

**Implications of the World Health Organization (WHO) regulations concerning the sales
of breast milk substitutes and country-specific indicators per the Diamond Location
theory: A multi-country analysis**

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Abstract

Although multinational firms have placed considerable efforts to improve the safety profile of infant formula milk to best mimic breastmilk, the negative health impacts for both mother and baby remain a threat. For this reason, the World Health Organization launched a demarketing initiative, the International Code of Marketing of Breast-milk Substitutes, to curb the demand for infant formula milk across the globe. This study purposed to investigate the implications of such restrictive regulations on the sales of infant formula milk using a quantitative, multi-country study design. Using the Porter's Diamond Location Theory as the underpinning study framework, data was extracted from secondary sources to test eight hypotheses, mainly around key relationships between the scale of sales of infant formula milk and other independent variables. The study had a number of revelations pointing to direct and/or indirect implications. The scales of sales of infant formula milk were significantly lower in countries with stringent restrictions. Lower sales were also seen in countries with lower innovation indexes, poor water quality, and those with higher fertility rates. Secondary findings resurfaced the central roles of ethics and equity which have long plagued demarketing strategies. This paper offers pragmatic usefulness to firms wanting to gain competitiveness in the infant formula industry. Furthermore, there is academic, policy, and methodological significance concerning demarketing strategies and national competitive advantage theories. At the end, six spheres of recommendations are offered to businesses, policymakers, and scholars.

Keywords: Demarketing, WHO Code, Scale of Sale of Infant Formula Milk, Theory of National Competition of Industries.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Philosophy International Business at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorization and consent to carry out this research.

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Table of Contents

Abstract	ii
Declaration	iii
Table Of Figures	x
Table Of Tables	xii
List Of Acronyms	xiii
CHAPTER 1: INTRODUCTION TO THE STUDY	1
1.1 The Infant Formula Milk versus Breastfeeding conundrum	1
1.2 The Background: The WHO Code is born	4
1.3 The Research Problem	4
1.3.1 Setting the Stage: What is known	5
1.3.1.1 Partial WHO Code implementation	5
1.3.1.2 Links between infant formula feeding and child mortality	5
1.3.1.3 Business projections of the infant formula market	6
1.3.2 Research Gaps: What is unknown	6
1.3.2.1 Insufficient Academic Literature	6
1.3.2.2 Effective business-policy-science interface	7
1.4 Theoretical Framework.....	7
1.5 Research Question(s)	7
1.6 Research Aim(s) and Objective(s).....	8
1.7 Scope of the Research	8
1.7.1 Conceptual Scope of the Study	8
1.7.2 Geographical Scope of the study	9
1.7.3 Definition of Terms	9
1.8 Importance and Benefits of the Research.....	10

1.8.1 Theoretical Benefits	10
1.8.2 Significance to Policy	11
1.8.3 Methodological Significance	12
1.9 Structure of the Document.....	12
CHAPTER 2: LITERATURE REVIEW	14
2.1 Introduction	14
2.2 Porter's Diamond Location Theory (PDLT)	15
2.2.1 Demand Conditions	16
2.2.2 Factor Conditions	17
2.2.3 Related and Supporting Industries	18
2.2.4 Firm Rivalry, Structure & Strategy	19
2.2.5 The Role of Government and Chance	20
2.2.6 PDLT used as a Research Framework	21
2.2.7 Critique of PDLT	22
2.3 Demarketing.....	25
2.3.1 The Historical Evolution of Demarketing	25
2.3.2 The Anatomy of Demarketing	27
2.3.2.1 Types of demarketing	27
2.3.2.2 The Marketing Mix	28
2.3.3 Ethics in Demarketing	29
2.3.4 The WHO Code as a plausible Demarketing Strategy	30
2.4 The Study of Implications	32
2.5 Materiality of Literature Review to the Study.....	34
2.5.1 Identification of Research Gap	34
2.5.2 Study Design Schema	34

2.5.3 Assigning Suitable Study Variables	35
CHAPTER 3: RESEARCH QUESTION(S) AND HYPOTHESES.....	36
3.1 Introduction	36
3.2 Research Questions.....	36
3.3 Research Hypotheses	37
3.4 Conclusions.....	39
CHAPTER 4: RESEARCH METHODOLOGY.....	40
4.1 Introduction	40
4.2 Research Design.....	40
4.2.1 Research Philosophy.....	40
4.2.2 Applicability of Research Design.....	41
4.2.3 Feasibility of Research Design	42
4.3 Research Setting and Population	42
4.4 Unit and Level of Analysis	43
4.5 Sampling Method	44
4.5.1 Sampling Criteria	45
4.5.2 Sample Size	45
4.6 Research Instrument.....	45
4.7 Data Collection.....	46
4.7.1 The Use of Secondary Data Sources	47
4.7.2 Rapid Critique of Secondary Sources	48
4.7.3 Data Collection Step-by-Step	49
4.8 Data Analysis Approach	49
4.9 The Research Quality.....	50
4.9.1 Internal Validity	50

4.9.2 External Validity	51
4.9.3 Reliability	51
4.9.4 Objectivity.....	51
4.9.4.1 Selection Bias.....	51
4.9.4.2 Measurement Bias.....	52
4.9.4.3 Analysis Bias	52
4.10 Methodological Limitations	52
4.11 Ethical Considerations.....	53
CHAPTER 5: RESEARCH FINDINGS.....	54
5.1 Introduction	54
5.2 Methods	54
5.2.1 The Use of the Listwise Technique for Missing Data	54
5.2.2 Establishment of a Denominator Ratio.....	55
5.2.3 Types of Nonlinear Regression Models.....	56
5.2.4 Description of Nonlinear Statistical Parameters.....	56
5.3 Descriptive Results.....	58
5.3.1 Numerical Summaries.....	58
5.3.2 Categorical Summaries	59
5.4 Correlates Results: Testing Study Hypotheses.....	60
5.5 Secondary Observations	65
5.6 Summary of Results	67
CHAPTER 6: DISCUSSION	69
6.1 Introduction	69
6.2 Pattern and Distribution of Data: Use of Nonlinear Models	69
6.3 Discussing Hypotheses	70

6.3.1 H₁: WHO Code and Scale of sales	70
6.3.1.1 The Good of the WHO Code.....	70
6.3.1.2 The Bad Side of the WHO Code	72
6.3.1.3 The Ugly Threat.....	72
6.3.2 H_{2a}: The Role of Innovation as a Factor Condition	73
6.3.3 H_{2b}: Relationship between National Fertility Rates and Scales of sales	74
6.3.4 H_{2c}: The Role of the GDP in the sale of infant formula milk	75
6.3.5 H_{2d}: Dairy Price Index and the Scales of Sales	75
6.3.6 H_{2e}: The Role of Water Quality as a Supporting Determinant	76
6.3.7 H_{2f}: The Role of Geopolitics and the Scale of sales	76
6.3.8 H₃: Infant Formula Milk versus Child mortality rates	78
6.4 Secondary Observations: Ethics & Equity in Demarking Strategies	80
6.5 The Resultant Diamond Model of the Study	82
6.6 Conclusions.....	83
CHAPTER 7: CONCLUSIONS	84
7.1 Introduction	84
7.2 Reflections on the Study Objectives	84
7.3 Research Gaps Revisited.....	85
7.3.1 Residual Research Gaps	85
7.3.2 Business-Policy-Science Interface	86
7.4 Study Contributions	86
7.4.1. Contribution to Academia	86
7.4.1.1 Concerning the PDLT	86
7.4.1.2 Concerning Taxonomies for Demarketing strategies.....	87
7.4.2. Contribution to Business and Policy	87

7.4.2.1 Insights for Firms	87
7.4.2.2 Insights for Policymakers	87
7.5 Study Limitations	87
7.6 Justification of the Study Variables	88
7.7 Future Research Areas	89
7.8 Study Recommendations	89
7.8.1 For Academia	89
7.8.2 For Business	90
7.8.3 For Governments & Policymakers	90
7.9 Concluding Remarks	91
REFERENCES	92
APPENDICES	106
Appendix A: Consistency Matrix for the Study	106
Appendix B: Ethical Clearance from GIBS REC	107
Appendix C: List of Final Study Sample	108
Appendix D: MPhil IB Thesis Purple Pages Dashboard 1 – Page Count	110
Appendix E: MPhil IB Thesis Purple Pages Dashboard 2 – Plagiarism Score	111

Table Of Figures

Figure 1: WHO Code implementation by states.....	5
Figure 2: Geographical Scope of the Study: The Six Regions of the WHO.....	9
Figure 3: Literature Review Roapmad.....	14
Figure 4: The Graphic Model of the PDLT.....	15
Figure 5: Rugmand and Cruz's Generalized Double Diamond Model.....	24
Figure 6: Cho's Nine-Factor Model.....	25
Figure 7: A Dummy Sample of the Research Instrument.....	46
Figure 8: The Six Data Quality Dimensions.....	47
Figure 9: Data analysis approach in phases.....	50
Figure 10: Sample size adjustment during data analysis.....	55
Figure 11: WHO Code implementation by share of countries.....	59
Figure 12: The Democracy Index spread across the cohort.....	59
Figure 13: Statistical relationship between the WHO Code regulations and the scale of sales of infant formula milk.....	60
Figure 14: Statistical relationship between the Global Innovation Index and the scale of sales of infant formula milk.....	61
Figure 15: Statistical relationship between the fertility rates and the scale of sales of infant formula milk in a country.....	62
Figure 16: Statistical relationship between the GDP and the scale of sales of infant formula milk in a country.....	62
Figure 17: Statistical relationship between the water quality and the scale of sales of infant formula milk in a country.....	64
Figure 18: Statistical relationship between the geopolitics and the scale of sales of infant formula milk in a country.....	64
Figure 19: Statistical relationship between the under-five mortality and the scale of sales of infant formula milk in a country.....	65

Figure 20: Low sales, High death hypothesis sketch.....	79
Figure 21: Global child mortality trends.	79
Figure 22: The Resultant Diamond Model of the Study	83

Table Of Tables

Table 1: Table of Key Definitions	10
Table 2: Typology of demarketing strategies.....	27
Table 3: WHO Code’s Seven Legal Measures.....	30
Table 4: Theoretical factors aligned with the assigned study variables.....	35
Table 5: Assumptions of the relevant research paradigm.....	41
Table 6: Description of the study variables with their unity of analysis.....	43
Table 7: List of Secondary Databases.....	47
Table 8: Establishment of denominator ratio.....	56
Table 9: Regression model formulas.....	56
Table 10: Description of the curve parameters.....	57
Table 11: Descriptive Summaries of Numeric Data.....	58
Table 12: Summary of results from regression analysis on the Dairy Price Index as an independent variable.....	63
Table 13: Top ten countries with the highest Under-five Mortality Rates.....	66
Table 14: Top ten countries with the highest Fertility Rates.....	66
Table 15: Top sellers of infant formula milk by geopolitical orientation for the year 2022.....	66
Table 16: Summary of hypotheses and their correlates.....	67
Table 16: Consistency Matrix Adopted By The Researcher For This Study.....	106
Table 17: List of the 128 countries final sample size	108

List Of Acronyms

BMS	Breastmilk substitutes
CAGR	Compound Annual Growth Rate
IFM	Infant Formula Milk
GII	Global Innovation Index
PDTL	Porter's Diamond Location Theory
SDG	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 The Infant Formula Milk versus Breastfeeding conundrum

Infant formula feeding has been associated with adverse health risks for both mother and baby (Stuebe, 2009), despite notable innovations by large infant milk manufacturers to improve the safety profile of their products in the past 150 years (Munblit et al., 2020). Concerns include the health of the mothers themselves, as metabolic sequelae for breastfeeding versus formula-feeding mothers seem to endure long-term. Several studies have shown increased risks of premenopausal breast cancer, late-onset type 2 diabetes which is associated with syndrome x in women who skip breastfeeding (Stuebe, 2009). Among babies, especially in young infants, evidence shows an increased risk of infectious and gastrointestinal diseases, a higher risk of obesity, and more frequent lung aspiration during feeding (Munblit et al., 2020). Not surprisingly, therefore, the literature is adamant that breastmilk is best (Tomori et al., 2022). Subsequently, the World Health Organization (WHO) has taken a keen interest in reducing demand and uptake of infant formula milk through the passing of the International Code of Marketing of Breast-milk Substitutes (also known as the WHO Code in short) (Piwoz & Huffman, 2015). In as much as this code is meant to improve child morbidity and mortality indicators by increasing exclusive breastfeeding rates, forty years later, governments are slow to adopt and some are even stagnant in the implementation of the proposed code (WHO, 2022). Whilst it may be true that breastmilk is best, evidence from pragmatic research provides alternative and compelling narratives on why there is an investment case for breastmilk substitutes.

The first narrative is *medical*. There are medical reasons why mothers cannot breastfeed. Although extreme contra-indications to breastfeeding are rare, there are clinical circumstances where the gains of breastfeeding need to be judged against the adverse risks posed to the baby (Lawrence, 2013). Women living with HIV who might have an unsuppressed viral load count are not advised to breastfeed given the high possibility of HIV vertical transfer from breast to baby (Nlend, 2022). Women on radioactive treatments (Bethesda, 2022) or those struggling with excessive illicit drug abuse are additional scenarios where exclusive breastfeeding may be high-risk (Gray & Spry, 2018).

The second narrative is a mixture of various *societal barriers* such as the rise of women and mothers focused on their careers, as well as single parenthood that also limits the amount of

time mothers can take off before returning to work (Patil et al., 2020). There has been a distressing increase in children forced to take up foster care in the last decade due to unsafe households. Commonly, these households suffer from a range of substance abuse. In the USA alone, between the years 2000 and 2017, there has been a 12% spike in these cases as these breastfeeding setbacks continue to rise (Meinhofer & Angleró-Díaz, 2019).

The third is *welfare or humanitarian support*. In the United States, more than 50% of formula milk is purchased by welfare organizations for vulnerable families (Y. Y. Choi, Ludwig, Andreyeva, et al., 2020). This is not limited to the USA alone as Rabbani et al (2020) highlight, but rather that this is also often done as a response - locally or internationally - to cushion against hunger during natural disasters or prolonged periods of civil distress (Kent, 2006).

Although the mentioned narratives may not be exhaustive, they do force governments to consider both sides of this reality when drafting policies. In this way, governments are burdened with the dual duty to balance the conundrum between saving lives and safeguarding livelihoods (Decerf et al., 2020). Currently, there is no winning formula to this predicament nor are there any published guidelines on acceptable trade-offs (Xiao, 2020). It remains a grey area and a subject of contestation whether government policies, specifically those of restrictive nature which this study interprets as *demarketing*, are indeed effective. A critical question remains: have these restrictions had a meaningful (beneficial or detrimental) impact on the lives and livelihoods of families? A careful literature observation reveals three dominant ideologies surrounding this twisted conundrum.

The *first school of thought* believes that government restrictions are necessary, and protective and act as effective means to curb harmful consumption or uptake of certain health-inflicting products or services (Stead et al., 2007). Using demarketing strategies, these restrictions are often designed as global, regional, or country-specific policy interventions that will disrupt access to that identified product/service. An example of this is the seatbelt movement that policymakers pushed into law many years ago using social marketing skills (Johnston et al., 1994). Although pockets of controversies have emerged about the disadvantages of seatbelts, systematic reviews have consistently defended the protective role of seatbelts over the years, keeping legislation intact (Morrison et al., 2003) (Ganti et al., 2021).

The *second school of thought* believes that restrictive regulations are ineffective and might be harmful to both citizens and businesses. They poke holes in the weak evidence presented to implement additional sin taxes on sugar, and cigarettes, among others, and more recently, on the COVID-19 health restrictive policies (Bardosh et al., 2022). They raise valid arguments that despite several sugar bans, obesity is still on the rise globally (Bes-Rastrollo et al., 2016). It becomes meaningful to bear in mind that these policies tend to place disproportionate burdens on the poor and may negatively affect employment as companies in those industries shut down, stagnating economic growth (Allcott et al., 2019).

The *third school of thought* is more neutral and centers its arguments around social behavioral sciences, pointing out that these regulations are often contradictory with severe forms of mixed messages (Wall, 2005). They believe that these regulations do not have any effect at all on both citizens and the markets. They pull their arguments from human psychology-based theories that point to the fact that most uptake of unhealthy lifestyles stems from addictive patterns and is driven by deeper systemic issues such as depression, loneliness, and/or anxieties (Gifford & Humphreys, 2007). They caution that these societal ills would remain unaffected by laws or regulations without an overhaul of key societal systems (Bate et al., 2020; Pegington et al., 2020).

Our research observes that there are ideologies converge somehow surfacing three players: (1) a specific government-led policy that acts as a demarketing strategy; (2) an important global health agenda; and (3) a business product or service deemed to be a health hazard. *This study has taken both academic and business lenses to investigate the implications of the WHO Code on the sales IFM within an anti-marketing context.* Therefore, the key players as outlined in our framework are: (1) The WHO Code, (2) child health, and (2) infant formula milk.

This study aims to document the relationships between the WHO Code implementation, the sales of infant formula products, and relevant child health outcomes using a multi-case, multi-country quantitative design. One of the goals of our study is to test correlations between the sales of infant formula and the reported under-five mortality rates using fresh data for the year 2022.

This opening chapter introduces the research problem, weaving in context and outlining both its scholarly and secular scale. The presentation includes the research questions, research aim, and objectives. The width and depths of the study are discussed with their theoretical framework. Finally, the study's significance is given citing benefits and areas of novelty.

1.2 The Background: The WHO Code is born

The World Health Organization (WHO) is a global health-specialized agency of the United Nations formed in 1948. In its infancy, it was instrumental in eradicating infectious diseases such as Malaria, Cholera, and Syphilis which were causing high morbidity and early-life mortalities (Gostin et al., 2015). Over the years, the agency has kept its ancestral objective to uplift the health status of citizens in all its signatory states. In so doing, they redefined *“health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity”* (Leonardi, 2018). This provided more space for the organization to have an influential voice over peripheral matters that may impact people's well-being, coding these as 'determinants of health' (Braveman & Gottlieb, 2014).

In 1981, WHO adopted the Code as part of global efforts to promote breastfeeding of newborn babies up until the ages of three years (Costello & Sachdev, 1998). The Code represents a set of recommendations that discourages the active marketing and distribution of breastmilk substitutes by industries, especially multinational companies (WHO, 2020). Many argue that this kind of policy does constitute a form of demarketing as there are clear efforts to discourage consumption or uptake of a certain product. Despite efforts to discourage the use of infant formula, the infant formula industry is booming and is on an attractive upward trend (Future Market Insights, 2023). This puts into question the effectiveness of the WHO Code and its impact on the sales of infant formula milk products.

1.3 The Research Problem

The research complication explored in this study is that while much could be said for the merit of infant formula for mothers who cannot breastfeed or for the negative health-related consequences of infant formula, the implications of the WHO Code that signifies a demarketing strategy to curb the sales of infant formula are unknown at the moment. Leaving this gap unknown is costly as documented by health economists who estimated that governments are losing close to \$302 billion a year each time a baby is not breastfed (Rollins et al., 2016).

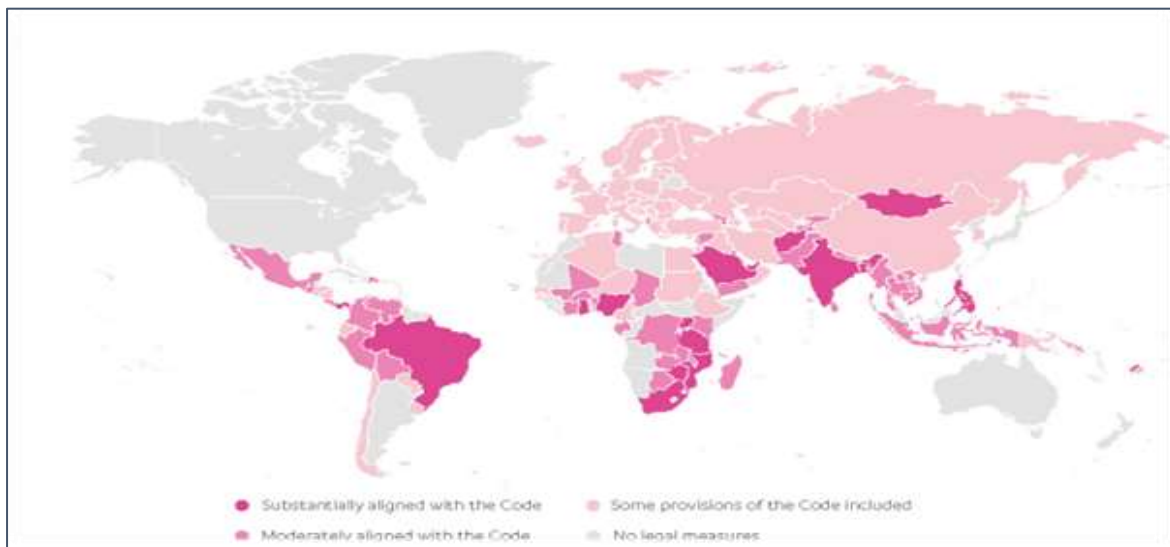
Given the heavy personnel, administrative, and monetary investments made by specific states and the WHO/UNICEF leadership towards implementation of the Code (Michaud-Létourneau et al., 2019), it is momentous to understand the implications of these regulations to contemplate a sober and evidence-based policy going forward.

1.3.1 Setting the Stage: What is known

1.3.1.1 Partial WHO Code implementation

It is known that countries are implementing the WHO Code at varied levels ranging from non-compliance to others having strict regulations (Becker et al., 2022). The WHO report paints a bleak picture as it highlights that close to 63% of the world's countries either do not have legal measures at all or only have a few in place (WHO, 2020)(**Figure 1**). In the eyes of many, this would translate into some form of partial or complete policy failure needing a holistic probe. This study aims to probe from a causal-effect perspective to indicate if the levels of implementation in various countries have any real bearing on infant formula sales.

Figure 1: WHO Code implementation by states.



Source: World Health Organization Report (2022)

1.3.1.2 Links between infant formula feeding and child mortality

Motsa (2016) analyzed survey data from four Southern African countries and found that infants on breastmilk only manifested lower chances of demising compared to infants not breastfed in the region.

This chance was as low as 97% and it was also significant. Edmond and colleagues reported a fourfold higher risk of neonatal deaths in children given breastmilk with other solid feeds which equates to a form of mixed feeding (Edmond et al., 2006).

Therefore, although the links between infant formula feeding and child mortality are known and understandable, confounding factors like inadequate access to unsoiled drinking water, low maternal education, and inadequate social and healthcare services cloud the credibility of these associations (Anttila-Hughes et al., 2018).

1.3.1.3 Business projections of the infant formula market

Business reports indicate that the infant formula industry is thriving at a compound annual growth rate (CAGR) of 9% (Future Market Insights, 2023). In addition to growing, the infant formula market has been shifting from its historical oligopolistic nature with new growing players emerging from Europe and Asia (Yi Chen, 2018). It is readily apparent that the infant formula market is gaining traction each year, a phenomenon that business practitioners, economists, and scholars should take note of. For countries seeking to grow economic opportunities through industrialization and entrepreneurship, infant formula is a prime example of an area with significant potential, especially in Africa where players remain few and/or faint.

1.3.2 Research Gaps: What is unknown

1.3.2.1 Insufficient Academic Literature

A non-exhaustive yet targeted literature search yielded very little information on demarketing strategies in the context of infant formula sales. Much work has been done on legislative gains against smoking, alcohol, and other forms of sin taxes (Othman Yousif, 2014), yet the topic of infant formula has been shied away from by academics, especially business scholars (Skidan et al., 2017). A plethora of literature on infant formula feeding and regulations stems from nutritionists, global health experts, and social advocacy organizations. In as much as their debates are valuable to showcase the push factors behind demarketing strategies, not enough is known about the pull effects of such strategies on product sales.

1.3.2.2 Effective business-policy-science interface

The importance of the science-policy interface (van den Hove, 2007) and the business-government interface (Dahan et al., 2014) have been previously reported. However, there remains a gap when it comes to where and how the three spheres of influence – namely science, policy/government, and business– balance each other effectively when combined. The world as a collective is forced to confront serious challenges such as climate change, poverty, and deep inequalities more and more (Clemens, 1999). Besides the pending 2030 UN Sustainable Development Goals or the 2050 Vision for Africa, there is a humanitarian need to get these interfaces right going forward. This study considers all three spheres intertwined and aims to add insights on how the three could balance in the following literature review, discussion, and recommendations chapters.

1.4 Theoretical Framework

Our study will lean on Porter's Diamond Location Theory (PDLT, also known as Porter's National Competitive Advantage Theory) (1990b) as its theoretical framework. According to the PDLT, an industry must have four determinant elements to gain a national competitive advantage. The elements are, (1) Demand Factor; (2) Factor Conditions; (3) Related and Supporting Factors; and lastly (4) Firm Rivalry, Strategy & Structure (Porter, 1990b). In a later publication, these tetrad elements were updated to include the role of chance and government as they were found to play a part in national competitiveness (Porter, 1990a). Applying PDLT, this study identifies the phenomenon of countries implementing the WHO Code at varied levels as an important independent factor or input. Using analytical methods, which will be outlined in depth in subsequent chapters, this research project aimed to establish how sales relatively behave using standardized ratios in these different countries.

1.5 Research Question(s)

Three research questions were posed to direct the study, namely:

Research Question 1: What is the relationship between the status of implementation of the WHO Code regulation and the scale of sales of infant formula milk per child under 5 years old in WHO member states for the year 2022?

Research Question 2: What is the relationship(s) between the PDLT factors (namely Demand Factor; Factor Conditions; Related and Supporting Factors; and Strategy/Structure and Rivalry) and the scale of sales of infant formula in the countries?

Research Question 3: What is the relationship between the under-five mortality rates and the scale of sales of infant formula milk per child under 5 years old in the WHO member states for the year 2022?

1.6 Research Aim(s) and Objective(s)

Our research paper purposed to investigate the implications of the WHO Code on the sales of infant milk in a selection of 194 WHO member states, however as the methodology section will later outline, our final sample size landed at 128 states.

The core of the study was to understand how infant formula sales behave in four country contexts: when the implementation of the WHO Code is (1) Absent, (2) Minor, (3) Moderate, or (4) Substantial.

This aim/purpose will be driven by the following study objectives:

Objective 1: To describe the relationship between the WHO Code implementation and the scale of sales of infant formula per country.

Objective 2: To adopt the PDLT to understand multi-country competitiveness as it relates to infant formula sales

Objective 3: To study the relationship between the reported under-five mortality rates and the scale of sale of infant formula milk per country during the year 2022.

1.7 Scope of the Research

1.7.1 Conceptual Scope of the Study

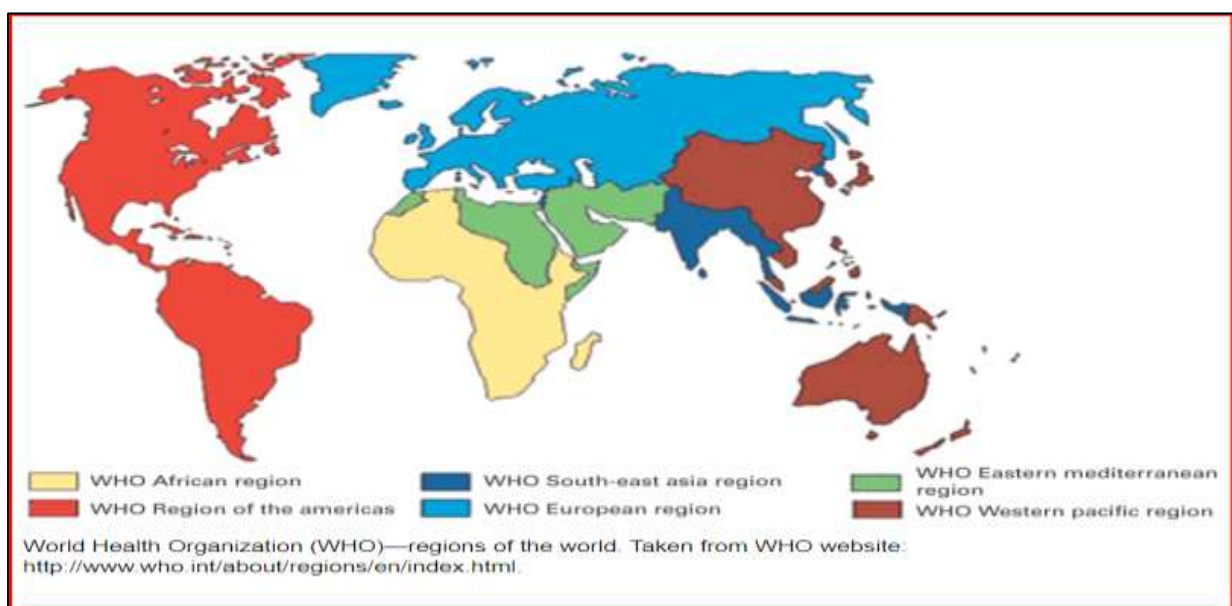
Many factors remain unknown or poorly researched concerning demarketing strategies and product sales from an international business perspective. For example, in this case between the WHO Code and infant formula sales, it would be important to understand how and when multinational enterprises (MNEs) internationalize their operations to other countries given the global restrictions. Theoretically, this would look into barriers of entry for the industry or what

the Dunning eclectic paradigm looks like for this industry. Furthermore, it would be of value to review how the firms have managed to adapt their marketing processes since 1981, which is the year the WHO Code was passed into effect, given this unique external restrictive constraint. However, the scope of this study will limit the research to focus on the implications of the WHO Code on breastmilk substitute sales only. Using a cross-sectional research approach, the timeframes of this research will zoom in to extract annual sales of infant formula for the year 2022.

1.7.2 Geographical Scope of the study

The WHO has 194 member states across six regions (Africa, Asia, Europe, Latin America, the Caribbean, Oceania, and North America) (**Figure 2**). This study spans all of the region under the WHO umbrella therefore by default excluding the state of Taiwan and smaller non-independent islands.

Figure 2: Geographical Scope of the Study: The Six Regions of the WHO.



1.7.3 Definition of Terms

Under this brief section, the researcher introduces terms that revolve frequently and are referred in almost all the sections of the thesis. They are going to help contextualize many of the literature, findings and interpretations of the results, thus the deliberate inclusion early in the paper.

