## HEC MONTRÉAL

## Volatility, Uncertainty, Complexity, and Ambiguity in the Cannabis Global Value Chains

## **An Exploratory Study**

by

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## HEC MONTREAL

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#### Abstract

The global cannabis industry is a fertile ground for research across many disciplines. It lends a rich landscape of exploration and experimentation as jurisdictions shift from prohibitionist drug policies towards regulated cannabis policy frameworks. Whereas the nascent industry continuously evolves along paradigm shifts and changes in policy directions across jurisdictions, our understanding of the industry's (trans) formation and its global value chain (GVC) orchestration remain limited. As such, cannabis lead firms are left to navigate a volatile, uncertain, complex, and ambiguous (VUCA) cannabis industry landscape vis a vis the orchestration of its value chain activities within a turbulent international business (IB) environment.

How do cannabis lead firms orchestrate their value chain activities under the conditions of volatility, uncertainty, complexity, and ambiguity across various jurisdictions? The question is apt is laying out a foundational research work in the orchestration of GVC activities of the burgeoning cannabis industry using VUCA as the core analytical framework. The VUCA framework offers a unique lens of exploration that can explicate how cannabis lead firms orchestrate their value chain activities across jurisdictions. While the current literature describes VUCA as resolvable GVC aberrations, the explanation on the interplay of these aberrations still eludes many IB scholars. A firm's response to VUCA elements has also been delineated in previous studies but have since yet to further investigate these responses in the context of GVC orchestration. The latter necessitates a specific industry of focus vis a vis the occurrence of exogenous shocks like a global pandemic.

The crux of this exploratory study hinges upon an embedded multiple case study that utilizes the dual asymmetry replication design where two directly opposite contexts of cannabis operators were examined. The cannabis value chains were mapped out whereby key areas of focus on value chain activities were described and explored. VUCA was then introduced as the framework of analysis in the context of value chain activity orchestration. A temporal dimension was also integrated as the case study period of pre, intra, and post lockdown timelines of the pandemic's first wave.

Results suggest that in the orchestration GVC activities (1) volatility can be stabilized by embedding agility and flexibility in the value chain models (2) uncertainty can be reduced by increasing knowledge capacity (3) complexity can be simplified by outsourcing partial or some components of value chain activities relative to value chain governance models, and (4) ambiguity can be reduced by wait-and-see as well as experimentation strategies in certain operations of the value chain activities. Moreover, this study's emergent finding delineates the VUCA elements within an interdependent framework where volatility is the triggering point of value chain activity risk signals (VCARS).

The implications of this study's findings are threefold: first, the outcomes align with the IB literature on how VUCA elements are dealt with in the context of GVC orchestration. Second, the emergent dimension of the VUCA framework that highlights an interdependent/ overlapping view offers a potential alternative to the framework's mutually exclusive/ quadratic view. Third, as more jurisdictions trudge the path of cannabis decriminalization, then legalization, and subsequently regulation- for both medical and adult-use, this study illustrates that balanced policy prescriptions and sound iteration of current regulatory frameworks are crucial. The latter is key to efficiently orchestrate and optimize cannabis value chains operations across jurisdictions.

Keywords: volatility, uncertainty, complexity, ambiguity, global value chains, cannabis industry

#### Résumé

L'industrie mondiale du cannabis est un terrain fertile pour la recherche dans de nombreuses disciplines. Elle offre un riche paysage d'exploration et d'expérimentation à une époque où les juridictions passent de politiques prohibitionnistes en matière de drogues à des cadres réglementaires en matière de cannabis. Alors que l'industrie naissante évolue continuellement en fonction des changements de paradigme et des changements d'orientation politique dans les différentes juridictions, notre compréhension de la (trans)formation de l'industrie et de l'orchestration de sa chaîne de valeur mondiale (CVM) reste limitée. Les entreprises du secteur du cannabis doivent donc naviguer dans un paysage industriel volatile, incertain, complexe et ambigu (VICA) pour orchestrer les activités de leur chaîne de valeur dans un environnement turbulent des affaires internationales (AI).

Comment les entreprises du secteur du cannabis orchestrent-elles les activités de leur chaîne de valeur dans des conditions de volatilité, d'incertitude, de complexité et d'ambiguïté dans diverses juridictions? La question est pertinente car elle permet d'établir un travail de recherche fondamental sur l'orchestration des activités de la CVM de l'industrie florissante du cannabis en utilisant VICA comme cadre analytique de base. Le cadre VICA offre une perspective unique d'exploration qui peut expliquer comment les entreprises principales du cannabis orchestrent leurs activités de la chaîne de valeur à travers les juridictions. La littérature actuelle décrit la VICA comme des problèmes résolubles des CVM, mais l'explication de l'interaction de ces problèmes échappe encore à de nombreux chercheurs. La réponse d'une entreprise aux éléments VICA a également été décrite dans des études antérieures, mais celles-ci n'ont pas encore approfondi ces réponses dans le contexte de l'orchestration des CVM. Cette dernière nécessite de se concentrer sur une industrie spécifique face à l'apparition de chocs exogènes tels qu'une pandémie mondiale.

Le principe de cette étude exploratoire se fonde sur une étude de cas multiples intégrée qui utilise la réplication à double asymétrie dans laquelle deux contextes directement opposés d'opérateurs de cannabis ont été examinés. Les chaînes de valeur du cannabis ont été décrites et explorées, et les principaux domaines d'intérêt des activités de la chaîne de valeur ont été précisés. VICA a ensuite été introduit comme cadre d'analyse dans le contexte de l'orchestration des activités de la chaîne de valeur. Une dimension temporelle a également été intégrée comme période d'étude de cas des chronologies pré, intra et post verrouillage de la première vague de la pandémie.

Les résultats suggèrent que dans l'orchestration des activités de la CVM (1) la volatilité peut être stabilisée en intégrant l'agilité et la flexibilité dans les modèles de la chaîne de valeur (2) l'incertitude peut être réduite en augmentant la capacité de connaissance (3) la complexité peut être simplifiée en externalisant une partie ou certaines composantes des activités de la chaîne de valeur par rapport aux modèles de gouvernance de la chaîne de valeur, et (4) l'ambiguïté peut être réduite par l'attentisme et de l'expérimentation dans certaines opérations des activités de la chaîne de valeur. En outre, la conclusion émergente de cette étude décrit les éléments VICA dans un cadre interdépendant où la volatilité est le point de déclenchement des signaux de risque des activités de la chaîne de valeur (SRACV).

Les implications des résultats de cette étude sont : d'abord, les résultats s'alignent sur la littérature du AI sur la façon dont les éléments VICA sont traités dans le contexte de l'orchestration des chaînes de valeur mondiales. Deuxièmement, la dimension émergente du cadre VICA, qui met en évidence une vision interdépendante offre une alternative potentielle à la vision mutuellement exclusive/quadratique du cadre. Troisièmement, alors que de plus en plus de juridictions s'engagent sur la voie de la décriminalisation du cannabis, puis de sa légalisation, et enfin de sa réglementation - tant pour l'usage médical que pour l'usage adulte, cette étude montre qu'il est crucial de mettre en place des prescriptions politiques équilibrées et une itération judicieuse des cadres réglementaires actuels. Ce dernier point est essentiel pour orchestrer et optimiser efficacement les opérations des chaînes de valeur du cannabis dans les différentes juridictions.

Mots-clés: volatilité, incertitude, complexité, ambiguïté, chaînes de valeur mondiales, industrie du cannabis

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## List of Abbreviations and Acronyms

API	: Active Pharmaceutical Ingredient
ASOCOLCANNA	: Asociación Colombiana de Industrias del Cannabis
CAS	: Complex Adaptive Systems
CBD	: Cannabidiol
CEO	: Chief Executive Officer
EVP	: Executive Vice President
EU	: European Union
GACP	: Good Agricultural and Collecting Practices
GCC	: Global Commodity Chains
GDP	: Gross Domestic Product
GMP	: Good Manufacturing Practices
GPN	: Global Production Networks
GVC	: Global Value Chains
IB	: International Business
ΙΟ	: Industrial Organization
IRRCA	: Instituto de Regulación y Control del Cannabis
LATAM	: Latin America
MLCO	: Multiple Location Cannabis Operator
MNC	: Multinational Corporation
MNE	: Multinational Enterprise
NGO	: Non-Governmental Organization
NPO	: Non-Profit Organization
OLI	: Ownership Location Internalization
R&D	: Research and Development
SLCO	: Single Location Cannabis Operator
SME	: Subject Matter Expert
SP	: Study Participant
THC	: delta-9-tetrahydrocannabinol or $\Delta$ -9-tetrahydrocannabinol
UCATR	: Uncertainty-Complexity-Ambiguity Triadic Reaction
VCARS	: Value Chain Activity Risk Signals
VP	: Vice President
VUCA	: Volatility, Uncertainty, Complexity, Ambiguity
VUCTR	: Volatility-Uncertainty-Complexity Triadic Reaction
WOS	: Wholly Owned Subsidiary

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## ambitious kid

let yesterday's mistakes and omissions not define you let today's struggles and tribulations motivate you let the vision of tomorrow's success and triumph propel you

*let your sorrows, pain, and suffering embolden you your frustrations and hardships strengthen you let your failures and stupidities teach you* 

*let perseverance and hard work remain perpetually in you let humility and gratitude ground you let resilience and self-love be cultivated in you* 

for the day will come that you will look back and ask yourself if all this time you've been off the track you'll then realize how hard you've been trying to achieve, ambitious kid you persisted through it all when no one else would believe

> you go through sleepless nights and restless days you stress and worry, to the walls you stare blankly those monsters and demons in your nightmares they stay just give it up - you loser! to you they always say

but then I pray hard, to the pillows I cry I whisper God please help me, stay by my side never let the ambitious kid in me go astray suicide, drug addiction, bad people - don't let them harm his way

so the ambitious kid is almost there, his thesis almost done regrets on life choices he has none what a journey and discovery he has undergone the ambitious kid has grown, he's now an accomplished man!

## **CHAPTER 1** INTRODUCTION

The global cannabis industry is an ideal laboratory for researchers of all backgrounds. More specifically, it offers an opportunity for management and international business (IB) researchers in conducting timely research in the relevant domains and the grand challenges of our epoch (Buckley et al., 2017). The intersection of public policy, IB, strategic management, and behavioural and social sciences is right at the nucleus of the global cannabis industry's emergence - where we are invited to explore the orchestration of its global value chain (GVC) activities through the lenses of the VUCA framework (Bennet & Lemoine, 2014a, 2014b).

The orchestration of cannabis GVC activities amid cannabis policy variations across jurisdictions render a thought-provoking theme of investigation. This can be attributed to the volatile, uncertain, complex, and ambiguous nature of the cannabis industry landscape directly linked to the in-vivo (trans) formation, iteration, and evolution of cannabis policy reforms at international and national levels (Decorte et al., 2020). For instance, the path of decriminalization, then legalization, and subsequently regulation of medical cannabis has always been cumbersome and an arduous struggle in attaining the most basic human right to access the cannabis plant as medicine. And when the eventual legalization and regulation of medical cannabis is attained, what follows is a series of iteration and modifications to the industry's rules and regulations that which have implications on the orchestration of value chain activities amongst lead firms and other value chain actors. These regulatory changes become more complicated and at times vague across national boundaries vis a vis the globalization of the cannabis industry (Decorte et al., 2020; Seddon & Floodgate, 2020). Thus, delineating the GVC orchestration trajectory of the nascent cannabis industry across jurisdictional variations can be described as constantly evolving and dynamic- especially in the purview of macro and meso environments where cannabis lead firms operate.

