CHAPTER 6
SUMMARY AND CONCLUSION

This is the final chapter of dissertation that provides a discussion on the envisaged research objectives. The findings of this research provide a number of recommendations for both researchers and practitioners. The research implications, key findings, theoretical contributions and managerial implications have been described in the subsequent sections. Finally, the research limitations and suggestions for future research are discussed before providing conclusion to this thesis.

6.1 Research implications

The study inquires into the local drug adoption situation against the global drug adoption process by examining the relationships among the communication dimensions, stemming from the diverse sources of information access. This research sheds light on how these are related to healthcare outcome at both firm- and patient-level.

The research gap was identified after an in-depth literature review. The gap between global and local adoption has been identified after a thorough literature review. First, it identifies stakeholders involved directly or partially in determining the drug adoption for new late-entrants. Second, the concepts are drawn from the theory-driven constructs, used frequently in healthcare. The study also provides a thorough understanding of the variables that might play a role in answering the research question. Third, the study discusses and explains the relationships that have been hypothesized between these variables in conceptual or empirical studies. Lastly, it identifies an instrument for measuring drug adoption to compare and to present a contrast among these variables with earlier studies. After identification of research gaps, questions for the study were formulated. To facilitate attaining the three major research objectives as discussed in Chapter Three, a framework revealing the complex relationships that exist
between the contextual variables was developed. Both empirical and non-empirical approaches were adopted to test the propositions set out in the research framework. Based on the Venkatesh’s Unified Theory of Acceptance and Use of Technology (UTAUT) theory with its extension in Technology Adoption Model (TAM) 2 [136-138] and supported by Ajzen’s (1980) Theory of Planned Behaviour (TPB), the direct and indirect effects of drivers on drug adoption were examined [199]. A multivariate data analysis was adopted to delineate several interesting results from which a series of conclusions have been drawn and implications provided in the rest of this chapter.

6.1.1 Key findings

This section presents the significant findings from this research, starting with providing the insights on theoretical contribution. Next, a strategy-making process for improving adoption of prescription drugs into healthcare value chain has been delineated. Strategies at stake-holders level are explored. With subsequent exploration and explanation of the local drug adoption process in which the strategy-making processes occur, the business knowledge emerging from these processes has been discussed. Finally, the confirmatory models tested in this thesis, are reviewed in the light of policy development, thereby improving the healthcare outcome in India.

Little research has been done in academics about how prescription intent of medical practitioners is affected by communication drivers. The research findings guide for choosing a suitable strategy to improve the drug adoption process, connoting both treatment efficiency and firm sustainability. The following findings are summarized as support for strategy building:

i. The key finding was that the marketing communication did not directly influence the drug adoption process in presence of other competing variables. Instead, all variables operated through word of mouth communication, impact drug adoption. The variable, prescription intention, mediates the relationship
between marketing communication and social communication indicated by word of mouth exchanges between physicians.

ii. Furthermore, the physicians’ experience had moderated the relationship among the communication drivers, influencing drug adoption. The study also addresses the knowledge gap in respect to Indian pharmaceutical managers working in tandem with medical practitioners for successful product launch with single chemical-entity drug formulation.

iii. Moreover, this research contributes to the body of knowledge as it attempts to explore the role of communication in order to create awareness among influencers or imitators, and highlights the benefits of modifying existing, tried-and-tested products [15, 37, 40-41].

iv. Since supply chain integration efforts involve costly, and often risky, managerial decisions, it is imperative to operationalize the communication dimensions using the TAM2 principle [138]. This research endeavours to make the healthcare value chain responsive [7] not only for the providers (i.e., firms’ marketers and doctors), but also for the consumers (patients).

The rising cost, fragmented market and multiple competitors make the scope of success for the late-entrants very doubtful as observed from the SEM results. Probably, due to the non-standard communication dimensions, the adoption of late-entrant branded ARB is at lower level ($r^2$ for ARB drug adoption is 0.20) as depicted in Figure 5.5 of Chapter Five. This revelation should equip marketers to identify attributes of pre-purchase evaluations which are more likely to be affected by negative WOM that mediates adoption. These finding indicates that lack of drug-marketers’ surveillance on doctors’ WOM transactions, remains the root cause for lower adoption behaviour.

### 6.1.2 Theoretical contributions

Based on the extant literatures on technology adoption models [36], theoretical relationships among the communication dimensions impacting drug adoption [37-38]
were established. The acceptance of four hypotheses in the pivotal quantitative study, as tabulated in Table No 5.6 of Chapter Five, reflects linkage to the theoretical perspectives as discussed below:

- TAM dimensions such as perceived usefulness, perceived ease of use, perceived behavioural control (i.e., doctor’s prescribing intentions to buy) and social influence, need to be integrated to a communication model for drug adoption in emerging or highly unpredictable markets.