Table 1: Table of Key Definitions

Breastmilk Substitutes	The WHO Code makes mention of 'breastmilk substitute'. This includes several items such as milk, bottles, complimentary baby food, and teats. Throughout this paper, the concept of breastmilk substitutes will be limited to the view of infant formula milk or baby milk.
PDLT	Porter's Diamond Location Theory; also known as Porter's National Competitive Advantage Theory
Demarketing	As much as the notion of demarketing is broad, insofar as it concerns this study, the main demarketing strategy in reference would be the WHO Code.
Scales of sales	The study will refer to the 'scale of sales' as a calculated ratio that considers total sales per annum over the under-five population in that country.

1.8 Importance and Benefits of the Research

The findings of this study carry academic, policy, and perhaps even methodological significance. Below is the narrative about the benefits the study was able to surface for these three platforms or targeted audiences.

1.8.1 Theoretical Benefits

Two ideologies dominate this research, which are PDLT and Demarketing. Theorists can extract four benefits that the research was able to surface as a contribution.

- (1) The study adds a new discourse on **the role of government as per the PDLT** (Eickelpasch et al., 2010). The study proposes that the role of government be placed as an internal factor since it influences much of a nation's processes. In the case of infant formula sales, it set the level of WHO Code implementation, it gave structure to the countries through geopolitics, and it accounts for the state of the water quality amongst other things.
- (2) The study found conflicting realities between the role of related industries and supporting industries as it relates to infant formula sales. The study believes these two factors may not be equally reinforcing as proposed by the theory thus a proposal to identify these as **separate and independent actors** on their own, that is, have a

set of conditions that speak to related industries and allocate a new place for supporting frameworks. This study agrees with critics that the theory took a lenient approach in unpacking these complex conditions (AJ Smit, 2010).

- (3) On the matter of demarketing, the benefit of this study is the elaboration of the typologies and the identification of a gap to assign new **taxonomies for emerging hybrid models** such as the WHO Code (Bradley & Blythe, 2013).
- (4) This study re-surfaces the critical debate of **Ethics, Equality, and Equity** that once plagued the demarketing space (Laczniak et al., 1979). This is tied to some of the secondary observations the study extracted from the dataset.

1.8.2 Significance to Policy

There is an intent to share this paper with relevant policymakers. The desire is that it will shape subsequent policy reviews or commission further work on this matter. All in all, there are four major deposits made by this research into policy matters.

- (1) The chief and perhaps the most obvious benefit is that this study could confirm that **policy works, and it is effective**. There were significant differences between the scales of sales of infant formula milk when the policy was there compared to when it was absent.
- (2) The second deposit is that this policy works well but there seems to be partial effects after the WHO Code 'moderate' level. This means that there is **a decline in its effectiveness on sales beyond that implementation scale**. Policymakers and monitoring officials should look into how and why the gradient of power decreases as the levels increase, that is, causes of partial policy failures (Hudson et al., 2019). The discussion section of this thesis proposes several scenarios.
- (3) **The policy works where it is implemented**. The study hopes that the audience recognizes the gaps between countries that have measures and those that do not. Of importance, there were countries with high child mortality that had little to no measures in place and they may benefit from some form of policy intervention (Sharro et al., 2022).
- (4) The advocacy statements that **breastmilk substitutes kill babies** could not be supported by the findings of this research (Anttila-Hughes et al., 2018). Policymakers can extract the relationships examined herein and use fresh/updated science to

further inform the next lifecycle of the WHO Code as a global public policy tool (Watson, 2005).

1.8.3 Methodological Significance

As far as this study is aware, no similar work has been published elsewhere that explores the implications of the WHO Code looking into infant formula sales globally. The study was able to push methodological boundaries that add significance to the field, particularly logical regression.

- (1) From a methodological perspective, a salient benefit of this study is the **exposure of the statistical curvatures** that exist across and within the variables (Kesavulu et al., 2016). The research needed to run nonlinear regressions in parallel with traditional linear models.
- (2) The study resuscitated **other indicators of significance** that are not commonly used like the F-value and Standard of Error (Sureiman & Mangera, 2020). A unique benefit is the triangulation that we used to verify and establish levels of significance without depending on the p-value alone.
- (3) Given the healthy sample size of 128 countries and the rigorous statistical analysis, we believe this study will accomplish high internal and external validity in that it will be **found trustworthy and to a certain extent generalizable**.

1.9 Structure of the Document

Following this initial chapter, the rest of the document is structured as follows:

Chapter 2: Literature Review

The literature review addresses the constructs of the study and their related theories, extracting lessons from previous scholarly work, and also indicating research gaps.

Chapter 3: Research Questions and Hypotheses

Three research questions are specified, also outlining the study's hypotheses based on the literature.

Chapter 4: Research Methodology

The research design and methodology are presented per the underlying philosophical paradigms which have been shaped by the nature of the research questions and study objectives. The quality of the research and ethical considerations are presented.

Chapter 5: Research Findings

The research results are presented in chronological order, commencing with the descriptive results, also displaying relevant graphs and tables. The statistical outcomes from analytical tests also report other observations made during data analysis.

Chapter 6: Discussion of Findings

The results of the study are discussed in three parts pooling insights from previous research and within the pragmatic context of this study.

Chapter 7: Recommendations and Conclusions

The final chapter reflects on whether the research objectives were met. The study's contributions and limitations are outlined. The chapter closes with several recommendations for academia and practice.

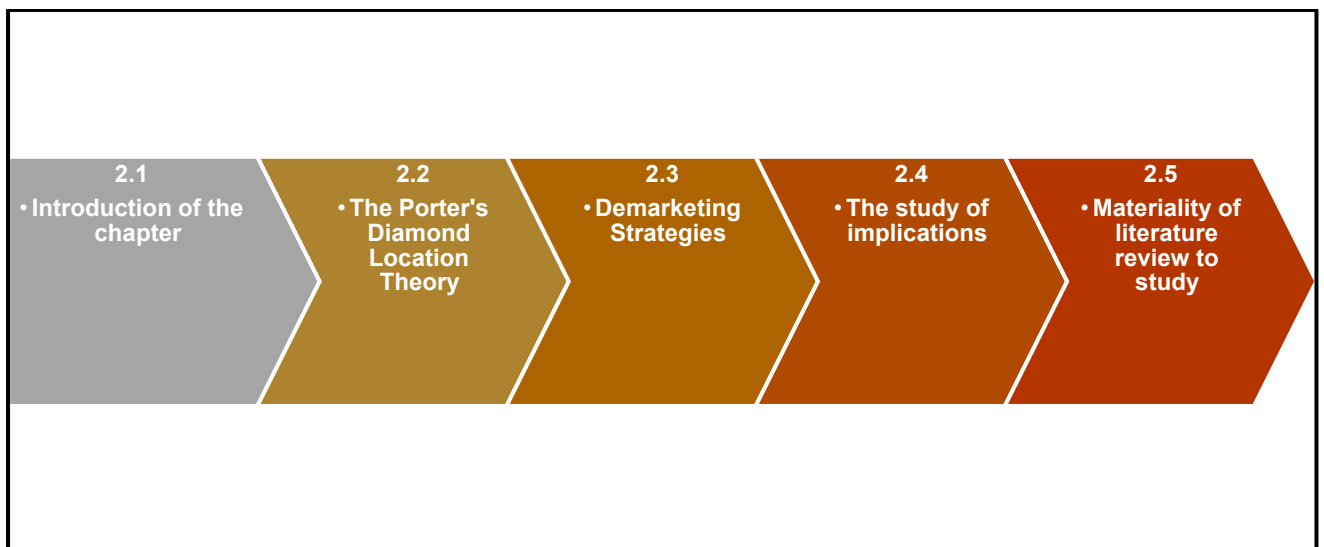
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The previous chapter introduced the problem statement of this study, its research aim, and several objectives embedded in its vision. This chapter focuses on reviewing the literature that pertains to the crosscutting keystones of this study, namely PDLT as the anchoring framework and the concepts of demarketing, and its strategies. Importantly, is also the study of how these two constructs can conceptually intertwine to ultimately have direct or indirect implications for infant formula sales. Therefore, this chapter will host three broad headings: PDLT will be discussed first, followed by Demarketing and the study of Implications.

Hart (2001) provides five reasons a research project should undertake a literature review. He mentions that literature reviews are done to identify work that is already done to avoid duplication, to identify and avoid flaws in previous studies, to help shape the proposed research in terms of design choice, and to identify a research gap. It is based on this guidance that this review features separate sections where the literature will be consolidated and critiqued to further extract its relevance to this research (**Figure 3**).

Figure 3: Literature Review Roapmad.

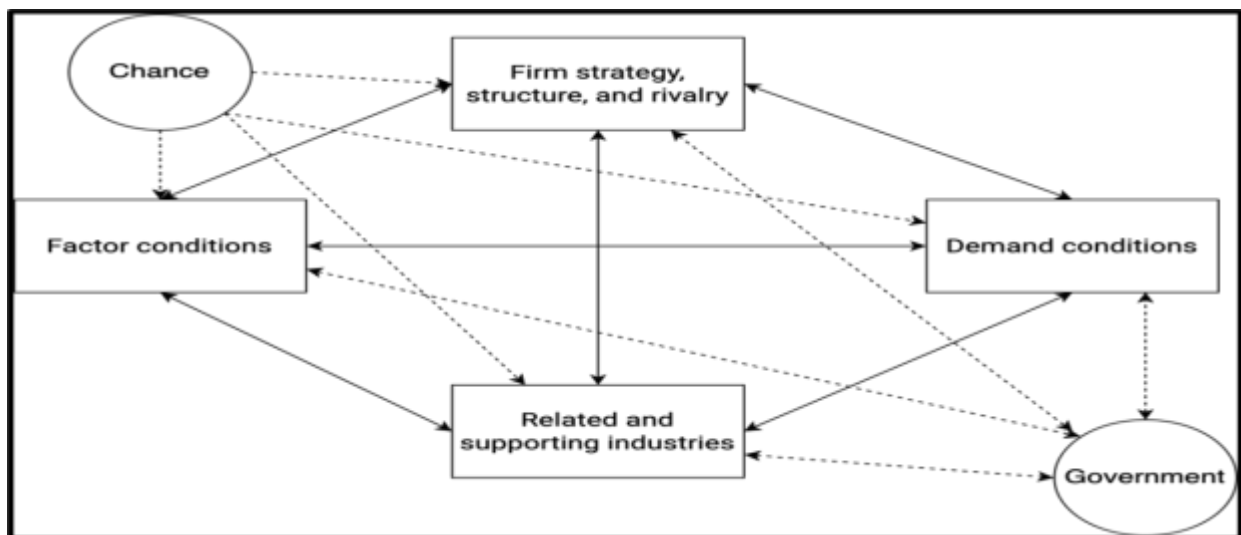


Source: Author

2.2 Porter's Diamond Location Theory (PDLT)

PDLT is a theory that combines Porter's wealth of knowledge in the areas of strategy, management sciences, and business economics. It attempts to describe and explain why one nation would be found to be more successful in a given industry than another (Kuloğlu, 2023). It postulates that a state will yield a competitive advantage in a particular industry when it has in its ecosystem a set of location-specific conditions, four are internal whilst two are positioned as external influences (Vlados, 2019). Demand conditions, Factor conditions, Related and Supporting industries, and Firm Rivalries and their structures would be the four internal conditions, whereas the role of Government and Chance is given as external conditions within the broader processes of a country (Kuloğlu, 2023). Figure 4 displays how these conditions assemble and connect.

Figure 4: The Graphic Model of the PDLT.



Source: (Porter, 1990b)

From the onset, one can discern that this theory is a daedal product connecting heterogeneous parts in one model. Adding to this, none of these conditions are given ranks over the other, as they all carry equal weight (Ketels, 2006). PDLT expects that all should be present in a successful nation and if present, that all should be strong (Cho et al., 2009). The subsequent subheadings in this section will attempt to deep dive into each of the conditions. Later the review revisits previous work where PDLT was used as a study framework, as this is what we intend to do with this research project. To conclude this insert, an appraisal of PDLT is added.

2.2.1 Demand Conditions

Porter proposes that the presence of demand conditions is a source of competitive advantage for a nation. Demand conditions refer to the size and nature of the customer base for products, goods, or services (Huggins & Izushi, 2015). According to Bakan & Doğan (2012), there are three facets within this condition: (1) the nature of demand; (2) the size of demand; and (3) internationalized demand.

The **nature of demand** is interested in the *quality* of the customers or buyers. These are consumers that are both willing and able to buy at each particular price meaning that they are sophisticated and often loyal clients (Butt et al., 2019a). On the other hand, **the size of demand** is interested in the *quantity* of the customer base. These are potential customers in any given population or country who may buy a product or access a service at a certain price (Bakan & Doğan, 2012). Lastly, **internationalized demand** is interested in the *quantum speed* of the demand. These are clients who can reach a product or service even if they do not reside in that particular country. Firms seeking to cater to this kind of client must lead in agility to get their products quickly cross-border or offshore (Murmman et al., 2015).

There is an ongoing scholarly debate regarding which type of demand proves beneficial for countries and firms alike. Studies looking into demand conditions have found value in all the cited types (Butt et al., 2019a), especially now with the emergence of management theories such as cost leadership, product and price differentiation, and economies of scale (Islami et al., 2020). Therefore, it is observed from historical records that empirical studies that have ventured to test the PDLT often bend towards assessing quantitative variables more than qualitative features of customers (Sölvell, 2015). This is evidenced by the multi-country study done by Stone and Ranchhod (2006) who applied this theory comparatively by looking at the BRICS nations, UK and USA. Under demand factors, the pair assigned quantitative variables: unemployment rate, labor force, gross domestic product (GDP), and exports and import ratios. A similar approach was taken by Wilson et al (2014) when they revisited the theory choosing Sweden, South Korea, and the USA as case studies. They allocated the unemployment rate and national buying power of domestic people under the demand factor.

Learning from Stone and Ranchhod's approach, this study will look into how many customers **can buy** infant formula milk in any given country and assign a quantifiable variable to capture that size. Judging from current market analysis reports, analysts are tracking factors such as the fertility rate the rise in female employment, and the affordability

of middle-income households as markers to estimate the market size for the infant formula industry (Palak Srivastava, 2023).

This market observation aligns with general market trends where the size of demand is determined by demographic shifts such as population growth, migration patterns, and other global behavior indicators encompassed as big data (Mikalef et al., 2020). As a standardized indicator used by institutions such as the World Bank, WHO, and others, the fertility rate would be the first and most feasible cross-cutting marker to determine the size of demand for infant formula in different countries.

2.2.2 Factor Conditions

Factor conditions are the resources and skills of production that a country can use to gain and sustain a superior competitive advantage in a particular industry (Vlados, 2019). Broadly, these can be manufactured or natural in the same way they can either be viewed as **basic or advanced** (Bakan & Doğan, 2012). Basic factors include natural resources, climate, location, raw population numbers, and other inherited skills whereas advanced factors would be refined and processed outputs such as research outputs, highly skilled graduates, technology, and high-spec infrastructure developments (Öz, 2002). PDLT puts forward two key propositions regarding factor conditions. Porter argues that advanced factors are much more valuable than basic resources as firms in other nations can easily purchase or bargain basic skills and/or get them replicated (Porter, 1990a). Secondly, he argues that mismanagement of even the advanced types of resources degrades value and places nations at a disadvantage. He places proper management as being efficient and effective with continuous improvement (Porter, 1990b).

Based on the second proposition, studies have been launched to either identify advanced factors of nations or compare these amongst competing states. Examples of this include the extensive work done in Turkey where the researcher collected sources of advantages from many industries ranging from textiles, glass, and automobile sectors (Öz, 2019). Similar ventures have been done in Pakistan (Butt et al., 2019b) and other countries such as the USA, China and India (Shuai et al., 2022). Rather than isolate each advanced condition and measure one by one, Porter and Stern (2001) suggested that the concept of innovation could bundle up both input and output activities of the most advanced conditions. For instance, for a country to have highly skilled graduates it needs education and training centers. Training institutions themselves require continuous upgrading of curriculum and

technology to reach more students. This continuous cycle sees innovation both as an input and output (Berkhout et al., 2006).

It is because of this central role that innovation itself has been seen as the representative indicator to test how countries advance or how efficiently or fast countries use basic resources to stand out (Afzal et al., 2019). This has birthed a global innovation annual census, called the Innovation Index, that condenses common advanced conditions into a set of six metrics: “Human capital and research; Infrastructure; Market sophistication; Business sophistication; Knowledge and Technology outputs; and Creative outputs” (Oturakci, 2023). This global tool has now provided a feasible mechanism for policymakers and researchers to use as an operative for PDLT's factor conditions.

2.2.3 Related and Supporting Industries

Related and supporting industries are proposed as equal twins in the diamond model. They stand out from the model as they are the ones that bring in much of the external economies into the framework as they deal with the state and health of supply chains (Porter, 2003).

Related industries are those that **supply inputs** directly into the value chain and/or production line of a particular product or service (Bakan & Doğan, 2012). These inputs can be raw or processed materials, they can also be standard or specialized in nature depending on the firm requirement (Kharub & Sharma, 2016). Porter recommends that suppliers should be accessible, close in proximity, affordable, and specialized (AJ Smit, 2010).

To understand the role of this condition, one would need to assess the all-inclusive supply chain processes that go behind a particular product. In one such case, PDLT was used by Ndou and Obi (2013) to analyze South Africa's competitiveness in the citrus industry. To understand related industries, they chose to assess national nurseries, citrus growers, and fresh produce suppliers as these provide direct inputs to the market. For the supporting conditions, they assessed peripheral factors such as the availability of transportation systems, stability of local financial systems, and the electricity supply.

It would therefore be relevant to this study to determine the key inputs firms need to produce infant formula milk. Although the industry is quickly advancing to formulate milk from plant-based extracts and develop new strains of protein fractions and carbohydrates (Ahern et al., 2019), dairy from cows and goats remains the cornerstone contributor in the greater scheme of the industry's value chain (Gallier et al., 2020). It is for this reason that the dairy supply

and prices existent in each country will constitute one of the key variables to assess this PDLT factor.

PDLT is also careful to highlight the role of supporting industries as an advantage (AJ Smit, 2010). According to Brosnan (2016), "*Highly competitive supporting industries provide innovations and motivation for upgrading of components, inputs and processes*". Continuing with the infant formula value scenario, Ahmad and Guo (2021) argue that the day-to-day feeding practice that involves preparing baby bottles at home is another crucial quality control step that is often overlooked when disease outbreaks arise. They point out that there is a link between developing countries that have water disruptions and poor health in children given infant formula milk. The role of water quality as a supporting condition for formula milk should not be minimized as it was Filer LJ Jr (1993) who pointed out that water alone will end up making up 87% of the baby bottle once the mixture is done, thus it is vital. For this cause, the study will collect data on water quality for each country as a proxy to gauge this diamond condition.

2.2.4 Firm Rivalry, Structure & Strategy

The competitiveness found in a commonwealth or any particular country relies on benign competition among local firms (Tsai et al., 2021). Porter (1990) argues that rivalry is of utmost importance in motivating companies to innovate, reduce costs, and enhance quality. In regard to the strategy and structure of domestic firms, he asserts that national circumstances have an impact on both management practices and competitive choices.

Zooming into this condition beyond the firm level, Mahuni (2023) analyzed the Africa Continental Free Trade Area (AfCFTA) through the lens of the PDLT. His review highlighted that firms strategize around the country's tax laws, licensure guidelines, turnaround for loans, repatriation of profits, trade, and corruption levels amongst other things. He ties in the role of governmental institutions, especially their judiciary structures, as silent drivers behind the health of most firms operating in competitive nations.

It is Fainshmidt (2016) who dives into how politics shape government institutions which then affects the elements in the diamond model. He submits three arguments. The first allegation is that political stability builds institutions where laws are made, but perhaps most importantly where these are implemented. Secondly, he specifies that it is under good governance that the correct laws are passed, especially laws that safeguard firms' rights to assets, property,

or transactional frauds. The last submission is that often political instability leads to corruption which erodes trust between economic players such as firms/large corporations. This was corroborated by a group of scholars who used the diamond model to focus on ports. They blame the political frailty and with the accompanying security volatility in Gwadar for the dysfunctions of its port systems (AiMin Deng & LiHui Du, 2018).

From these arguments, it is clear that the political structures of a nation contribute to how it competes. Taking Armenia as a case study, Chobanyan (2016) studied the benefits of political stability assigning this under a broad 'geopolitical' category. His study highlighted that having a democratic society provided Armenia with stability which led it to produce successful economic reforms.

2.2.5 The Role of Government and Chance

As per the theory, the function of government is to create an enabling business climate through policies, laws, taxation, and subsidies while also ensuring ethical business standards (Vlados, 2019). In this capacity, the government adopts a role as either a catalyst, which cascades innovation and productivity of firms and communities, or a challenger, policing and regulating the very same groups (Wonglimpiyarat, 2018). The government has a responsibility to collect revenue and reinvest it for public good, whether this is towards public health matters, supply of basic services, and/or supporting vulnerable populations. The Gross Domestic Product (GDP) is one of the universal measures that indicates where governments fare in terms of productivity. Given that this study is interested in exploring how sales fare in various countries, tracking governments and their respective GDPs would be a critical component of this study. A large correlation multi-country looked into infant formula market and the wealth of states. It found that infant formula milk was consumed significantly more in countries with higher economic outputs (Neves et al., 2020).

In contrast to the well-defined entity of the government, Chance consists of those random, unexpected factors or external events that can alter the fabric of a country in significant ways and change the direction of competitiveness (Porter, 1990b). Examples of this are wars, regime changes, and/or catastrophic disasters (Kuloğlu, 2023). Although these examples are often negative, some scholars do add positive events such as fundamental scientific breakthroughs that change the outlook of a country or region (Mridha et al., 2022). Importantly, many studies testing PDLT shy away from allocating variables under this

condition as in reality, they sit beyond the containment of the institutions, people or businesses (Valiollahpour et al., 2014).

2.2.6 PDLT used as a Research Framework

As far back as 1993, Bellak and Weiss took a cluster approach to when analysing the state of Austria applying the theory in their methodology. They pointed out that PDLT was problematic to implement given the small size of Austria and the complexity of measuring its factors especially when objectively looking into service industries. However, they were also first to endorse it as a framework tool when they said, *“Despite the many issues which seem to involve severe problems with Porter analysis we find it a helpful starting point for analysis”*. Thus from those days, Porter’s theory has been used as a study framework to initiate complex national competitiveness enquiries.

In 2012, Iran used PDLT to investigate barriers that could be influencing low Saffron exports. They extracted and assigned variables against the six location determinants and did several analytical tests. They eventually found that the most important barriers were issues around all five factors except for the factor conditions (Amiri Aghdaie et al., 2012).

Recently, Tsiligiris (2018) adopted the PDLT as a studious framework to reappraise transnational education in host countries. This study added new knowledge in terms of PDLT application as it was a departure from the conventional use of this theory in production and manufacturing-focused research projects. His work focused on the four internal conditions using China and Malaysia as the sample population. His work applauded the applicability of the PDLT as a framework even in the transnational education sector.

In light of the rapid rise of FinTechs, Laidroo & Avarmaa (2020) initiated a study to identify location-specific factors linked to the intensity of FinTech establishments, employing the PDLT framework. Their sample covered 107 countries and they reviewed several databases to track FinTech institutions. They established a cluster of important location-specific determinants and showed that FinTechs seemed to be doing well in countries with prime college enrolment rates, stronger university-industry cooperation, greater fixed line availability, and overall ICT readiness. They found the adoption of this framework useful for entrepreneurs and countries wanting to increase their footprint and gain a competitive advantage in the future (Laidroo & Avarmaa, 2020).

The literature is wide and convincing that the PDLT is adaptable as a study framework tool, it can be cross-cutting in terms of subjects and academic disciplines and can offer insights even in this modern world.

2.2.7 Critique of PDLT

Volumes of publications have come out with stern criticism of the PDLT. They frequently point out that this theory is vague, non-encompassing, and misleading. This review highlights critically some of its commonly cited weaknesses, defends its strengths, and reflects on some suggested alternatives.

Weaknesses: Since the early days of this model, it has been criticized as too general in its core to be applied to all countries with equal intensity. It was Waverman 1995 wrote, "*This model is so general that by trying to explain all aspects of trade and competition, it ends up explaining nothing*". Therefore, it is seen as ill-suited to accommodate the real differences in countries especially those with developing contexts. Mounting evidence is pointing out that it often yields little significant results when applied in small states, this was seen and cited by studies looking in Canada, Denmark, and New Zealand for instance (Van Den Bulcke et al., 2009).

The second recurring critique is the poor acknowledgment of the phenomenon of **globalization**. Narula (1993, p. 105) contends that the PDLT is selective, based only on an idiomatic analysis of a few high-income countries. This was later resurfaced by Cho and colleagues when they argued that multinational corporations need a more thorough framework to thrive in the new era of globalization. They pointed out that the four factors were limited to accommodate vibrant global connections and high interdependencies between countries (Cho et al., 2009).

AJ Smit (2010) found the PDLT **misleading** in a way. His observation is that it conveys a mistaken perception of being a competitive theory, despite its origins in the theory of management. Davies and Ellis judge harshly Porter's object of analysis. They say, "*There were elisions with respect to the object of the analysis which meant that explanations for productivity at national level became confused with explanations for industry level success in gaining market share*" (H. Davies & Ellis, 2000). In essence, the model lacks proper categorization of its factors and perplexes its scholarly roots.

Strengths: Regardless of its age, this theory contains insights that have remained useful over the years. Up until today, the PDTL is used by multinational corporations to strategize internationalization processes, that is, where and how to plant their firms. Yang and colleagues contrasted the evolution of Chinese and Korean multinational corporations where they focused on their motivations for internationalization and/or strategic mergers (Yang et al., 2009). They were able to establish that the existence of one or two domestic competitive disadvantages outlined in the PDTL were encouraging motivators. India used the PDTL to understand why certain provinces and/or districts received greater foreign subsidies and showed obvious success more than others. After reviewing large data from 113 foreign firms, they concluded that subsidiary triumph was linked to the availability of human capital, the degree of governmental regulations, and the suitability of suppliers (Holtbrügge & Friedmann, 2016).

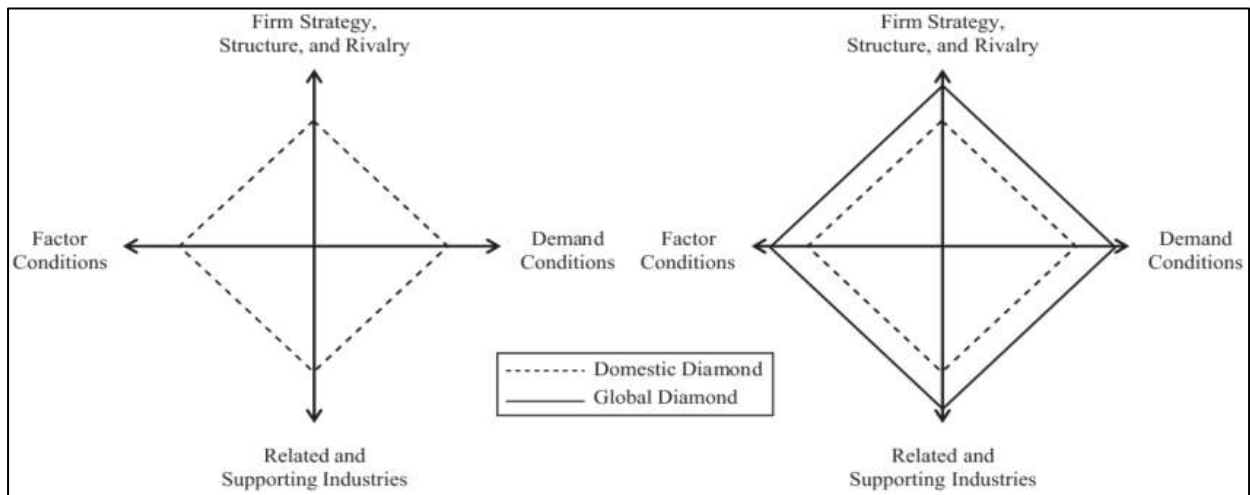
The six factors mentioned in the PDTL have added value to countries that are seeking to understand or tackle complex productivity problems (Brosnan et al., 2016). Although not comprehensive, these determinants provide a minimum checklist for countries who want to improve their state of business by pointing to the fundamental areas of investment such as having pro-productive policies, upgrading skills, and investing in continuous cycles of innovation. This is best evident in the work done by Fang and collaborators when they compared which factors ranked high and effective when it comes to renewable energy amongst the G20 countries. Adopting the PDTL, their results revealed that the role of government policies, strategic collaborations, and having skilled and experienced drivers gave countries latitude to be leaders in the renewable energy space (Fang et al., 2018).

Lastly, Porter is praised as brilliant by Sölvell (2015) for his ability to connect different levels of analysis to formulate a model that can be used by firms, countries, and entrepreneurs. He recognizes that the model intentionally goes against the dominant research logic of simplification and thus challenges young researchers to venture into profound thinking and develop novel frameworks that can cut across academic levels.

Scope of alternative theories: Over the years, alternatives to this iconic theory have emerged. This review showcases three dominant alternatives proposed by reputable scholars such as Dunning, Rugman, and Cho. Dunning simply reintroduced Porter's original model adding a new component to it, which is, the concept of transnational corporations (Vlados, 2019). This neo-classical approach folds well the simplifications of investment and entrepreneurship, which Porter's work overpass (Kuloğlu, 2023).

Rugman and Cruz (1993) birthed the controversial ‘Generalized Double Diamond Model’ (Figure 5) when they studied the mutualism of the Canadian diamond model together with the American model. Their new proposed model is different from the PDLT in that its econometric approach brings in both host-based and offshore firms as active players in creating competitiveness (Vlados, 2019).