# How do cannabis lead firms orchestrate their value chain activities under the conditions of volatility, uncertainty, complexity, and ambiguity across various jurisdictions?

The research question seeks to understand how cannabis firms orchestrate their GVC activities within various contexts of operations amid the specificities of a volatile, uncertain, complex, and ambiguous cannabis policies and regulatory frameworks in various jurisdictions. A knowledge gap is evident on how cannabis lead firms are ought to organize and coordinate their value chain activities amid regulatory dynamics vis a vis the differing paces of cannabis policy reforms in each country. Such lacuna also highlights the need to understand how cannabis firms orchestrate their GVC activities within the scope of the firm's value chain governance models, (co) location choice, and operational strategies while navigating a volatile, uncertain, complex, and ambiguous cannabis industry landscape.

Moreover, what has made the mobilization of the VUCA framework more interesting from a research standpoint is its aptness with the emergence of the Covid-19 pandemic right at the early stages of this study. The concept of VUCA has become even timelier in studying a budding industry in the context of an ongoing global pandemic. The latter can be considered a natural experiment where an exogenous shock implicates the already volatile, uncertain, complex, and ambiguous pre-pandemic condition of an emergent industry. Thus, this study aims to capture the characterization of the global pandemic as an intensifying agent of the pre-existing VUCA elements.

The research question is relevant in four ways: first, the VUCA framework offers a unique lens that is apt in addressing the research question to capture the nuances and subtleties of an emergent industry from an IB lens. Second, it allows for the exploration on how the coordination of production and manufacturing activities of a nascent industry take place across boundaries, contexts, as well as varying regulations. Although previous studies have elaborated the emergence of the licit cannabis industry and described the foundational mapping of its production and distribution networks (Decorte et al., 2020; Potter & Weinstock, 2019; Seddon & Floodgate, 2020; Summers, 2018), a lacuna persists on an actual mapping of these value chain activities anchored in the GVC and IB literature. Thirdly, it opens an avenue for debate and further explorations- both at practical and

theoretical fronts on how cannabis GVC could be governed in a dynamic and evolving industry landscape. Along this line, the concept of VUCA can be unpacked and what this may tell us in the context of GVC orchestration (Clegg et al., 2019). Fourthly, although the scope of this study only covers events related to the first wave of the pandemic, the research question neatly ties up on the conditional/ contextual dimensions of the VUCA framework in action that is highlighted by the pandemic.

#### The VUCA Framework and GVC Orchestration

This study is set to unpack volatility, uncertainty, complexity, and ambiguity (VUCA) as familiar antecedents of a turbulent cannabis industry landscape in relation to the orchestration of cannabis GVCs across jurisdictions. The VUCA framework remains an elusive topic of application in the IB and GVC context, albeit a common jargon amongst firm managers, and that which has received some decent scholarly attention to date. (Bennet & Lemoine 2014a, 2014b; Clegg et al., 2019; van Tulder et al., 2019a, 2019b). While these constructs can be self-explaining from the surface, the interplay of these constructs in a globalized setting from a broad operational perspective is yet to be explored. Specifically, VUCA as a framework remains to be examined in the context of orchestrating cannabis global value chain (GVC) activities.

The VUCA phenomenon and its IB and GVC implications is best introduced by articulating the current state of the art on key foundational concepts: the VUCA framework in the IB context and its initial approximation in the global factory setting suggested by (Buckley, 2019; Clegg et al., 2019; van Tulder et al., 2019, 2020 as well as the concept of global value chains (GVC) and its orchestration (Buckley, 2010, 2021; Gereffi, 2019; Gereffi & Fernandez-Stark, 2019; Gereffi et al., 2005; Goerzen & Van Assche, 2021; Henderson et al., 2002; Kano et al., 2020; McWilliam et al., 2020; Pitelis & Teece 2018; Van Assche, 2017)

From a broader IB scope, what is known about these foundational concepts is that volatility pertains to external changes and dynamic externalities that which are unstable (Bennet & Lemoine, 2014a, 2014b; Buckley, 2020; Clegg et al, 2019; Mack et al., 2016; Millar et al, 2018). Uncertainty pertains to situations where the level of knowledge is low or non-existent (Alpers, 2019; Buckley, 2020; Knight, 1921; Sniazhko, 2019). Complexity is a multidimensional construct all linked by the interconnection of systems, processes, and

networks in the global factory context (Arregle et al., 2016; Buckley, 2020; Mack et al., 2016; Ryall, 2009). Ambiguity pertains to the grey areas whose prior antecedents (and some outcomes) are unknown, or a situation wherein the cause-effect relationship is not fully established. Simply put, ambiguity can be the *"unknown of the unknown"* (Beleskova-Spasova & Glaister, 2013; Clegg et al., 2019; van Tulder et al., 2019)

Previous knowledge also points out that predictability of change and knowledge level shape the perception of VUCA elements and how firms mitigate them vis a vis the firm's operations in an international setting (Bennet & Lemoine 2014a, 2014b; Clegg et al.,2019). What remains to be seen however is how the VUCA constructs interplay in either a mutually exclusive or interdependent fashion in an actual industry where firms orchestrate value chain activities across geographies. The latter follows Gereffi and Fernandez-Stark (2019) broad description of value chains as "*the full range of activities that firms and workers perform to bring a product from its conception to end use and beyond*" (Gereffi & Fernandez-Stark, 2019 p.7; Gereffi & Raj-Reichert, 2021). Along the same vein, this study pertains to GVC orchestration consistent with Kano et al.,'s (2020) definition. In its broadest sense, GVC orchestration is defined and applied in this study as the organization, coordination, bundling, arranging, and strategically aligning all resources and capabilities to generate and capture value via governance models as goods flow from the upstream activities all the way to downstream activities (Kano et al., 2020; Mudambi, 2007; Shih, 1992)

#### What this Study Aims to Accomplish

*Prima facie*, this seminal work to the best of our knowledge is among the few dissertations that has explored the value chains orchestration of the nascent cannabis industry post- Canadian legalization using VUCA as a theoretical framework. In doing so, building knowledge on the nascent cannabis industry offers an opportunity and a unique challenge in using an apt framework of analysis that reflect the industry's evolving reality - within the confines of an academic research and graduate school intellectual exercise.

This study's findings align with the IB and strategic management literatures on how volatility is stabilized by agility and flexibility, uncertainty reduced by knowledge building, complexity reduced by outsourcing, and ambiguity reduced by wait-and-see as well as experimentation. Further, the emergent findings on the interdependent view of the VUCA framework offer a potential alternative to the framework's mutually exclusive/ quadratic view.

At the managerial front, the initial mapping of the cannabis GVC using the VUCA framework may offer managers a complementary tool in assessing the macro, meso, and microenvironments vis a vis the orchestration of a firm's value chain activities. This study also offers an analytical dimension for firms contemplating how their value chain governance models thus far reflect the realities and hurdles they face at various stages of their value chain strategy. At the policy level, findings in this study drive the impetus to craft and iterate multi-dimensional, inclusive, and balanced cannabis policy frameworks and regulations as primordial - if jurisdictions ought to smoothen the orchestration and regulation of cannabis value chain activities across national boundaries.

An exploratory research work on the case of cannabis firms orchestrating their value chain activities across various jurisdictions is laid out in this study. The scant IB literature on VUCA and the cannabis industry's nascency alongside the fieldwork constraints amid a pandemic pose a unique yet challenging dissertation to complete. To that aim nevertheless, this study was carried out using a mono-method qualitative approach (Creswell, 2017). An embedded multiple case study (Yin, 2014) was employed utilizing a dual asymmetry replication design. The context of Single Location Cannabis Operators (SLCO) was juxtaposed to that of the Multiple Location Cannabis Operators (MLCO) where the initial cannabis GVC mapping in both contexts was explored. Key areas of focus in the cannabis value chains were also described within each context. Comparison and contrast of the two apposed contexts remained a key technique in looking at the interplay of VUCA elements in the orchestration of cannabis GVC where the pre, intra, and post lockdown periods of the pandemic's first wave set the timeline of the cases being studied.

This dissertation is structured as follows: chapter two sets the theoretical backgrounder of the VUCA framework in the context of global value chains orchestration. Chapter three situates the cannabis industry as the research context of this study. Chapter four summarizes the methodological procedures and processes undertaken in carrying out this study. Chapters five and six present a within-case and cross-case analyses on how firms in the SLCO and MLCO case groups orchestrate their cannabis value chains. These chapters underscore a high-level comparison and contrast of findings that dials back to the research question on how firms orchestrate their value chain activities within two inherent

asymmetric conditions. Chapter seven presents this study's emergent propositions and novel theoretical dimension of the VUCA framework. Chapter eight presents the implications of the study's emergent findings at various fronts. Chapter nine concludes with the limitations inherent in this study at the methodological and theoretical fronts. This chapter also includes suggestions for future research directions leveraging on the emergent findings on the VUCA framework, as well as furthering research efforts on the cannabis industry as a promising laboratory for IB studies

## **CHAPTER 2** LITERATURE REVIEW

Chapter two lays out the theoretical underpinnings of the study through a brief survey of the literature. The broad definition of global value chains (GVC) is offered along the key GVC governance models and the notion of GVC orchestration within the purview of GVC and IB literatures. The latter is identified as the key context where the VUCA elements are at play. The VUCA framework is then presented as initially described by Clegg et al. (2019) that which is further adapted in the research question previously articulated; and thus, segues to the presentation of the central theoretical framework of this study.

#### 2.1 The Global Value Chains: Literature Overview from the IB Perspective

This study hinges upon the Global Value Chain (GVC) framework in order to explore how cannabis firms orchestrate the different operational processes and production activities to bring their product or service into the market vis a vis the cannabis VUCA industry landscape. To that aim, the GVC literature is reviewed from a multidisciplinary perspective where foundational concepts and applications are highlighted. The section begins by briefly describing the GVC from various literature perspectives as a key step in accomplishing the study's theoretical backgrounder. Then, the dimensions of the GVC are delineated following Gereffi and colleagues' model (Gereffi 1994, Gereffi et al., 2005, Frederick & Gereffi, 2009; UNCTAD, 2013) for detailed definition and applications of GVC. Finally, the GVC governance models are briefly described as modalities of GVC orchestration and structural organization of global production networks. The former will guide the analyses of the cannabis GVC as referent templates in the data presentation and discussion of findings.

Kano et al. (2020) comprehensively presents the GVC framework from various perspectives where the framework's overarching feature is that of the organization, governance, and sequencing of the operational processes and production activities orchestrated by the lead firm. In its broadest sense, a global value chain (GVC) is the actual

interconnected fragmentation of production activities that are carried out to manufacture products or deliver services. These activities can be fine- sliced and dispersed across geographies that may involve multiple partners and supplier networks from conceptualization all the way to consumption stages- and in many cases, the recycling of the product and beyond. For each stage of the activity being carried out to manufacture a product, value is added. The logic of a chained or interlinked activity is hence apt that sequences which stages, or subsequent processes will increase the value as the raw material is transformed further in the chain towards a final product (Gereffi et al., 1995; Gereffi et al, 2005; Frederick & Gereffi, 2009; Kano, 2020)

While the above describes the GVC framework that is simplified at the firm level (i.e., micro-level), the GVC framework extends beyond the firm. The firm-level is one of the three main levels where the GVC framework can be described. Kano et al. (2020) suggest the actual GVC meso-level and macro-level areas where a GVC and its governance is described from various perspectives and interventions applied from various disciplines.