- Another stream of literature examines modern social capital theory [39], in context to pharmaceutical firms, engaging in social relationships with influential doctors, in order to gain resourceful access to prescription generations [21]. Following Webb and Sheeran [75], the intention to adopt (technology based product) lowers the adoption behaviour. Hence, applying the attitude model of social cognitive theory [76], prescribing intention was measured for promoting adoption or diminishing switches to other brands.

- The present study develops a communication framework, based on information supplied by marketing and social information transactional channels, anchored to information diffusion theory [236].

Despite the fact that existing models on perceived adoption intentions mostly consider price sensitivity and advertising effects [53,12, 291], the impact of communication drivers [321, 137] on drug adoption, based on the dimensions of imitation theory [70,73,156], has not been previously explored in Indian context. Given the influence of mediation effect of adoptees’ experience, communication under social influence, was related to the theories of Bandura’s SCT [124], Fishbein and Ajzen’s TPB [199] and Venkatesh’s UTAUT [136], to address the research proposition. However, the insignificant relationships had also been addressed, touching upon the theoretical concepts of intention and adoption models in discussion section of Chapter Five. Under the given backdrops, the drug adoption has not been guaranteed, explaining
the insignificant (H3) and (H6) direct relationship, as visualized in Figure 5.8. Further research, in this direction, might aim to replicate the study finding.

6.2 Managerial implications

This study, therefore, yields several implications for firm-managers that will ensure quality communication with and training for the doctors. The next section discusses these implications and provides insight on how they could be helpful in improving business practices.

6.2.1 Implications for business practice

Covin and Slevin argued that an empirical research, managerial experience, and theoretical underpinnings for both process and context are essential ingredients for improving business practices [412]. Firms engaged in strategizing cost reduction for drug adoption in a domestic market, can make use of the techniques developed in this study. The developed instrument, meeting the research objective to a certain extent, is less time-consuming, less expensive, and better suited to new-entrants firms launching late-entrant products.

Instead of applying the traditional marketing process, firms adopting this study’s strategy can easily develop communication relationships with stakeholders and work with them as part of a team to include their suggestions in strategy-making processes. Practitioners may find this research instrument valuable as a support for their business objectives and are suggested to practice simplistic strategic path. If firms engage in these practices, it is likely that they will improve their drug adoption performance, which in turn will improve healthcare outcomes for the nation. Eventually, with the improvement of healthcare quality services, the use of communication indicators can enrich social progress for the country. However, an overly narrow focus on strategy development that does not consider environmental challenges and market dynamics may reduce the new product success rate in the market place [314]. Based on
intersecting multiple methods with multivariate data analysis techniques, this research built an operational framework for improving the level of drug adoption. Further, firms that spend frugally on professional managers and marketing consultants to develop communication based drug adoption model might lose competitiveness with new LEGPD launches. As domestic firms still lack risk analysis capabilities, this study projects business risk associated with the sharp rise in R&D expenses for late-entrant drug launch of new drugs.

Another implication is that product differentiation and marketing innovation can be used to obtain increasingly favourable drug adoption decisions in the fragmented indigenous market. The support from government agencies, from training, and from mentoring should help late-entrant firms to overcome the persisting communication barrier between firms and medical practitioners, i.e., the LEGPD adopters. Instead of having to increase the sales force and incur the cost burden involved in new LEGPD detailing to achieve adoption, it should be possible to employ the proposed strategy-making processes to link the resources to envisaged business objectives efficiently. Finally, following Miller’s strategy, the context should be integrated with different strategy-making processes for diverse types of firms that are exposed to different circumstances and different environmental challenges [413]. As marketing competition is intense for late-entrants, neither the old practices nor the employment of highly experienced (no less than ten years) decision-makers suffices, as the subtle confluence of adoption and resistance to it will inevitably be overlooked, unless a comprehensive study on prescription decision-making is undertaken exhaustively.

6.2.2 Implications for patients’ wellness

This research investigation, using a holistic approach to the study of drug adoption, illuminates the patients’ perspective regarding quality healthcare. The patients’ demand for wellness as a quality of life feature have been negatively affected by the observed lacuna in medical communication as revealed in the retrospective case study (discussed in the Chapter Four). More specifically, patient characteristics play a negligible role in
prescribing anti-hypertensive drugs. The miniscule influence of patients’ characteristics in prescription decision-making has opened avenues to improve patients’ wellness as a benefit of increasingly effective communication transactions, a notion that has been ignored by policy-makers and the regulatory authorities. With improved communication, the healthcare agencies should be able to manage an anti-hypertensive drug’s side effects on patients, a process that can be maximized if the regulatory bodies actively support the flow of medical communication through the channels of the medical supply chain. Awareness from the producer-prescriber relationship, for improving a quality healthcare chain, based on communication of both the benefits and risks in new late-entrant consumption, has been created in this research.