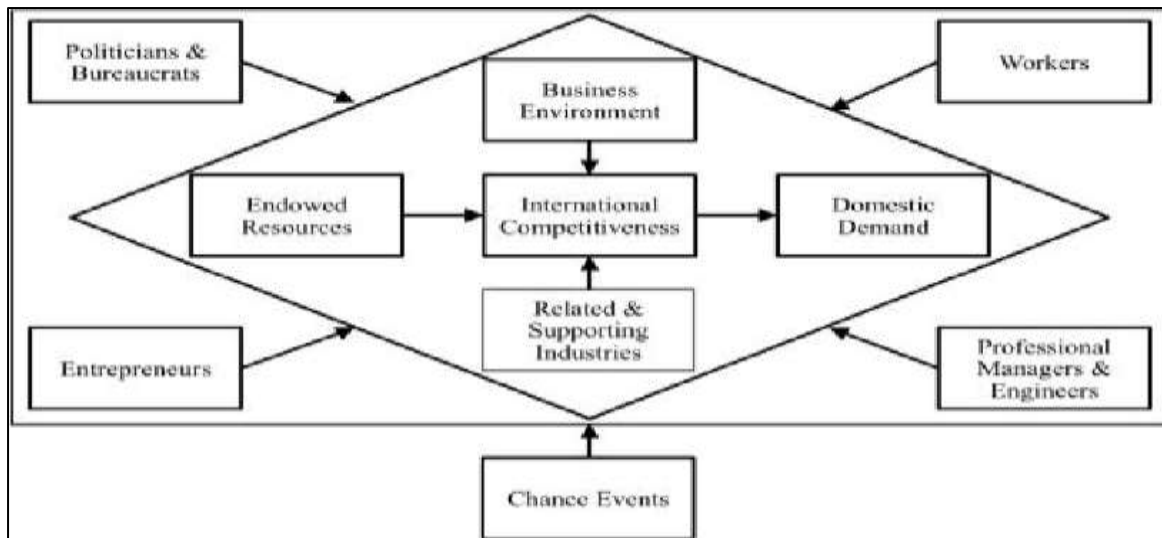
Figure 5: Rugmand and Cruz’s Generalized Double Diamond Model.



Source: (Parc, 2018)

A year later after the double diamond went public, Cho released his version of national competitiveness captured in the ‘Nine Factors Model’ (Figure 6). Basing his theory on work done in Korea over 30 years, he adds several new factors. He argues that his model is more robust than the PDLT in that it elevates and expands the concept of resources and incorporates the government as the major determinant. As a result, Cho’s model included prominently the roles of politicians and bureaucrats. In addition, Cho places special ascendancy on the human factor because entrepreneurs, professional managers, and engineers are incorporated as additional factors (Çivi et al.,2008).

Figure 6: Cho's Nine-Factor Model.



Source: (Cho, 1998)

2.3 Demarketing

2.3.1 The Historical Evolution of Demarketing

The term 'Demarketing' was coined in 1971 by Kotler and Levy to describe a phenomenon whereby organizations use marketing tools to manage undesirable demands or excess (Chaudhry et al., 2019). Cintron (2017) attempted to put together the evolution of demarketing covering literature that spans over four decades. Since the phrase was formally envisioned in the early 1970s, their paper demonstrates how demarketing has fared from that time point till the mid-2000s. The first decade (between 1971 and 1981) presented demarketing as a management tool driven by firms (Cravens, 1974). It leaned heavily on reducing demands for 'products' and did not expand to include other forms of commercial uptake such as services (Cullwick, 1975). Retrospectively, researchers acknowledge that this angle was motivated by the scarcity era that emanated from the petroleum crisis in 1973 (Cintron et al., 2017)(Harvey & Kerin, 1977).

It was during the second decade, between 1982 and 1992, that the notion of segmentation of customers within the demarketing framework was introduced. This urged managers to apply a more targeted approach to where and to whom these strategies were aimed in their designs (Deutsch & Liebermann, 1985).

It is also at this stage that a new typology of demarketing emerged from adjacent disciplines such as law, economics, and other social sciences (Hollander, 1984). It was also the works of Rößl (1991) and colleagues that extended demarketing as a concept to hospitality industries as the proposed measure to mitigate the concurrent presence of incompatible segments in the service space.

The third decade, which lasted until 2003, brought tangible social ramifications to the demarketing discussions as the dilemma around the storm of consumerism and a heavy burden on services began to increase in the public sector (Kindra & Taylor, 1995). Conscious use of demarketing became pivotal during this era, especially in the healthcare field. In the UK and USA for instance, the expensive provision and excessive use of healthcare services preceded situations where demand for overall service provision had to be managed (Mark & Brennan, 1995). This was the beginning of the gradual shift that saw demarketing transition from just a marketing tool looking at products and services, to integrating human behaviour doctrines to understand and address harmful habits (Eisenhauer, 1996).

The last decade, which bridges the years 2004-2014, saw a proliferation of demarketing publications by 160% when compared to the previous decade (Cintron et al., 2017). This decade merged demarketing with social marketing and sustainability agendas.

Kotler and Lefebvre (2011) urged firms to not only limit their attention to demand reduction but also stretch themselves to wider matters such as sustainability using social marketing skills. Almost ten years after the last review, Lawrence & Mekoth (2023) published a systematic review on demarketing covering the years 2000 – 2020. They conclude in their paper that demarketing can be applied with good results to sustainability challenges encountered by lawmakers and executioners hinting that there is room for demarketing to be used at a public policy level going forward.

Given the evolution of how demarketing has been defined over the last half-century, it is therefore necessary to establish whether the WHO Code, an international public policy, can be classified as a demarketing strategy. Further, it is necessary to consider the historical implications these sorts of policies have had on market indicators, specifically sales and profits.

2.3.2 The Anatomy of Demarketing

The initial step towards an effective critique of whether the WHO Code qualifies to be classified as a demarketing strategy is to unravel the anatomy of this construct. Given that there are no formal conceptual frameworks of demarketing as Bradley & Blythe (2013) explain in their paper, the typologies and core theories of demarketing would then form the spine from which other elements get balance. Another major component of what differentiates demarketing from other forms of marketing is its objective. Demarketing uses the traditional 4Ps of marketing mix (product, price, promotion, and place) to achieve its chief purpose: to reduce demand for social good whereas when it is in the hands of business managers is to reduce demand to preserve business, renew value and sustain profits (Kotler & Levy, 1971). Therefore, there is an understanding that demarketing has a certain type and has a mix.

2.3.2.1 Types of demarketing

There have been two types of approaches to describe demarketing strategies in the literature. One is the pioneering paper by Kotler and Levy (1971) and the other is from Lepisto (1983) (outlined in **Table 2**). Although these sentinel papers formed the backbone of how the field views demarketing strategies, given the wide application of demarketing since its early conceptualization, there now exist deficiencies and gaps (Lawrence & Mekoth, 2023). These are perpetuated since demarketing has expanded to be a tool in various sectors including tourism, healthcare, and the environmental sector (Varadarajan, 2014). Therefore, it remains an open question whether demarketing behaves the same across sectors and how to determine which strategies work best to address specific problems.

Table 2: Typology of demarketing strategies.

Types of Demarketing by Kotler and Levy	Types of Demarketing by Lepisto
<p>General</p> <p>The aim is to reduce demand/purchase/consumption of a service or product to all users/customers. This type of demarketing does not discriminate nor does it apply segmentation techniques in its design.</p>	<p>Active</p> <p>The aim is proactive and channels all the marketing mix to discourage uptake to both users and non-users. Therefore, the scale of active demarketing reaches all markets.</p>

<p>Selective</p> <p>The aim is to reduce demand for a particular product for a segment of customers. This technique has a niche audience and is targeted to selected clusters of consumers/users.</p>	<p>Passive</p> <p>This strategy is used for existing products/services with strong demand. The aim is to discourage uptake and offer substitutes. The messages are passive, meaning only the users of that particular product are likely to be reached by this tactic.</p>
<p>Ostensible</p> <p>The aim is to create an illusion of scarcity of a product/service to stimulate premium demand. This strategy orchestrates an artificial shortage of a specific product to stir up demand and thus concurrently, raise the prices.</p>	<p>Complete</p> <p>This strategy aims to eliminate the demand for a specific product/service by completely withdrawing it from the market. Oftentimes, it can be voluntary (initiated by firms) or it could be imposed (by governments using sanctions/bans).</p>

Source(s): Kotler & Levy (1971); Lepisto (1983)

2.3.2.2 The Marketing Mix

Generally, the field agrees that most demarketing strategies/interventions can be identifiable by their hallmark use of the 4P marketing mix, which is product, price, place, and promotion. Gülşen et al (2021) researched this trend focusing on the over-tourism debate. They conducted a meta-analysis pulling from thirty different studies which contained sixty different case studies where demarketing used the marketing mix to try to combat oversaturation in tourist destinations across the globe. Using the logit model for analysis, their paper found that the manipulation of price was the only significant predictor in the mitigation of over-tourism through demarketing. Unfortunately, the other three Ps did not show marked effects. This recent study adds to the body of evidence that a majority of demarketing strategies incorporate the 4Ps in their design.

Taking a different approach, Shiu et al (2009) provided another angle where the effects of demarketing strategies, combining all 4Ps, were used to curb the uptake of a health-hazard product, tobacco. Their study demonstrated that the mix element of price and promotion were the two central significant factors whilst the other two failed to produce significant effects. As a result, they offered sound recommendations to governments to scale back on efforts to promote product replacement/displacement or create restricted smoking areas in

workplaces as these showed lower grades of effectiveness towards reducing tobacco uptake.

The integration of the 4Ps as anchoring elements in demarketing strategies has been studied for service industries as well. Haq et al (2011) referred to selective demarketing of healthcare services where healthcare providers and agencies manipulate prices and access to lessen the abuse of emergency services by patients who do not require them. They based their arguments on ancestral literature by Kotler and Clarke (1987) who spelled out that *“healthcare demarketing would discourage demand through such steps as raising prices and reducing promotion, access or service”*.

It is worth noting that most demarketing strategies do use the marketing mix which can be argued as its basic anatomy. In that way, strategies – whether they originate from firms or by governments, voluntary or mandatory – that aim to manipulate price, promotion, product, and place of a service, product, or conduct/preference, have the skeleton of demarketing. Therefore, the endpoints of a successful demarketing strategy concerning a certain product would include changes in pricing (increase), reduction of active promotion, low visibility or access of products in selected places, and a significant reduction of total sales of that product.

2.3.3 Ethics in Demarketing

There is an ethical cloud that lingers over demarketing tracing back to the late 1970s. Laczniak (1979) reminds his readers that the term 'two-edged sword' was assigned to it due to its bidirectional effects. It was hailed as an innovative offspring of marketing, able to communicate social value not previously seen, however, there were concerns about its ethical compass. One of the veteran concerns is that demarketing could be hijacked by powerful agencies to push non-socially beneficial ideas (Wood, 2012). If so, demarketing itself could be a weapon of power and control. A more recent concern emerges from the rising number of public policy failures. Little et al (2019) caution that there are no set guidelines on who picks up the accountability bill when such policies fail. This observation and many others alike are sparking calls for demarketing or social marketing to be professionalized with a set of codes of ethics (Eagle & Kennedy, 2022).

2.3.4 The WHO Code as a plausible Demarketing Strategy

The WHO Code is a global health resolution and a public policy that aims to promote breastfeeding by ensuring the proper use of BMS when these are necessary. As a legal requirement, it contains seven broad prohibitory measures created for governments to implement and for firms to comply with (**Table 3**).

Table 3: WHO Code’s Seven Legal Measures.

Legal Measures	Key Prohibitions/Requirements
Scope of Inhibitions	The government legislation should cover breastmilk substitutes from birth up until 36 months of life; laws to prohibit complementary foods and also baby bottles and teats.
Monitoring and Enforcement	Governments are required to legislate sanctions for violations; formalize official bodies to monitor compliance and conduct inspections followed by reports.
Information/Educational materials on infant feeding	The product labels should warn of health hazards and the risk of contamination when using formula amongst other requirements under this measure.
Promotion to the general public	Firms are prohibited from contacting pregnant mothers directly; using public spaces to display their products; to openly broadcasting their products at points of sale such as retail stores or shopping centers.
Promotion in healthcare facilities	Overall prohibition on the use of health care facilities for promotion, display, meetings, and/or advertising of breastmilk substitutes.
Engagement with health workers and systems	Overall prohibition by firms to gift or incentivize health workers and/or health systems.
Labelling	Prohibition of nutrition and health claims by the products; pictures that may idealize the use of infant formula on label of infant formula products and direct promotion of any supplementary baby foods for children up to the age of three years of life.

Source: Marketing of breast-milk substitutes: national implementation of the international code, status report 2022

Extensive annual reports are compiled by the WHO, UNICEF, and partners to track progress and country-specific compliance assigning points under each legal measure. Countries are then placed in four categories: (1) No legal measures; (2) Some provisions of the Code included; (3) Moderately aligned with the Code and lastly, and (4) Substantially aligned with the Code (WHO, 2022).

Given the wide divergence in implementation across the globe, many question the design and impact of these measures and whether they fit a demarketing schema. This was raised in the critique by Anaemene (2013) who scrutinized the operationalization of the WHO Code as a public policy in Nigeria.

Few publications have raised a query about the WHO Code's identity from a strategy design perspective. For example, the seven legal measures (**Table 3**) have prohibitions towards product labelling, specified places where firms are barred from advertising, and restrict the level or scope of promotion allowable directly to pregnant, breastfeeding mothers or the general public which indicate basic elements of the 4Ps found in demarketing initiatives.

Salem (2013) attempted to establish if there were any links between the WHO Code and the 4Ps of marketing in Palestine. His study found that the WHO Code does affect all the 4Ps equally. However, his study had some grave limitations. Although he used a quantitative survey approach, he did not triangulate his data to incorporate standardized indicators or industry data. This would have further corroborated his findings, adding a stronger objective voice to his conclusive arguments. His findings are also difficult to generalize across other countries given that Palestine does have its own unique culture and geopolitical status. Although there were some issues with that publication, the same author partnered with Myriam Ertz in 2023 to publish an expansion and revision of his previous work. Their study established that the WHO Code uses a combination of promotion, place, price, and product interventions to affect women's attitudes, intentions, and behaviour toward breastfeeding. They found that these interventions were relatively effective. Based on studies such as these, the WHO Code could be categorized as a form of a 'demarketing' strategy.

2.4 The Study of Implications

There is a keen interest by in this project to dive into '**implications**' as a concept given the title of the study. With strong mathematical roots, the study of implications is when researchers use objective formulas to draw different logical types of connections between particular antecedents and specific consequents (Bronstein DJ, 1936). Fundamentally, implications seek to connect exposures with outcomes (Danaeefard, 2022). One of the important objectives of this study is to isolate, measure, and test the relationship between the scale of sales for each country and the corresponding rates of under-five child mortality. These types of inquiries have plagued the infant formula industry for decades with contradictions of whether infant formula feeding is connected to child mortality and if so, in what way (Strobel et al., 2022).

Given that these allegations continue to fuel demarketing policies to this day (WHO, 2022), there is great value in examining the multiple connections that exist between formula milk and other social issues and what implications it has on business and society. Consequently, the phenomena of implications are isolated and defined in this review as a foundation and an axis for the entire project.

There are three common and accepted classes of implications in literature: Material, Strict, and Illative.

Material Implications emphasize the role of consistency. The basic interpretation of these types of implications would be, "*Exposure A tends to be consistent with Outcome B*", thus highly relying on **patterns** and trends as the core fabric of their inquiry. A large cohort study that was done in which they followed over 9,000 infants in three countries found that non-breastfed babies had higher mortality when juxtaposed with those who had been predominantly breastfed (Bahl et al., 2005). A similar approach was adopted recently by Vietnamese researchers. They followed 2,030 newborn babies during their infancy year and compared incidences of hospitalizations between those who were breastfed versus those given formula milk. They found that prelacteal feeding and early formula feeding are associated with greater chances of illness from infections and hospital admissions (Nguyen et al., 2020).

The famous Boyd-Orr cohort study that followed infants from birth for almost 65 years are typical example of analytical studies that lean towards drawing material implications between exposures and outcomes, specifically infant feeding practices and health outcomes (Martin et al., 2004).

Strict Implications emphasize the role of possibility. These types of implications pit input and outcome variables against each other to obtain measurements such as odds, hazard, relative and other forms of ratios, and determine how plausible their connections could be (Celani & Jansana, 2005). Such studies tend to be highly deductive, meaning they introduce the exposure, isolate and control for confounding factors, and then track the endpoint or outcome over a specified period (Marcus, 1953). They are fundamentally shaped by causal inference doctrines that aim to confidently pinpoint that '*Exposure A causes Outcome B*'. A Kenyan trial randomized 371 infants into two arms. Bisected, roughly fifty percent of the volunteers received exclusive breastfeeding and the rest were given infant formula milk. The trial found that the hazard ratios for death, diarrhoea, and pneumonia were similar in both arms. However, the HIV-1 free survival risk at 24 months was significantly greater in the group that received IFM (Mbori-Ngacha et al., 2001).

Illative Implications capitalize on conditions. Closely linked with Situation Theories, these types of implications lead the researchers to interpret analytical findings based on circumstantial contexts. An example of this would be the ecological analysis done by Anttila-Hughes et al (2018) who documented peaking occurrences in children under the age of one year dying after Nestlé's take over into developing countries. They note however that these deaths were also linked to other factors such as impoverished avenues to clean water and other maternal and unsafe living challenges (Anttila-Hughes et al., 2018). It was Nair et al (2011) who advocated using evidence that external circumstances, whether downstream or upstream, facilitate in the survival discourse of a newborn especially the first month of life. Beasley and Amir (2007) unpacked 'unsafe living conditions' to include incidents such as crowded households and poor sanitation. It is only recently, in 2021, that unsafe households include socioemotional hazards and physical threats (Reece, 2021). Therefore, the application of an illative perspective is when a researcher can claim that Exposure A is connected to Outcome B under certain and/or well-defined conditions.

2.5 Materiality of Literature Review to the Study

While it is not possible to review all the major constructs comprehensively in such a brief chapter, there are a number of lessons that emerged pertinent to and will be material in shaping this research. As per Hart's five guiding points (Hart, 2001), the researcher aims to pull out language to frame the research gap, its relevance, and if it can be pursued. The literature has also assisted in modelling how the study schema should be designed including which variables to assign under each condition as per the PDLT framework.

2.5.1 Identification of Research Gap

This literature review confirms that little research, especially from an international business perspective, has been done testing the implications of demarketing strategies such as the WHO Code to sales of infant formula milk. This observation does not only further highlight the research gap but it buffers the study from duplicating work that has already been done. Furthermore, demarketing of products has previously unilaterally focused on commercial items that have a clear link to health hazards such as tobacco, alcohol, illicit drugs, or excessive use of salt and sugar.

It is known that these products perpetuate addictive traits in vulnerable people, however, there is not enough work done to look into products that have the duality to help and harm at the same time. Given the knowledge that infant formula milk could be life-saving in critical situations, there is a research gap to further explore the real implications of restrictions for this industry. Studies performed up to this point that sought to test PDLT did so with a limited set of countries, at most continental representation in Europe or Asia and none have been inclusive of all continents/the six regions of the WHO diaspora. This study would explore a novel angle by reviewing data from all WHO member states.

2.5.2 Study Design Schema

The literature review presented here reveals that studies exploring 'implications' typically take a quantitative design. Departing from this literature review is the realization that the study schema would need to have input and outcome variables, both clear and measurable. These would use logical regression models to test various mathematical scenarios to establish correlation, causation, or both. This study in its simplicity seeks to understand what sort of relationships and/or associations exist between the WHO Code implementation levels across many countries and the reported scale of sales of infant formula milk.

2.5.3 Assigning Suitable Study Variables

This study will use PDLT as a skeleton structure to support and assign study variables. The review highlighted the four factors that would be most suitable to explore in this study (**Table 4**), excluding the two factors of chance and firm strategy. Chance would be difficult to quantify in this simple study and it will be a silent determinant throughout the study. The researcher will place relevant variables under the four factors aligning with the multitude of examples from the bibliographical review.

Table 4: Theoretical factors aligned with the assigned study variables.

Theoretical Location Factors	Study Variable(s)	Lessons Learnt from Literature
Demand Conditions	Fertility Rate	Proxy to estimate the size of demand
Factor Conditions	Innovation Index	Proxy to scale advanced resources in a particular nation
Related and Supported Industries	Dairy Price Index	Cow milk is seen as a direct input factor for infant formula milk production
	Water Quality	Water Quality is seen as a supporting determinant in the value chain of the infant formula market
Firm Rivalry, Strategy and Structure	Geopolitics	Proxy for assessing country structure as it pertains to political stability and power control of government institutions
The Role of Government	Country GDP	Proxy to assess the country's productivity and economic power

Source: Author

CHAPTER 3: RESEARCH QUESTION(S) AND HYPOTHESES

3.1 Introduction

This chapter outlines the research question (s) of the study adopting the PICOT framework as a guiding tool. This framework envisages five aspects when designing a holistic research question, which are: the population or people, intervention, comparator, outcomes, and timeframe (K. S. Davies, 2011). The WHO member states will serve as the population sample, the demarketing strategy (implementation of the WHO Code) disguises as a proxy intervention, the Diamond Location factors will be analyzed and discussed comparatively, and the scale of sales of infant formula milk will act as the outcome while zooming into the year 2022 as the determined timeframe.

According to Saunders et al, (2019), there are four types of research questions commonly used in business research. They are: Exploratory, Descriptive, Explanatory, and Evaluative. In their eighth business research textbook edition, they acknowledge that a single study can have a situation where more than one type of question is being explored, and in certain instances, a blend of questions can be embedded within one broad single inquiry (Saunders et al., 2019). Incorporating all five aspects of the PICOT framework, this study produced three research questions that parallel as both **explanatory and evaluative**. This is because they seek to probe and explain causal relationships between variables whilst also understanding their implications simultaneously.

Notwithstanding that a brief insert of these research questions appears in the first chapter, this section of the thesis finds them coupled with the hypotheses. In that way, the content of this chapter will form the basis of the research plan which is detailed in the methodology division of this project.

3.2 Research Questions

Research Question 1: What is the relationship between the status of implementation of the WHO Code regulation and the scale of sales of infant formula milk per child under 5 years old in WHO member states for the year 2022?

Research Question 2: What is the relationship(s) between the independent factors for the respective countries as per the Diamond Location theory and the scale of sales of infant formula in the various countries? Specifically, the:

2.1 Innovation index;

2.2 Fertility rates;

2.3 Gross Domestic Product (GDP);

2.4 Dairy Price Index;

2.5 Water Quality; and

2.6 Geopolitical Index as reported in the year 2022

Research Question 3: What is the relationship between the under-five mortality rates and the scale of sales of infant formula milk per child under 5 years old in the WHO member states for the year 2022?

3.3 Research Hypotheses

The study proposes the following hypotheses, which are linked to the research questions:

The first hypothesis: Relationship between the sales and the WHO Code.

H₁: The more stringent the **implementation of WHO Code regulations** is, the lower the scale of sales of infant formula milk per child under 5 years old.

This hypothesis was drawn from parallel research done on the use of e-cigarettes in various countries, indicating that states with weak or no regulations on e-cigarettes were increasingly becoming targets for companies and might experience growth in sales or market margins in the future (van der Eijk et al., 2022).

The second hypothesis: Relationship(s) between the theoretical factors and the sales

H_{2a}: Based on the Diamond Location theory, the study expects to find a positive relationship between the national **Innovation Index** and the scale of sales of infant formula per child under five years.

The infant formula industry is a research-intensive production platform that thrives on continuous innovation cycles. This was found in a paper that compared four countries, namely the USA and the UK versus Australia and New Zealand. The paper places national innovation as a competitive advantage for both infant formula and processed foods markets (Kollmann., 2021).

H_{2b}: Based on the Diamond Location theory, the study expects to find a positive relationship between the national **Fertility rates** and the scale of sales of infant formula per child under five years.

Drawing from economic supply and demand curves, the study expects higher sales in countries with higher fertility rates. The number of children, precisely those above four, in a household was found to be a predictor for introducing formula milk to infants early in Ethiopia (Tesfaye et al., 2020).

H_{2c}: Based on the Diamond Location theory, the study expects to find a positive and significant relationship between the national **GDP** and the scale of sales of infant formula per child under five years.

A recent multi-country study found that infant formula milk, also referred to as breastmilk substitutes, was positively associated with higher gross domestic product at the national level (Neves et al., 2022).

H_{2d}: Based on the Diamond Location theory, the study expects to find an inverse relationship between the national **Dairy Price Index** and the scale of sales of infant formula per child under five years.

The study expects that higher sales of infant formula milk will be found in countries with lower dairy prices/points. A study conducted in Kenya found that the increase in milk price will decrease milk allocation and consumption by infants (Muunda et al., 2021).

H_{2e}: Based on the Diamond Location theory, the study expects to find a positive relationship between the **Water Quality Index** and the scale of sales of infant formula per child under five years

The study is expecting to find higher sales of infant formula milk in countries with higher water quality indexes. Given that this is a related factor to the successful mixture of a

majority of the milk formulas, we postulate that households with cleaner water or bottled water might be the ones purchasing bulk quantities of infant formula milk (Osborn & Lyons, 2010).

H_{2r}: Based on the Diamond Location theory, the study expects to find a positive relationship between the national **Geopolitical indexes** and the scale of sales of infant formula per child under five years

The study is expecting to find higher sales ratios in countries that are highly democratized states. A study found that multinational entities, such as those that drive infant formula markets, tend to partner more with countries that embrace a diverse set of foreign policy issues (I. N. S. Kim & Milner, 2021).

The third hypothesis is: Relationship between the sales and the under-five mortality rates.

H₃: The study expects no direct relationship between the under-five mortality rates in countries and the sales of infant formula per under-five population.

Bottle feeding has been associated with higher incidences of childhood respiratory and diarrhoeal diseases but not death in children (Ahmed et al., 2020).

3.4 Conclusions

The study acknowledges that no single factor, such as the sales of infant formula will influence the mortality rates of children. However, the study assumes that stringent implementation of regulations to curb the sales of infant formula, however well meant, will lead to certain unwanted consequences, placing doubt on the worthiness of WHO regulations. Using a structured framework such as the PICOT (Nishikawa-Pacher, 2022) and leaning on the literature review from the previous chapter, three research questions were designed. Three broad hypothetical statements are presented, of which the second hosts several sub-statements. The study plans to use analytical methods to test the hypotheses and the research approach is detailed in the next methodology chapter.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

The central research theme of this study is to understand how the infant formula market, specifically the sales, behaves in the context of demarketing strategies such as the WHO Code. The research methodology in this chapter is going to be presented as the overarching strategy for how the research questions are going to be answered. Metaphorically, it will follow a head, body, and tail concept. The head will introduce the research design, research setting, and the unit of analysis. It is also at this apex where the underpinning philosophy is discussed. The body will feature the sampling techniques as well as the data collection and analysis approaches used for this research. At the tail end, insights on research quality and key ethical considerations are discussed. As such, the tone of this section attempts to lay out the operationalization processes that were followed to collect data for this empirical study.

4.2 Research Design

This study utilized a mono-quantitative, multi-case, and multi-country study strategy. Using a cross-sectional study design, which is an observational method that analyses data at a specific point in time, data was collected by zooming in on sales that happened for one year (Mann, 2012). Three factors played a role in the selection of this research design. These are, (1) the *Research Philosophy* ; (2) the *Applicability of the methods*, and (3) the *Feasibility to execute*.

4.2.1 Research Philosophy

Given the characteristics of the research questions, a positivist philosophical stance was chosen. The philosophy behind positivism is purely concerned with observable reality (Alharahsheh & Pius, 2020), and is commonly associated with objectivism and functionalism paradigms (Saunders et al., 2019). This means that the study believes that collecting quantitative data and using both descriptive and analytical research tools is the optimum pathway toward the set research aim. To expand on this, the research assumptions cover ontological, epistemological, and axiological ideologies (Antwi & Hamza, 2015)(**Table 5**).

Table 5: Assumptions of the relevant research paradigm.

Research Paradigms Assumptions	
Ontological	The study assumes that the variables such as those that pertain to country factors will shed light on the realities of interest in this study. By analyzing the scale of sales per country and simultaneously looking at their state of implementing the WHO Code, the realities can be connected. This means that even if countries may be enforcing some regulations, real family needs might persuade/drive consumption over policy.
Epistemological	The study assumes that the secondary data available is suitable and valid to be used to draw knowledge. Care and caution were taken in designing the study to layer in authentication processes for all data entered. Furthermore, the study will be transparent in its narrative regarding observed outliers and limitations in terms of data quality. The final interpretation will be viewed through objective lenses using well-accepted statistical tools and parameters.
Axiological	The researcher's ethical principles took precedence over values shaped by children's advocacy organizations when conducting this study, which was to be done as objectively and fairly as possible. Despite the personal reality of the researcher's professional background as a public health practitioner and a policymaker, the results and discussion sections were kept uncontaminated from personal experiences and/or objectives.

4.2.2 Applicability of Research Design

A multi-case study is a prototype of the typical case study research that assesses a list of homogeneous variables or cases. Case studies also dives into differences to identify what could make some cases different from others. The cases can be designated based on a pre-determined criteria and study objectives, such as typicality, diversity or theory testing (Pauwels & Matthyssens, 2004). In this study, a total of 194 states were included as case studies sharing the commonality of being member states of the WHO and being signatories to the Code. There are also obvious dissimilarities in terms of their geography, political structures, and the pace of implementation of the WHO Code, all of these features will be folded into the study to add a comparative texture to the design.

In terms of applicability, the literature confirms that multi-case strategies have been applied before in both qualitative and quantitative studies similar to this one (Takahashi & Araujo, 2020). It was Neves et al (2022) who did a multi-country study looking into the country's

wealth and the consumption of infant formula milk. His study was quantitative and multilayered with more than one variable. Researchers like Stone and Ranchhod (2006) as well as Wilson et al (2014) investigated more than one country and at times even regional clusters.

Narrowing common applications in international business as an academic field, Pauwels and Matthyssens (2004) mention several topics as examples. They cite that it has become common to find researchers in this field using case studies to document firm experiences as they venture into new markets, undertake mergers and acquisitions, and branch off through vertical or horizontal diversification. Often, due to the complexities of international studies, these studies adopt a case-by-case analysis, within and across case analysis. Drawing from these examples, this study is well-positioned to apply a multi-case, multi-country study approach with equal success.