In general, the strategic management literature primarily views the GVC from a micro perspective. From this viewpoint, the lead firm is the key actor where its behaviours have important impact on the GVC orchestration at the firm level. The supply chain management, economic geography, as well as the economic sociology perspectives look at the global value chains from an intra-firm, intra-chain, and cross -industrial perspectives. The IB perspectives describe the GVC at a macro-level in relation to international development, economics, as well as institutional and policy viewpoints to name a few. In sum, the various layers and cross- sections of a GVC can be well understood using multidisciplinary lenses to capture a bigger picture of a complex model that allows for the organization, orchestration, and coordination of operational processes and production activities of a particular product or service (Kano et al., 2020).

Various terminologies are also used to refer to the global value chain as attributed by institutions, supra national organizations, academics, as well as specific sectors and industries. These attributions describe the elements of the GVC framework that reflect the interpretations of its elements relative to the attributing paradigm or discipline. For instance, the disciplines of economic geography as well as international political economy attribute the terminology Global Production Networks (GPN) to highlight a nexus of interconnected functions across traditional organizational boundaries within a network (Antras & Chor, 2021; Gereffi, 2019, Kano et al.,2020). The network may comprise of organizations such as governments, firms, and economic actors. Developmental and industrial studies attribute the terminology Global Commodity Chain (GCC) and the actual GVC to highlight the concepts of value adding, industrial upgrading, and developmental policies (Kano et al., 2020). While most literature reviewed recognize cross-disciplinary and uses the terms interchangeably, the use of the GVC terminology has been the popular term as a reference to the framework.

#### 2.1.1 Dimensions of the GVC Framework

Gereffi & Fernandez-Stark (2016, 2019) summarize the six key dimensions of the GVC in where research and analyses can be built upon. These dimensions are crucial to better understand and locate the possible levels of analysis and intervention in a particular GVC. Further, these dimensions can be situated in any (or all) of the previously described levels of a GVC from analytical and intervention standpoint. The dimensions include: (1) input-output structure, (2) geographic scope, (3) upgrading, (4) local institutional context, (5) stakeholder analysis, and (6) governance. The last dimension of the GVC framework (i.e., governance) will be further elaborated as a key dimension of focus in this study and will be discussed separately on the subsequent sub-section.

#### 2.1.1.1 Input/Output Structure

The input-output structure primarily identifies the underlying mechanism that guides the conception all the way to the delivery of the product or service to the consumer. This dimension's key feature is the transformation aspect of the raw material that undergoes various processes and activities up until the product is produced. Throughout these activities, segments or stages can be identified in the transformational process. It is also in this dimension where we can locate the firms that take part or belong to particular segments or series of segments of the activities that add value in every stage of the transformational process (Gereffi & Fernandez-Stark, 2019)

#### 2.1.1.2 Geographic Scope

This dimension highlights location or co-location of GVC activities at different geographic scales (domestic, regional, international) that can be mapped relative to the

value-adding process within the chain of activities. As the raw material is being transformed in one location and further transformed to another, the scope in which these activities are dispersed in various geographies offer a distinct analytical avenue (Gereffi & Fernandez-Stark, 2019).

#### 2.1.1.3 Upgrading

Given that each activity in the GVC corresponds to value being added in the transformational process of raw material to final output, the firm's movement from a lower value adding activity to a higher one presents potential upgrading dimensions/ opportunity that can be analyzed. In essence, upgrading highlights the capability to move upwards in the chain towards higher value adding activities and being able to capture such added value efficiently. Upgrading can be in the forms of process, product, functional, and chain (intersectoral (Humphrey & Schmitz, 2002). Likewise, other types of upgrading exist in the forms of entering a new value chain, upgrading through linkages with a firm that is already inserted in a GVC (backward linkage upgrading), as well as upgrading by moving to more sophisticated markets or GVC (end-market upgrading)

#### 2.1.1.4 Local Institutional Context

The location or co-location choices of value chain activities across geographies is influenced by the local institutional context. Similarly, the local institutional context is shaped by the value chain activities that are located in any geography (Gereffi, 1995). It is in these dynamics that local institutional context is crucial in understanding the GVC framework. The dimension of the local institutional context in the GVC framework usually comprise of local, regional, geographical, or socio-economic conditions that shape a country's ability to participate in a GVC and its stages. The analysis of this dimension involves the interplay of macro-level influences along with GVC (meso) level influences across jurisdictions and industries (Kano et al., 2020)

#### 2.1.1.5 Stakeholders Analysis

The stakeholder dimension of the GVC primarily concerns all the key players and actors in the GVC at the micro, meso, and macro level. Understanding the power dynamics and interplay of influence of one stakeholder to the other offers a unique vantage point on

how to orchestrate GVC activities across a spectrum of influences. By examining the stakeholder dimension of the GVC and identifying key players that can lead to value chain growth and upgrading, one is more likely to identify which actor is in a suitable position to exert influence and which actor is more adaptive in the receiving end (Gereffi & Fernandez-Stark, 2019).

#### 2.1.1.6 Governance

Governance primarily concerns how resources in the chain of activities flow. Authority and power relationships determine how these resources are allocated in every stage of the activities amongst the participants in a GVC (Gereffi, 1994). A variety of relationship types could exist relative to carrying out the value chain activities and related processes. Likewise, the level of participation of suppliers/ partners in a GVC could vary. Hence, the various governance models described below highlight how resources are allocated as a function of authority and control of the lead firm over its suppliers and partners (Gereffi & Fernandez-Stark, 2019).

#### 2.1.2 GVC Governance Models

Understanding the various GVC governance models is crucial to situate how resources are to be allocated, as well as how manufacturing activities can be fine-sliced or tiered – that which can be either dispersed or fragmented across many locations. It also implies understanding the interplay of power relations between the lead firm and its suppliers and buyers reflected in each governance model type. Gereffi et al. (2005) suggest five major GVC governance models that primarily considers the dynamics of several variables including power asymmetry and degree of explicit coordination. The latter being dependent on how transactions and information in the GVC activities are complex, codifiable, as well as the necessary supplier competencies in carrying out codified transactions.

#### 2.1.2.1 Markets Value Chains

The key feature of a market governance model is the codifiability of information and in transactions, and where product specifications are easily transferred. The market governance model type also offers the lowest switching cost to new partners between a lead firm and its suppliers where price can be the key determining mechanism. In essence, the market governance model does not require intensive information transfer, low cost, and where power is mostly conferred to and exercised by the lead firm (Gereffi et al.,2005; Gereffi & Fernandez-Stark, 2019).

#### 2.1.2.2 Modular Value Chains

Modular governance model is primarily characterized by the codification of complex transactions in a relatively easy manner. The latter is usually reliant on standardized technologies that facilitate the exchange of information, and hence the codification process. The typical outcomes of a modular governance model are products that have customer's specifications under the full responsibility of the supplier. Switching costs between partners amongst customer and supplier is mainly dependent on the complexity of the transactions as well as the interactions necessary between the two (Gereffi et al.,2005; Gereffi & Fernandez-Stark, 2019)

#### 2.1.2.3 Relational Value Chains

In cases where tacit information is difficult to codify, and when transactions are complex with their unique specificities, relational value chains are most likely to be expected. Frequent interactions and exchanges occur between the customer and the supplier and thus take time to establish trust and linkages in relational value chains. In most relational value chains, suppliers wield most of the power given the knowledge they acquire over time that are specific to its customers. The switching cost between both parties are relatively high and most likely difficult in relational value chains (Gereffi et al.,2005; Gereffi & Fernandez-Stark, 2019)

#### 2.1.2.4 Captive Value Chains

In captive value chains, control and dependence to the lead firm is expected if the suppliers in the chain lack the necessary competence in dealing with complex transactions in the chain. Frequent intervention and constant monitoring by the lead firm amongst the suppliers indicate dependencies to the lead firm, and how captive value chains are mostly dominated by the lead firm (Gereffi et al.,2005; Gereffi & Fernandez-Stark, 2019)

#### 2.1.2.5 Hierarchical Value Chains

Hierarchical value chains are also known as vertical value chains. In common industry parlance, these chains are referred to as vertically integrated value chains. In this model, all the activities and processes are internalized and integrated in-house by the lead firm. The lead firm in this model can either own the supplier-ship network or form a conglomerate of suppliers. When tacit knowledge and intellectual property need to be transferred between complex activities, hierarchical value chains are viable options for the lead firm to exercise full control and monitoring of these activities (Gereffi et al.,2005; Gereffi & Fernandez-Stark, 2019)

## 2.2 GVC Orchestration: Broad Definition of the Organizing Process of GVC Activities

In its broadest sense, global value chain orchestration pertains to the overall organizing and coordination of all the value chain activities dispersed across geographies. In alignment with Kano et al.,'s (2020) definition, orchestration involves the decisions and actions undertaken by the firm and its managers that all lead up to fulfillment and execution of all the value chain activities set forth to create and deliver a product or service (Kano et al.,2020). GVC orchestration is an "encompassment of key elements of formal and informal relationships within the network, the entrepreneurial element of resource bundling, interest alignment among parties achieved through strategic leadership by the lead firm, knowledge management, and value distribution" (Kano et al., 2020 p. 605). This verbatim sum up how modern day GVC orchestration looks like vis a vis the lead firm' choice of governance models as well as the manner in which value is created, captured (or destroyed) within the functional and internationally dispersed activities chained or networked all together (De Marchi et al., 2014). Hence, the analogy of an orchestra has never been more apt as it takes the lead firm as the conductor throughout the entire value chain orchestral performance of generating value and then (ideally) capturing it from the starting point all the way to the end point of the streams of value chain activities (Pitelis & Teece, 2018).

GVC orchestration can be viewed from two distinct perspectives. It can be viewed from (1) the internalization paradigm (Benito et al.,2019; Strange & Humphrey, 2019) and (2) GVC orchestration as viewed from the dynamic capabilities' paradigm (Goerzen & Van Assche, 2021; Pitelis & Teece, 2018). On the one hand, internalization theory views GVC

orchestration within the purview of economics where transaction costs heavily influence how the value adding activities are to be internalized, controlled, and orchestrated across geographies. The former justifies why GVC activities need to be orchestrated and internalized in consideration of the geography that would cost the least to the lead firm (Benito et al.,2019; Buckley & Casson, 2020; Strange & Humphrey, 2019). The dynamic view on the other hand views GVC orchestration from the strategic management lens as a function of the lead firm's dynamic capabilities to develop competencies and mobilize its assets vis a vis the transformation of raw materials to end-product across geographies. Hence, recent scholarly work from the dynamic capabilities' paradigm view internalization and its other components encompassed within the orchestration theory proposed by Pitelis and Teece (2018).

The firm's dynamic capabilities influence the evolving nature of GVC orchestration (and vice versa) where such dynamism is a key element of the dynamic capabilities' paradigm repertoire (Teece et al., 1997; Teece, 2014; Teece, 2018; Teece & Petricevic, 2021). The orchestration theory as the envelope for internalization theory best captures the current reality of value chains that is dynamically orchestrated by lead firms across geographies. However, Pitelis and Teece's (2018) proposal of replacing internalization theory by orchestration theory is yet to be empirically tested in its aptness and suitability at various GVC contexts and governance models. It is yet to be proven if there are other nuances and subtleties it may fail account vis a vis the limitations of internalization theory and the post-pandemic reality of lead firms within a turbulent IB landscape (Buckley & Casson, 2020; Strange et al., 2021).