The failure of firms to develop adequate measures to handle adverse-event monitoring systems for patients within Indian healthcare institutions is commonly in evidence. The use of a poor or un-standardized (or both) communication network for sharing information about the new branded extensions can trap the current healthcare system in a circularity. Based on the blueprint for the firms’ allocation of funds, the entire spending on marketing and advertising is unrelated to and will not positively influence the quality of treatment. Further, this allocation will not improve trust and confidence for prescribers of late-entrant adoptions. The substantial allocation of funds to corporate social responsibility could bridge the communication gap between the healthcare providers and consumers, perhaps through a patient-based medical information and communication system connecting healthcare providers with consumers and designed specifically to meet the patients’ needs. Moreover, the integration of the patients’ perspective on treatment decisions is indicative of good healthcare for a progressive society. In summation, this study suggests that doctors’ training require a focus on practicing patient–centred communication so that decisions regarding the prescription of late-entrant pharmaceuticals can be made on an informed basis.
6.2.3 New Insights for practitioners

This study agrees with the literature findings that social contact is an important construct in predicting drug adoption as summarized from the pivotal study results (Chapter Five). To improve the direct influence of the marketing on the adoption decisions, communicated messages may be customized with an intuitive approach. For example, the framing of arguments as questions [399] while detailing draws support because this technique increases clarity of communication regarding drug benefits.

The reason for lower adoption of late-entrant ethical drug that has been linked to poor healthcare outcome can now be better understood. Both marketing communication and intention to prescribed LEGPD operate through word of mouth (WOM) communication dimension, suggesting social on adoption decision. To optimize the WOM dimension, the senior peers and junior doctors can also be reached at the same time in presenting the details regarding product characteristics so that the pharmaceutical firms ensure the higher adoption and conformity of use of a quality product. WOM communication regarding drug adoption is an indicator of quality healthcare program as it contributes to the nation’s positive healthcare outcomes. Finally, organizational support for reducing prescriber or consumer resistance becomes highly essential. Learning from the expectation outcome theory, the management can further attempt to increase the benefits for substituting from the pioneer drug to a late-entrant counterpart.

6.2.4 Global perspective

This study addresses both macro- and micro-level perspectives that emerge from the critical evaluation of dissertation findings. The macro-level issues are a reflection of the diverse sources of information that reach the medical decision maker through communication channels. The information asymmetry, varying multi-tasking abilities of doctors, unavailability of data regarding LEGPD action on behalf of patients, and fragmented marketing communication contributed to a higher degree of adoption
uncertainty in emerging markets like India. The variation in communication diffusion that influenced prescription decision-making for competitive generic products has emerged as a global problem for both providers and consumers, especially for high density population nations, ranked lower in SPI indices.

As initially discussed in this thesis, since India shares the same socio-economic background as other members of BRICS and SAARC, healthcare indicators might point to comparable outcomes. Given the environmental factors presented above, a path for favourable healthcare progress has been presented. The financial stimulus alone may not suffice for high quality medical care in SAARC countries such as India, Pakistan, Bangladesh and Sri Lanka and may not improve the healthcare performance substantially [3]. The experience of nations with higher SPI rankings can be beneficial to the improvement of healthcare conditions in India, if these are implemented using the strategy formulated in this dissertation. Adequate companion policies for healthcare delivery, supported with substantial funding from government and supplemented by insurance, can significantly improve healthcare in these nations.

More precisely, business theorists and practitioners in such countries can also use this instrument for evaluating healthcare service quality, especially in predicting new drug adoption among consumers. Using this newly validated communication framework, a global perspective of healthcare service delivery has been elucidated, allowing other emerging markets to follow the same path. The theoretical model that links prescription choice with communication drivers of adoption of late-entrant ethical drugs demonstrates, to a certain extent, a comparable relationship between the studies conducted in developed or developing nations.