4.2.3 Feasibility of Research Design

There were practical considerations such as costs, the researcher's expertise, and timelines that needed to be factored in when designing the breadth and width of this study. There was a notable theme in the literature review when analyzing the types of research designs commonly paired with explanatory or evaluative studies looking into demarketing strategies and/or testing Porter's theories. There are three common approaches: systematic reviews with meta-analysis, cross-sectional designs, and longitudinal or cohort designs which track set variables over time.

Considering the scope of this study, a cross-sectional design was found to be the most feasible pathway to explore the research questions posed at the beginning. Structurally, this design is the most efficient of the three in that it does not require extensive personnel resources in the form of assistants, it is relatively low cost, and can be executed within tight timeframes (Mann, 2012). All these properties aligned with the researcher's desire to execute the research project effectively without compromising its integrity.

4.3 Research Setting and Population

The countries, all 194 member states, served as the research setting and target population for this study. Accessing the WHO website, the list of all the member states was obtained and downloaded onto the data extraction sheet. The countries were arranged in alphabetical order as part of early data sorting.

4.4 Unit and Level of Analysis

The unit and level of analysis were done at the country level using secondary data (statistics). Eleven variables, some independent and dependent, were collected and analyzed for each country (**Table 6**).

Table 6: Description of the study variables with their unity of analysis.

Study variables	Description	Unit of Analysis
Dairy Price Index ¹	<p>“The Dairy Price Index is computed using eight price quotations of four dairy products (butter, skim, and whole milk powder, and cheese) from two representative markets.”</p> <p>This indicator is a crucial indicator for the dairy industry worldwide.</p>	<p>Unit of measure: Points/Price</p> <p>The global average in 2022: 141.2 points</p>
Democracy Gauge (Geopolitics) ²	<p>The index is based on 60 indicators which will then place countries in four broad categories. This variable provides nominal values.</p>	<p>Full democracies</p> <p>Flawed democracies</p> <p>Hybrid regimes</p> <p>Authoritarian regime</p>
Fertility Rates ³	<p>“The fertility rate at a given age is the number of children born alive to women of that age during the year as a proportion of the average annual population of women of the same age.”</p>	<p>The fertility rate is the ratio of live births per 1,000 women of reproductive age</p>
Gross Domestic Product ⁴	<p>“The GDP is the standard measure of the value added created through the production of goods and services in a country during a certain period. As such, it also measures the income earned from that production or the total amount spent on final goods and services (minus the imports).”</p>	<p>Measured in local currency. This study will report this variable in US Dollars.</p>
Innovation Index (GII) ⁵	<p>This index inputs a total of 81 indicators including measures on the political environment, education, infrastructure, and knowledge creation of each economy. The different metrics that the GII offers help to monitor</p>	<p>Unit of measure: Points</p> <p>The global average in 2022: is 32.09 points.</p>

	performance and benchmark developments against economies within the same region or income group.	
Population pyramid under 5 years ⁶	This is a demographic variable that tracks the proportion of children under 5 years of age whose births were registered in a given country.	Type of discreet data reported in raw numbers in thousands/millions depending on the size of the country.
Scale of sales of infant formula ⁷	The total sales of infant formula products reported by industry/national reports in one year.	Measured in local currency. This study will report this variable in US Dollars.
Under-five mortality rate ⁸	The under-five mortality rate refers to the probability a newborn would die before reaching 5 years of age.	This child health indicator is monitored and measured per 1,000 live births.
Water Quality Index ⁹	“A Water Quality Index (WQI) is a tool that describes the overall water quality by averaging the individual index values of some or all of the parameters within five water quality parameters. WQIs predict water quality since they reflect the impact of multiple Water Quality Parameters (WQPs) and allow for spatial-temporal comparison of water quality status.”	Unit of measurement: Scale between 0 – 100 points. Poor: 0 – 25 points Fair: 26 – 50 points Average: 51 – 70 points Good: 71 – 90 points Excellent: 91 – 100 points
WHO Code Implementation ¹⁰	The scale of implementation or enforcement placed by each country. This variable is reported as a categorical value classifying countries' performance into four groups.	The unit of analysis is in categories: No legal measures Minor legal measures Moderate legal measures Substantial measures in place

Note: Sources are from the following sites; (1) (FAO Food Price Index); (2) (Democracy Index 2022); (3) (The World Bank Data); (4) (The Economist Impact); (5) (The Global Economy); (6) (UNICEF Data); (7) (Statista); (8) (UNICEF Data); (9) (Environmental Performance Index); (10) (World Health Organization)

4.5 Sampling Method

Although statistical support was solicited during the design of the study, no formal sampling estimation was done for this study given that all WHO member states formed the study

cohort. One can approach sampling methods by using two ways: probability versus non-probability techniques. Each one carries its strengths and specific applications (Pace, 2021). Because the study possesses complex queries entangling both exploratory and evaluation, a probability sampling technique would be preferable and would have been in use if a nested case study branch was to be explored within this study (R. S. Kim, 2013).

4.5.1 Sampling Criteria

After the research setting and target population were defined, the next important sampling step was to decide on the optimum year of review. The field does not have standardized guidelines or a set of criteria for selecting the year cut-off for cross-sectional or systematic review studies (Alexander, 2020). In the absence of consensus, it is often left to the researchers to apply judgment on where to place the selection cut-off and offer sound justifications to that effect. This study chose to use data for the year 2022 for the following reasons:

- Recent data is more readily available and would be easier to interpret: To mitigate recall bias, the study chose to extract data that was still preservable and could be interpreted in fresh contexts (Talari & Goyal, 2020).
- Retrospective data have several validity threats as discussed by Talari & Goyal (2020) including showing inferior levels of statistical confidence when compared with prospective or on-time studies.

4.5.2 Sample Size

The sample size of the study enhances the confidence it needs to make analytical judgments. It is also known that a larger sample size has the capacity of a healthier margin of error (Etikan & Babatope, 2019), and the larger the sample size, the lower the likelihood of interpretative errors (Mweshi & Sakyi, 2020) The sample size for this study ended up being 128, which covers more than sixty percent of the targeted population.

4.6 Research Instrument

A simple Microsoft Excel spreadsheet was used as the data extraction tool. Figure 7 illustrates a dummy version of the tool depicting the countries in the rows and the data elements across the columns. The instrument was color-coded to show input, denominator,

and outcome variables. It is here where the factors postulated in the study’s theoretical framework were systematically translated into input (independent) variables. The instrument also allocated a column and a color for the denominator variable, which was the raw population number of children under 5 years in a country. This was done to adjust and standardize the scale of sales into a comparative ratio. The sales of the infant formula remained an outcome variable throughout the study. The under-five mortality rates were slotted as an additional data element to test for the third study hypothesis.

Figure 7: A Dummy Sample of the Research Instrument.

All countries	2022						First Hypothesis	Third Hypothesis	Neutralizing	2022		Independent Ratio	
	Input Variables									Third Hypothesis	Denominator Variable		Outcome Variable
	Factor Conditions	Demand Conditions	Role of Government	Related & Supporting Industries	Country Structure	Geopolitics/Democracy Index				Under 5 Mortality	Under 5 Years Population		Sales per year in \$
All countries	Innovation Index	Fertility Rates	Country GDP in US Billions	Dairy Price Index	Water Quality	WHO Code	Under 5 Mortality	Under 5 Years Population	Sales of products	Sales Ratio (L/M)			
Afghanistan	20	4.53	14,939	137	28	Authoritarian Regime	Substantial	56	6.61m	5 million	x		
Albania	24	1.55	20,177	87	54	Flawed Democracy	Moderate	10	139,537	7 million	x		
Algeria	17	2.47	206,007	73	53	Authoritarian Regime	Minor	22	4,80m	117 million	x		
Andorra	40	1.46	3,669	56	68	Hybrid Regime	Minor	3	2,501	2 million	x		
Angola	14	5.76	117,877	187	13	Authoritarian Regime	No measures	69	6.12m	50 million	x		
Antigua and Barbuda	56	1.94	1,864	188	70	Flawed Democracy	No measures	6	5,374	8 million	x		
Argentina	29	2.17	641,102	143	65	Flawed Democracy	Minor	7	3,24m	800 million	x		
Armenia	27	1.65	23,725	91	58	Hybrid Regime	Substantial	11	170,061	6 million	x		
Australia	47	1.73	1,707,548	145	87	Full Democracy	Minor	4	1,53m	289 million	x		
Austria	50	1.51	515,199	105	95	Full Democracy	Minor	4	426,68	58 million	x		
Azerbaijan	21	1.86	70,030	70	46	Authoritarian Regime	Minor	19	672,041	No data	x		

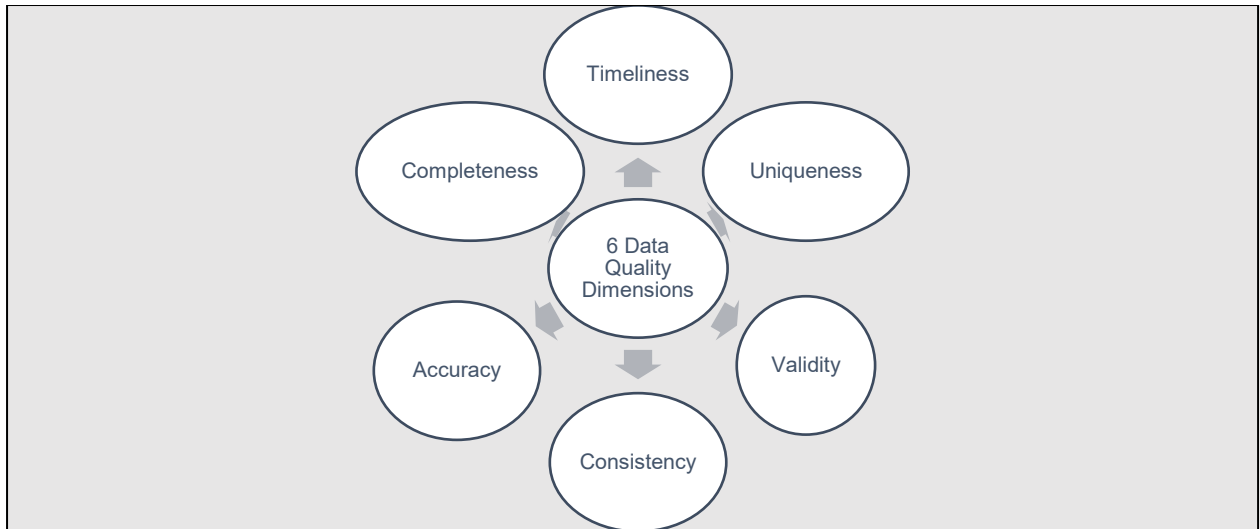
Notes: Please note that this is a dummy sample. The data inserted is for display only. Source: Author

4.7 Data Collection

The data collection process commenced after receiving ethical clearance. Data collection refers to the systematic steps to be taken by the researcher to gather and measure the data that is collected from relevant sources (Li T et al., 2021). The six data principles, depicted in Figure 8, were followed to maintain data integrity and quality.

These metrics insist that data should be entered correctly as it pertains to the chosen timeframe of review, that unique outliers must be investigated and flagged appropriately, and that data should be accurate, complete, and consistent.

Figure 8: The Six Data Quality Dimensions.



Source: (Batini et al., 2009)

4.7.1 The Use of Secondary Data Sources

Data was pulled from identified secondary sources. Table 7 provides these sources and the type of data extracted. Although in principle, such data had been collected for other reasons, it can still serve either as raw or refined for different research purposes (Tripathy, 2013).

Because this study inter alia aims to review and compare the sale of infant formula products across the globe, large databases were deemed to be the most appropriate sources to access for credible data. Secondary extraction of data from a large database was guided by the principles outlined by Smith and colleagues (A. K. Smith et al., 2011)

Table 7: List of Secondary Databases.

Study Variables	Secondary Sources	Type of Data
Dairy Price Index	Food and Agriculture Organization (FAO)	Raw data
Democracy gauge (Geopolitics)	The Economist Intelligence/Democracy Index	Raw and Summarized data
Fertility Rates	World Bank Open Data	Raw data

Global Food Security Index	The Economist Impact Report	Raw data
Gross Domestic Product (GDP) by country	World Bank Open Data	Raw and Summarized data
Population pyramid under five years	UNICEF Data	Raw Data
Innovation Index	The Global Economy	Raw data
Sales of Infant Formula	Statista/ GlobalData	Raw data
Under 5 mortality rates	UNICEF Data	Raw data
Water Quality Index	Environmental Performance Index	Raw data
WHO Code implementation status	WHO: Marketing of breast-milk substitutes: national implementation of the international code, status report 2022	Summarized data

4.7.2 Rapid Critique of Secondary Sources

Secondary data may come in numeric or non-numeric formats, meaning they can be both quantitative and qualitative. It is necessary to not only critique the suitability of the sources against the proposed objectives but also to evaluate the quality of the data supplied (Johnston, 2017). Information collected by secondary sources can come from three main outputs, these are surveys, documents, and/or multiple sources (Ajayi, 2017). A rapid critique of the secondary sources accessed indicates that these are reliable sources that triangulate data from global statistics, epidemiology surveys, and/or other large monitoring platforms. Experience-wise, the data sources range between ten to forty years doing these consolidations as often as quarterly or on an annual basis for others. In practice, it is common that these are referenced during policy deliberations or priority-setting meetings by organizations (Young & Ryu, 2000).

4.7.3 Data Collection Step-by-Step

The meticulous data collection process is described below:

Step one: Obtaining Ethics Clearance and Approval for the research project

The initial step towards our data collection journey was to obtain ethical clearance from the Research Ethics Committee. The REC clearance letter is given as Appendix B at the end of this thesis.

Step two: Extracting data

The second step was accessing the secondary data sources and extracting the data onto the Excel sheet. None of the databases required special permissions or gatekeeping procedures.

Step three: Data Charting

The step of data charting was done iteratively, screening the accuracy of captured data per country and for each variable. The objective of data charting is to clean and arrange the data in such a way that it begins to tell a descriptive narrative (Kitchin & Lauriault, 2014).

Step four: Data Organization

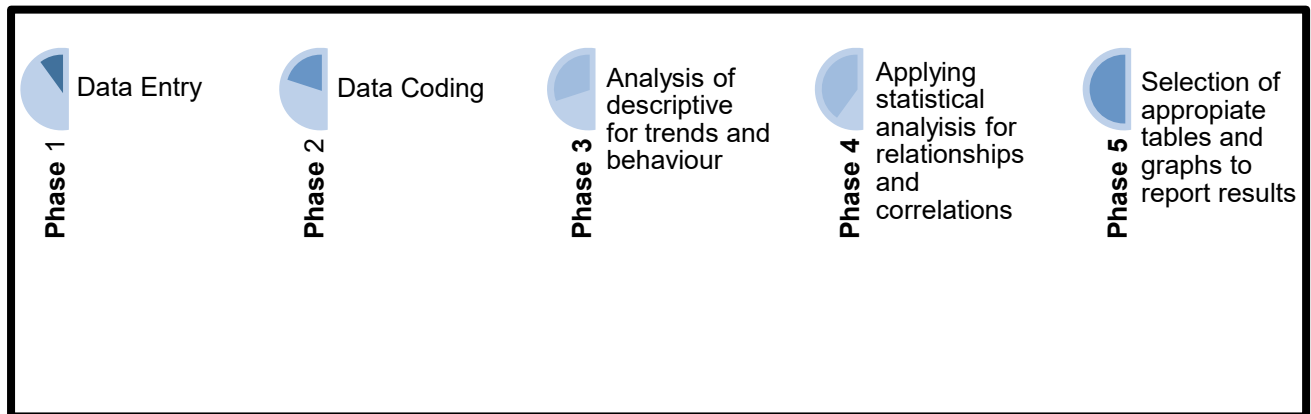
After data charting, missing data/gaps were cleared from the cohort. Clean and complete data was then transferred into the SPSS system to begin data processing.

4.8 Data Analysis Approach

The Statistical Package for the Social Sciences (SPSS) tool was used to run the data analysis. The analysis was phased (**Figure 9**) beginning with data entry where there was manual checking that the frequencies of all variables were accurate. The second phase included assigning codes to all the categorical variables, specifically the WHO Code and Geopolitical variables, which needed to be transcribed. The third phase was to summarize the data descriptively looking at the central means, medians, and the ranges of sample data. Due to the complexities of the data, non-linear correlation analysis was done to test the relationships between variables. This was largely done as the fourth phase.

Lastly, once the descriptive and analytical phases were completed, tables and graphs were generated that could represent the narrative of the data.

Figure 9: Data analysis approach in phases.



Source: Author's Own

4.9 The Research Quality

There is a reasonable expectation that formal research projects have high-quality standards. Characteristics of such standards include principles related to neutrality, context, applicability, reliability, and validity. However, there are differences in how these qualities are conceptualized according to the type of research method used (Stamenkov, 2023). As this study identifies as quantitative research, the quality cornerstones will cover four indicators of interest. These are (1) Internal Validity, (2) External Validity, (3) Reliability, and (4) Objectivity.

4.9.1 Internal Validity

Internal Validity refers to the extent to which findings can be attributed to the interventions rather than any intrinsic flaws in the design. It questions the accuracy at which the study can filter the input data to pinpoint key causal findings (Onwuegbuzie, 2003). For this study, a p-value of 0.05 or less, indicates a significant finding, and the confidence interval was set at 95% making it the margin of certainty the study is willing to accept. The results chapter will present with care each major finding. These are interpreted through the lens of data accuracy markers such as the F-values, standard of error values, and the p-values.

4.9.2 External Validity

External validity refers to the extent to which the research results from a particular study are generalizable to all relevant contexts. It questions whether the sample does truly represent the target population (Onwuegbuzie, 2003). It is known that countries have different contexts thus the discussion and interpretation of the findings will accommodate the context of countries when making assertions, recommendations, and/or conclusions. Furthermore, the study acknowledges that due to missing data, the sample size was reduced to 128 countries. However, the study argues that this cohort still represents the global picture as these states covered the six geographical regions under the WHO. It is therefore expected that the results can and should be generalizable to the other excluded countries/states equally.

4.9.3 Reliability

Reliability refers to the extent to which the results are consistent if the study is replicated. (Sürücü & Maslakçı, 2020). The Classic Test theory seeks to estimate the internal consistency across repeated measures ((Anselmi et al., 2019). By drawing data from one source for a particular variable, a single measurement was applied thus the study maintained a fair standard of consistency.

4.9.4 Objectivity

Objectivity refers to the extent to which personal biases are removed ((Rogers, 2000). The literature highlights three common biases that may apply, especially to quantitative research designs. Considering the order of a traditional research implementation sequence, these are: (1) Selection, (2) Measurement, and (3) Analysis bias.

4.9.4.1 Selection Bias

Selection bias can occur when investigators use improper procedures for selecting a sample population thus distorting the representation of the target population. This systematic error could then lead to the study reflecting findings that do not align with the true reality (Henderson & Page, 2007). This study followed a simple theoretical sampling by including all of the 194 member states as part of the sample cohort.

4.9.4.2 Measurement Bias

Measurement bias, also referred to as 'Information bias', occurs when the researcher measures key study variables incorrectly so that the outcome ends up overstated or underreported (Page & Henderson, 2008). This kind of bias is closely tied to the observer bias whereby the researcher, being aware of the study hypothesis beforehand, systematically focuses on certain variables to arrive at a pre-conceived outcome ((Mahtani et al., 2018). This study controlled for these types of bias by applying an iterative component to its data collection and cleaning process, using standard units of measure for each variable, collecting information from reliable sources, and using one statistical tool to measure outcomes.

4.9.4.3 Analysis Bias

Data analysis bias can occur at any stage of the analysis phase. By subjecting all sections of the analysis to review by the supervisor, personal bias was reduced. It will also be addressed by ensuring that the software being used is well-calibrated and updated to trigger alerts in a scenario where incorrect formulas could be inserted. The data was analyzed against various curved models to ensure that each relationship is tested in its entirety in terms of spectrums.

4.10 Methodological Limitations

The study experienced methodological limitations in that the original (intended) sample size was reduced to 128 countries from the 194 WHO members. Primarily small states and islands had to be excluded due to missing data, which would preclude accurate interpretation and application. However, a careful empirical analysis of the remaining 128 states, confirms that the quality, quantity, and diversity of the remnant countries remained representative of the population and served reliable for analysis. At the analysis stage, both linear and non-linear regression models had to be used due to the curvature of the issues. This expands the interpretations of findings beyond the usual p-value parameters. The study did not encounter data access limitations as all the secondary sources could be downloaded with ease.

4.11 Ethical Considerations

Ethical considerations in research are important principles that must be upheld in research. These principles were considered in both the early inception phases of the research project and the late close-out stages. To uphold ethical standards, this study was evaluated by the Research Ethics Committee (REC) of the Gordon Institute of Business Sciences (GIBS), before commencing with the data collection and analysis. During the study, structured and raw data were sourced from **reliable secondary databases**. All the sources were public domain webpages, reports, and statistics for open use. The researcher was the principal investigator in this study extracting the data personally so that it is not tampered with or changed to achieve any preconceived outcomes.

It is also ethical to report results as truthfully and objectively as possible including null findings as they were found in our study (Roloff & Zyphur, 2019). As such, transparency and reflexivity are applied when discussing the study limitations in the last chapter of the thesis. As this work is done for the academic fulfillment of a degree, supervisory oversight was maintained to safeguard the integrity of the project from plagiarism and other forms of fraud. To add a layer of accountability, a qualified statistician was sourced to guide and confirm that the correct procedures were followed for analysis and interpretation. The study will also adhere to good data practices by keeping all research source documents safe and e-cloud stored for a minimum of ten years per the GIBS ethics guidelines. This would be made available for secondary and independent analysis and cross-checking if later required. To safeguard against plagiarism, all references used are properly cited.

CHAPTER 5: RESEARCH FINDINGS

5.1 Introduction

This chapter will visually display the major findings of this research project. The flow will follow a logical path beginning with descriptive results followed by the analytical findings which are mainly the correlates. The correlates will ripple chronologically from the first hypothesis till the third one. A concise insert of secondary findings is added as these were found to be interesting observations worthy to be flagged. To summarize the statistical findings, a table is provided with key conclusive statements.

5.2 Methods

Data was collected from secondary sources and entered methodologically into a data extraction sheet and then transferred to the Statistical Package for the Social Sciences SPSS statistical model for the analysis. The study aimed to analyze all 194 countries as the whole sample size for the study and to use linear regression models to test the relationships between the variables as highlighted in the third chapter. However, a few pivots occurred. The sample size ended up being 128 countries due to missing data and non-linear regression formulas and parameters were used instead of the traditional linear tests. The sub-sections under this heading aim to make plain these pivots.

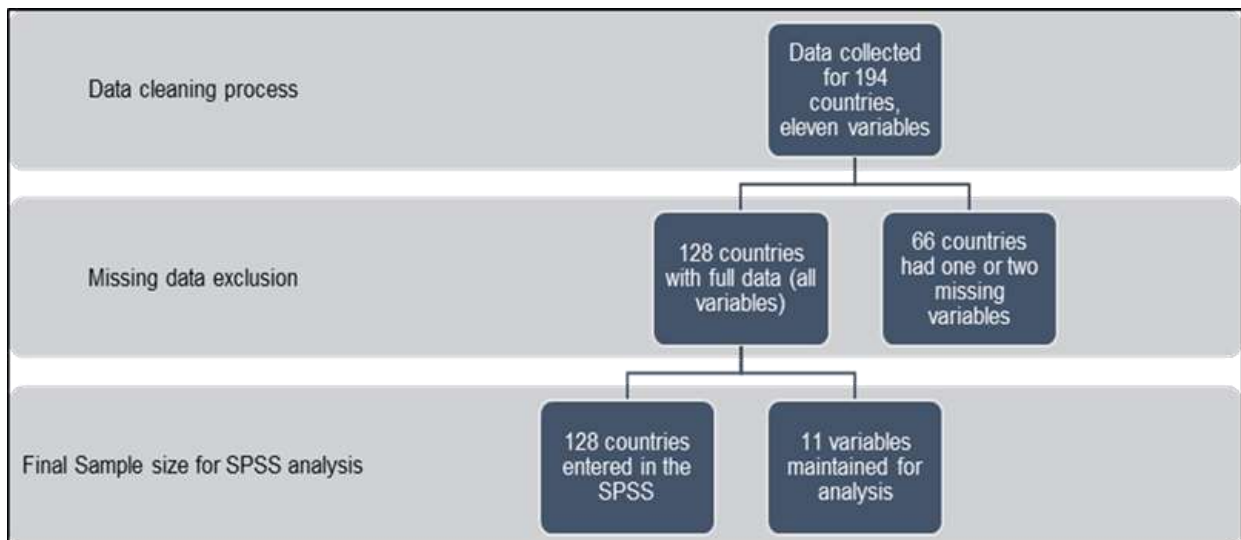
Another important thread in the method process was to establish a comparable ratio as our dependent variable. The study acknowledged that comparing the pure dollar sales of countries that have wide economic discrepancies would introduce flaws in the results and their interpretation. Therefore, the study sought to measure the scale of sales leaning towards finding a common ratio that all countries shared, which will be explained in more detail below.

5.2.1 The Use of the Listwise Technique for Missing Data

It is known that missing data reduces statistical power, introduces bias and impacts on sample representativeness (Little et al., 2012). Kang (2013) introduces a process termed 'Listwise' or complete case deletion as an effective technique to address missing data during research data analysis. Listwise deletion is when the researcher opts to exclude cases with the missing data and analyze the residual data. Over the years, this has grown to be the

most widely used method for accounting for missing data, and thus has become the default expectation during analysis in most statistical software packages. If the sample data remains adequate in terms of size and the study power is intact, the listwise deletion may be a reasonable strategy (Kang, 2013). From the cohort of 194 countries, sixty six states (34%) had missing data for one, two and some others even four variables and thus were rendered unusable. A listwise deletion was actioned in SPSS reducing the final sample size to 128 states. The level of unacceptable missing data was set at 100 entries, therefore, even if the sample size deviated from the desired scale, the study was still powered to do correlates effectively. **Figure 10** depicts the listwise deletion. **Appendix C** is a list of the final 128 states which covered all the key geographical regions of the world and included low, middle and high income states, thus maintaining a degree of representativeness.

Figure 10: Sample size adjustment during data analysis.



Source – Author

5.2.2 Establishment of a Denominator Ratio

It was important that the denominator be a standardized comparative ratio so that countries could be viewed fairly. To determine the 'scale of sales', a ratio was established pairing two variables: Sales of Formula Milk per year/Population number of children under five years. This equation formed the denominator baseline: Scale of Sale for Formula Milk per year per

child under 5 years. **Table 8** depicts what the scale of sales were as it formed the foundation for all the correlates that would follow.

Table 8: Establishment of denominator ratio.

Denominator Ratio	Unit of Analysis	Mean	Median	Std. Deviation	Minimum	Maximum
Scale of Sale Formula Milk per Year per Child Under 5 Years	In US Dollars	147	93	233	1,39	1 963

Source: Author

5.2.3 Types of Nonlinear Regression Models

In regression analysis, curve fitting is specifying the model that provides the best fit to the dataset. For each hypothesis tested, a table of the various curved models is provided.

Commonly, the data fitted the Compound, S-curve, Power and the Inverse model. **Table 9** displays the formulas for both the linear and non-linear models that were explored during data analysis (Vittinghoff et al., 2007)

Table 9: Regression model formulas.

Regression Models of Inquiry	Equation forms
Linear Model	$Y_t = a + bt$
Logarithmic model	$Y_t = a + b \text{Ln}(t)$
Quadratic model	$Y_t = a + b_1t + b_2t^2$
Cubic model	$Y_t = a + b_1t + b_2t^2 + b_3t^3$
Compound growth model	$Y_t = a b^t$
Exponential model	$Y_t = a e^{bt}$
Power model	$Y_t = a t^b$

Parametric linear and non-linear trend functions

5.2.4 Description of Nonlinear Statistical Parameters

The pattern of the variables was more suitable to be analyzed using non-linear statistical models or curved models. Although curved models still determine correlations and relationships, they require additional triangulation of factors to fully establish significance.

This is different from traditional linear models where the p-value holds principal weight in determining significance. For non-linear models, the F-value, R-square, Standard of Error, as well as the p-value share the course on the direction and scale of significance. **Table 10** outlines these five parameters and how they should be placed in proper context for interpretation.

Table 10: Description of the curve parameters.

Curve Parameters	Description	Interpretation	Application in the study
F-value ¹	The F-value is used in analysis of variance and is instrumental to test the fitness of the variables against the analytical test.	A higher F-value reflects that the model is suitable for the data and is often an early indication that there are relationships worth exploring.	This was the first criteria used to decide on which curved formula to pursue. A tray of both linear and non-linear tests was done and the test with the highest F-value was pursued for further analysis.
p-value ²	A p-value measures the probability of obtaining the observed results, assuming that the null hypothesis is true.	A p-value of 0.05 or lower is generally considered statistically significant	The level of significance was set at 0.05 for this study meaning a p-value of 0.05 or less supported the hypothesis.
R-square ³	R-squared measures the strength of the relationship between the statistical model and the dependent variable on a convenient 0 – 100% scale.	The higher the R-square is to 100, the stronger the fit of the variable with the model.	Alongside with the F-value, the R-square was used to determine the best curve model to pursue.
Standard of Error ⁴	For regression models, the standard error of the mean is a measure of the dispersion of sample means around the population mean.	Standard error indicates how well the sample data represents the whole population. By calculating standard error, you can estimate how representative your sample is of your population and make valid conclusions.	A standard error of 1.96 or less was considered a good and a fair representative finding in this study and supported the narrative that the correlations are significant.

Source: (Shrestha, 2020)

5.3 Descriptive Results

The descriptive component of the results aims to paint a sketch of the general demographics of the sample data. These results will be displayed in their numeric and non-numeric or categorical formats.

5.3.1 Numerical Summaries

Table 11 summarizes the numeric data using both the measures of central tendencies and of spread/variability found upon analysis. For each variable, arithmetic mean and the median are displayed, along with standard deviation and sample ranges.