There are three key dimensions of analysis that can be implicated when orchestrating a GVC as suggested by De Marchi et al. (2014). The dimensions of firm organizational forms, internationalization paths (via offshoring and outsourcing) and knowledge management are the central dimensions that lead firms shape when orchestrating GVC activities. All of these have since been viewed in full consideration on the evolving role and identity of the lead firm. The conventional lead firm that rests on the headquarters can nowadays be viewed as the central GVC orchestrator being the primary producer or supplier, or the central buyer. The examples of Walmart and Tesco substantiates the evolution of the identity of lead firm as the central orchestrator and major influencer in a GVC (De Marchi et al.,2014). In essence, GVC orchestration and its

dimensions does not rest in the lead firm having a uniform identity as the headquarter entity. It can be the sole producer or supplier or an agglomerated group of buyers that which has the capacity to shape and influence the production of goods and services in the dynamic and evolving IB landscape.

Finally, a key feature of the orchestration work in a GVC is the creation of value and its capture as the goods flow from the upstream, towards the midstream, and then to the downstream of activities. Shih's (1992) and Mudambi's (2007) depiction of the value chain smile curve corresponds to the relative value each activity adds that which the lead firm has to ensure. To attain value creation and capture, control and flexibility have to be embedded in the activities being orchestrated. And in such orchestration, power and location choice are key variables that determine how and where the value adding and capturing activities are performed (Buckley, 2010; Dallas et al., 2019).

In summary, an overview of the GVC framework has been presented to lay the theoretical foundations in this section. A broad description of the GVC, its governance models, and orchestration have been delineated. The latter situates this study along the lines of GVC orchestration viewed as a dynamic process. By dynamic it means that the lead firm has to adapt to external and internal changes vis a vis the assets and capabilities it has at its disposal while value is created and captured as goods flow from the starting to the end point (Pitelis & Teece,2018; Goerzen & Van Assche, 2021).

#### 2.3 VUCA as Viewed from the IB Perspective: Key Theoretical Focus

Volatility, uncertainty, complexity, and ambiguity (VUCA) best characterize the current international business landscape. Yet with such characterization, literature is scant that situates the VUCA framework as a core tenet of a firm's business decision making - let alone an element of a firm's GVC strategy. The rarity of a theoretical framework in a globalized business landscape situating the various facets of a turbulent business environment such as the VUCA has been called for by scholars as a knowledge gap in the contemporary international business literature. To respond to such knowledge gap, dissecting the individual elements of the VUCA framework is key to unlock potential theorization avenues. The following section reviews the epistemological nature of the VUCA framework. The review of the existing literature highlights the relevance of each

construct in the global factory model where these abstractions can be viewed as threats and mitigated as such, in an MNE's global value chain. The axial placement of each element's predictability and the knowledge level available to an MNE in mitigating each element as an operational aberration is presented. The latter locates the threat and the corresponding MNE behaviour in the likes of threat-response pairing. Finally, the section concludes with the proposed theorization framework by Clegg et al. (2019) that locate VUCA elements as operational aberrations. The responses to these threats as evidenced by the MNE behaviour through existing IB theories are also presented

The concept of VUCA is a recent addition to the IB literature suggested by Bennett and Lemoine (2014a, 2014b). As a commonly applied concept in organizational leadership, the VUCA framework encompasses elements that depict the external environments where organizations operate (Mack et al., 2016; Saleh &Watson, 2017). Clegg et al. (2019) approximated the concept of VUCA into international business studies that primarily implicates the global factory model. The same approximation has also been suggested by Buckley (2020) and other IB scholars (Buckley & Casson, 2020; Buckley & Strange, 2015; Clegg at al. 2019; Millar et al, 2018) in which the MNE acts as the central orchestrator of the global value chain, and where threats and aberrations such as the VUCA do exist as part of an MNE's reality (Buckley, 2016, 2021; Buckley& Casson, 2010a, 2010b).

In the geographically dispersed environment where MNEs operate, previous literature points out on the existence of volatility, uncertainty, complexity, and ambiguity as fragmented constructs (van Tulder et al., 2019a, 2019b). For instance, while uncertainty often overlaps with the construct of volatility and risk, volatility is viewed as an outcome of uncertainty as opposed to a mutually exclusive phenomenon (van Tulder et al, 2019; Clegg et al., 2019). A different picture also emerges on how these fragmented constructs are perceived, measured, and applied based on specific domains, context, and area of inquiry. While industrial organization scholars measure complexity as a reflection of the global factory reality specific to an industry (Cannon & John, 2007; Dess & Beard, 1984), IB scholars prefer using a rational action approach in measuring and simplifying complexity (Buckley & Casson, 2010b). In addition, while the construct of uncertainty is well studied in the IB literature (Alpers, 2019; Sharma et al., 2020; Sniazhko, 2019), the

construct of ambiguity has received less scholarly attention over the last decade in the IB discourse resulting to knowledge disparity in the IB literature.

A systematic review of the existing literature on unitary VUCA constructs is summarized in Table 1. It charts out the unitary elements of VUCA that resemble the contemporary international business landscape. The table suggests that studies on each construct has existed, but a single study regarding an overarching VUCA framework is hardly delineated - particularly in the IB context. Where one construct is related and sometimes overlapping to the other, literature is scant underscoring VUCA as an ensemble of characterization of the international business landscape. The latter is an impetus to view VUCA a set of postulates that better positions these individual constructs to form a more timely, coherent, and gestalt perspective in IB.

 Table 1

 Literature Survey on Central Themes of the VUCA Framework in the IB Context

Volatility		
	Key Findings	Authors
•	When the cause of disruption has something to do with natural disasters/ naturally occurring events, MNEs are less likely to pull out. If disruption of activities is man- made (i.e., terrorism, geopolitical instability) governance in the host country is more likely to be a determining factor if the firm will disinvest	Oh & Oetzel (2011, 2017) Figueira-de-
•	Experience in a political risk in a country is dependent on the type of risk involved. Experience on non-state violent conflicts is transferrable. But only country specific experience appears to yield measurable benefits to conflicts involving host country government	Hadjikhani (2014)
•	Strategic decisions relative to intangible and tangible assets: depending on the level of environmental changes and stability, the level of commitment to increase of tangible and intangible assets through strategic decisions can be based on these strategies (a) wait and see (b) exit (c) de-commitment and (d) new entry strategy Experiential knowledge does not necessarily reduce the uncertainty in a firm's market entry process. Firms' societal knowledge of the host country reduces the uncertainty effects in markets that are relatively distant from the home country	Delios & Henisz (2003)
	Uncertainty	
•	The current COVID-19 pandemic is an impactful revival and review of uncertainty	~1
•	and its implications to business managers from a global perspective. Uncertainty is the most researched construct in a firm's international operation. The many definitions of uncertainty contribute to the inconsistency, metrical difficulty, and multi -dimensionality of the construct.	Sharma et al. (2020) Sniazhko (2019)
•	The integrative framework of uncertainty is shaped by various dimensions where uncertainties emanate. Uncertainty management approaches were also proposed along the characteristics of individual decision makers that are observable in face of uncertainties	Simangunsong et al. (2012)
•	Uncertainty in the context of the supply chain was reviewed aggregating 14 sources of uncertainty, 10 approaches that seek to reduce uncertainty at its source, and 11	Hilmersson & Jansson (2012)
•	Millar introduced the initial categorization of uncertainties as environmental, industrial, firm specific. Miller also proposed how organizations respond to uncertainties bases off on financial and strategic risk management.	Miller (1992)
	Complexity	
•	Decision makers employ heuristics as a tool in order to formulate strategies in an unknown/ uncertain context. These heuristics are cognitive tools developed from previous experiential learning	Maitland & Samartino (2015)
•	homogenous region wherein there is moderate regional institutional diversity. A region with high or low diverse institutional structure renders it highly complex whereas the moderately diverse institutions within a region constitutes lower	Arregle et al. (2016)
•	complexity hence is more conducive to internationalization. Environmental complexity is a multi-dimensional construct. A comprehensive synthesis covers the complexity literature built up from Dess & Beards (1984) work	Cannon & St. John (2007)

	where subsequent complexity models were developed. The extensive review along with exploratory and confirmatory analyses of industry level data suggests a multi- dimensional approach in developing metrics for environmental complexity.	
	Ambiguity	
•	The higher the levels of knowledge ambiguity the more challenging it is to facilitate knowledge acquisition in the context of international strategic alliances. Poor knowledge acquisition leads to innovation stagnation. Absorptive capacity facilitates knowledge acquisition in the partnering firm where knowledge is transferred. Institutional distance mediates knowledge transfer and absorptive capacity between the entering firm and host firm.	Beleskova- Spasova & Glaister (2013)
•	Four typologies of causal ambiguity were identified. Characteristic ambiguity and linkage ambiguity are key dimensions that identify causal ambiguity types (viz. Type 1,2,3, or 4) based off on how managers perceive these two dimensions. Typologies of ambiguity resulting from	Ho et al. (2018)
•	Interfirm causal ambiguity and intrafirm causal ambiguity were identified as ambiguity categories. Different types of competencies were also identified as complex or simple, tacit, or articulated, interconnected or independent. The speed of innovation resulting from efficient knowledge transfer intrafirm is a balancing act and in some cases a trade off on whether how the competencies are viewed by the manager.	Ambrosini & Bowman (2010)
•	From a continuum perspective, causal ambiguity describes how decision makers understand the relationship (or lack thereof) between organizational inputs and results. Related variables to competency were identified as high degree of tacit-ness of the competence and high competency complexity. Causal ambiguity is multi-level and multidimensional construct.	King (2007)
•	Causal ambiguity can be viewed from the both the firm and its rival's perspective. In both cases, neither the firm nor the rival can fully determine the cause of the firm's performance. The challenge in such determination can come from lexical ambiguity. Lexical ambiguity pertains to one terminology that contains many denotations, variations, and interpretations from one firm to the other. Causal ambiguity can also be inflated by self-serving bias when managers assess its competencies as usually above average compared to competitors. A firm's	Powell et al. (2006)
•	performance as viewed by the manager can be influenced by the attributes of the performance itself, attributes of the attributor, as well as specific attributes of the firm. The concept of ambiguity was introduced as uncertain imitability. An economic model was derived based on the assumptions that interfirm differences in profitability may come from efficient production functions of superior firms that are inherently inimitable by the rival. The inimitable features impede perfect replication by the rival thereby leaving the rivals inferior	Lippman & Rumelt (1982)

#### Volatility

Volatility depicts an environment where a certain amount of information is available and there is an understanding of the current situation/phenomenon but whose frequency and predictability of change is unstable. In a volatile situation, the level of knowledge on the issue/ phenomenon is sufficient, but predicting the variation, fluctuation, or periodicity of change is difficult to assess (Bennet & Lemoine, 2014a, 2014b; Buckley, 2020; Clegg et al, 2019; Mack et al., 2016; Millar et al., 2018)

In the context of the global value chain, volatility takes place in the socio and geopolitical context of the host country where the value adding activity is performed. The levels of volatility in the host country as perceived by the MNE depend on various factors (Delios & Henisz, 2003; Figueira-de-Lemos & Hadjikani, 2014). For instance, the type of economy (viz. developed, emerging, developing) in the host country could shape the regulatory and geo-political volatility that MNEs could face. Clegg et al. (2019) posits that the volatility faced by internationalizing MNEs of developed economies into a developing country is higher than the volatility experienced by MNEs of developing economies into to developed countries. The former is likely to be the case with respect to changes in labour laws and practices, policies, and economic dynamics in the host country (Delios & Henisz, 2003).