The following micro-level issues, based on the insights from this study, can also be used for trade and commerce opportunities globally:

i. The current scenario of the healthcare industry is challenging as it neither supports indigenous drug producers’ huge investments for late-entrant drugs, nor fulfils the healthcare quality demands of patients, as evident from the low drug adoption findings. Therefore, both the suppliers and healthcare providers need to
collaborate to fill this institutional gap; otherwise, India, as a favoured global destination for medical tourism, might not be sustainable. A strong healthcare outcome is the focus of this study; however, the evidence based practice might not fulfill the ethical prescription requirements while treating patients.

ii. A dynamic and active close relationship with the practicing doctor team and the provision of detailed specifications on the disease risk minimization characteristic of products (i.e., drug formulation) could help to avoid costly failures in late-entrant brand launches. A pharmaceutical marketing model, based on an improved social relationship with both new and experienced doctors, could minimize variations in new LEGPD adoption decisions. Following Monteiro, et al.’s modelling with moderating variables [64], this study evaluated the intervening effect of prescription intention implemented in an SEM model, predicting the prescription outcome for new late-entrants.

Price sensitivity has not emerged as a driver for hypertension treatment, which depicts quality-centric consumers opting for the services of private hospitals in the NCR regions of India. An informed and quality conscious ‘patient alliance’ preferred to adhere to costly pioneer drugs despite the fact that generic counterparts perform better in terms of safety and efficacy. Therefore, compromising quality against price is not beneficial for drug marketers supporting NCD management for private healthcare institutions.

iii. Thus, these results emphasize that communication drivers accurately reflect late-entrant (ARB) drug adoption scope and opportunities in an unpredictable market. Otherwise, the healthcare value chain becomes unresponsive, despite huge investments from drug producers. Foreign direct investment, with friendly taxation, should be solicited to promote medical tourism. Support from global investors improves the fund crunch of domestic R&D based pharmaceutical firms. To summarize, medical communication needs to be oriented toward value based prescription, rather than volume based, low margin drug marketing [1, 3].
6.3 Limitations

While the findings provide both theoretical bases and managerial implications, some issues that constrained the study need to be considered when interpreting the results. The limitation of the study suggests caution when drawing conclusions from the thesis.

The ethical issue that impacted the research finding was maintaining utmost confidentiality. Intentionally, no pharmaceutical company was named or represented during the survey to preclude bias due to firm loyalty. Confidentiality of information from the survey was preserved by not including the names of private hospital institutions, as well as doctors and patients who voluntarily completed the questionnaires and agreed to appear in face-to-face interviews. Healthcare institutions were cited anonymously, using size, infrastructure and type of practitioners and consumers treated. The usage of data was restricted to gleaning information to develop into a thesis and publishing research papers that may result there from., strictly keeping confidential the volunteers or respondent data.

First, the research framework, the variables and the relationships suggested in this thesis are comprehensive, but certainly not exhaustive, in predicting the drug adoption process. The data analysis simply shows that some unknown factors related to drug adoption are underlying. Approximately twenty percent of the variation in drug adoption process can be explained by the use of suggested research processes. The development of strategy can only be possible if healthcare institutions, prescribers and drug producers are ready to communicate sufficiently to improve the healthcare outcome of consumers. Furthermore, the fact that the regression analysis and SEM models did not explain a significant variation in drug adoption performance suggests that operation practices or supply chain issues may be equally affecting the model.

Second, research regarding different pricing strategies and the impact of those strategies on consumers’ adoption and prescription practices for late-entrant drugs, based on single moiety or FDC, and could have been further explored. Since doctors
have been asked direct questions about attribute variables, it seems appropriate to consider how well these self-reported measures adhere to actual prescribing behaviour, given that the chance to ignore some attributes while prescribing always exists.

Despite the data collection being conducted in two phases involving pilot study and pivotal study management, the bias in field survey response (with RMSEA = 0.8 after analysing SEM for pivotal study) cannot be completely ignored. In this study, some of the variables that were omitted may still have an effect. Moreover, a multivariate model was used to minimise this effect.

Given that this research has used limited samples due to practical feasibility, a larger sample size, probably a multicentre study design could have included more items for each dimension. However, pursuing a longitudinal study, examining the rate of changing perceptions, can also reveal more prominently the uncertainty underlying in adoption of LEGPDs. This limitation also leaves room for future research.

- Additionally, the relationships of uncertain prescribing decisions of drug adoption studied in this research are exploratory in nature; as such, further research is needed to validate and improve these measures. Moreover, inclusion of dimensions of Theory of Resistance [254], Expectation Confirmation Theory [399] and Elaboration Likelihood Model (ELM) of persuasion [389,390] may have supported the affect of marketing communication and intention influence on drug adoption. Unexplained factors that affect the strength of the dimensions in a model could have better explained the variance of drug adoption.

- While, the results of this study are focused on responses received from individual doctors residing in sub-continental India, it is possible that results could vary for other countries. The generalisability of the result to other settings is questionable; according to Hofstede [277], different cultures may show preferences toward different business relationships.