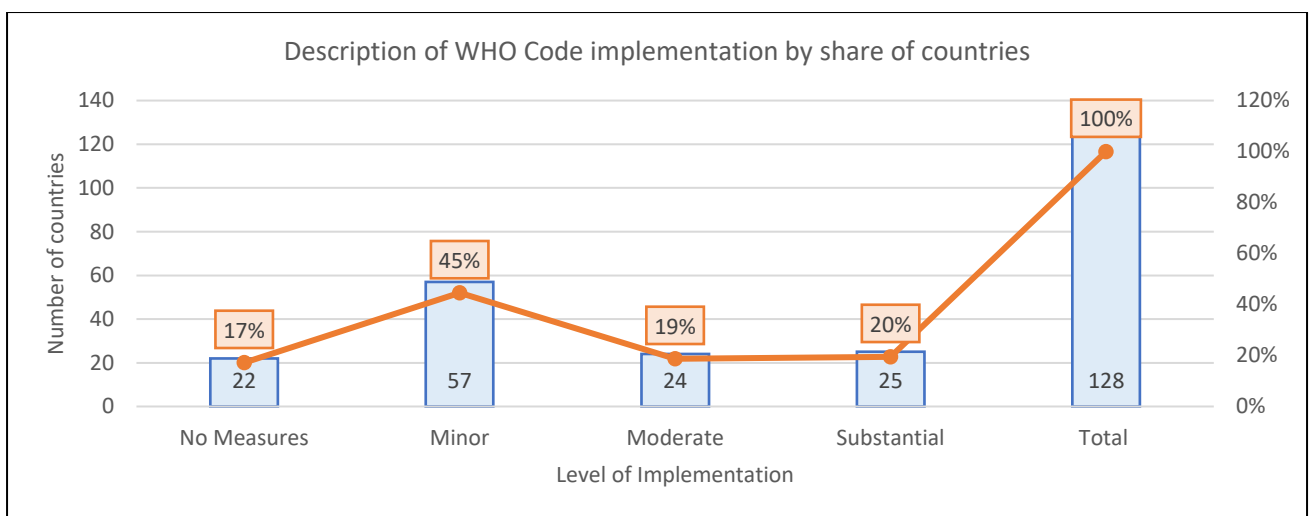
Table 11: Descriptive Summaries of Numeric Data.

Quantitative Variable	Unit of Analysis	Mean	Median	Std. Deviation	Minimum range	Maximum range
Annual Sales of Infant Formula Milk for the year 2022	In US Dollars	449 398 437	50 000 000	1 466 735 060	1 000 000	13 000 000 000
Country GDP	In US Dollars	795	101	2 975	1,95	26 854
Dairy Price Index	Price Points	110	104	30	56	228
Fertility Rate	The ratio of live births per 1,000 women of reproductive age	2,2	1,89	1,03	1,11	6,73
Global Innovation Index	Scale from 0 – 100 points	32,51	29,00	12,998	14	65
Population Count of Children Under 5 Years	Raw numbers	4 515 199	1 045 000	12 546 122	8 372	114 060 000
Under 5 Mortality	Per 1000 live births	20	11,00	22,690	2	115
Water Quality	Scale from 0 – 100 points	54	54	28	2	100

5.3.2 Categorical Summaries

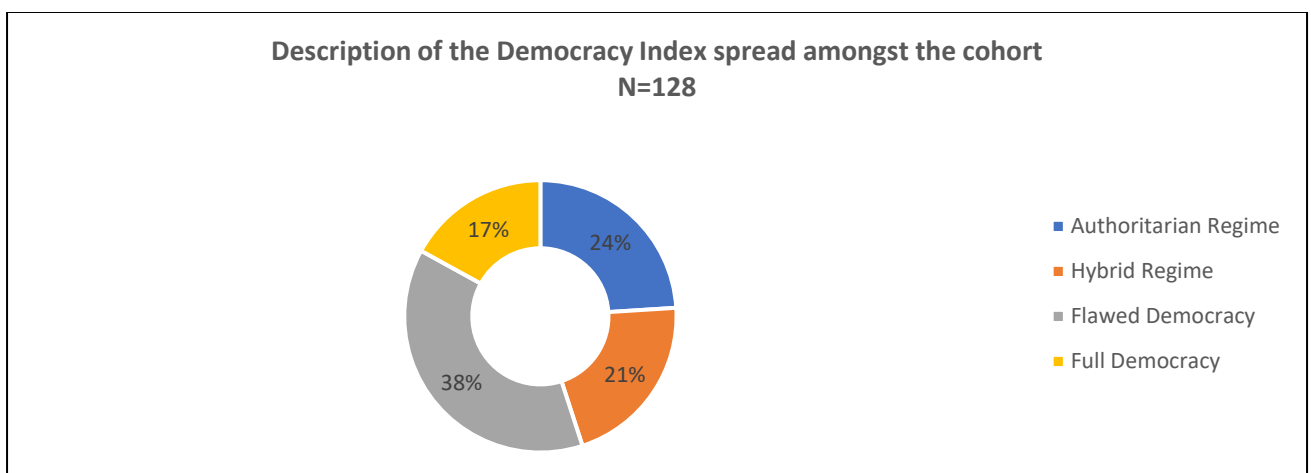
The WHO Code implementation (**Figure 11**) and the Democracy Index/Geopolitics (**Figure 12**) were the two datasets that were qualitative amongst the sample. The measure of frequency is used to summarize both these variables as found in the analysis – meaning how common were these observation points in the sample data. The percentages in graphs depict that from the 28 states, a majority (62%) fell between no measures at all and minor restrictions.

Figure 11: WHO Code implementation by share of countries.



In terms of geopolitical observation, there was almost an equal spread of authoritarian and hybrid types of regimes, however, flawed democracies dominated the cohort with 38%.

Figure 12: The Democracy Index spread across the cohort.



5.4 Correlates Results: Testing Study Hypotheses

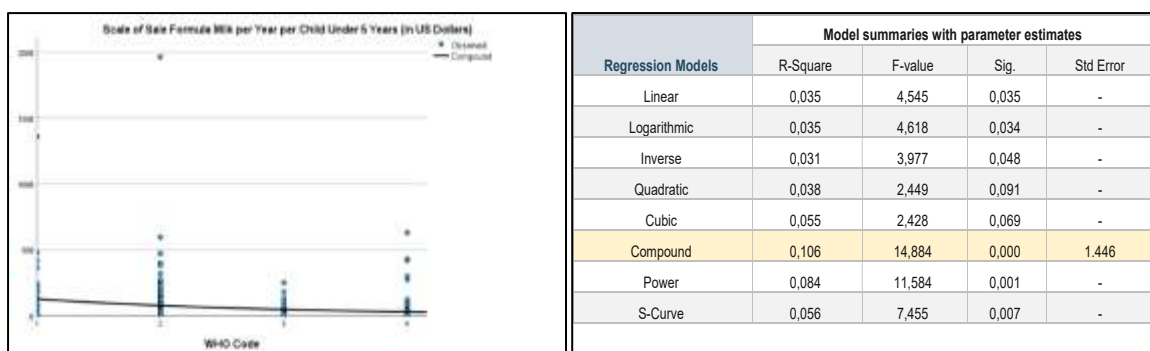
The study had three broad hypotheses, one of which had sub-statements within it. In total, the study had eight relationships to test statistically. They were as follows: (1) to test the relationship between the WHO Code levels with the scale of sales per country, (2) to test between the theoretical factors and the scale of sales and (3) to look into the relationship between the under-five mortality rates and the scale of sales. The model that was selected as the best fit for each hypothesis gave the highest R-square and F values. The study placed a p-value of 0.005 as a significant finding. The key finding was that all the tests except for the Dairy Price Index proved to have significant relationships, whether positive or inverse.

The first hypothesis: Relationship between the sales and the WHO Code.

H₁: The more stringent the implementation of WHO Code regulations are, the lower the scale of sales of infant formula milk per child under 5 years old.

- **Results: This hypothesis is accepted.**
- The compound model was the best fit and the p-value was 0.000 which is significant with a standard error of 1.446. From the results, the study can accept the assumption that the higher the WHO Code restrictions, the lower the scale of sales in the 128 countries analysed.

Figure 13: Statistical relationship between the WHO Code regulations and the scale of sales of infant formula milk.

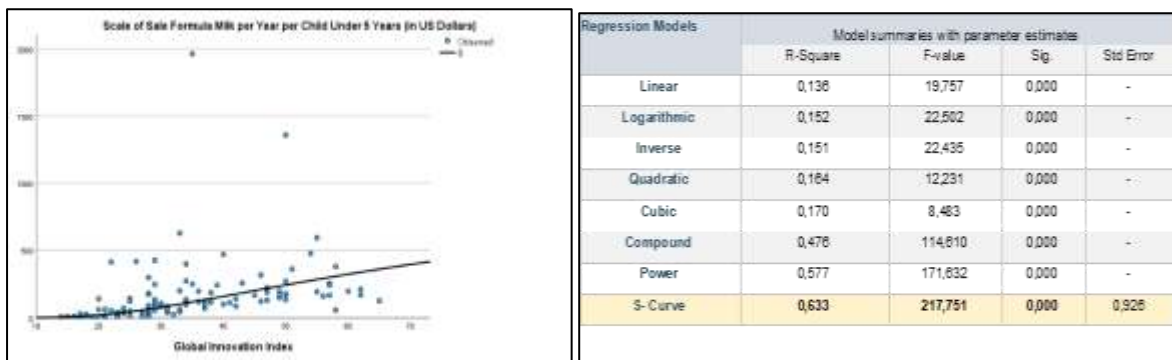


The second hypothesis: Relationship(s) between the theoretical factors and the sales.

H_{2a}: Based on PDLT, the study expects to find a positive relationship between the **Global Innovation Index** and the scale of sales of infant formula per child under five years.

- **Results: This hypothesis is accepted.**
- The S-curve model was the best fit and the p-value was 0.000 which is significant with a standard error of 0.926. From the results, the study can accept that the higher the innovation index of a country, the higher the scale of sales.

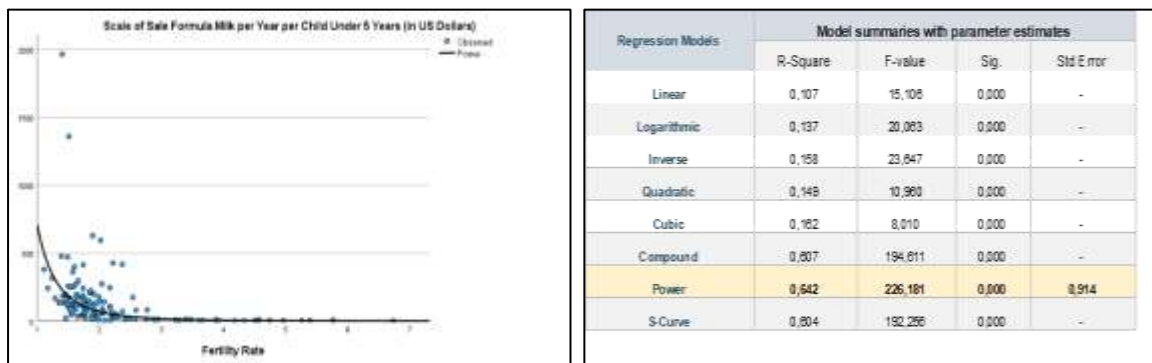
Figure 14: Statistical relationship between the Global Innovation Index and the scale of sales of infant formula milk.



H_{2b}: Based on PDLT, the study expects to find a positive relationship between the national **Fertility Rates** and the scale of sales of infant formula per child under five years.

- **Results: This hypothesis is rejected.**
- The power model was the best fit and there was a clear inverse relationship between the variables implying that the higher the fertility rates of a country, the lower the scale of sales of infant formula milk. The p-value result was 0.000 which is significant with a standard error of 0.914.

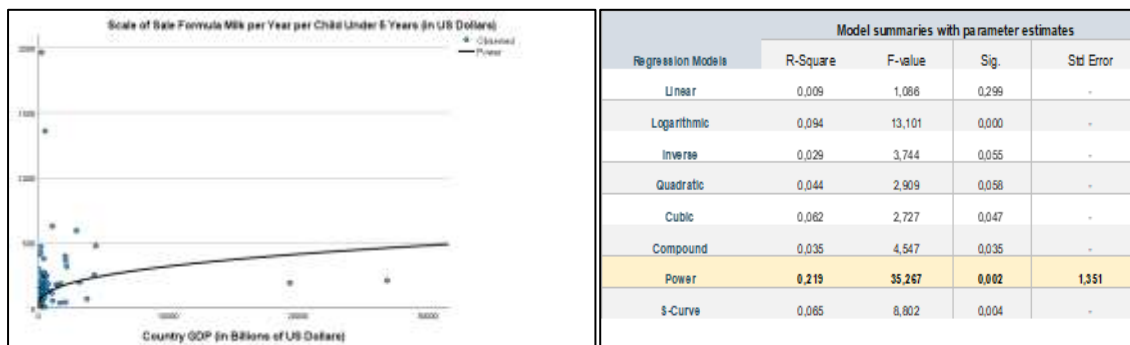
Figure 15: Statistical relationship between the fertility rates and the scale of sales of infant formula milk in a country.



H_{2c}: Based on PDLT, the study expects to find a positive relationship between the national **GDP** and the scale of sales of infant formula per child under five years.

- **Results: This hypothesis is accepted.**
- The power model was the best fit and the p-value result was 0.002 which is significant with a standard error of 1,351. The results imply that the higher a country's GDP, the higher the scale of sales of infant formula milk.

Figure 16: Statistical relationship between the GDP and the scale of sales of infant formula milk in a country.



H_{2d}: Based on PDLT, the study expects to find higher scales of sales of infant formula milk in countries with lower **Diary Price Indexes**.

- **Results: This hypothesis is rejected.**
- The inverse model was the best fit and the p-value results was 0.093 which is slightly above the accepted level of significance. The results imply two important messages, firstly that the direction of the relationship is valid but secondly that it is not of a

significant level. Therefore, the study can establish that the lower the dairy prices are in a country, the higher the scales of sales would be. However, the caveat is that this might not be in a significant way.

- Due to the insignificant levels, the SPSS could not produce graphic models of these correlations. **Table 12** is provided below to depict the regression models matched against this relationship.

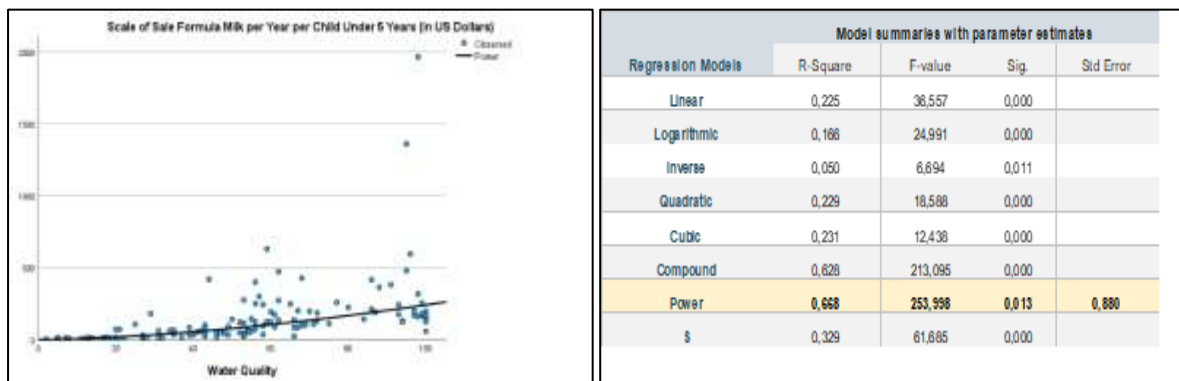
Table 12: Summary of results from regression analysis on the Dairy Price Index as an independent variable.

Regression Models	Model summaries with parameter estimates		
	R Square	F	Sig.
Linear	0,016	2,080	0,152
Logarithmic	0,020	2,508	0,116
Inverse	0,022	2,858	0,093
Quadratic	0,020	1,259	0,288
Cubic	0,031	1,338	0,265
Compound	0,007	0,874	0,352
Power	0,007	0,848	0,359
S-Curve	0,007	0,863	0,355

H_{2e}: Based on the Diamond Location theory, the study expects to find a positive relationship between the **Water Quality Index** and the scale of sales of infant formula per child under five years.

- **Results: This hypothesis is accepted.**
- The power model was the best fit and the p-value result was 0.013 which is significant with a standard error of 0,880. The results imply that the higher the water quality, the higher the scale of sales of infant formula milk.

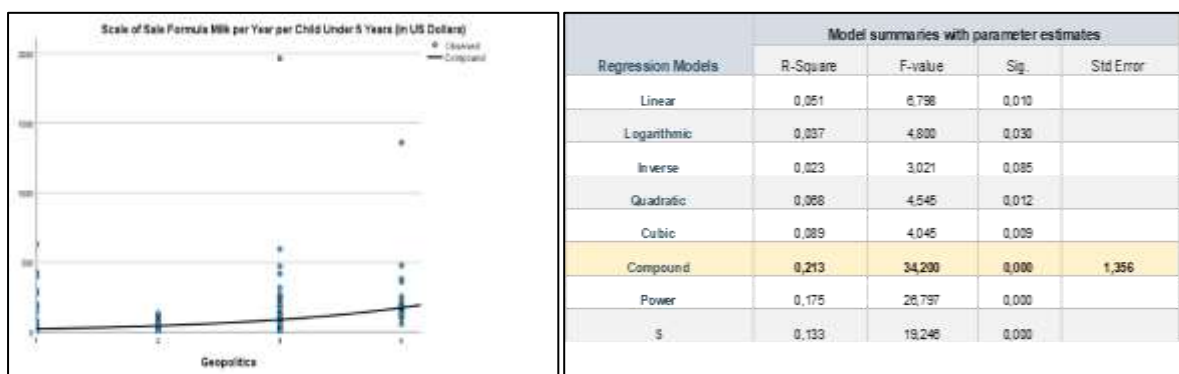
Figure 17: Statistical relationship between the water quality and the scale of sales of infant formula milk in a country.



H_{2r}: Based on the Diamond Location theory, the study expects to find a positive relationship between the national **Geopolitical indexes** and the scale of sales of infant formula per child under five years

- **Results: This hypothesis is accepted.**
- The compound model was the best fit and the p-value result was 0.000 which is significant with a standard error of 1,356. From the results, the study can establish that the higher the democracy index of a country, the higher the scale of sales of infant formula milk.

Figure 18: Statistical relationship between the geopolitics and the scale of sales of infant formula milk in a country.

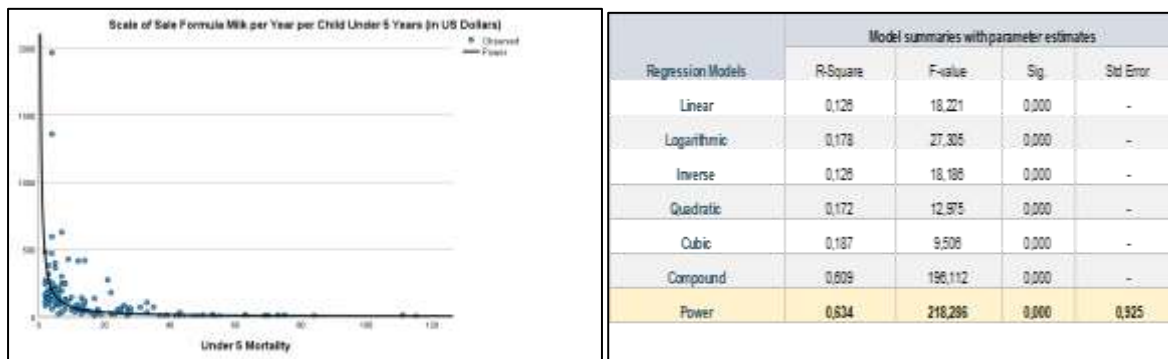


The third hypothesis: Relationship between the sales and the under-five mortality rates.

H₃: The study expects no direct relationship between the **under-five mortality rates** in countries and the sales of infant formula per under-five population.

- **Results: This hypothesis is rejected**
- The power model was the best fit and the p-value result was 0.000 which is significant with a standard error of 0.925. These findings demonstrate that higher-than average under-five mortality rates were found in countries with lower formula sales.

Figure 19: Statistical relationship between the under-five mortality and the scale of sales of infant formula milk in a country.



5.5 Secondary Observations

Due to the interesting finding linked to the third hypothesis around child mortality and the scale of sales, further investigation was done to scan the top ten countries in the cohort that had the highest under-five mortality rates. This was also expanded for the fertility rates.

Table 13 and **Table 14** below reveals the top ten countries on reported under-five child death and fertility rates. They also show their other variables such as the Innovation index, Fertility rate, GDP, Water Quality scale, WHO Code implementation level and their democracy index. Although no analytical correlates were done to test these cluster of findings, looking descriptively at this table, there is pattern that emerged as an adjacent finding. It can be noted that the country that reported the highest deaths in children under five years, also was the leading state with fertility rates and had the lowest range of water quality. Similarly, fifty percent of the top countries by fertility rates had strict marketing rules applied in their states. These points will be linked and discussed in the discussion section.

Table 15 is a ranking of the top three states (out of the 128) that sold the highest infant formula milk for the year under review. This deep dive was done to further extract trends following the correlates found in Figure 18.

Table 13: Top ten countries with the highest Under-five Mortality Rates.

Country	Innovation Index	Fertility Rates	GDP in US Billion	Water Quality	WHO Code	Geopolitics	Under5Mortality
Niger	15	6,73	17	2	Minor	Authoritarian regime	115
Nigeria	17	4,57	507	5	Substantial	Hybrid regimes	111
Benin	15	5,39	19	14	Moderate	Hybrid regimes	84
Côte d'Ivoire	18	3,47	70	17	Moderate	Hybrid regimes	75
Lesotho	27	2,88	3	7	Minor	Flawed democracies	73
Cameroon	15	4,5	49	8	Minor	Authoritarian regime	70
Mozambique	15	4,74	20	16	Substantial	Authoritarian regime	70
Angola	14	5,76	118	13	No measure	Authoritarian regime	69
Pakistan	23	3,39	377	18	Moderate	Hybrid regimes	63
Togo	15	4,18	9	5	No measure	Authoritarian regime	63

Table 14: Top ten countries with the highest Fertility Rates.

Country	Fertility Rates	Population of Children Under 5 years	GDP	Dairy Price Index	Water Quality	WHO Code Implementation
Niger	6,73	5 140 000	17	138	2	Minor
Angola	5,76	6 120 000	118	187	13	No measures
Benin	5,39	2 170 000	19	146	14	Moderate
Uganda	5,26	7 870 000	50	86	18	Substantial
Burundi	4,96	2 070 000	3	130	5	Substantial
Mozambique	4,74	5 370 000	20	108	16	Substantial
Nigeria	4,57	35 380 000	507	87	5	Substantial
Sudan	4,54	7 190 000	47	77	22	Minor
Cameroon	4,5	4 400 000	49	149	8	Minor
Tanzania	4,33	10 760 000	85	102	19	Substantial
Togo	4,18	1 290 000	9	115	5	No measures

Table 15: Top sellers of infant formula milk by geopolitical orientation for the year 2022

Ranking of the top three infant formula sellers according to geopolitical columns	Authoritarian	Hybrid Regime	Flawed Democracy	Full Democracy
1	China	Turkey	India	Japan
2	Russia	Pakistan	Indonesia	Germany
3	Saudi Arabia	Nigeria	United States of America	United Kingdom

5.6 Summary of Results

Although the study had aimed to analyze 194 WHO member states as the sample size for this study, after excluding missing data, only 128 countries became the final empirical dataset for analysis. The three common descriptive measures were used to summarize and present the initial portion of the results: measures of central tendencies, measures of spread or variability and the measure of frequency (D. A. Choi et al., 2020).

An important intermediary step before testing the correlates was to establish a baseline denominator for the formulas. A ratio was birthed to fairly assess the scale of sales from standardized comparative ground looking at pure sales of infant formula milk per the children under-five years living/recorded in that particular country.

The dataset proved to be complex and interlinked in that non-linear regression models had to be used further to describe the relationships between the variables. These regression models were curved for most of the variables highlighting the importance of the S-square and F-values which are unique and complimentary parameters of significance in addition to the traditional p-values.

The models picked up significant relationships in all the variables except for one, which was the link between dairy price index and scale of sales of infant milk in the countries (**Table 16**). Surprisingly, the study had to reject the assumption that there was no relationship between child deaths and the scale of sales which prompted an expanded search leading to some secondary observations.

Table 16: Summary of hypotheses and their correlates.

Study Hypotheses	What was the Assumption(s)?	Is it Supported?	Which Curve estimation regression model used?	What was the R-Square and the Level of significance?
H ₁	The stricter the WHO Code regulations, the lower the sales/sales ratios in that country	Yes	Compound	R-Square 0.106 Sig. 0.000
H _{2a}	The higher the country's Innovation Index , the	Yes	S-curve	R-Square 0.633

	higher the scale of sales of infant formula milk			Sig. 0.000
H _{2b}	The higher the fertility rate of a country, the higher the demand and thus the higher the scale of sales of infant formula milk	No	Power	R-Square 0.642 Sig. 0.000
H _{2c}	The higher the GDP of a country, the higher the scale of sales of infant formula milk	Yes	Power	R-Square 0.219 Sig. 0.000
H _{2d}	The countries with lower dairy prices , the higher the scale of sales of infant formula milk	No	Inverse	R-Square 0.022 Sig. 0.09
H _{2e}	The higher the water quality of a country, the higher the scale of sales of infant formula milk	Yes	Power	R-Square 0.668 Sig. 0.013
H _{2f}	The higher the Geopolitical/democracy index of a country, the higher the scales of sales	Yes	Compound	R-Square 0.213 Sig. 0.002
H ₃	There is no direct relationship between under-five mortality rates and the scales of sales of infant formula milk	No	Power	R-Square 0.634 Sig. 0.000

CHAPTER 6: DISCUSSION

6.1 Introduction

In this discussion, the researcher will reflect on the major findings asking, *'What do we know now that we did not know before and what implications does this have based on the current literature?'* This chapter kicks off by outlining the pattern and distribution of the dataset and the subsequent need to use nonlinear regression models. Following that, it will revisit the hypotheses and the secondary observations as outlined in the previous chapter.

6.2 Pattern and Distribution of Data: Use of Nonlinear Models

Table 11 together with **Figures 11 and 12** displayed descriptively the pattern and distribution of the sample data which was predominantly nonlinear. Kesavulu et al (2015) takes the time to explain the role of nonlinear models in unpacking multicollinearity effects which are commonly seen in the business and economics sciences. Our data proved to be curved and complex which needed the use of nonlinear regression models. These models have several advantages over the traditional linear methods such as: Versatility, Parsimony, and Outliner detection.

Nonlinear models are versatile to capture more complex relationships and thus can offer more than one way to explain patterns and relationships (Andersen, 2009). Such was the case for the first hypothesis test between the WHO Code implementation levels and the scales of sales. **Figure 13** shows that the inverse model also picked up a positive and significant relationship, however, given that this model is often used in combination with other prediction models and U-shaped data (Ries et al., 2023), it was the least fit for our type of data. Nonetheless, it is hinting that this relationship has potential for more than one explanation such as the role of predictability and the role of inverse reality.

Nonlinear models are also sharper diagnostic tools in that they can appropriate the best fit for data making them ideal parsimonious tools (Archontoulis & Miguez, 2015) and lastly, they are superior models for detecting outliers in a dataset. Dalatu et al (2017) compared linear versus nonlinear models in detecting outliers in datasets and found that nonlinear models could expose outliers 98% of the time compared to 68% when linear models were used. Having said so, they are difficult to interpret and threats of overfitting are some of its disadvantages (Archontoulis & Miguez, 2015).

6.3 Discussing Hypotheses

6.3.1 H₁: WHO Code and Scale of sales

The heart of this study is understanding the implications of demarketing strategies on the scales of sales. As the study unfolded, 'the good, the bad, and the ugly' of the WHO Code as a demarketing strategy rose to the surface. Under this first hypothesis, the paper will canvass these three sides. Ultimately, the good is evidenced by the effectiveness it seems to have on sales of IFM and its scalability in that it is in motion in more than a hundred countries in this world. The bad on the other side is manifested in its impact beyond a certain level and the wide gaps in implementation seen across the globe. It does have an ugly side in that it remains violably structured and it has not transformed much from its ancient tactics.

6.3.1.1 *The Good of the WHO Code*

The findings of this study signify that the WHO Code is effective in curbing demand for infant formula milk and it does this by using two strong arms: the use of the marketing mix and its hybrid typology.

Use of Marketing Mix: This paper argues that the code utilizes three of the 4Ps in its design, a view that is different from Salem and Ertz (2023) who claim that all four Ps are present. The description from the literature review, outlined in Table 3 of this paper, makes clear that the Code has restrictions on **product, promotion, and place** intentionally and directly. The demarketing of products affects product availability and packaging (Ergin et al., 2013). Restrictions on promotion are evident with the mandatory warning labels, embargo to make inappropriate health claims, and the limitation to advertising in public places (Vinje et al., 2017). The Code has put clear measures around the places where firms can advertise, restricting them from health facilities, government institutions, and even doctor's rooms (Dodgson et al., 2014).

The component of price is however impalpable given that there are no special taxation judgments against the manufacturers. As far as the published Codes are concerned, governments are not given the power to influence prices nor to impose extraordinary tariffs on these products (J. Smith et al., 2014). It is based on this observation that our study did not find the WHO Code to be using the entire four elements. Literature is not clear what are the consequences and/or benefits when strategies, especially those that align themselves as demarketing, are found to be missing one or two elements of the basic 4P mix.

Several authors have revisited the mix with others casting doubts in its role as a management tool to draft personalized strategies whilst others suggest that these four Ps have been stretched beyond point and might need a total reconfiguration (Constantinides, 2006)(Gordon et al., 2013). Either way, none of these scholars encourage trimming down the four Ps into three or two but rather the marketing movement seems to be fortifying the existent four and galvanizing additions on top of them instead of subtractions (Lim, 2021). This observation can go either way. The WHO Code can be praised for still being effective despite missing a piece or this could be seen as a limitation. The latter assertion is a question of how much more effective could the Code be if it had all the components. This new gap is flagged as an area for further debate and/or investigation.

Typology: Adopting the typologies of demarketing as per Kotler and Levy, the study here argues that the Code has taken a more **hybrid form by mixing selective and general** in one basket. Whether this is deliberate or circumstantial, it is unique and perhaps fortifying. The legal requirements of the WHO Code have combined the segments it aims to reach – for example, some requirements are tailored to reach pregnant women or healthcare providers, but it also adds elements where messaging needs to 'educate the general public'. This bundles up the segments resulting in a hybrid form of an intervention.