Oh and Oetzel (2011, 2017) propose that location choice is key in determining how much volatility can be present in the host country as the firm internationalizes. Hence, the full consideration of the geo-political and regulatory volatility in the host country with respect to the industry where the firm operates is essential for firms to thrive. The latter assertion is consistent with the argument of Clegg et al. (2019) as well as the OLI paradigm by Dunning (2001) within the framework of the global factory model.

There is a consensus across reviewed literature that to hedge against volatility, firms need to embed agility and flexibility in its strategies from an operations standpoint (Bennett & Lemoine 2014a, 2014b; Buckley, 2020; Clegg et al.,2019; Millar et al.,2018; Petricevic & Teece, 2019). From a global factory model, this may mean building internal capacity to optimize agility. Specific examples would be diversifying suppliers or distribution

channels to maintain internal slack should the volatility increase (Buckley, 2020; Clegg et al.,2019).

In essence, volatility pertains to exogenous changes, irregularities, or inconstancies of the international business environment. These changes are relatively unstable and unpredictable. Information is available regarding these changes or at least some level of knowledge is available in understanding these changes. To hedge against these unpredictable changes or irregularities from the global factory framework, strategies need to be embedded with certain levels flexibility and internal slack in order to optimize agility (Buckley, 2020; Clegg et al., 2019).

#### Uncertainty

Uncertainty pertains to a situation where the information available regarding a situation/ phenomenon is low or non-existent. In the Knightian (1921) paradigm, the level of knowledge is assumed insufficient during the decision-making process of an uncertain situation. Consequently, successful decision making can be predicted by how uncertain a situation is - as a function on how much knowledge is available at the time when decisions are being made (Alpers, 2019; Buckley, 2020; Sniazhko, 2019).

Miller (1992) defines uncertainty in terms of "the unpredictability of environmental and organizational variables that impact corporate performance." Within this definition, the source of uncertainty emanates from multiple types of variables. These variables are dynamic, can co-occur, and tangential at times. In Miller's (1992) perspective, uncertainty can be classified in three major categories based on where these uncertainties come from: environmental, industrial, and organizational.

The sources of uncertainty may come from the external environment. These external factors form a macro-level dimension where uncertainty lies. At a macro level, these uncertainties include economic, political, governmental, cultural, and discontinuous uncertainties (Simangunsong et al., 2012; Sniazhko, 2019)

The second source of uncertainty may come from the industrial or sectorial context. These meso level of uncertainties include those that lie between the industrial-level and the firm –level. The industrial dimensions of uncertainty may pertain to those that are usually present at industrial or sectorial levels, within a particular market, supply chain, value chain, or between competing firms. These types of uncertainties include input uncertainty, demand uncertainty, competition uncertainty, and technological uncertainty (Miller, 1992; Sniazhko, 2019).

The firm-specific level of uncertainty usually emanates from an organization. The dimension of uncertainty that may come from the firm/organization itself can be attributed to structural, systematic, operational, and behavioral aspects of the organization. These uncertainties may include R&D uncertainty, behavioural uncertainty, operating uncertainty, and the like (Miller, 1992).

In the IB literature, the construct of uncertainty is the most researched as compared to the other elements of the VUCA framework. Sniazhko's (2019) comprehensive review on the construct of uncertainty in the IB literature highlights a significant progress on the exploration of the construct. The extensive review also points out on the substitution of uncertainty by risk as a construct in most empirical studies that have been reviewed. The rationale for such substitution is that uncertainty is a construct that is very broad and difficult to measure as compared to risk. The use of risk as a proxy construct was deemed quantitatively convenient in most of the empirical studies reviewed (Sniazhko, 2019).

Given the variety of uncertainties that are present in the international business environment, managing and reducing uncertainty poses challenges inherent to the construct at many levels. And given how the use of risk as a proxy to uncertainty has been the convenient choice in most empirical studies reviewed, a broad and parsimonious approach to dealing with uncertainty is ideal (Hilmersson & Jansson, 2012; Simangunsong et al, 2012; Sniazhko, 2019). The parsimonious approach would then need to tackle the level of knowledge or the availability of information as the pillar of the construct.

Clegg et al. (2019) propose increasing the knowledge level on the perceived uncertainty in the context of the global factory. Knowledge and intelligence building would then be key to obtain more information and thereby reduce or cope with uncertainty. This approach aligns with the active uncertainty reduction strategy as suggested in the cognitive psychology literature (Alpers, 2019). The assumption is that as the level of information gathered increases, the knowledge gap is filled, and there is an increased chance of regaining control of an uncertain situation (Bennett & Lemoine 2014a,2014b; Buckley,

2020). Extrapolating from this assumption, Alpers (2019) suggest that the active regulation of uncertainty in the context of strategic decision making can be defined by the perception of the external environments amongst competitive decision makers. In other words, the level of knowledge or information shapes the perception of uncertainty that in turn influences the formulation of an active strategy to deal with such uncertainty.

Just as how much information should be gathered and data to be collected to increase the knowledge and consequently deal with an uncertainty is another challenge. At one point, uncertainties in the context of the global factory - be they in the home or host country, headquarters or subsidiary, there lies the other elements of the VUCA framework that can amplify or diminish these uncertainties. The interplay therefore of these constructs should be considered as moving parts of a dynamic and turbulent international business environment (Mack et al., 2016)

To sum, uncertainty pertains to the low level of information or knowledge available. In the context of the global factory, there are various sources of uncertainty (Knight, 1921; Miller, 1992; Sniazhko, 2019). The macro, meso, and micro levels of uncertainty may be simultaneously present. In order to reduce uncertainty, information should be collected, and knowledge levels should be increased (Alpers, 2019). Uncertainty should not be perceived in isolation from the other elements of the VUCA framework. In the dynamic and turbulent international business landscape, volatility, complexity, and ambiguity can either increase or decrease the levels of uncertainty of a global factory model (Ankiriwang et al. 2014; Clegg et al, 2019)

#### Complexity

As the GVC orchestration process presents more uncertainties at various levels, this also means that many levels of complexities will surface. With the interconnection of the many variables at the macro, meso, and micro levels of the global factory that make up the international business context, a certain level of complexity arises. Hence, complexity in the VUCA framework refers to the interconnectedness of a network or system that involve a series of processes or operations. In such instance, the predictability of change is clear - but an overlap, a sequence, a pattern, or a cycle can contribute only to a limited level of

knowledge and understanding of the situation/phenomenon (Bennett & Lemoine, 2014a, 2014b; Cannon & John, 2007; Clegg et al., 2019)

In the IB literature, the construct of complexity has been studied as it relates to the environmental and contextual backdrop that the firm navigates when internationalizing. Complexity as a construct is multidimensional. It reflects the intricacies, convolutions, and nuances of the host country environment where the firm operates from a global factory model. These complexities may refer to the industrial complexities, system complexities, the dynamic global business environment, institutions, joint ventures, as well as intra-firm and inter-firm processes themselves (Arregle et al., 2016; Buckley, 2020; Mack et al., 2016; Ryall, 2009).

Buckley and Casson's (2010b) approach to complexity in the IB context leans towards the rational action approach of strategic decision making. In this approach, strategic complexity is a combinatorial problem that can be simplified with existing theories in the business decision maker's strategy toolbox. In contrast to the systems theory that depicts complexity as a kaleidoscope on unexplainable external factors, the rational action approach to complexity is viewed to be multiple layers of combinatorial issues. In such assumption, a layer-by-layer unpacking of complex issues may be unraveled by combinatorial approaches. For instance, the rational approach in viewing the host country complexities when it comes to tariffs and regulatory frameworks on importing material inputs can be solved by the logic of transaction cost, information cost, and internalization (Buckley & Casson, 2010a).

Another approach presented by Clegg et al. (2019) suggests that firms deal with complexity by simplification through specialization. A firm can simplify the complexity of its operations if it is ought to specialize in a particular core process or activity. The rest of the auxiliary activities may well be delegated elsewhere in the context of the global factory (Buckley, 2020). This then makes the other global factory actors specialize on these auxiliary activities that may then result to further specialization (Bukley & Casson, 2020).

With the firm internalizing the activity with the highest values in its activities and hence specializing, complexity becomes more computable. In the context of the global factory, for such complexity being computable, it would mean that complexity can be measurable. For instance, this state of computability can be achieved through specific operational strategies such as offshoring or outsourcing (Maitland & Samartino, 2015).

While the IB approaches presented above offer sufficient logic in defining complexity as a construct, on how it may function and can be simplified, such approaches do not offer how complexity can be measured. With such metrical deficiency, the themes of complexity from the industrial organization (IO) literature may well offer measurable environmental backdrop. Further, the IO literature depicts complexity as the current reality of the global factory. For example, the dynamic and fluid elements of a complex business environment have been depicted by Dess and Beard's (1984) seminal model. In this model, environmental complexity can be viewed through two dimensions: (1) heterogeneity-homogeneity dimension and (2) concentration dimension. Subsequent models developed following Dess and Beard's (1984) model have added additional dynamic layers namely the one that pertain to overseas operations and competitors. The literature review in Table 1 presents the environmental complexity measures from Dess & Beard (1984) and the complexity measures that has since followed from the IO literature (Cannon & St. John, 2007).

In summary, complexity is a construct that pertains to the interconnection of systems, networks, chains, and processes in the global factory context. The IB literature offers two approaches on how complexity can be dealt with by internationalizing firms. On the one hand, the rational approach offers solutions based on combinatorial problem solving. On the other, the simplification through specialization strategies suggests that dividing or delegating the activities throughout various actors in the value chain makes complexity more computable (Buckley, 2020; Clegg et al., 2019). The IO literature offers some metrics that can be applied in the global factory context. Given that the IB approaches are lacking from the metrical dimension of complexity, integrating the IO metrical perspective creates a more integrated framework of complexity as construct.

#### Ambiguity

Ambiguity is the grey area that connects the antecedents and outcomes of a firm's behaviour. Such gray area can either be tacit, implicit, discreet, or unobservable - but is critical in propelling or impeding that which is considered a competitive advantage of the
firm. Ambiguity is characterized by the lack of causal or direct relationship between an input and output in a process (Beleskova-Spasova & Glaister, 2013), between a firm's competencies and superior (or inferior) performance (Ambrosini & Bowman 2010; King, 2007; Powell et at., 2006) as well as between cause and effect of an operation (Beleskova-Spasova & Glaister, 2013).

