journal of Management, November, Vol. 43 No. 8: 2411-2420

Works Cited (Continued)

41. Markides, C., 1997. 'Strategic Innovation', Sloan Management Review, Spring : 9-23
42. Michael Birshan, Thomas Meakin, and Kurt Strovink, 2017. 'What makes an exceptional CEO', Mckinsey Insights.
43. Nelson, R.R. and Winter, S.G., 2002. 'Evolutionary theorizing in economics', Journal of economic perspectives
44. Noda, T. and Bower, J.L., 1996. 'Strategy Making as Iterated Processes of Resource Allocation', Strategic Management Journal 17 I: 69-92
45. Peteraf, Margaret A., 2005. 'Research Complementarities: A Resource based view of the Resource Allocation Process Model (and Vice Versa)', 'From Resource Allocation to Strategy', Oxford University Press:409-426
46. Podolny, J., 2005. 'CEO as Change Agent?', 'From Resource Allocation to Strategy', Oxford University Press: 427-438
47. Porter, Michael E., 1980. 'Competitive Strategy: Techniques for analysing Industries and Competitors', Free Press
48. Raynor, Michael E., 2005. 'Strategic Flexibility: Corporate Level Real Options as a Response to Uncertainty in the pursuit of Strategic Integration', 'From Resource Allocation to Strategy', Oxford University Press:330-364
49. Roberts, John 2005. 'Resource Allocation, Strategy, and Organisation: An Economist's Thoughts', 'From Resource Allocation to Strategy', Oxford University Press: 395-402
50. Schragenheim, Dettmer and Patterson, 2009. 'Supply Chain Management at Warp Speed'
51. Sengul, M. and Gimeno, J., 2013. 'Constrained delegation: Limiting subsidiaries' decision rights and resources in firms that compete across multiple industries', Administrative Science Quarterly
52. Sengul, M., Costa A.A. and Gimeno, J., 2019. 'The Allocation of Capital within Firms', Academy of Management Annals, 13/1: 43-83
53. Slywotzky, A.J. and Drzik, J., 2005. 'Countering the biggest risk of all', Harvard Business Review, 83(4): 78-88
54. Souder, D. and Bromiley, P., 2017. 'Timing for Dollars: How Option Exercisability Influences Resource Allocation', Journal of Management, 43: 2555-2579
55. Stein, J.C., 2002. 'Information Production and Capital Allocation: Decentralised versus Hierarchical Firms', Journal of Finance, 57: 1891-1921
56. Sull D., 1997. 'No Exit: Overcapacity and Plant Closure in the U.S. Tyre Industry', The Academy of Management Best Paper Proceedings, 45-9
57. Sull, Donald N., 2005. 'When the Bottom-up Resource Allocation Process Fails', 'From Resource Allocation to Strategy', Oxford University Press: 93-98
58. Teece, D.J., Pisano, G. and Shuen, A., 1997. 'Dynamic Capabilities and Strategic Management', Strategic Management Journal, 18: 509-34
59. Thomas Corbett, 1998. 'Throughput Accounting'

Works Cited (Continued)

60. Thorndike, William N. Jr., 2012. 'The Outsiders: Eight Unconventional CEOs and Their Radically Rational Blueprint for Success', Harvard Business Review Press
61. Vieregger, C., Larson, E.C. and Anderson, P.C., 2017. 'Top Management Team Structure and Resource Reallocation within the Multibusiness Firm', *Journal of Management*, 43: 2497-2525
62. Williamson, O.E., 1975. 'Markets and hierarchies, analysis and antitrust implications: A Study in the economics of internal Organisation', New York: Free Press
63. Witcher, B., 1999. 'Hoshin Kanri, How Xerox Manages', *Long Range Planning*, June 32(3), 323 - 332
64. Yves L. Doz, 2005. 'Resource Allocation Processes in Multidimensional Organisations: MNCs and Alliances', 'From Resource Allocation to Strategy', Oxford University Press:365-394
65. Zahra, S.A. and George, G., 2002. 'Absorptive capacity: a review, reconceptualization, and extension', *Academy of Management Review*
66. Zairi, M. and Erskine, A., 'Excellence is Born out of Effective Strategic Deployment: The Impact of Hoshin Planning', *International Journal of Applied Strategic Management*: Vol 2 Issue 2

----- End of Document -----