Bradley & Blythe (2013) expanded on the taxonomies of demarketing where they added new concepts such as 'Synchromarketing' and 'Countermarketing', almost suggesting that these be recognized formally as new types of demarketing. Syncromarketing is simply re-routing demand and is a hybrid strategy that focuses on providing customers with alternatives more than anything. It is commonly used as a 'place demarketing tool' in tourism but it has been applied in other sectors such as healthcare (Warnaby & Medway, 2013). Counter-marketing on the other hand seeks to destroy demand, not just reduce it (Evans & McCormack, 2008).

Lindberg and Seeler (2021) did a review of demarketing strategies in the tourism sector. They also realized the trend of a 'demarketing mix' that did not fit the traditional three forms introduced by Kotler and Levy. They testified that they were seeing a dynamic mixture of selective demarketing with other forms and vice versa. Shao (2023) introduces another hybrid form of demarketing which is termed 'green marketing'. In his argument, he points out that green marketing 'markets by demarketing' whereby it promotes the uptake of an environmentally safe product/service whilst highlighting the harmfulness of another product/service. It then takes a unique hybrid form by blending these two objectives into a single intervention (Shao et al., 2023).

It appears true what Jim Blythe said, “*Because demarketing has been virtually ignored in the half-century since Kotler and Levy first coined the work, there have been few attempts to develop a working conceptual framework for its study, and (perhaps more important) its applications to practice*” (Blythe, 2013). A decade later, his statement about the truancy of a solid conceptual framework for demarketing prevails. This is exaggerated by the journey demarketing took as it landed in the hands of policymakers, a place far away from its initial corporate roots.

Our study is one of the few to dissent the typologies embedded in the WHO Code from a demarketing perspective. Limited by the abridged breadth of our analysis, the study is however confident to hold a view that the WHO Code is a demarketing strategy and holds features of a hybrid model in its design. So far, it does not fit the perfect boxes of green marketing, syncromarketing, or countermarketing. A comprehensive systematic review, perhaps with meta-analysis, could confirm or dismiss this view.

6.3.1.2 The Bad Side of the WHO Code

Saturation of Impact: Referring to Figure 13 of this paper, the grade and speed of the sales began to stagnate after the 'moderate' level of implementation. There was little impact seen between substantial versus moderate which indicates a form of saturation of its impact. There may be two reasons for this: the first one is the probability that countries that claim to have strict measures on paper are doing more at a moderate level in real terms. This is plausible given the findings from Ching et al (2023). Their study evaluated the WHO Code implementation in the South Asian region and discovered interesting findings. They pointed out that almost all the countries reported a 'lag in operations' to enforce the measures and that there were major gaps in implementation that did not fully align with the self-reported Code level.

The other practical reason could hint at subtle duplications and overlaps between these levels making the upgrade from one to the next minimal in its impact.

6.3.1.3 The Ugly Threat

Lack of transformation: Perhaps the ugly threat is paradoxical to the initial praise given to the Code. In as much as the Code is effective, the study cannot neglect the data that sales continue to occur and by the market analysis, sales will continue to thrive. Literature has added other techniques into the marketing mix which the strategy has not leapfrogged to

adapt. Since its release in 1981, little reform has been done to strengthen its impact. For instance, with the evolution of time, firms have innovated ways to violate the Code and bypass its chronic tools. Such ways include the use of digital marketing platforms.

Although the Code prohibits all forms of marketing, digital marketing using social media, blogs, and digital streaming services is rife with advertisements for BMS (Jones et al., 2022). This digital trend is not only limited to breastmilk substitutes, but the article by Lara-Mejía and colleagues (2022) picked up that the same mechanisms are used to sell unhealthy foods and beverages to young children. This dilemma is wide and deep and may affect demarketing strategies beyond the scope of infant formula milk (Lara-Mejía et al., 2022).

In terms of product labeling and packaging, the Code is unambiguous in its instructions that firms are to refrain from false health claims and are required to spell out that 'breastmilk is best' on the front of their packages. Conway (2023) interviewed twenty-five mothers with young children to understand if product labeling affected their choices. They found that how the packages are labeled does impact the attractiveness to mothers, specifically the 'on-pack messaging suggesting progression from one product to the next led mothers to believe that these products were necessary'. Some of the mothers claimed that products that mentioned science, research, and nature made them more attractive. Every participant admitted reading the front logo but this was perceived to only mean the products mimic breastmilk as well (Conway et al., 2023). This highlights how firms are bypassing the system and undermining the restrictions.

Admittedly, the WHO Code has an audience and the advantage of history but adding more pressure on the three Ps in use might not solve the issue. To scale up its effectiveness and persuade non-compliant countries to be on board, the WHO Code could leapfrog and transform its approach including expanding its current mix as per literature (Lim, 2021).

6.3.2 H_{2a}: The Role of Innovation as a Factor Condition

Our study was successful in proving statistically that innovation attracted higher sales. This was a less surprising finding given the wide literature on the emphasis and role of innovation on competitiveness (Momaya, 2019). However, two alarming observations were unexpected. The first one would be the wide gaps between national innovation indexes among the countries. As depicted in **Table 11**, the range was 14-65 out of 100, indicating a persistent global divide. Dutta et al (2019) noted in their Global Innovation Index report for 2019 that

“Shifts in the global innovation landscape are materializing; some middle-income economies are on the rise...Innovation inputs and outputs are still concentrated in very few economies; a global innovation divide persists.”

The other striking extraction from the innovation data, given its importance, was that the maximum score was rather dismal. The USA ranked top with 65 points, which by the measure of how developed countries should have evolved, is disappointing (Savrul & Incekara, 2015). This was also observed by Aytekin et al (2022) who compared innovation efficiencies across Europe. Five countries were found to be underperforming which raised concerns. They recommend that the low outputs be addressed by improving non-research and entrepreneurship capabilities and that increased investments in science and technology be committed countrywide.

6.3.3 H_{2b}: Relationship between National Fertility Rates and Scales of sales

The results found that sales dropped significantly with increasing family sizes, that is, fertility rates. Therefore, these findings tilt towards the argument that the size of host demand, which is **quantity, is not sufficient to achieve competitiveness** (Bakan & Doğan, 2012).

Although testing for quality of demand did not form part of the study objectives, there is increasing literature to validate that quality demand is a superior determinant over quantity. However, critics rightfully challenge this assertion. It is for that reason that the paper proposes to add three presumptive factors that can cause low sales in the context of high demand. These are: *Marketing, Pricing, and Culture*.

Marketing can affect brand performance and sales, as seen in the US when they saw spikes in infant formula sales post aggressive marketing activities (Y. Y. Choi, Ludwig, & Harris, 2020). To apply this assumption in the study, this could be one of the reasons that explains why the results found lower sales in countries with the highest birth rates. **Table 14** highlights that 50% of the countries with the highest fertility rates had substantial levels of the WHO Code.

If combined with the moderate and minor levels, the total is 9 out of 10 countries which translates to a dominant 90%. Even though the study did not explore these secondary observations statistically, there is a strong suggestion that marketing was the most restricted in these top ten states.

The second sub-determinant that would manifest low sales in the context of high demand is the price sensitivity of products. This will see shifting customers electing alternatives to save costs (Krishna et al., 2007). Referring to the data collected, the top ten states were also on the bottom list for country GDP. Advocacy groups and governments have lamented the increasing prices of infant formula milk/products over the years (Oliveira et al., 2011). This is proposed as the second factor that could contribute to lower sales in the context of big demand size.

The last presumptive factor could be the role of the culture of the customer base. This has been a strong antagonist of the PDLT in that the model is silent or somewhat negligent to the culture of a nation (Van Den Bosch & Van Prooijen, 1992). The issue of infant formula feeding, although it extends to the broader approach to raising babies, is highly cultural (Van Esterik, 1996). Sales in these countries could be low because the culture is leaning towards breastfeeding or the early introduction of solid meals. It appears that entrepreneurs or established firms should be using triangulated theories to estimate demand well before they enter a country.

6.3.4 H_{2c}: The Role of the GDP in the sale of infant formula milk

This positive finding was another confirmatory result given the extensive work by Neves et al (2022). Simionescu et al (2021) found that the GDP was the main driver behind the country's competitiveness. They established that human and physical capital, research, and development alongside strategic investments influence the strengths of national gross outputs.

6.3.5 H_{2d}: Dairy Price Index and the Scales of Sales

What the literature review confirmed is that cow milk was still widely used in the process, therefore the study had assigned the Dairy Price Index (DPI) as a related PDLT factor (Gallier et al., 2020). The expectation, as per Porter's thoughts, is that the presence of cheaper, specialized, and closer related industries would be advantageous for countries and the respective firms (Vlados, 2019). However, this was not so for the infant formula.

The study found no relationship between the dairy prices and the scales of sales which might point to two industry behaviours. The first one is that the industry is becoming more specialized and the second behavior centers around supplier's proximity.

The industry is moving towards more specialized or sophisticated inputs making ordinary dairy milk less significant. With advancing technologies, it is now possible to engineer (using genetic manipulations from yeast and bacteria) several human milk oligosaccharides from the lab (Schönknecht et al., 2023). This might be early hints that the high skills of genetic engineering are influencing the market displacing the need for natural dairy from the supply chain.

The other issue is distance. Porter emphasized the role of proximity and this is what the study argues to be compromised. Given that international laws are strict on milk quality, manufacturers might be limited to central/certified suppliers rather than just any dairy farmers (Sharma & Rou, 2014). This could lead to scenarios where milk is available, cheaper, and close to local farmers but due to high-quality requirements, they do not get to be integrated into the value chain, a chronic issue experienced in Australia (Robinson, 1986; Smith, 2014).

6.3.6 H_{2e}: The Role of Water Quality as a Supporting Determinant

Water is often required to prepare infant formula feeds including milk. There were significant increases in infant formula sales that corresponded with better water quality in each country. **Table 12** shows a trend whereby the countries with the highest number of under-five deaths coincidentally also had the lowest water quality standards. Two pragmatic opportunities are seen with this finding. The first would be an opportunity for existing firms, mostly well-known MNEs, to produce 'ready-to-feed' infant formula packages that bypass the need for water. These would be beneficial in emergencies where acute interruptions of the water supply are common (Gribble & Berry, 2011). The second opportunity is for firms to direct their corporate social responsibility efforts to support water quality initiatives in the countries where their products are sold. This is because improving water and food security falls within the SDGs (Shayan et al., 2022)

6.3.7 H_{2f}: The Role of Geopolitics and the Scale of sales

Countries with open and higher democratic systems sold more infant formula milk than those operating under lesser incumbencies. Looking at our dataset, no particular regime stood out as the study saw a balanced spread of the geopolitical orientation in our cohort with 38% of countries representing flawed democracy followed by 24% that were classified as authoritarian (**Figure 12**). There may be a plethora of political reasons why the dataset

results are bent towards democratic states, however, we insinuate two susceptible explanations. They are Openness in Trade Agreements and Maternity leave dogmas.

We begin the first explanation basing our grounds on what Mahuni (2023) picked up in his work. Speaking about Africa, he highlighted the importance of having political will to cultivate competitive countries by fostering mutually beneficial trade agreements. Kincaid (2005) further expands that trade agreements have the power to impact import and export dynamics in almost every sector of international business. Therefore, countries that trade openly and widely tend to be more competitive, this has been noted as a non-discriminatory trend regardless of the type of industry.

Our explanation was articulated well by Mansfield et al (2002, pg 215), "*Leaders in democracies have a greater incentive to pursue international cooperation in trade than do their nondemocratic counterparts. In commercial matters, democracies are more cooperative than are other states because of the domestic political benefits that can be generated by international trade agreements.*" Therefore the study wants to believe that sales were more in democratic states due to their wider trade channels which then brings in an expanded list of options and varieties for consumers to choose from.

The runner-up explanation circles around the political will to adopt progressive maternity leave policies by governments (Baker et al., 2023). Exclusive breastfeeding rates have been seen to improve in households where the mother was protected financially via maternity leave coverage plans (Huang & Yang, 2015). Given that governments or states tend to shoulder the bulk of national employment (Perry, 2007), political ideologies will ultimately influence national policies around this issue (Zacka, 2022).

To test if this explanation is conceivable, we pulled further from the resultant 128 cohort in the database. To scrutinize the plausibility of this explanation, the top-selling states in each geopolitical type were grouped aside (**Table 15**). China sold the highest within the authoritarian group, then Turkey led in sales under the hybrid regimes, India ranked first under flawed democracies and Japan was apical under the full democracy group.

A rapid comparison of their maternity leave coverage plans reveals that China has the most progressive reforms out of the other top three. Not only does China provide 98 days of paid leave to eligible mothers, but they were amongst others to embrace the notion of paternity benefits (J. Li et al., 2021). On the contrary, Japan only provides two-thirds of the basic

salary to pregnant mothers, making their plan a selective type of model (Whitehouse & Nakazato, 2021). India has a universal maternity leave coverage plan, however, it is highly conditional, including the number of live children per woman and whether the labor in question is categorized as formal or informal (Kalra & Priya, 2020).

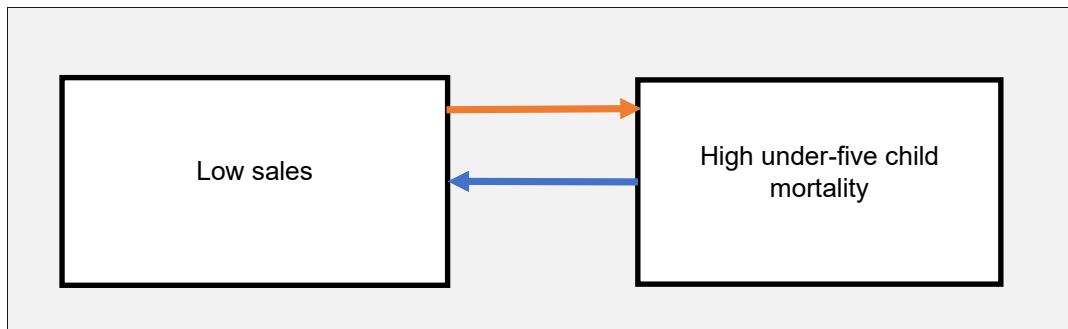
Similar shortfalls were found in Turkey as it was the state that offers the shortest coverage plan of only 40 days (or eight weeks) of paid maternity leave after childbirth (Çelebi, 2021). Although these secondary observations were fully subjected to other analytical tests such as correlates, they provide superficial clues that political ideologies impact what type of policies countries adopt and thereafter what results they obtain.

It appears that democratic states are struggling to embrace comprehensive policies regarding maternity leaves perhaps influenced by constant crossroads with capitalist ideologies. The study wants to believe that infant formula milk is sold less in lesser democratic states due to their comprehensive stance on maternity leave and family inclusiveness reforms (Ghosh, 2020).

6.3.8 H₃: Infant Formula Milk versus Child mortality rates

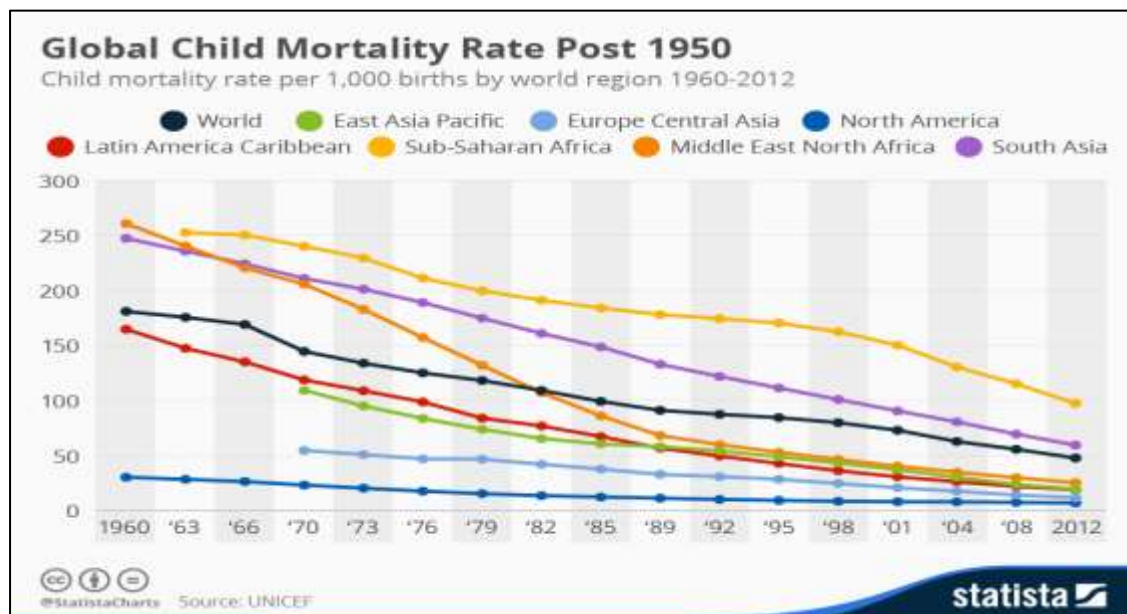
The study found an inverse relationship between the under-five child mortality rates and the scale of sales of infant milk in the countries. Translated, it implies that it was the countries with the lowest sales that reported the highest deaths. The discussion pierces through this finding by focusing on the *course trajectory* of this relationship. The statistical tool utilized is weak to identify the trajectory of this relationship, meaning, are sales found low because children are dying, or are children dying because sales are low? It is common for observational studies, especially cross-sectional designs, to contribute new knowledge as well as spring new hypotheses. Knowing this, the study extracts clues from available literature to place a few hypotheses.

Figure 20: Low sales, High death hypothesis sketch.



It is possible that the trajectory is facing backward, meaning it is retrospective in that countries that had high deaths in the past adopted the WHO Code in a more stringent way to try to curb the death rates. It might be that this observation is a result of effective policies where the study gets to see a snapshot of child health in its path to recovery. Looking at the global trend of child mortality by Statista (**Figure 21**), it can be appreciated that deaths have been declining in the past years more sharply in the Southern Asia region, North Africa, and the Middle East. It is also noted that the decline accelerates after 1985 which corresponds with the early demarketing movements by the WHO which took force in 1981.

Figure 21: Global child mortality trends.



The second assumption, which is concerning, is that the trajectory is current. This means that due to families not being able to access formula milk, families could be resorting to hazardous infant feeding practices that harm them.

Kerr (2007) documented Malawian feeding practices and how they affect children. This is widely documented and carries terms such as mixed feeding. They observed and interviewed 160 caregivers/families caring for children between the ages of six months to four years. It was discovered that the early introduction of porridge and local herbal infusions to compensate for milk (when children were hungry) led to clinical signs of malnutrition (Kerr et al., 2007). This trend of mix-feeding babies when they are hungry was also seen in India (Suryavanshi et al., 2003) and South Africa (Chakona, 2020). In fact, Chakona (2020) stated that mixed feeding was the leading feeding practice in the Republic of South Africa.

It is worth noting that India, Nigeria, and South Africa all had stringent measures in the 2022 WHO report and in the study's datasheet (WHO, 2020). Therefore, a consistent thread is noted. In keeping with the material implications logic, the study believes that this is another assumption worth flagging. An illative perspective on the other hand would decline to view the trajectory as linear, but it would explore a circle of circumstances. This illative perspective calls for a targeted search to explore other confounding factors not expressed in this study.

Common implication language in modern days sways between the concepts of causality and associations (Lukka, 2014). Zhao is quoted as saying, "*Correlation implies association, but not causation. Conversely, causation implies association, but not correlation*" (Zhao et al., 2021). The term 'association' is a broad brush as it can generalize a scenario where one specified variable lends information about another. Correlation on the other hand is targeted and earmarks trends more precisely (Rizwan, 2020). Statistically, the study is firm in that it found higher deaths correlated with lower sales. In effect, the third and final research question of the study was answerable.

6.4 Secondary Observations: Ethics & Equity in Demarking Strategies

Demarketing strategies have been labeled as *thorny* by the iconic Kotler & Levy (1971) and later as *pragmatically risky* by MacStravic (1995) given its brush with ethics over the years (Alali et al., 2019). Brenkert (2002) summarized these ethical issues into three light streams, when he scribbled, "*Social marketing faces distinctive ethical challenges, which are not*

faced by commercial marketing, with regard to the ends it seeks, the rationale it offers for achieving those ends, and the effects it may have on its target". As the study reflects on both primary and secondary findings, it cannot help but acknowledge Brenkert's concerns.

As a demarketing strategy, the WHO Code seeks to curb a behavior that is swayed by various geopolitical and socio-economic factors. Current data insists that breastfeeding rates remain a public health challenge despite all the agency's efforts over the past forty years (North et al., 2022). In the initial chapter, the business scale of the problem was given, which is the upward CAGR growth of the infant formula market (W. Li et al., 2022). Our study could confirm that the highest revenue collected in a single country was 13 billion US dollars. With threats that these sales could thrive upwards, this demarketing initiative faces an ethical question of, *what does it seek to end and when?*

When this demarketing strategy was adopted, advocacy groups lobbied around its risks for child health, quoting specifically child mortalities (Lester, 1992). The data collected and literature review highlight the direction of infant formula manufacturers going towards more advanced routes with hints of key advancements (Ahern et al., 2019). There is a need to further acknowledge the health advancements to save children over the years, through childhood immunizations, health specialization, and water and sanitation controls (Grove et al., 2015; Headey & Palloni, 2019). Of note, this study could not find concerning links between the scales of sales of infant formula milk and under-five mortality rates. Thus the follow-up ethical question would be, *what is the real rationale for the Code, and does it remain relevant given current/advanced sciences?*

It appears appropriate to bundle the third issue around *effects* with the equity agenda. Whilst some have called for stringent systems to enforce the Code (McFadden et al., 2016), others have questioned what could be the spillover effects of this demarketing policy on parallel priorities such as food security in a context like Africa (Frank, 2018). Concerns around infant formula availability especially during critical instances such as hurricanes, floods, and pandemic lockdowns have been gradually mounting (Doherty et al., 2022).

The disparities seen between countries with minor to no measures versus those with strict measures bring equity into question (**Table 10**). If indeed countries with fewer restrictions are found to be the ones selling more products, then it can be appreciated that the revenue or economic curve bends more heavily towards these nations. Applying Porter's theory, firms based in those countries would have higher advantages and could be the kingmakers that

set the prices (Vlados, 2019). This might perpetuate the existing oligopolistic powers and further widen equality gaps between the takers and the givers (Chamlagai et al., 2022). If there are compelling reasons for the Code to be in place, it should be enforceable, and at minimum, the WHO should aim for all countries to have a basic basket of rules as a step towards equality (Forsyth, 2013).

There is no standard approach to policy design for health agendas that fall outside the 'usual illicit suspects' such as smoking, cocaine intake, and other addictive substances. Whilst many may bundle these health hazards into a single bucket, the study identifies a unique difference with infant formula because it touches on food security and is a need in some households that cannot breastfeed. There is a practical and even ethical reason to update infant formula and the restrictions literature. It was Laczniak who wrote, "*When judging social marketing from an ethical standpoint, it appears to be difficult to separate the ethics of applying marketing techniques to social ideas and programs from the ethics of the ideas themselves*" (Laczniak et al., 1979).

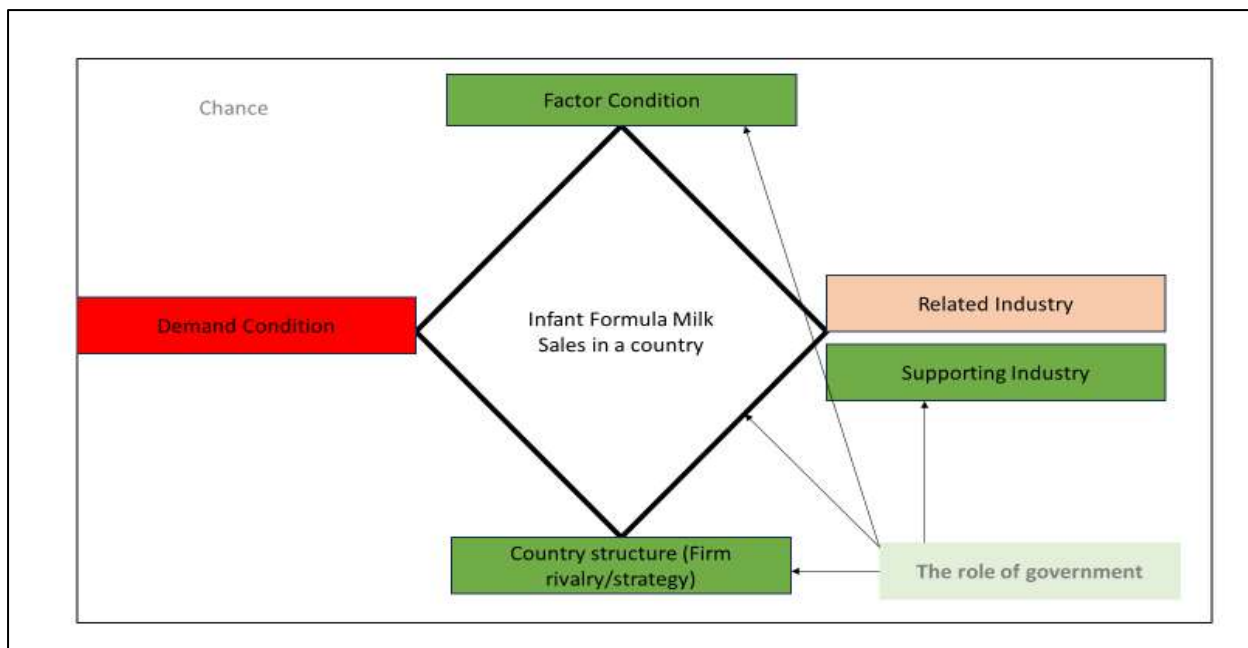
6.5 The Resultant Diamond Model of the Study

Adjusting to what the study found to be significant factors, the researcher presents a graphic of what the study's diamond model would look like. Four factors were found to be significant, these are, Factor Conditions, Supporting Industry, Country Structure (Firm rivalry and Strategy), and the Role of Government. This means that the Demand and Related Industry Conditions were negative and neutral, respectively.

Figure 22 depicts the re-configured diamond based on the results obtained in this study. What stands out as obvious arguments from the original framework by Porter is the role of Government as an external factor and the synonymous pairing of Related and Supporting Industries. Because this study focused on demarketing, which sits at the policy level most of the time, the role of government was pivotal in at least four areas, in direct ways for some and indirectly for others. For instance, the Codes themselves are adopted and driven by the arms of the state, and the geopolitics and innovation programs all fall directly under the influence of governments. The water quality, as many would argue, belongs under the jurisdiction of the local or municipal agencies in most countries which need to ensure that water is safe and accessible. In this way, the study agrees that the government can be active catalysts and/or challengers in any given circumstance.

Based on this sketch and interaction, the study agrees with Porter in the description of governments as catalysts and challengers, however, it differs in its role as an external factor that may or may not affect industries in countries. For this study, the role of government seems to influence more than one condition and thus it was important if not critical. Therefore, the study takes the stance that the role of government should be an internal factor as proposed by (Cho et al., 2009), (Fainshmidt et al., 2016), and others.

Figure 22: The Resultant Diamond Model of the Study



Notes: Colour coding: Green conditions were significant, orange was neutral and red was non-aligned. Source: Author

6.6 Conclusions

The literature review was successful in shaping the schema of the study in that variables were assigned under each of the four factors mentioned in the PDLT. This discussion section of the thesis revisited the eight hypotheses outlined in the third chapter and summarized in Table 16 in the previous chapter. It opened the discussion by justifying how and why nonlinear models were used to test relationships in the sample data and journeyed to highlight key primary and secondary learnings from the results only to close with what the researcher perceives to be the study's version of the PDTL.

CHAPTER 7: CONCLUSIONS

7.1 Introduction

This final chapter traces back the original study objectives and research gaps to reflect if indeed these were successfully addressed. Due to the multifarious nature of the findings, only key summaries and their contributions are presented. A separate sub-section is devoted to outlining the recommendations for academia, business, and policymakers. This chapter also aspires to be transparent about the study limitations as it places a few suggestions on how the study quality could have been enhanced. Future research angles are proposed to pave for further scholarly pursuits.

7.2 Reflections on the Study Objectives

The study had three objectives:

Objective 1: *To describe the relationship between the WHO Code implementation and the scale of sales of infant formula per country.*

The study was able to test and prove that there is a demarketing effect on the relationship between the WHO Code and the scale of sales of IFM, meaning where the Code was strong, sales were low. This finding was significant and consistent across the analytical models used.

Objective 2: *To adopt the PDTL to understand multi-country competitiveness as it relates to infant formula sales*

The PDTL was adopted, and five location-specific determinants were tested as per the model. Countries with advanced factor conditions, better state of their supporting industries, and those that had higher democratic systems sold more infant formula milk in the year 2022. Under this objective, the study could establish that the size of demand did not offer significant competitiveness as it pertains to the infant formula scale of sales. We could not obtain any significant relationships between related industries and the outcome variable.

Objective 3: *To study the relationship between the reported under-five mortality rates and the scale of sale of infant formula milk per country during the year 2022.*

The study found low under-five child mortality rates in countries where sales peaked and discovered higher-than-average death rates in the countries with lower IFM sales. The relationship between these interesting trends was not fully fleshed out in this study due to its limited scope, however, the discussion in the body of the paper placed forward plausible speculations, one of which is the idea of mixed feeding practices in the states with higher mortality rates

7.3 Research Gaps Revisited

The study revisits the two research gaps that were flagged earlier in the developmental stages of this research project. The purpose is to respond to the ultimate question of 'Have the research gaps been closed or do these remain'.