Scholars view ambiguity (also causal ambiguity or uncertain imitability) as the degree to which the manager understands the relationship between the firm's competencies and performance outcome. In most of the related literature reviewed, two typologies of ambiguities are identified: (1) linkage ambiguity and (2) characteristic ambiguity (Beleskova-Spasova & Glaister, 2013). Linkage ambiguity primarily deals with the perceived the value of certain competencies that drive the firm's superior performance. Characteristics ambiguity pertains to how these perceive these competencies contribute to the firm's superior performance. In other words, linkage ambiguity refers to what competencies drive the firm's superior performance, while characteristic ambiguity refers how these competencies drive the firm's superior performance (Ambrosini & Bowman, 2010; Konlechner & Ambrosini, 2019)

Little is known on the construct of ambiguity in the IB literature let alone in a global factory context. The closest conceptualization of ambiguity in IB draws from the strategic management and organizational learning literature in an internationalization context. This construct is particularly studied as it relates to firm performance in the internationalization process (Beleskova-Spasova & Glaister, 2013; Ho et al, 2019). In the latter context, a key feature of ambiguity is the unobservability or discreetness on how a particular activity or competency creates value, as well as the lack of clarity or fuzziness on how these activities and competencies become a firm's source of competitive advantage. Further, the degree to which such gray area is exposed (or discreet) when firms internationalize can predict the firm's success in the internationalization process as well as the formation of global strategic alliances.

Beleska-Spasova & Glaister (2013) investigated the role of intrafirm causal ambiguity and its antecedents to the exportation performance of British firms. This study highlighted that the tacit nature of firm competencies (viz. linkage ambiguity) are most likely to contribute to the firm's exportation success than the quality of the products or services being exported. These competencies however remain fuzzy from a manager's view when asked how these competencies contribute to the firm's exportation success (viz. characteristic ambiguity). What has been a crucial finding is the negative association between causal ambiguity and firm's performance. The fuzzier the manager's perception is on how certain competencies translate to a firm's competitive advantage, the more inimitable these competencies are from a competitors' point of view; hence is more likely to result to the firm's superior performance (Beleskova-Spasova & Glaister, 2013).

Ho et al. (2019) found opposing results on how knowledge ambiguity affects knowledge acquisition and transfer, and consequently superior performance in the context of international strategic alliances. Whereas previous research suggests that the more ambiguous is the relationship between competence and performance outcome, the higher chances of success, Ho and colleagues (2019) found out that high ambiguity levels impede successful knowledge acquisition. As a consequence, high levels of ambiguity contribute to innovation stagnation amongst partnering firms in a joint venture. The latter findings also suggest how absorptive capacity can facilitate international knowledge acquisition amongst receiving firms. In sum, this study counter-posits how higher levels ambiguity might hinder a firm's superior performance in the international context.

Indeed, the ambiguity paradox from the two opposing results has been alluded by Powell et al. (2006) as it relates to a firm's superior performance. On the one hand, ambiguity in terms of certain competencies that are implicit in nature such as sophisticated technical know-how can lead a firm to a superior performance. In this case, competitors are not able to perfectly imitate such tacit competencies; hence other competing firms remain inferior. On the other, a sophisticated technical know-how that remains implicit, discreet, and exclusive to a very few within a firm may lead to poor knowledge transfer. Likewise, if such implicit competence is not properly articulated resulting to poor knowledge transfer, then there is a possibility of innovation stagnation (in some cases retardation) and ultimately the focal firm's inferior performance relative to its competitors. In the end, the onus is on the manager to balance the types and levels of ambiguity that is observable and discreet in relation to the tacit competencies that contribute to the focal firm's superior performance (Buckley 2020; Konlechner, 2019; Ryall, 2009). In the global factory context, Clegg et al., (2019) suggest that ambiguity could be reduced through experimentation. With the firm's experimentation efforts in trend leading markets, ambiguity can be reduced as the cause – effect relationship is established through heuristic learning (Maitland & Samartino, 2015). In this suggestion, incremental internationalization is envisioned as suggested by the Uppsala Model (Johanson & Vahlne, 1977, 1990). When the firm locates its learning activities such as experimentation in the most competitive markets, the new knowledge gained can be integrated to its current ones as it further commits to other markets. Consequently, as firms incrementally commit to other markets, the continuous refinement of its knowledge base reduces ambiguity that further enhances its competencies and ultimately the firm's superior performance. The rationale from this suggestion aligns with the organizational learning theory where knowledge acquisition leads to competencies and facilitates innovation. This approach also puts less emphasis to the value of high ambiguity levels and more so concur with the idea that low ambiguity levels contribute to superior firm performance in the global factory context.

To sum, ambiguity in the global factory context points out the blurred lines and gray areas between the cause and effect that firms ought to establish relative to its implicit competencies (Beleskova- Spasova & Glaister, 2013). In order to establish clearer areas, firms need to locate experimentation activities in the most competitive markets. Once knowledge is built up, firms reduce ambiguity. As the firm commits to other markets, it can leverage on the constant improvement in its competencies and thereby foster knowledge transfer and innovation; hence ultimately become more superior (Clegg et al., 2019).

# 2.3.1 Knowledge Level and Predictability as Dimensions of the VUCA Framework in the Global Value Chain Context

Thus far, the elements of the VUCA framework have been outlined. The previous research on the theoretical underpinnings of each VUCA construct has been highlighted from the global factory context. The next theoretical exploration brings us to the two dimensions of the VUCA framework: knowledge level and predictability. This section positions the construct of knowledge level and predictability as the primary axes (viz. x

axis and y axis) where the VUCA framework lies. Figure 1 illustrates the iterated IB model of the VUCA framework as an adaptation by Clegg et al. (2019) from Bennet & Lemoine's (2014a, 2014b) initial framework.

The knowledge dimension of the VUCA framework essentially asks the question: "how much do we know about the situation?" In the lower quadrants of the theoretical model lie the constructs of uncertainty and ambiguity (Clegg et al, 2019). Recall that both constructs depend on how much information is available to ascertain uncertainties and how much knowledge can be harnessed to clarify ambiguities. Also recall how the blurred lines and gray areas can be cleared out by experimentation to continuously refine and iterate the firm's existing knowledge. The X- axis therefore representing the knowledge level of the current situation mostly corresponds to how information can be gathered, made available, and utilized. It also corresponds on how certain types of relationships such as cause-effect can be explicated through various knowledge generating activities such as experimentation.

The predictability dimension primarily seeks to respond to the question: *how well can you predict the results of your action?* "In the upper quadrants of the theoretical model lie the construct of complexity and volatility. This dimension can be viewed in terms of outcome predictability as a function of specialization and simplification relative to complexity, as well as a function of flexibility and agility relative to ambiguity. The assumption of the y-axis in this model is that complexity can be computable, hence predictable if a firm is able to specialize and simplify complex processes or operations. Along the same lines, volatility can be mitigated by leveraging on agile strategies whose speed and dynamic capabilities can be calculated, and therefore predicted (Clegg et al., 2019).

While the two dimensions aptly situate the VUCA constructs in a conceptually sound fashion, neither previous literature nor similar conceptual frameworks can theoretically elucidate the relationship (or lack thereof) between knowledge level and predictability to that of VUCA. In other words, supporting literature is exiguous or even non-existent in describing the interplay between these two dimensions and the VUCA elements. Aside from Clegg et al., (2019) painting broad brush strokes on how the framework may open a potential theorization avenue by suggesting current theories from the IB toolbox, the actual role of these two dimensions in shaping the VUCA constructs

remains unknown. What can be observed however is that model makes theoretical sense albeit wide open to many (mis) interpretations, (mis)applications, or (mis)appropriation.

## 2.4 The VUCA Framework in the Global Value Chain Context: Integrated Theoretical Framework

When firms orchestrate their GVC activities, the VUCA framework situates how firms develop strategies that highlight the elemental presence of volatility, uncertainty, complexity, and ambiguity in the host country. Along with these strategies are the orientation of the risks that needs to be avoided, tolerated, accepted, or mitigated through the firms' value chain strategies.

The initial VUCA framework by Bennet and Lemoine (2014a, 2014b) illustrate the elements of volatility, uncertainty, complexity, and ambiguity that cannabis firms must confront as they internationalize. The predictability of change and knowledge flow management can be analyzed as determining factors on how firms respond to VUCA environment of the global cannabis industry.

Figure 1 illustrates the quadratic view of the VUCA framework and initial approximation on how the VUCA elements interact in the context of global value chain orchestration. The knowledge level (X axis) and the predictability of change (Y axis) are the primary dimensions that create the four mutually exclusive quadrants where each VUCA element manifests. Depending on how much is known about the phenomenon and the predictability of the results of actions or changes that are ought to occur relative to the phenomenon, the partition to four quadrants exclusively situate and isolate the VUCA elements. The arrows connecting the elements to one another characterize the non-directional flow or transmission of information that is aggregated as firms gain more knowledge and change becomes more predictable (Clegg et al.,2019; Verbeke et al., 2019).

The theoretical framework depicted in figure 1 will be adopted in this study as an encompassing conceptual guide in the exploration of the VUCA framework in the analysis sections of the study. The same analyses will look at the interplay of the framework's construct

vis a vis the firm's response to the VUCA elements in the orchestration of cannabis value chains across jurisdictions.



Figure 1. VUCA Framework in the GVC orchestration of cannabis firms Author's Adaptation from Clegg et al.,2019

Guided by the same approximation by Clegg et al., (2019), this study will examine how a firm's strategic choices within their business model and value chain structure respond to each of the elements of the VUCA framework. For instance, location choice as posited by Oh and Oetzel (2011, 2017) suggests how firms strategize in hedging against volatility in which a firm's operational and production capacity can be increased through well-structured and diverse supply chains thereby increasing predictability. Information gathering and effectuation as proposed by Saravasthy et al., (2014) offer some insight on how uncertainty can be responded to by increasing knowledge stocks within competitive markets. Complexity is dealt with by developing expertise and specializing in certain activities through offshoring or outsourcing as suggested by Maitland and Samartino (2015). These specialized activities would have to be integrated parts of a firm's global value chain. Finally, the Uppsala model by Johanson and Vahlne (1977) illustrates how ambiguity can be reduced by the eventual/ gradual steps of experimentation in trend leader/ mature markets prior to internationalization. The latter highlights the cause- effect relationship through experimentation where firms rely on heuristics in the global factory context.

Firms develop expertise by specializing in some activities to manage complexity. These activities can be located offshore given the cost implications if these activities were to be done in the home country. For instance, scaling production capacities in one facility overseas where the integration of all processes and standardized operational elements can make the complexity more computable. If these processes and operations are more calculable and computable to a certain degree, expertise is thereby developed. Hence, the offshoring certain activities are not only cost efficient but can reduce the complexity of the value chain integration (Maitland & Samaratino, 2015).

Ambiguity is dealt with by the experimentation in the trend leader markets or the home markets in which firms can discern some unknowns in the industry at incremental levels. The cause -effect relationship as well as innovation testing are carried it out in trend leader markets that is characterized by a mature consumer base. Eventually, such innovation (in the form of a process, technology, product, or service) is integrated as a portable element of the *internationalizable* business model (Johanson & Vahlne, 1977)

To sum, the guidance offered by the initial approximation on how VUCA elements interact along key strategic responses by the lead firms in orchestrating their value chain activities amid VUCA conditions form the initial tenet of the theoretical framework set forth in this study. The subsequent sections outline how the VUCA framework is rolled out in examining the orchestration of cannabis value chains across geographies as the research context.

### **CHAPTER 3** RESEARCH CONTEXT

Chapter three situates the cannabis industry as an ideal research context for this study. The economic and international business rationale situate the bourgeoning industry teeming with business opportunities and economic potential. As the global landscape of an emergent industry is charted, it hinges upon cannabis policy reforms enacted in each jurisdiction's own pace. This offers sneak peak for the world as each country/ jurisdiction waits and sees what happens in the neighbouring ones as cannabis policy reforms are implemented, iterated, and further refined. While pushbacks and drawbacks are inherent as the industry develops, so are the economic contributions manifesting in recent market and commercial data generated by the licit cannabis industry in various jurisdictions. The latter is the key focus of the cannabis industry's compelling business case and economic rationale.