The disconnect between economic growth and social progressive index affects the healthcare outcome of a country. Since healthcare communication can be an indicator of healthcare SPI, the level of prescription intention or drug adoption
will vary from country to country. Thus, geographic disparities in the context of drug technology adoption could have minimised those cross-national differences.

6.4 Future research

This study offers suggestions for future research as discussed below:

- Rogers (2003) indicated that cross-sectional survey data are unable to answer many of the ‘why’ questions about diffusion [321]. This could be due to the fact that adoption performance has a time lag. As discussed in the limitation section of this Chapter, a time-series analysis employing longitudinal survey as well as inclusion of decomposition approaches [41], could also be undertaken in the future.

- Future research should also incorporate a kinetic study based on patients’ micro-level responses to new generic drugs for chronic diseases like diabetes, arthritis, etc. Considering the limitation stated above, the study can be extended beyond India. This approach could support a responsive healthcare chain in India and other allied emerging markets to capture the cultural dimension of Hofstede [178].

- Furthermore, in order to understand the weak relationship between marketing communication and drug adoption performance, it is necessary to explore this relationship in the presence of contextual factors like fragmented market, size of the firm, and local regulatory and governmental policies.

- Integrating computer based decision support systems, linking symptoms with branded drug therapy (using a disease taxonomic classification approach), based on real time experience seems essential.

- Last but not the least, future research should focus on applying real world buying situations to discern if similar results occur, indicating any preferential selection of generic prescription drugs based on trust and loyalty. To include
variables in the model, the refinement of instruments to ensure the appropriate measure of items has been suggested. The rate of diffusion of late-entrant drug could be included to widen the scope of future research.

### 6.5 Conclusion

This study represents an exploratory effort to investigate factors affecting prescription drug adoption based on extensive literature, theories, and models. The findings of this study may provide further research motivation to both academia and businesses in medical service or product adoption fields, and may help them to enhance their understanding of drug adoption in general. The study shows that with the increasing complexity of a disease, the perception of adoption changes as a life threatening disease requires greater involvement of patients in decision-making regarding new late-entrant drugs. Specifically, this study extended an existing model of technology adoption in healthcare and presented an extended technology acceptance-adoption model for drug adoption that was successfully supported by empirical investigation.

As the proposed prescribing intention framework is supported by all indicators, it can be concluded that the five basic communication drivers, i.e., perceived usefulness, doctor’s prescription intentions, physicians’ experience, word of mouth communication, and drug adoption are all suitable for measuring adoption decisions in the context of the Indian healthcare market. Integrating marketing communication responses with social influences, anchored to social cognitive theory [124], is the essence of predicting drug adoption in an uncertain environment [179,180,380]. The impact of this research is demonstrated in revealing communication drivers, significantly influenced by word of mouth communication among doctors, that ultimately reduce the adoption of late-entrant branded drugs. This study contributes to the literature by supporting the recent advances of TAM theories [133, 138,139] and the subsequent challenges faced while applied in a practical scenario.
Despite having a few limitations, the study provides comprehensive guidelines to marketing managers and healthcare practitioners alike, in identifying communication strategies for adopting a value-based drug prescription process. These results do not directly contradict previous studies, which found significant relationships between prescribing behaviour and physician characteristics [49-51]. Strategy-making processes and their relationship to firm performance in achieving a higher level of drug adoption depend on a variety of contextual factors such as environmental uncertainty, fragmented market, firm category, and doctors’ prescription intentions. The finalized model indicates that adaptive and/or participative strategy-making seem indicative of a perceived firm’s performance in achieving a positive healthcare outcome.

In summary, this research reveals pharmaceutical firms’ perspectives in leveraging generic prescription drug business, as well as creates awareness for transforming these parameters into a patient oriented, medical decision support system. Business knowledge from this research will support practitioners, both doctors and pharmacists, in making patient-centred prescription decisions by accepting a shared decision-making model. A drug adoption scale for effective communication strategies will determine the survival of single drug formulation against the costly, fixed-dose formulation. Research on communication factors affecting prescribing decisions in India is a pioneering endeavour, as major regions of India are either studied through literature or studied empirically, as shown in previous chapters.

Thus, economic and commercial impact will be significant if this strategic model is used by the healthcare industry to predict medical decision-making. It is expected that the results of this study will increase the motivation of firm managers/new-entrants with late-entrant products to engage in strategy-making activities. At the same time, guidelines for matching specific business needs with individual circumstances can be promulgated. In summation, this research is among the few studies that have examined the linkage between marketing and social communication influences with prescription intent, in order to refine the understanding of the processes through which intention exerts its influence on drug adoption.