7.3.1 Residual Research Gaps

The study reflects with appreciation that the PDTL is widely covered by old and modern literature as partly illustrated in the second chapter of this thesis. A simple scholarly search of the PDTL filtering for '2023' alone produced more than 3600 fresh articles. The dominant direction of these articles seems to be going towards applying the PDTL in case studies for either one country or a cluster (Bouchra & Hassan, 2023), although there are pockets of review writings that still debate Porter's six determinants (Butt et al, 2023). What our study appreciates is that there are no new proposed theories to either replace or strengthen the PDTL which remains a gap. On the other hand, the same scholarly search on the '*WHO Code*' brought up more than 4500 articles. These were mainly focused on the 'violations' (mainly digital) that continue to occur (Franco-Lares et al., 2023) and a bulk of them were more 'evaluative' regarding WHO Code policy implementation and challenges zooming into specific countries (Wungrath, 2023). Unfortunately, the list of fresh articles reduces to 3000 articles when '*WHO Code and Infant Formula Milk*' is applied which shows the fracture of the many policy evaluations to assess sales as an end goal or an impact indicator. Even more concerning, the search only showed 16 brand new publications when '*WHO Code & Demarketing*' were filtered in. Only one paper from Salem & Ertz (2023) approaches the Code from a demarketing angle. This is the vacuum that remains as a research gap and hopefully, our study was able to pour in new value in this domain.

Being critical of our title and seeing the extent of the empty spaces, the researcher could rephrase this study as "Implication of the World Health Organization Code as a demarketing strategy using the Porter's Diamond Location Theory: Analysis of Infant Formula Milk sales in six regions"

7.3.2 Business-Policy-Science Interface

At the end of this research project, the study remains convicted that this gap is open and wide. Navigating this study, the silent voices from businesses were loud on the attractiveness of the infant formula business amidst the revenues and profit margins it enjoys each year. Furthermore, a literature search could not surface new scientific trials or evidence on where IFM stands in terms of child morbidity and mortality. However, Hastings et al (2023) published a section of their book citing IFM as the 'Baby Killer'. Therefore the view of the study is that the dynamics of this interface if it exists, is still dominated by policy more than science and/or corporate.

7.4 Study Contributions

This study extends itself to several contributions to academia and practice. In line with the explanatory and evaluative nature of the research and its cross-sectional design, the study tables more hypotheses than solutions. It was Wang & Cheng (2020) who explained that descriptive studies, especially those of a cross-sectional nature, are useful for hypothesis building. The findings presented here can facilitate a practical understanding of sales within the infant formula industry and create a policy appetite to review the WHO Code as it heads toward its jubilee years. For academia, these contributions may serve as a foundation for further conceptualizations, perhaps even theory building and/or new model developments.

7.4.1. Contribution to Academia

7.4.1.1 Concerning the PDLT

The research was able to agree with Porter's theory that the role of government can be a both catalyst and a challenger. However, the study does not align with the model's framework of assigning the role of government as an external influencer. This then pulls the study to align with Porter's alternatives like Cho's nine-factor model (Cho, 1998) which best parallels with our observations. The government took up a significant and internal role in the factors explored concerning IFM sales.

7.4.1.2 Concerning Taxonomies for Demarketing strategies

The study made observations that the WHO Code operates under a hybrid typology as a demarketing strategy. No other work has delved into this before, and this could be a basis for arguments and social marketing conceptualization.

7.4.2. Contribution to Business and Policy

7.4.2.1 Insights for Firms

The results confirmed that sheer demand in size did not offer much competitive advantage for the countries/firms. Departing from traditional speculations that market size matters, this study contributes new information regarding quantity versus quality of demand. For new businesses wanting to produce infant formula (especially in high-volume regions like Africa where the fertility rates remain high), or for firms in other regions wishing to internationalize to other countries, this information proves vital for planning.

The study also contributes into the value chain of infant formula milk production as it pertains to dairy and their prices. This contribution would be appropriate for local farmers seeking to play a pivot role in the supply chains of infant milk manufacturers. The assertion is that futuristic advancements indicate for more innovation and specialization of the input products to keep up with international quality control standards.

7.4.2.2 Insights for Policymakers

The findings of this study were significant enough to hint that the WHO Code is effective where implemented. However, signs of impact saturation were picked up which may warrant further analysis by policymakers. Using search engines for similar papers published this year, this study will be the first to contribute relationships between IFM sales and under-five mortality rates using data from more than 120 countries.

7.5 Study Limitations

According to Price et al (2004), study limitations commonly spring from two sources, internal and external validity. Internal validity was achieved by designing a tool that could extract appropriate data and embed a series of quality controls between this tool design, data collection, data transfer to SPSS, and data analysis. External validity could be argued to be intact for this study as the final sample size provides a fair glimpse and representativeness of the countries across the globe.

Our study, like many others, suffered from limitations. One of the key limitations of this study would be its inability to infer causal relationships between the selected variables. By its design, it cannot make reliable judgments on any causal relationships between the prevalence of infant formula sales and the other variables within the units of analysis. However, the study was powered to provide insights into correlations and relationships as they pertain to how the market behaved in the year of review.

Another important limitation to declare would be its inability to provide insights into longitudinal trends. Due to the transverse nature of the study, tracking and tracing the performance of infant formula sales globally over time, whether retrospectively or prospectively, was not possible looking at the findings.

This study was not designed to predict future trends using modelling techniques as with most business studies. In that case, a casual reader would not be able to predict how the infant formula market would or could behave if certain situations were to change.

7.6 Justification of the Study Variables

According to Ross & Zaidi (2019), the limitations should be intentional and comprehensive to the extent of granting fair alternatives. It is based on this that this section is added as a direct extension of the study's overall limitations.

The study selected few variables, only ten, under the four broad PDLT framework. The acknowledgment is that the variables could have been expanded, potentially an area of future research. The admission is that more could have been added including a deeper search for a proxy to test the 'chance' factor. Given the complex value chain involved in the infant formula industry, perhaps more indicators could have been paired under related and supporting industries. Similarly, the study shied away from inserting firm rivalries in each state, that is, to count how many manufacturers exist per country, how they compete, and how that ultimately affects IFM sales.

The research was self-funded by the researcher and pulling additional variables would have compromised the budget, crossed deadline expectations, and added new confounders in the dataset. This, in the researcher's view, would have ultimately compromised the quality of the entire project.

7.7 Future Research Areas

The first chapter of this thesis presented three dominant ideologies regarding the role of demarketing strategies and their effectiveness. The one side favored the narrative that these strategies are effective and good, the second side insisted that these policies are ineffective and may be even harmful whereas the third group was neutral and cautious these may be holistic enough for complex issues. This study reflects on whether enough was done either by the data collection and analysis or during the literature review to take an ideological stand. *At a minimum, this study indicates to a certain degree that demarketing strategies are effective.* This is evidenced and supported by the significant patterns observed when sales were compared between countries with no regulations to those with substantial measures. Sales were seen to be significantly lower in countries that have stringent implementation of this demarketing model. However, it was also noted that the countries with substantial measures were the very ones with higher under-five mortality rates. This places a grey area if these strategies do good more than harm. It is because of these uncertainties that the study is placing a few proposals for future research angles:

- Demarketing policy development studies: Investigate what would be the added benefits/effects if the WHO Code used all 4Ps or transformed to include all 10Ps of the marketing mix as per modern literature.
- Spillover/Epidemiology studies: Investigate the trajectory and/or link(s) between high mortality rates and strict demarketing strategies.
- Sustainability studies: Investigate the barriers to national innovation outputs at a country level given the low performance and wide inter-country gaps.
- Value Chain Analysis: Investigation into the supply chains of formula firms and how can better avenues be created to support local suppliers.
- Projection/Prediction studies: A longitudinal design can be done that tracks sales over time linking these to other competitive advantage models.
- Demarketing systematic review: A review that will collect and critique the various typologies in the domain.

7.8 Study Recommendations

7.8.1 For Academia

Expanding Theories: Two theories were centre stage in this research, PDLT by Michael Porter and the Demarketing theories/strategies. The findings of the study hint that more can be done to build on these existing ones, for example, the role of ethics, equity, and culture in the PDLT and new concepts such as Countermarking for the latter. Otherwise, when considering the complexities given by the statistical models and the relationships seen between the variables, there is room to develop new theories and/or frameworks altogether.

Economic Growth: More data and literature need to inform demarketing initiatives on how they could be used to stimulate and support economic growth without compromising social good.

7.8.2 For Business

Entrepreneurship: The revenues made by baby milk industries, as evidenced by the large sales seen in the data, should be an encouragement for young and upcoming entrepreneurs. The study still believes that the infant formula milk sector remains an untapped market, with many missing middles and opportunities, particularly in Africa. Of note, dairy products are often a by-product of many local processes in typical African farms. Converting these raw materials/local resources into advanced factor conditions could lead to new zones of growth and development.

Empowerment: It is recommended that firms already in the baby milk industry invest more in social development/local communities to empower communities and government agencies to be able to improve basic input factors such as water quality. The data revealed a wide gap between developed versus developing countries in terms of water quality. This indicator was found to be a supporting determinant for the infant formula industry, put another way: if businesses aimed to improve it, sales could thrive.

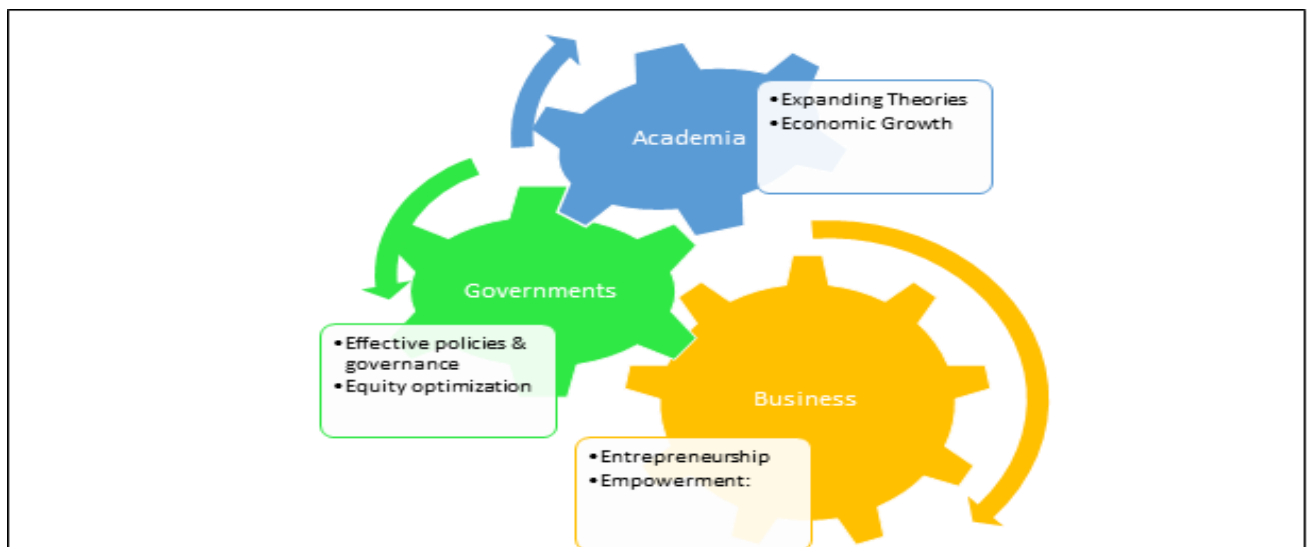
7.8.3 For Governments & Policymakers

Effective policies & governance: The implementation of the WHO Code as a demarketing strategy was largely fragmented and poorly operationalized across the countries in the study sample. Policy makers need to review and revisit why this is so and what can be done further.

Equity optimization: Demarketing strategies do not only affect the state of promotion of product, but they do also affect the price as per the 6P Marketing theories. Tighter

regulations might push prices upwards/uphill making it an equity agenda for families that truly cannot afford baby milk. Governments may be tasked to search and find an equitable balance given that milk is essential for growing babies, across high-, middle- and low-income states. Incentives/vouchers/family support can be one of the steps towards closing these large equity gaps for vulnerable mothers/families in the circumstance where breastfeeding is impossible.

Figure 23: The six spheres of study recommendations.



7.9 Concluding Remarks

Within the purview of this paper, several important concepts recurred: the PDTL, Demarketing, and Scale of sales of infant formula milk. Using statistical models, the study was able to test and discuss three broad hypotheses and also share secondary observations resulting from the data. The study perceives that pressing contributions were made, both for academia and in practice. Without emptying all that is possible, future study areas are also condensed and listed in no particular order. Recommendations were packaged under six pillars: the 6Es which the researcher believes are not just feasible but necessary.

REFERENCES

- Afzal, M., Lawrey, R., & Gope, J. (2019). Understanding national innovation system (NIS) using porter's diamond model (PDM) of competitiveness in ASEAN-05. *Competitiveness Review*, 29(4). <https://doi.org/10.1108/CR-12-2017-0088>
- Ahern, G. J., Hennessy, A. A., Anthony Ryan, C., Paul Ross, R., & Stanton, C. (2019). Advances in Infant Formula Science. In *Annual Review of Food Science and Technology* (Vol. 10). <https://doi.org/10.1146/annurev-food-081318-104308>
- Ahmed, K. Y., Page, A., Arora, A., Ogbo, F. A., Agho, K. E., Diallo, T., Ezeh, O. E., Uchechukwu, O. L., Ghimire, P. R., Akombi, B. J., Ogeleka, P., Abir, T., Issaka, A. I., Rwabilimbo, A. G., Subramanee, D., Nagdev, N., & Dhimi, M. (2020). Associations between infant and young child feeding practices and acute respiratory infection and diarrhoea in Ethiopia: A propensity score matching approach. *PLoS ONE*, 15(4). <https://doi.org/10.1371/journal.pone.0230978>
- AiMin Deng, A. Y., & LiHui Du. (2018). A Study on Gwadar Port International Competitiveness using Porter's Diamond Model. *World Journal of Innovative Research (WJIR)*, 4(1).
- AJ Smit. (2010). The competitive advantage of nations: is Porter's Diamond Framework a new theory that explains the international competitiveness of countries? | Southern African Business Review. *Southern African Business Review*, 14(1).
- Ajayi, V. O. (2017). Primary Sources of Data and Secondary Sources of Data Benue State University. *Distinguish Between Primary Sources of Data and Secondary Sources of Data*.
- Alali, H., Wishah, R., & Al-Weshah, G. (2019). The demarketing of energy drinks using Facebook media: A healthcare perspective. *International Journal on Advanced Science, Engineering and Information Technology*, 9(3). <https://doi.org/10.18517/ijaseit.9.3.8988>
- Alexander, P. A. (2020). Methodological Guidance Paper: The Art and Science of Quality Systematic Reviews. In *Review of Educational Research* (Vol. 90, Issue 1). <https://doi.org/10.3102/0034654319854352>
- Amiri Aghdaie, S. F., Seidi, M., & Riasi, A. (2012). Identifying the Barriers to Iran's Saffron Export by Using Porter's Diamond Model. *International Journal of Marketing Studies*, 4(5). <https://doi.org/10.5539/ijms.v4n5p129>
- Andersen, R. (2009). Nonparametric methods for modeling nonlinearity in regression analysis. *Annual Review of Sociology*, 35. <https://doi.org/10.1146/annurev.soc.34.040507.134631>
- Anselmi, P., Colledani, D., & Robusto, E. (2019). A Comparison of Classical and Modern Measures of Internal Consistency. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.02714>

- Anttila-hughes, J., Krauss, P., Wydick, B., Behrman, J., Binder, M., Carpenter, K., Currie, J., Dustan, A., Fikkert, B., Mask, R., Miguel, T., Rollins, N., & Villa, K. (2018). Mortality from Nestlé's Marketing of Infant Formula in Low and Middle-Income Countries. In *NBER Working Paper Series*.
- Antwi, S. K., & Hamza, K. (2015). Qualitative and Quantitative Research Paradigms in Business Research: A Philosophical Reflection. *European Journal of Business and ManagementOnline*, 7(3).
- Archontoulis, S. V., & Miguez, F. E. (2015). Nonlinear regression models and applications in agricultural research. *Agronomy Journal*, 107(2).
<https://doi.org/10.2134/agronj2012.0506>
- Bahl, R., Frost, C., Kirkwood, B. R., Edmond, K., Martines, J., Bhandari, N., & Arthur, P. (2005). Infant feeding patterns and risks of death and hospitalization in the first half of infancy: Multicentre cohort study. *Bulletin of the World Health Organization*, 83(6).
<https://doi.org/S0042-96862005000600009>
- Bakan, İ., & Doğan, İ. (2012). Competitiveness of the industries based on the Porter's diamond model: An empirical study. *International Journal of Research and Reviews in Applied Sciences*, 11(3).
- Baker, P., Smith, J. P., Garde, A., Grummer-Strawn, L. M., Wood, B., Sen, G., Hastings, G., Pérez-Escamilla, R., Ling, C. Y., Rollins, N., & McCoy, D. (2023). The political economy of infant and young child feeding: confronting corporate power, overcoming structural barriers, and accelerating progress. In *The Lancet* (Vol. 401, Issue 10375).
[https://doi.org/10.1016/S0140-6736\(22\)01933-X](https://doi.org/10.1016/S0140-6736(22)01933-X)
- Batini, C., Cappiello, C., Francalanci, C., & Maurino, A. (2009). Methodologies for data quality assessment and improvement. *ACM Computing Surveys*, 41(3).
<https://doi.org/10.1145/1541880.1541883>
- Berkhout, A. J., Hartmann, D., Van Der Duin, P., & Ortt, R. (2006). Innovating the innovation process. In *International Journal of Technology Management* (Vol. 34, Issues 3–4).
<https://doi.org/10.1504/IJTM.2006.009466>
- Blythe, J. (2013). Demarketing and marketing: A conceptual discussion. In *Demarketing*.
<https://doi.org/10.4324/9780203591208>
- Bradley, N., & Blythe, J. (2013). Demarketing: An overview of the antecedents and current status of the discipline. In *Demarketing*. <https://doi.org/10.4324/9780203591208>
- Brosnan, S., Doyle, E., & O'Connor, S. (2016). From Marshall's Triad to Porter's Diamond: added value? *Competitiveness Review*, 26(5). <https://doi.org/10.1108/CR-05-2015-0037>
- Butt, M. A., Katuse, P., & Namada, J. M. (2019a). Demand Conditions According to Porter's Diamond and Competitive Advantage of Firms of Pakistan Automotive Industry. *European Journal of Business and Management Research*, 4(5).
<https://doi.org/10.24018/ejbmr.2019.4.5.109>

- Butt, M. A., Katuse, P., & Namada, J. M. (2019b). Porter's Diamond Factor Conditions Determinant: Effect on Automotive Industry of Pakistan. *European Journal of Business and Management Research*, 4(4). <https://doi.org/10.24018/ejbmr.2019.4.4.78>
- Celani, S., & Jansana, R. (2005). Bounded distributive lattices with strict implication. *Mathematical Logic Quarterly*, 51(3). <https://doi.org/10.1002/malq.200410022>
- Çelebi, Ö. (2021). Parental Equality in Turkey: Understanding Gender Roles through the Legal Treatment of Working and Divorced Mothers. *International Journal of Law, Policy and the Family*, 35(1). <https://doi.org/10.1093/lawfam/ebab030>
- Chakona, G. (2020). Social circumstances and cultural beliefs influence maternal nutrition, breastfeeding and child feeding practices in South Africa. *Nutrition Journal*, 19(1). <https://doi.org/10.1186/s12937-020-00566-4>
- Chamlagai, L. K., Silva, E., & Alikhani, A. (2022). The blame game of the US baby formula crisis. *Public Health Challenges*, 1(4). <https://doi.org/10.1002/puh2.36>
- Chaudhry, P. E., Cesareo, L., & Pastore, A. (2019). Resolving the jeopardies of consumer demand: Revisiting demarketing concepts. *Business Horizons*, 62(5). <https://doi.org/10.1016/j.bushor.2019.05.002>
- Cho, D. S. (1998). From national competitiveness to bloc and global competitiveness. *Competitiveness Review*, 8(1). <https://doi.org/10.1108/eb046358>
- Cho, D. S., Moon, H. C., & Kim, M. Y. (2009). Does one size fit all A dual double diamond approach to country-specific advantages. *Asian Business and Management*, 8(1). <https://doi.org/10.1057/abm.2008.27>
- Choi, D. A., Tagore, P., Siddiq, F., Park, K., & Ewing, R. (2020). Descriptive statistics and visualizing data. In *Basic Quantitative Research Methods for Urban Planners*. <https://doi.org/10.4324/9780429325021-7>
- Choi, Y. Y., Ludwig, A., Andreyeva, T., & Harris, J. L. (2020). Effects of United States WIC infant formula contracts on brand sales of infant formula and toddler milks. *Journal of Public Health Policy*, 41(3). <https://doi.org/10.1057/s41271-020-00228-z>
- Choi, Y. Y., Ludwig, A., & Harris, J. L. (2020). US toddler milk sales and associations with marketing practices. *Public Health Nutrition*, 23(6). <https://doi.org/10.1017/S1368980019003756>
- Cintron, V. Q., Hack, J., Rivera, M. M. P., Velazquez, A. Y. M., & Pellot, J. D. (2017). The Evolution Of Demarketing Literature. *Forum Empresarial*, 22(1).
- Clemens, W. J. (1999). From AD 2000 to AD 2025: Six alternative futures. *International Journal*, 54(2). <https://doi.org/10.1177/002070209905400205>
- Constantinides, E. (2006). The Marketing Mix Revisited: Towards the 21st Century Marketing. *Journal of Marketing Management*, 22(3–4). <https://doi.org/10.1362/026725706776861190>

- Conway, R., Ritchie, I., Esser, S., Steptoe, A., Smith, A. D., & Llewellyn, C. (2023). Perceived influence of commercial milk formula labelling on mothers' feeding choices in Great Britain: a qualitative study. *Archives of Disease in Childhood*.
<https://doi.org/10.1136/archdischild-2023-325767>
- Costello, A., & Sachdev, H. S. (1998). Protecting breast feeding from breast milk substitutes. In *British Medical Journal* (Vol. 316, Issue 7138).
<https://doi.org/10.1136/bmj.316.7138.1103>
- Cravens, D. W. (1974). Marketing management in an era of shortages. *Business Horizons*, 17(1). [https://doi.org/10.1016/0007-6813\(74\)90026-3](https://doi.org/10.1016/0007-6813(74)90026-3)
- Cullwick, D. (1975). Positioning Demarketing Strategy. *Journal of Marketing*, 39(2).
<https://doi.org/10.2307/1250115>
- Danaeefard, H. (2022). Implication studies: a methodological framework. *Quality and Quantity*, 56(5). <https://doi.org/10.1007/s11135-021-01257-w>
- Davies, H., & Ellis, P. (2000). Porter's competitive advantage of nations: Time for the final judgement? In *Journal of Management Studies* (Vol. 37, Issue 8).
<https://doi.org/10.1111/1467-6486.00221>
- Davies, K. S. (2011). Formulating the evidence based practice question: A review of the frameworks. *Evidence Based Library and Information Practice*, 6(2).
<https://doi.org/10.18438/B8WS5N>
- Deutsch, J., & Liebermann, Y. (1985). Effects of a public advertising campaign on consumer behavior in a demarketing situation. *International Journal of Research in Marketing*, 2(4). [https://doi.org/10.1016/0167-8116\(85\)90040-0](https://doi.org/10.1016/0167-8116(85)90040-0)
- Dodgson, J. E., Watkins, A. L., Bond, A. B., Kintaro-Tagalao, C., Arellano, A., & Allred, P. A. (2014). Compliance with the international code of marketing of breast-milk substitutes: An observational study of pediatricians' waiting rooms. *Breastfeeding Medicine*, 9(3).
<https://doi.org/10.1089/bfm.2013.0096>
- Doherty, T., Coutsoudis, A., McCoy, D., Lake, L., Pereira-Kotze, C., Goldhagen, J., & Kroon, M. (2022). Is the US infant formula shortage an avoidable crisis? In *The Lancet* (Vol. 400, Issue 10346). [https://doi.org/10.1016/S0140-6736\(22\)00984-9](https://doi.org/10.1016/S0140-6736(22)00984-9)
- Eagle, L., & Kennedy, A.-M. (2022). Ethics in Practice in Social Marketing. In *The Palgrave Encyclopedia of Social Marketing*. https://doi.org/10.1007/978-3-030-14449-4_7-1
- Eickelpasch, A., Lejpras, A., & Stephan, A. (2010). Locational and Internal Sources of Firm Competitive Advantage : Applying Porter's Diamond Model at the Firm Level. *Journal of Strategic Management Education*, 7(2).
- Eisenhauer, J. G. (1996). The simple analytics of habit formation. In *Studies in Economics and Finance* (Vol. 16, Issue 2). <https://doi.org/10.1108/eb028719>
- Ergin, A., Hatipoğlu, C., Bozkurt, A. I., Erdoğan, A., Güler, S., Ince, G., Kavurgaci, N., Öz, A., & Yeniay, M. K. (2013). Compliance status of product labels to the international code on

- marketing of breast milk substitutes. *Maternal and Child Health Journal*, 17(1).
<https://doi.org/10.1007/s10995-012-0971-5>
- Etikan, I., & Babatope, O. (2019). A Basic Approach in Sampling Methodology and Sample Size Calculation. *MedLife Clinics*, 1(1006).
- Evans, W. D., & McCormack, L. (2008). Applying social marketing in health care: Communicating evidence to change consumer behavior. *Medical Decision Making*, 28(5). <https://doi.org/10.1177/0272989X08318464>
- Fainshmidt, S., Smith, A., & Judge, W. Q. (2016). National Competitiveness and Porter's Diamond Model: The Role of MNE Penetration and Governance Quality. *Global Strategy Journal*, 6(2). <https://doi.org/10.1002/gsj.1116>
- Fang, K., Zhou, Y., Wang, S., Ye, R., & Guo, S. (2018). Assessing national renewable energy competitiveness of the G20: A revised Porter's Diamond Model. In *Renewable and Sustainable Energy Reviews* (Vol. 93). <https://doi.org/10.1016/j.rser.2018.05.011>
- FAO Food Price Index. (n.d.). *FAO Food Price Index*.
- Forsyth, S. (2013). Non-compliance with the International Code of Marketing of Breast Milk Substitutes is not confined to the infant formula industry. In *Journal of Public Health (United Kingdom)* (Vol. 35, Issue 2). <https://doi.org/10.1093/pubmed/fds084>
- Frank, L. (2018). Finding formula: Community-based organizational responses to infant formula needs due to household food insecurity. *Canadian Food Studies / La Revue Canadienne Des Études Sur l'alimentation*, 5(1). <https://doi.org/10.15353/cfs-rcea.v5i1.230>
- Gallier, S., Tolenaars, L., & Prosser, C. (2020). Whole goat milk as a source of fat and milk fat globule membrane in infant formula. In *Nutrients* (Vol. 12, Issue 11). <https://doi.org/10.3390/nu12113486>
- Ganti, L., Bodhit, A. N., Daneshvar, Y., Hatchitt, K., Kuchibhotla, S., Pulvino, C., Ayala, S. W., & Peters, K. R. (2021). Effectiveness of seatbelts in mitigating traumatic brain injury severity. *World Journal of Emergency Medicine*, 12(1). <https://doi.org/10.5847/WJEM.J.1920-8642.2021.01.011>
- Ghosh, S. (2020). Democratic capitalism at the crossroads: technological change and the future of politics. *Democratization*, 27(4). <https://doi.org/10.1080/13510347.2019.1657412>
- Gifford, E., & Humphreys, K. (2007). The psychological science of addiction. *Addiction*, 102(3). <https://doi.org/10.1111/j.1360-0443.2006.01706.x>
- Gordon, R., Tapp, A., & Spotswood, F. (2013). From the 4Ps to COM-SM: Reconfiguring the social marketing mix. *Journal of Social Marketing*, 3(3). <https://doi.org/10.1108/JSOCM-01-2013-0011>

- Gribble, K. D., & Berry, N. J. (2011). Emergency preparedness for those who care for infants in developed country contexts. In *International Breastfeeding Journal* (Vol. 6). <https://doi.org/10.1186/1746-4358-6-16>
- Grove, J., Claeson, M., Bryce, J., Amouzou, A., Boerma, T., Waiswa, P., & Victora, C. (2015). Maternal, newborn, and child health and the Sustainable Development Goals - A call for sustained and improved measurement. In *The Lancet* (Vol. 386, Issue 10003). [https://doi.org/10.1016/S0140-6736\(15\)00517-6](https://doi.org/10.1016/S0140-6736(15)00517-6)
- Harvey, M., & Kerin, R. (1977). Perspectives on demarketing during the energy crisis. *Journal of the Academy of Marketing Science*, 5(4). <https://doi.org/10.1007/BF02722063>
- Headey, D., & Palloni, G. (2019). Water, Sanitation, and Child Health: Evidence From Subnational Panel Data in 59 Countries. *Demography*, 56(2). <https://doi.org/10.1007/s13524-019-00760-y>
- Henderson, M., & Page, L. (2007). Appraising the evidence: What is selection bias? In *Evidence-Based Mental Health* (Vol. 10, Issue 3). <https://doi.org/10.1136/ebmh.10.3.67>
- Hollander, S. C. (1984). Sumptuary Legislation: Demarketing by Edict. *Journal of Macromarketing*, 4(1). <https://doi.org/10.1177/027614678400400102>
- Holtbrügge, D., & Friedmann, C. B. (2016). Does location choice affect foreign subsidiary success in India? An empirical study based on Porter's diamond model. *International Journal of Business and Emerging Markets*, 8(1). <https://doi.org/10.1504/ijbem.2016.073399>
- Huang, R., & Yang, M. (2015). Paid maternity leave and breastfeeding practice before and after California's implementation of the nation's first paid family leave program. *Economics and Human Biology*, 16. <https://doi.org/10.1016/j.ehb.2013.12.009>
- Hudson, B., Hunter, D., & Peckham, S. (2019). Policy failure and the policy-implementation gap: can policy support programs help? *Policy Design and Practice*, 2(1). <https://doi.org/10.1080/25741292.2018.1540378>
- Huggins, R., & Izushi, H. (2015). The Competitive Advantage of Nations: origins and journey. *Competitiveness Review*, 25(5). <https://doi.org/10.1108/CR-06-2015-0044>
- Islami, X., Mustafa, N., & Topuzovska Latkovikj, M. (2020). Linking Porter's generic strategies to firm performance. *Future Business Journal*, 6(1). <https://doi.org/10.1186/s43093-020-0009-1>
- Johnston, M. P. (2017). Secondary Data Analysis: A Method of which the Time Has Come. *The QQML E-Journal*, 3(No. 3).
- Jones, A., Bhaumik, S., Morelli, G., Zhao, J., Hendry, M., Grummer-Strawn, L., & Chad, N. (2022). Digital Marketing of Breast-Milk Substitutes: a Systematic Scoping Review. In *Current Nutrition Reports* (Vol. 11, Issue 3). <https://doi.org/10.1007/s13668-022-00414-3>