#### 3.1 The Cannabis Industry's Economic and Business Rationale

Consider the following: by May 2021, the Canadian cannabis sector has so far injected CAD 18.29b to the Canadian GDP, while the cannabis sector in Canada has grown by 49.5% between December 2019 and December 2020 (Statista, 2021; Statistics Canada, 2021) It is estimated that by 2025, Canadian cannabis sales would have reached USD 3.2b with a CAGR of 10% (Prohibition Partners, 2021).

From a continental perspective, industry experts estimate that North America (Canada & US) will have reached total sales of USD 30.47b with 16% CAGR between 2020 and 2025. In Europe, the cannabis market is projected to be worth EUR 403.4m by end of 2021. It is estimated that the cannabis market would grow by EUR 3.2b by 2025 with a CAGR of 67.4% from 2021 to 2025. For the Latin American and Caribbean regions, the value for the regulated cannabis markets (CBD, medical, recreational) is estimated to surpass USD 12b by 2028. (Prohibition Partners 2018, 2020a, 2020b,2021a,2021b). Figures 2 to 7 illustrate key charts and graphs on market projections for the cannabis

industry from North America and Europe. Data is provided by Prohibition Partners based off on recent industry reports obtained from Atalis.

The above figures illustrate the robust economic rationale and a compelling business case for the cannabis industry. At the time when the global economy is pushing towards economic recovery, the contribution that the cannabis industry offers to the global economy cannot be ignored. Likewise, the global growth potential of the industry is something that MNEs are attuned to as more countries modify their own cannabis policy frameworks. Hence, entry modes and GVC formations would surely be shaped by the progress and developments of the policy frameworks in each country as more commercial opportunities arise.

When policy frameworks across countries move towards pathways of decriminalization, legalization, and then regulation, the economic contribution of the industry to country's GDP is worth noting. Likewise, the establishments of cannabis firms at various stages of the global value chain and related/ ancillary value chains exemplify a strong business rationale in developing business and value chain models where the flow of knowledge and goods is smooth. Hence, the orchestration of efficient value chains across geographies all hinges on regulatory compatibilities amongst countries intending to participate in the cannabis global value chains. The latter has been suggested by the IB literature as beneficial to a country's economic upgrading (Goerzen & Van Assche, 2021).



#### Key Market Projections for North American Cannabis





Figure 3. Estimated Total North American Legal Adult-Use (Recreational) Sales 2020-2025. Source: Prohibition Partners (2020)



Figure 4. Estimated Total North American Medical Cannabis Sales 2020-2025. Source: Prohibition Partners (2020)



Key Market Projections for European Cannabis





Figure 6. Projected Sales of Medical Cannabis in Europe 2020-2025. Source: Prohibition Partners (2020)



Figure 7. Projected Sales of Adult-Use (Recreational) Cannabis in Europe 2021-2025. Source. Prohibition Partners (2020)

#### 3.2 Emergence of the Cannabis Industry: Jurisdictional Perspectives

The emergence of the cannabis industry (licit and illicit) has been well documented across various literatures. In particular, Decorte et al., (2020) compiles the development of the cannabis industry through drug policy reforms varying across jurisdictions. Such jurisdictional variation reflects the policy priorities of each country vis a vis the driving factors in the formation of these policies. The latter begins with the path of decriminalization, then legalization and subsequently regulation. Whereas legalization marks the starting point of the emergence of a cannabis industry in a jurisdiction, what has been observed in most jurisdictions is that cannabis for medical purposes precedes the legalization of cannabis for adult-use or recreational purposes. Table 2 synthesizes a historical survey on the emergence of the cannabis industries on selected regions that are pertinent to the geography of the value chains being examined in this study.

As the cannabis industry emerges following drug policy reforms, two types of regulatory frameworks are notable: (1) the formal frameworks and the (2) quasi-formal frameworks. The formal frameworks are primarily regulated and guided by formal laws enacted that render cannabis cultivation and use as licit. These laws specify the implementation and rollout of cannabis rules and regulations that facilitate the commercialization and establishment of regulated markets for medical and/or adult-use cannabis. The quasi-formal frameworks are those that pertain to the creation of community-based structures that facilitate personal cultivation and personal consumption of cannabis for both medical and/or adult-use. Note that in the quasi-formal models such as most of the cannabis social clubs in Europe, commercialization is not the primary objective. These clubs are self-regulated and community-run where cultivation and consumption are not intended to generate revenue or profits, but rather create a commune for cannabis cultivation and consumption vis a vis the decriminalization (but not legalization) of adult - use cannabis in these regions (Decorte et al., 2020; Seddon & Floodgate, 2020).

The continental emergence of the cannabis industry also gave rise to two dominant models of the formal regulatory framework. In the lead up towards a regulated cannabis industry, two dominant regimes have emerged (1) the medical-only regime (2) and the medical and adult-use (or recreational) regime. While the regimes are self-explaining, the key distinction between the two is how cannabis can be delivered to the consumers as a medical/ pharmaceutical product and/or a regulatable adult-use product. The implications in terms of (global) value chain orchestration and supply chain coordination in these regimes are nuanced by the regulatory orientation and the maturity of the jurisdictions in implementing or refining these regulations (Decorte, 2018, 2020; Seddon & Floodgate, 2020)

Cannabis regulatory orientation can fall under: (1) state monopoly orientation, where the main distribution channels and consumer access to cannabis is via state owned entities (2) open market orientation, where dispensary permits/licenses are granted to private retailers and (3) hybrid orientation, where both state-owned and private retailers provide access to cannabis amongst consumers (Decrote et al.,2020; Graham, 2015; Potter & Weinstock, 2019)

In terms of jurisdictional maturity, mature jurisdictions have a streamlined integration of the value chains, supply chains, and regulatory guidelines that are designed for an optimized/ smoother flow of goods towards product delivery. The time element plays major factor in the iterations of cannabis industrial regulations. Hence, mature jurisdictions tend to have a more streamlined value chain and supply chain specificities across time. More nascent and evolving jurisdictions tend to undergo series of iterations especially when local markets are not yet developed. Consistent changes in these regulations mean changes in the market landscape as well as dynamics in value chain activities as time progresses (Graham, 2015; Decorte et at.,2020)

### Table 2

**Historical Survey on the Emergence of Cannabis Industries** Central Jurisdictional Themes Reviewed on Cannabis Policy Frameworks Regulations Period: 2010 – 2019

Themes	Description/ Findings	Author
Emergence of Cannabis Industry in Canada	<ul> <li>Recreational cannabis was legalized in Canada with the primary motivation of public health and safety</li> <li>The development of the cannabis industry was not the primary purpose/ motivation of legalization</li> </ul>	Potter & Weinstock, 2019
The Canada model of the	<ul> <li>The Canadian cannabis industry is characterized as health/ safety oriented following the medical model</li> <li>Prior to legalization, the underground/illicit market has been functioning efficiently.</li> <li>The medical cannabis industry has already been existing and production for medical and scientific use has been allowed in Canada prior</li> </ul>	Potter & Weinstock, 2019 Mahamad & Hammond 2019
cannabis industry	<ul> <li>to 2018</li> <li>The eradication of the illicit market is a long process and tougher measures from the government will be necessary</li> <li>The licit industry needs to compete with the illicit market by offering low prices and high quality of products to its consumers</li> </ul>	Traininond, 2019
The Uruguay model of the cannabis industry	<ul> <li>The legalization of recreational cannabis in 2013, while medical cannabis was legalized in 2015.</li> <li>The market is characterized as state run/monopoly as well as health/ safety or medical oriented model</li> <li>The legalization efforts were led by the executive branch of the Uruguay government.</li> <li>The main motivation was the growing concern of organized crimes</li> <li>The Uruguay model is highly regulated by the IRCCA where social clubs and pharmacies are the only legal distribution and access channels for personal cannabis use.</li> <li>There is a central registry system for all users of cannabis that is exclusive to Uruguayan</li> </ul>	Pardo, 2014 Graham, 2015 Cruz, Boidi & Queirolo, 2018 Decorte et al., 2017
The Colorado & Washington model of the cannabis industry	<ul> <li>citizens and permanent residents</li> <li>The Colorado and Washington model are market oriented</li> </ul>	Pardo, 2014 Graham, 2015 Caulkins, 2019

	<ul> <li>The market-oriented model resembles the model of alcohol and tobacco industries in the United States</li> <li>The key difference between Colorado and Washington model is that cultivation for personal use is allowed in Colorado but prohibited in Washington</li> <li>Sales tax for both states total to 25%</li> <li>The vertical integration of the value chain is aligned with taxation policies</li> <li>There was no federal government involvement when the state passed the legalization of recreational cannabis via state constitutional amendment</li> <li>Other researchers are initially concerned that the Colorado model resembles the tobacco and alcohol models that have resulted to public health crises across America</li> <li>The Colorado and Washington models are setting a distinct precedence on using the market model instead of the medical or public safety/ harm reduction models if compared to other invisitions</li> </ul>	Hunt & Pacula, 2017 Caulkins et al., 2018 Parker et al., 2019 Decorte & Potter, 2015 Bahji & Stevenson, 2019 Summer, 2018
The Cannabis Social Club in Europe - Belgium - Spain - Finland - Denmark - Netherlands	<ul> <li>In certain parts of Europe, recreational cannabis is decriminalized but commercial cultivation is prohibited</li> <li>The quasi-legal status of recreational cannabis in Europe was the impetus for the establishment of cannabis social clubs (CSC)</li> <li>Similar to the Uruguay social clubs, the European CSCs are community hubs for the cultivation and consumption of cannabis for personal use</li> <li>These are self-regulated not for profit organizations that is membership based</li> <li>The CSCs have no legal status and are not recognized by law</li> <li>Given the quasi-legality of cannabis in Europe, CSCs cannot be sanctioned or are subject to any legal action</li> <li>The main goal of CSCs is to assure quality and best practices in cultivating and consuming cannabis; not necessarily for commercialization purposes</li> </ul>	Decorte 2010 Decorte, 2014 Decorte, 2015 Decorte et al. 2017 Decorte, 2018 Athey et al, 2013 Belackova et al., 2016 Pardal 2018a Pardal 2018b Pardal 2018c Weinberger et al., (2019)

#### 3.3 Initial Approximation of the Cannabis Value Chains

The formation of cannabis value chains and supply chains follows the legalization of cannabis consumption and cultivation in a particular jurisdiction. Whereas timelines vary from one jurisdiction to the other in the legalization process, the emergence and evolution of cannabis markets and value chains are linked to the orientation of a jurisdiction and how it implements its cannabis regulations. Jurisdictions that lean towards state monopoly orientation allow for various types of governance models all throughout the streams of value chain activities - except that the distribution and retailing channels are primarily owned and operated by the state. Market oriented jurisdictions allow for many players to take part in all the streams of value chain activities where various licensing structures are put in place. Vertically integrated and modular type value chain models are common in market-oriented jurisdictions where distribution/ retailing is also privatized. In essence, the state (or any of its entities) is not directly involved in the value chain activities for market-oriented jurisdictions. The hybrid-oriented jurisdictions involve state owned wholesalers and distributors in its cannabis value chains – the rest of the activities are open to all player/ stakeholders to secure licenses/permits based off on their value chain activities (Decorte, 2018; Decorte et al., 2020; Seddon & Floodgate, 2020)

Krause and Pullman (2017,2020) identified three supply chain member groups that have evolved in the mature/ advanced cannabis jurisdictions of Oregon and Colorado. Amongst the three main groups are the (1) growers that include firms involved in cultivation, (2) the value-added producers, that include firms involved in the transformational/ manufacturing processes, and the (3) retailers that include dispensaries. Seddon and Floodgate (2020) described the regulatory approach to cannabis markets in parallel to the supply chain models that have since been formed in jurisdictions where cannabis consumption is either decriminalized or legalized. The supply chain model identifies five key activities encompassed within the cannabis regulatory frameworks in most jurisdictions globally. These activities include cultivation, processing/ packaging, distribution, retail, and consumption. Comprehensive literature covers and illustrate how the cannabis supply and value chains are initially modelled after the adjacent tobacco and alcohol market frameworks in most jurisdictions (Decorte et al.,2020; Pardal, 2018; Potter & Weinstock, 2019 Seddon & Floodgate, 2020; Kjellberg & Olson, 2017; Summer, 2018) but have since evolved (Caulkins & Kilborn, 2019; Pacula et al.,2015). The latter is attributed to the specificities of the cannabis plant that on the one hand fall under the category of a regulatable adult- use product, and on the other is a pharmaceutical/medical product.