- Kalra, A., & Priya, A. (2020). Birth pangs: Universal maternity entitlements in India. *Economic and Political Weekly*, 55(35). <https://doi.org/10.2139/ssrn.3486671>
- Kang, H. (2013). The prevention and handling of the missing data. In *Korean Journal of Anesthesiology* (Vol. 64, Issue 5). <https://doi.org/10.4097/kjae.2013.64.5.402>
- Kerr, R. B., Berti, P. R., & Chirwa, M. (2007). Breastfeeding and mixed feeding practices in Malawi: Timing, reasons, decision makers, and child health consequences. *Food and Nutrition Bulletin*, 28(1). <https://doi.org/10.1177/156482650702800110>
- Ketels, C. H. M. (2006). Michael Porter's competitiveness framework - Recent learnings and new research priorities. *Journal of Industry, Competition and Trade*, 6(2). <https://doi.org/10.1007/s10842-006-9474-7>
- Kharub, M., & Sharma, R. K. (2016). Investigating the role of porter diamond determinants for competitiveness in MSMEs. *International Journal for Quality Research*, 10(3). <https://doi.org/10.18421/IJQR10.03-02>
- Kim, I. N. S., & Milner, H. V. (2021). Multinational Corporations and Their Influence through Lobbying on Foreign Policy. *Global Goliaths*.
- Kim, R. S. (2013). Analysis of Nested Case-Control Study Designs: Revisiting the Inverse Probability Weighting Method. *Communications for Statistical Applications and Methods*, 20(6). <https://doi.org/10.5351/csam.2013.20.6.455>
- Kindra, G. S., & Taylor, D. W. (1995). Demarketing inappropriate health care consumption. Canada's prized health care system suffers from chronic overuse. In *Journal of Health Care Marketing* (Vol. 15, Issue 2).
- Kitchin, R., & Lauriault, T. P. (2014). Towards critical data studies : Charting and unpacking data assemblages and their work (preprint). *Geoweb and Big Data*.
- Krishna, A., Feinberg, F. M., & Zhang, Z. J. (2007). Should price increases be targeted? - Pricing power and selective vs. across-the-board price increases. *Management Science*, 53(9). <https://doi.org/10.1287/mnsc.1060.0695>
- Laczniak, G. R., Lusch, R. F., & Murphy, P. E. (1979). Social Marketing: Its Ethical Dimensions. *Journal of Marketing*, 43(2). <https://doi.org/10.1177/002224297904300204>
- Laidroo, L., & Avarmaa, M. (2020). The role of location in FinTech formation. *Entrepreneurship and Regional Development*, 32(7–8). <https://doi.org/10.1080/08985626.2019.1675777>
- Lara-Mejía, V., Franco-Lares, B., Lozada-Tequeanes, A. L., Villanueva-Vázquez, C., & Hernández-Cordero, S. (2022). Methodologies for Monitoring the Digital Marketing of Foods and Beverages Aimed at Infants, Children, and Adolescents (ICA): A Scoping Review. In *International Journal of Environmental Research and Public Health* (Vol. 19, Issue 15). <https://doi.org/10.3390/ijerph19158951>

- Lawrence, J., & Mekoth, N. (2023). Demarketing for sustainability: A review and future research agenda. In *International Journal of Consumer Studies*.
<https://doi.org/10.1111/ijcs.12904>
- Li, J., Zhao, C., Wang, Y., Wang, Y. P., Chen, C. Y., Huang, Y., Gao, Y. Q., Fang, J., & Zhou, H. (2021). Factors associated with exclusive breastfeeding practice among mothers in nine community health centres in Nanning city, China: a cross-sectional study. *International Breastfeeding Journal*, 16(1). <https://doi.org/10.1186/s13006-021-00416-x>
- Li T, Higgins JPT, & Deeks JJ (editors). (2021). Chapter 5: Collecting data. *Cochrane Handbook for Systematic Reviews of Interventions Version 6.2*.
- Li, W., Liu, B., Lin, Y., Xue, P., Lu, Y., Song, S., Li, Y., Szeto, I. M. Y., Ren, F., & Guo, H. (2022). The application of lactoferrin in infant formula: The past, present and future. In *Critical Reviews in Food Science and Nutrition*.
<https://doi.org/10.1080/10408398.2022.2157792>
- Lim, W. M. (2021). A marketing mix typology for integrated care: the 10 Ps. *Journal of Strategic Marketing*, 29(5). <https://doi.org/10.1080/0965254X.2020.1775683>
- Little, R. J., D'Agostino, R., Cohen, M. L., Dickersin, K., Emerson, S. S., Farrar, J. T., Frangakis, C., Hogan, J. W., Molenberghs, G., Murphy, S. A., Neaton, J. D., Rotnitzky, A., Scharfstein, D., Shih, W. J., Siegel, J. P., & Stern, H. (2012). The Prevention and Treatment of Missing Data in Clinical Trials. *New England Journal of Medicine*, 367(14).
<https://doi.org/10.1056/nejmsr1203730>
- Lukka, K. (2014). Exploring the possibilities for causal explanation in interpretive research. *Accounting, Organizations and Society*, 39(7). <https://doi.org/10.1016/j.aos.2014.06.002>
- Mahtani, K., Spencer, E. A., Brasseley, J., & Heneghan, C. (2018). Catalogue of bias: Observer bias. *BMJ Evidence-Based Medicine*, 23(1). <https://doi.org/10.1136/ebmed-2017-110884>
- Mann, C. J. (2012). Observational research methods - Cohort studies, cross sectional studies, and case-control studies. *African Journal of Emergency Medicine*, 2(1).
<https://doi.org/10.1016/j.afjem.2011.12.004>
- Marcus, R. B. (1953). Strict implication, deducibility and the deduction theorem. *Journal of Symbolic Logic*, 18(3). <https://doi.org/10.2307/2267407>
- Mark, A., & Brennan, R. (1995). Demarketing: Managing demand in the UK national health service. *Public Money and Management*, 15(3).
<https://doi.org/10.1080/09540969509387877>
- Martin, R. M., Smith, G. D., Mangtani, P., Tilling, K., Frankel, S., & Gunnell, D. (2004). Breastfeeding and cardiovascular mortality: The Boyd Orr cohort and a systematic review with meta-analysis. *European Heart Journal*, 25(9).
<https://doi.org/10.1016/j.ehj.2004.02.006>

- Mbori-Ngacha, D., Nduati, R., John, G., Reilly, M., Richardson, B., Mwatha, A., Ndinya-Achola, J., Bwayo, J., & Kreiss, J. (2001). Morbidity and mortality in breastfed and formula-fed infants of HIV-1-infected women: A randomized clinical trial. *JAMA*, *286*(19). <https://doi.org/10.1001/jama.286.19.2413>
- McFadden, A., Mason, F., Baker, J., Begin, F., Dykes, F., Grummer-Strawn, L., Kenney-Muir, N., Whitford, H., Zehner, E., & Renfrew, M. J. (2016). Spotlight on infant formula: Coordinated global action needed. In *The Lancet* (Vol. 387, Issue 10017). [https://doi.org/10.1016/S0140-6736\(16\)00103-3](https://doi.org/10.1016/S0140-6736(16)00103-3)
- Meinhofer, A., & Angleró-Díaz, Y. (2019). Trends in Foster Care Entry among Children Removed from Their Homes because of Parental Drug Use, 2000 to 2017. In *JAMA Pediatrics* (Vol. 173, Issue 9). <https://doi.org/10.1001/jamapediatrics.2019.1738>
- Michaud-Létourneau, I., Gayard, M., & Pelletier, D. L. (2019). Translating the International Code of Marketing of Breast-milk Substitutes into national measures in nine countries. *Maternal and Child Nutrition*, *15*. <https://doi.org/10.1111/mcn.12730>
- Momaya, K. S. (2019). The Past and the Future of Competitiveness Research: A Review in an Emerging Context of Innovation and EMNEs. *International Journal of Global Business and Competitiveness*, *14*(1). <https://doi.org/10.1007/s42943-019-00002-3>
- Murmann, J. P., Ozdemir, S. Z., & Sardana, D. (2015). The role of home country demand in the internationalization of new ventures. *Research Policy*, *44*(6). <https://doi.org/10.1016/j.respol.2015.03.002>
- Muunda, E., Mtimet, N., Schneider, F., Wanyoike, F., Dominguez-Salas, P., & Alonso, S. (2021). Could the new dairy policy affect milk allocation to infants in Kenya? A best-worst scaling approach. *Food Policy*, *101*. <https://doi.org/10.1016/j.foodpol.2021.102043>
- Mweshi, G. K., & Sakyi, K. (2020). Application of sampling methods for the research design. *Archives of Business Research*, *8*(11). <https://doi.org/10.14738/abr.811.9042>
- Neves, P. A. R., Barros, A. J. D., Baker, P., Piwoz, E., Santos, T. M., Gatica-Domínguez, G., Vaz, J. S., Rollins, N., & Victora, C. G. (2022). Consumption of breast milk, formula and other non-human milk by children aged under 2 years: analysis of eighty-six low- and middle-income countries. *Public Health Nutrition*, *25*(3). <https://doi.org/10.1017/S1368980020004061>
- Neves, P. A. R., Gatica-Domínguez, G., Rollins, N. C., Piwoz, E., Baker, P., Barros, A. J. D., & Victora, C. G. (2020). Infant Formula Consumption Is Positively Correlated with Wealth, Within and between Countries: A Multi-Country Study. *Journal of Nutrition*, *150*(4). <https://doi.org/10.1093/jn/nxz327>
- Nguyen, P., Binns, C. W., Ha, A. V. Van, Chu, T. K., Nguyen, L. C., Duong, D. Van, Do, D. Van, & Lee, A. H. (2020). Prelacteal and early formula feeding increase risk of infant hospitalisation: A prospective cohort study. *Archives of Disease in Childhood*, *105*(2). <https://doi.org/10.1136/archdischild-2019-316937>

- Nishikawa-Pacher, A. (2022). Research Questions with PICO: A Universal Mnemonic. *Publications*, 10(3). <https://doi.org/10.3390/publications10030021>
- North, K., Gao, M., Allen, G., & Lee, A. C. (2022). Breastfeeding in a Global Context: Epidemiology, Impact, and Future Directions. In *Clinical Therapeutics* (Vol. 44, Issue 2). <https://doi.org/10.1016/j.clinthera.2021.11.017>
- Oliveira, V., Frazao, E., & Smallwood, D. (2011). Rising infant formula costs to the WIC program: Recent trends in rebates and wholesale prices. In *Child Nutrition and the WIC Program*.
- Onwuegbuzie, A. J. (2003). Expanding the framework of internal and external validity in quantitative research. *Research in the Schools*, 10(1).
- Osborn, K., & Lyons, M. (2010). Is bottled water really unsafe for making up infant formula? *Community Practitioner: The Journal of the Community Practitioners' & Health Visitors' Association*, 83(3).
- Othman Yousif, R. (2014). Measuring The Effectiveness Of Demarketing In Influencing Consumer Behavior Of Individuals. In *International Journal of Business Management & Research (IJBMR) ISSN(P* (Vol. 4).
- Oturakci, M. (2023). Comprehensive analysis of the global innovation index: statistical and strategic approach. *Technology Analysis and Strategic Management*, 35(6). <https://doi.org/10.1080/09537325.2021.1980209>
- Öz, Ö. (2002). Assessing Porter's framework for national advantage: The case of Turkey. *Journal of Business Research*, 55(6). [https://doi.org/10.1016/S0148-2963\(00\)00167-3](https://doi.org/10.1016/S0148-2963(00)00167-3)
- Öz, Ö. (2019). The competitive advantage of nations: The case of Turkey: Assessing Porter's framework for national advantage. In *The Competitive Advantage of Nations: The Case of Turkey: Assessing Porter's Framework for National Advantage*. <https://doi.org/10.4324/9780429439087>
- Pace, D. S. (2021). Probability And Non-Probability Sampling-An Entry Point For Undergraduate Researchers. In *International Journal of Quantitative and Qualitative Research Methods* (Vol. 9, Issue 2).
- Page, L. A., & Henderson, M. (2008). Appraising the evidence: What is measurement bias? In *Evidence-Based Mental Health* (Vol. 11, Issue 2). <https://doi.org/10.1136/ebmh.11.2.36>
- Palak Srivastava. (2023). Fueling Growth: Exploring the Drivers and Challenges in the Infant Formula Market. In *LinkedIn Post* (Vol. 1, pp. 1–1). LinkedIn Post.
- Parc, J. (2018). Why has Japan's economy been staggering? A competitiveness perspective. *Competitiveness Review*, 28(4). <https://doi.org/10.1108/CR-01-2017-0005>
- Pauwels, P., & Matthyssens, P. (2004). The architecture of multiple case study research in international business. In *Handbook of Qualitative Research Methods for International Business*. <https://doi.org/10.4337/9781781954331.00020>

- Perry, J. L. (2007). Democracy and the new public service. *American Review of Public Administration*, 37(1). <https://doi.org/10.1177/0275074006296091>
- Porter, M. E. (1990a). Competitive Advantage of Nations: Creating and Sustaining Superior Performance. *Harvard Business Review*, 29(March-April).
- Porter, M. E. (1990b). New global strategies for competitive advantage. *Planning Review*, 18(3). <https://doi.org/10.1108/eb054287>
- Reece, J. (2021). More than shelter: Housing for urban maternal and infant health. In *International Journal of Environmental Research and Public Health* (Vol. 18, Issue 7). <https://doi.org/10.3390/ijerph18073331>
- Ries, D., Zhang, A., Tucker, J. D., Shuler, K., & Ausdemore, M. (2023). A Framework for Inverse Prediction Using Functional Response Data. *Journal of Computing and Information Science in Engineering*, 23(1). <https://doi.org/10.1115/1.4053752>
- Rizwan, M. A. H. (2020). Correlation and Regression. In *Machine Learning and Big Data: Concepts, Algorithms, Tools and Applications*. <https://doi.org/10.1002/9781119654834.ch3>
- Rogers, L. F. (2000). Scientific Objectivity. *American Journal of Roentgenology*, 174(4). <https://doi.org/10.2214/ajr.174.4.1740899>
- Rollins, N. C., Bhandari, N., Hajeebhoy, N., Horton, S., Lutter, C. K., Martines, J. C., Piwoz, E. G., Richter, L. M., & Victora, C. G. (2016). Why invest, and what it will take to improve breastfeeding practices? In *The Lancet* (Vol. 387, Issue 10017). [https://doi.org/10.1016/S0140-6736\(15\)01044-2](https://doi.org/10.1016/S0140-6736(15)01044-2)
- Roloff, J., & Zyphur, M. J. (2019). Null Findings, Replications and Preregistered Studies in Business Ethics Research. In *Journal of Business Ethics* (Vol. 160, Issue 3). <https://doi.org/10.1007/s10551-018-3864-8>
- Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students by Mark Saunders, Philip Lewis and Adrian Thornhill 8th edition. In *Research Methods For Business Students*.
- Savrul, M., & Incekara, A. (2015). The Effect of R&D Intensity on Innovation Performance: A Country Level Evaluation. *Procedia - Social and Behavioral Sciences*, 210. <https://doi.org/10.1016/j.sbspro.2015.11.386>
- Schönknecht, Y. B., Moreno Tovar, M. V., Jensen, S. R., & Parschat, K. (2023). Clinical Studies on the Supplementation of Manufactured Human Milk Oligosaccharides: A Systematic Review. In *Nutrients* (Vol. 15, Issue 16). <https://doi.org/10.3390/nu15163622>
- Shao, X., Jeong, E. H., Zhang, X., & Jang, S. C. (2023). Green Marketing Versus Demarketing: The Impact of Individual Characteristics on Consumers' Evaluations of Green Messages. *Journal of Hospitality and Tourism Research*. <https://doi.org/10.1177/10963480221147054>

- Sharma, S., & Rou, Z. (2014). Global Meat Complex: The China Series China's Dairy Dilemma Global Meat Complex: The China Series China's Dairy Dilemma: The Evolution and Future Trends of China's Dairy Industry. *Research Report (Institute for Agricultural and Trade Policy)* , February.
- Sharrow, D., Hug, L., You, D., Alkema, L., Black, R., Cousens, S., Croft, T., Gaigbe-Togbe, V., Gerland, P., Guillot, M., Hill, K., Masquelier, B., Mathers, C., Pedersen, J., Strong, K. L., Suzuki, E., Wakefield, J., & Walker, N. (2022). Global, regional, and national trends in under-5 mortality between 1990 and 2019 with scenario-based projections until 2030: a systematic analysis by the UN Inter-agency Group for Child Mortality Estimation. *The Lancet Global Health*, 10(2). [https://doi.org/10.1016/S2214-109X\(21\)00515-5](https://doi.org/10.1016/S2214-109X(21)00515-5)
- Shayan, N. F., Mohabbati-Kalejahi, N., Alavi, S., & Zahed, M. A. (2022). Sustainable Development Goals (SDGs) as a Framework for Corporate Social Responsibility (CSR). *Sustainability (Switzerland)*, 14(3). <https://doi.org/10.3390/su14031222>
- Shrestha, N. (2020). Detecting Multicollinearity in Regression Analysis. *American Journal of Applied Mathematics and Statistics*, 8(2). <https://doi.org/10.12691/ajams-8-2-1>
- Shuai, J., Zhao, Y., Wang, Y., & Cheng, J. (2022). Renewable energy product competitiveness: Evidence from the United States, China and India. *Energy*, 249. <https://doi.org/10.1016/j.energy.2022.123614>
- Skidan, I. N., Pyrieva, E. A., & Kon, I. Y. (2017). Development of the infant formula industry. *Voprosy Pitaniia*, 86(5). <https://doi.org/10.24411/0042-8833-2017-00081>
- Smith, A. K., Ayanian, J. Z., Covinsky, K. E., Landon, B. E., McCarthy, E. P., Wee, C. C., & Steinman, M. A. (2011). Conducting high-value secondary dataset analysis: An introductory guide and resources. In *Journal of General Internal Medicine* (Vol. 26, Issue 8). <https://doi.org/10.1007/s11606-010-1621-5>
- Smith, J., Galtry, J., & Salmon, L. (2014). Confronting the formula feeding epidemic in a new era of trade and investment liberalisation. *Journal of Australian Political Economy*, 73.
- Sölvell, Ö. (2015). The Competitive Advantage of Nations 25 years – opening up new perspectives on competitiveness. *Competitiveness Review*, 25(5). <https://doi.org/10.1108/CR-07-2015-0068>
- Stamenkov, G. (2023). Recommendations for improving research quality: relationships among constructs, verbs in hypotheses, theoretical perspectives, and triangulation. *Quality and Quantity*, 57(3). <https://doi.org/10.1007/s11135-022-01461-2>
- Strobel, N. A., Adams, C., McAullay, D. R., & Edmond, K. M. (2022). Mother's Own Milk Compared with Formula Milk for Feeding Preterm or Low Birth Weight Infants: Systematic Review and Meta-analysis. *Pediatrics*, 150. <https://doi.org/10.1542/peds.2022-057092D>
- Sureiman, O., & Mangera, C. (2020). F-test of overall significance in regression analysis simplified. *Journal of the Practice of Cardiovascular Sciences*, 6(2). https://doi.org/10.4103/jpcs.jpcs_18_20

- Sürücü, L., & Maslakçi, A. (2020). Validity And Reliability In Quantitative Research. *Business & Management Studies: An International Journal*, 8(3).
<https://doi.org/10.15295/bmij.v8i3.1540>
- Suryavanshi, N., Jonnalagadda, S., Erande, A. S., Sastry, J., Pisal, H., Bharucha, K. E., Shrotri, A., Bulakh, P. M., Phadke, M. A., Bollinger, R. C., & Shankar, A. V. (2003). Infant feeding practices of HIV-positive mothers in India. *Journal of Nutrition*, 133(5).
<https://doi.org/10.1093/jn/133.5.1326>
- Takahashi, A. R. W., & Araujo, L. (2020). Case study research: opening up research opportunities. In *RAUSP Management Journal* (Vol. 55, Issue 1).
<https://doi.org/10.1108/RAUSP-05-2019-0109>
- Talari, K., & Goyal, M. (2020). Retrospective studies - Utility and caveats. *Journal of the Royal College of Physicians of Edinburgh*, 50(4).
<https://doi.org/10.4997/JRCPE.2020.409>
- Tesfaye, F. G., Desta, E. A., & Dejene, E. M. (2020). Supply and demand side factors influencing utilization of infant and young child feeding in Gibe District, Hadiya Zone, South Ethiopia. *Journal of Public Health and Epidemiology*, 12(2).
<https://doi.org/10.5897/jphe2018.1074>
- Tomori, C., Hernández-Cordero, S., Busath, N., Menon, P., & Pérez-Escamilla, R. (2022). What works to protect, promote and support breastfeeding on a large scale: A review of reviews. *Maternal and Child Nutrition*, 18(S3). <https://doi.org/10.1111/mcn.13344>
- Tripathy, J. P. (2013). Secondary data analysis: Ethical issues and challenges. In *Iranian Journal of Public Health* (Vol. 42, Issue 12).
- Tsai, P. H., Chen, C. J., & Yang, H. C. (2021). Using Porter's Diamond Model to Assess the Competitiveness of Taiwan's Solar Photovoltaic Industry. *SAGE Open*, 11(1).
<https://doi.org/10.1177/2158244020988286>
- Van Den Bosch, F. A. J., & Van Prooijen, A. A. (1992). The competitive advantage of European nations: The impact of national culture - a missing element in porter's analysis? *European Management Journal*, 10(2). [https://doi.org/10.1016/0263-2373\(92\)90066-D](https://doi.org/10.1016/0263-2373(92)90066-D)
- Van Den Bulcke, D., Verbeke, A., & Yuan, W. (2009). Small nations in the global economy: An overview. In *Handbook on Small Nations in the Global Economy: The Contribution of Multinational Enterprises to National Economic Success*.
- van der Eijk, Y., Ping, G. T. P., Ong, S. E., Xin, G. T. L., Li, D., Zhang, D., Shuen, L. M., & Seng, C. K. (2022). E-Cigarette Markets and Policy Responses in Southeast Asia: A Scoping Review. In *International Journal of Health Policy and Management* (Vol. 11, Issue 9). <https://doi.org/10.34172/IJHPM.2021.25>
- Van Esterik, P. (1996). The cultural context of breastfeeding and breastfeeding policy. *Food and Nutrition Bulletin*, 17(4). <https://doi.org/10.1177/156482659601700425>

- Varadarajan, R. (2014). Toward sustainability: Public policy, global social innovations for base-of-the-pyramid markets, and demarketing for a better world. *Journal of International Marketing*, 22(2). <https://doi.org/10.1509/jim.13.0158>
- Vinje, K. H., Phan, L. T. H., Nguyen, T. T., Henjum, S., Ribe, L. O., & Mathisen, R. (2017). Media audit reveals inappropriate promotion of products under the scope of the International Code of Marketing of Breast-milk Substitutes in South-East Asia. *Public Health Nutrition*, 20(8). <https://doi.org/10.1017/S1368980016003591>
- Vittinghoff, E., McCulloch, C. E., Glidden, D. V., & Shiboski, S. C. (2007). 5 Linear and Non-Linear Regression Methods in Epidemiology and Biostatistics. In *Handbook of Statistics* (Vol. 27). [https://doi.org/10.1016/S0169-7161\(07\)27005-1](https://doi.org/10.1016/S0169-7161(07)27005-1)
- Vlados, C. (2019). Porter's Diamond Approaches and the Competitiveness Web. *International Journal of Business Administration*, 10(5). <https://doi.org/10.5430/ijba.v10n5p33>
- Warnaby, G., & Medway, D. (2013). Synchromarketing: Demarketing places. In *Demarketing*. <https://doi.org/10.4324/9780203591208>
- Watson, R. T. (2005). Turning science into policy: Challenges and experiences from the science-policy interface. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 360(1454). <https://doi.org/10.1098/rstb.2004.1601>
- Whitehouse, G., & Nakazato, H. (2021). Dimensions of social equality in paid parental leave policy design: Comparing Australia and Japan. *Social Inclusion*, 9(2). <https://doi.org/10.17645/si.v9i2.3863>
- WHO. (2020). *Marketing of breast-milk substitutes: national implementation of the international code, status report 2020*.
- Wonglimpiyarat, J. (2018). The role of government in Porter's Diamond model: Comparative cases of Singapore and Thailand. *International Journal of Technology, Policy and Management*, 18(1). <https://doi.org/10.1504/IJTPM.2018.088444>
- Yang, X., Lim, Y. taek, Sakurai, Y., & Seo, S. yea. (2009). Internationalization of Chinese and Korean firms. *Thunderbird International Business Review*, 51(1). <https://doi.org/10.1002/tie.20243>
- Young, W. B., & Ryu, H. (2000). Secondary Data for Policy Studies: Benefits and Challenges. *Policy, Politics, & Nursing Practice*, 1(4). <https://doi.org/10.1177/152715440000100408>
- Zacka, B. (2022). Political Theory Rediscovered Public Administration. In *Annual Review of Political Science* (Vol. 25). <https://doi.org/10.1146/annurev-polisci-051120-125131>
- Zhao, Z. D., Zhao, N., & Ying, N. (2021). Association, Correlation, and Causation Among Transport Variables of PM2.5. *Frontiers in Physics*, 9. <https://doi.org/10.3389/fphy.2021.684104>

APPENDICES

Appendix A: Consistency Matrix for the Study

Table 17: Consistency Matrix Adopted By The Researcher For This Study

Research questions	Literature Review (Dominant Theories)	Data collection	Data Analysis
What is the relationship between the status of implementation of the WHO Code regulation and the scale of sales of infant formula milk per child under 5 years old in WHO member states for the year 2022?	Demarketing Theories	Secondary Data <ul style="list-style-type: none"> ▪ Multi-case study ▪ Cross-sectional in nature 	Descriptive analysis, and inferential statistics: correlations
What is the relationship(s) between the independent factors for the respective countries as per the Diamond Location theory and the scale of sales of infant formula in the various countries? Specifically, the: (1) Innovation index; (2) Fertility rates; (3) Gross Domestic Product (GDP); (4) Dairy Price Index; (5) Water Quality; and (6) Geopolitical Index as reported in the year 2022	Theory of National Competitive Advantage (aka The Diamond Location Theory)	Secondary Data <ul style="list-style-type: none"> ▪ Comparative study 	Analytical statistics
What is the relationship between the under-five mortality rates and the scale of sales of infant formula milk per child under 5 years old in the WHO member states for the year 2022?	Causal Inference Probability Theory	Secondary Data	Inferential statistics: correlations

Appendix B: Ethical Clearance from GIBS REC

**Gordon Institute
of Business Science**
University of Pretoria

Ethical Clearance Approved

Dear Bongile Mabilane,

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

[Ethical Clearance Form](#)

Kind Regards

Appendix C: List of Final Study Sample

Table 18: List of the 128 countries final sample size

Case	Country	Case	Country	Case	Country	Case	Country
1	Albania	38	Estonia	77	Montenegro	116	Togo
2	Algeria	39	eSwatini	78	Morocco	117	Tunisia
3	Angola	40	Ethiopia	79	Mozambique	118	Turkey
4	Argentina	41	Fiji	80	Myanmar	119	Uganda
5	Armenia	42	Finland	81	Namibia	120	Ukraine
6	Australia	43	France	82	Nepal	121	United Arab Emirates
7	Austria	44	Gambia	83	Netherlands	122	United Kingdom
8	Bahrain	45	Germany	84	New Zealand	123	United States of America
9	Bangladesh	46	Ghana	85	Nicaragua	124	Uruguay
10	Belarus	47	Greece	86	Niger	125	Uzbekistan
11	Belgium	48	Guatemala	87	Nigeria	126	Venezuela
12	Belize	49	Guyana	88	North Macedonia	127	Vietnam
13	Benin	50	Honduras	89	Norway	128	Zimbabwe
14	Bhutan	51	Hungary	90	Pakistan		
15	Bolivia	52	Iceland	91	Panama		
16	Bosnia and Herzegovina	53	India	92	Paraguay		
17	Botswana	54	Indonesia	93	Peru		
18	Brazil	55	Iran	94	Philippines		
19	Brunei Darussalam	56	Ireland	95	Poland		
20	Bulgaria	57	Israel	96	Portugal		
21	Burundi	58	Italy	97	Qatar		

22	Cambodia	59	Jamaica	98	Romania	
23	Cameroon	60	Japan	99	Russian Federation	
24	Canada	61	Kazakhstan	100	Rwanda	
25	Chile	62	Kenya	101	Saudi Arabia	
26	China	63	Kuwait	102	Serbia	
27	Colombia	64	Kyrgyzstan	103	Seychelles	
28	Costa Rica	65	Lao PDR	104	Singapore	
29	Côte d'Ivoire	66	Latvia	105	Slovakia	
30	Croatia	67	Lebanon	106	Slovenia	
31	Cyprus	68	Lesotho	107	South Africa	
32	Czechia	69	Lithuania	108	South Korea	
33	Denmark	70	Luxembourg	109	Spain	
34	Dominican Republic	71	Malawi	110	Sri Lanka	
35	Ecuador	72	Malaysia	111	Sudan	
36	Egypt	73	Malta	112	Sweden	
37	El Salvador	74	Mauritius	113	Switzerland	
		75	Mexico	114	Tanzania	
		76	Mongolia	115	Thailand	

Appendix D: MPhil IB Thesis Purple Pages Dashboard 1 – Page Count

Chapter 1	13
Chapter 2	22
Chapter 3	4
Chapter 4	15
Chapter 5	15
Chapter 6	15
Chapter 7	8
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Appendix E: MPhil IB Thesis Purple Pages Dashboard 2 – Plagiarism Score



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Gordon Institute of Business Science
University of Pretoria

Implications of the World Health Organization (WHO) regulations concerning the sales of breast milk substitutes and parenteral nutrition indicators per the Diamond Leadership Policy: A multi-country analysis

Student Number: 20088623

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfillment of the requirements for the degree of Master of Philosophy International Business

27 November 2023