To sum, the economic rationale and business case presented by the cannabis industry is an impetus for management and IB researchers to look at the cannabis industry as a lucrative and promising emergent industry from the lenses of strategic management and IB. The jurisdictional perspectives on the emergence of cannabis industries along its supply and value chains highlight how the jurisdictional orientation shape the formation and evolution of cannabis markets and regulatory frameworks in a particular territory. Finally, the initial approximation of the cannabis supply and value chains follow the decriminalization and legalization processes that was initially modelled after the tobacco and alcohol regimes. The latter have since evolved due to the cannabis plant's dual purposes – as an adult-use product and as medicine - all needing a far more relevant and nuanced approach when it comes to regulating and instituting supply chain and value chains structures

### **CHAPTER 4** METHODOLOGY

Chapter four describes the key methodological procedures and processes undertaken in carrying out this study. The mono-method qualitative approach was employed where a multiple embedded case study was utilized to examine two distinct contexts of cannabis operators via dual asymmetry replication design. The Gioia (2013) methodology was employed in the data analysis where the quality of study results is all held to account by the established safeguards of high-quality research findings and output.

#### 4.1 Research Design

The exploratory nature of this study hinges upon the research question that asks the "how" in which cannabis firms orchestrate their GVCs amid the turbulence in a nascent global cannabis industry. Considering the international dimension of a burgeoning industry with extant literature that captures the orchestration of cannabis production networks, a qualitative approach is a natural and ideal fit to explore the topic. Piekkari and Welch (2004, 2011) argue that to fully consider the context across geographies, fully understand the circumstances across boundaries, and describe the holistic-ness of a phenomenon within IB studies, the qualitative approach would be the ideal choice to carry out this study. The aptness of the approach in making sense of human experience and social phenomenon as well as ground emergent theories resulting from organized analyses is consistent with the idea that qualitative research is more fitting when it comes to the exploratory nature of this study (Creswell, 2017; Yin, 2014).

#### 4.2 Research Strategy

The case study method is the ideal choice in exploring the research question in this study that fundamentally deals with the "how" of the phenomenon of interest. As Yin (2014) puts, the more the "how and why" of a social phenomenon becomes the central theme in an inquiry, the more the case study method becomes more relevant. Piekkari and

Welch (2011) further counsel the use of the case study method as most suitable in IB research "since it can capture the complexity of cross-border and - cultural settings and contribute to the examination of emerging research areas (p.187)". For the purposes of this research, the case study method was chosen in exploring the idiographic nature of firms as they orchestrate their cannabis production network across geographies. At the same time, the nomothetic nature of their classification being an SLCO or MLCO in midst of heightened VUCA elements during a pandemic are also best captured by the case study method.

This study uses a multiple case design with embedded units of analysis. The choice of a multiple case design that embeds units of analysis were guided by three principal advantages relative to this study as highlighted by Yin (2014). First, it confers a robust and compelling finding as opposed to single case design (Herriott & Firestone, 1983). Second, multiple case design that embeds units of analysis expose the contrast and dissimilarity of outcomes as it relates to the generated proposition. Third, the gestalt nature of the VUCA conceptual framework is better elaborated and explored under two main conditions under which the concept can be observed and illustrated. Having two main groups of cases that embed multiple units of analysis offer a more organized structurization of qualitative data and grounding theories later on in the study.

### 4.2.1 The Cannabis GVC and the First Wave of the Covid-19 Pandemic: Setting the Case Study Timeline

Another methodological feature of the study design is the temporal dimension in which the investigation was carried out. The first wave of the Covid-19 pandemic not only confers a natural experiment that can best induce the VUCA elements in the global value chain orchestration; it also offers an ideal time frame of reference in the study. Hence, a longitudinal approach provides an opportunity to feature the temporal dimension of the phenomenon in question.

It is important to note that the epidemiological characteristics and pandemic development experienced by countries differs from one to the other. As such, setting the case study period was inherently challenging to pinpoint a definitive timeline in VUCA intensification vis a vis the overall dynamics of a country's industries, as directly implicated by local public health measures in effect. The author's best estimate of the events within the first wave timeline was therefore guided by the Covid-19 case numbers reported in each country in question that is visualizable through the waxing and waning of case numbers (i.e., case curve). The daily case statistics and the accompanying data visualizations were primarily obtained through the John Hopkins Coronavirus Center (John Hopkins University, 2021). This period was identified between March 2020 – November 2020.

Further subdividing this period into three phases, the author then triangulated the data on the increase of case number (wax) and its decrease (wane) with the public health measures implemented in each country. The pre-lockdown was identified when the case numbers started to increase, and public health measure have begun to be more stringent and restrictive such as border closures. The intra-lock down involves the cresting/plateau of the case curve accompanied by the implementation of national lockdowns, curfews, or stay at home orders. The post-lockdown includes the waning segment of the case curve - where the case numbers crested and then eventually decreased. The latter is accompanied by the relaxation of certain sanitary rules such as terminating national lockdown orders and partial re-opening of international borders

#### 4.3 Replication Logic

The dual asymmetry replication design was utilized as the replication logic for this study. This design has been introduced by the author considering the GVC orchestration within multiple regulatory frameworks across countries that intrinsically renders two asymmetrical contexts in which firms operate. The first context is where the firms orchestrate its GVC in a single location (viz. SLCO; Single Location Cannabis Operators) with an overarching national/ federal regulatory framework. The second context is where the firm orchestrates its GVC in multiple locations (viz. MLCO; Multiple Locations Cannabis Operators) where multiple regulatory frameworks are involved. These two different contexts render the nature of SLCO and MLCO as asymmetrical groups *ab initio* in terms of the basis of their value chain activity orchestration; hence has been rationalized as two different case groups where firms are embedded in this study. This then forms the two main contexts where cannabis firms be grouped as either SLCO or MLCO.

Given the dispersed geography where firms operate as well as the high policy variation and regulatory frameworks where these firms to orchestrate its value chain activities, replication via asymmetry is expected. It has been identified from the beginning that each jurisdiction/ context where these firms orchestrate their GVC would be characterized by volatility, uncertainty, complexity, and ambiguity along with other specificities that render GVC orchestration different from one country to the other despite belonging to the same firm as a subsidiary. Hence, the inherent difference within groups as well as in-between groups render a dual asymmetry replication design more apt.

Belonging to two different groups that embed different types of SLCO and MLCO within it creates a natural asymmetry to begin with. There is therefore an expectation that such asymmetry would produce a theoretical replication where contrasting results would emerge - not because of a different type of event or experience is happening, but rather the inherent and innate features of an SLCO and MLCO render it susceptible to react differently. In other words, SLCO and MLCO having difference in-between (and within) groups from the outset will react differently as expected when exposed to VUCA elements. This then aligns with Yin (2014) analogy that SLCO and MLCO are two different experimental groups where similar treatment is administered and are expected to react differently to an identical treatment.

The expected difference in outcome is also consistent as far the longitudinal perspective is concerned. Provided that each country has implemented a variety of measures across various timelines as a function of local epidemiology, the intensification of VUCA elements would then vary. For instance, a subsidiary in one country would be more apt to react vigorously to volatility in the value chain than the other subsidiary in another country in compliance to differing public health measures implemented. Hence, a theoretical replication is an expected outcome vis a vis the role of public health measures in further shaping the SLCO and MLCO GVC dynamics in this study.

#### **4.4 Research Protocol**

#### 4.4.1 Ethical Concerns & Pandemic-Related Modifications

All the necessary paperwork and administrative requirements in conducting ethical research using human participants were deemed satisfactory by the Research Ethics Board

(REB) as evidenced by the issuance of Ethics Approval Certificate attached in the Appendix 4 of this thesis.

Modifications were implemented to ensure safety and security in conducting this study amid the emergence of Covid-19 across the globe. These include the cancellation of all travelling plans, attendance to international conferences, as well as onsite visits to cannabis cultivation and manufacturing facilities. In- person interviews were all replaced by virtual interviews consistent with the school's directives and public health measures. Since May 2020 all the way to the writing of this thesis, no in-person and face to face interaction have taken place in this study. In essence, this study was all carried out in a virtual fashion at 100%.

#### 4.4.2 Data Collection Technique

The primary data collection technique employed in this study was the virtual semistructured interview. The virtual semi-structure interview was a natural choice in the context of a pandemic and given the technique's compatibility with the exploratory nature of this study.

The virtual mode was the only option possible in collect primary data. Likewise, the arrangement, scheduling, cancellation, and re-scheduling of the interview appointments were all done virtually. Once the participant has agreed to participate in recruitment, the corresponding interview guide, consent forms, and applicable authorization forms were forwarded to the participant along with the Zoom meeting details. The participant was required to sign and submit these forms prior to the agreed interview date.

At the time of the actual interview, a standard script in the opening and closing parts of the interview were recited as captured in the recording. These scripts and complete interview verbiage were all compliant to the standard interview protocol submitted to the REB and part of the initial thesis study proposal.

The conduction of the virtual semi – structured was intended to be casual. Paraphrasing was a consistent element of the interview in ensuring that the participant's response was accurately captured and further probed. Note taking also accompanied the interview where documentation of interview notes and reflection notes were part of the post- interview routine. The interviewee was given ample time to respond to the questions. The interviewee was allowed to elaborate on items he/she felt was most pertinent and relevant, as well as given the liberty to skip and answer the questions in his/her own preferred order/ sequence of answering. Technical interruptions occurred on a regular basis where internet connections were either weak or lost. Hence, certain interview lines and paragraphs in the transcriptions were missing or sometimes the conversations were impossible to transcribe due to these technical difficulties. On average, the interviews ran between 45 - 60 minutes with 15 minutes as the shortest and 120 minutes as the longest interview.

Via Zoom, the convenience (Gray et al.,2020) as well as the disadvantages (Opdenakker,2006) of conducting virtual interviews were evident. In this study, the disadvantages and limitation in conducting Zoom interview primarily include the virtual and social desirability bias, absence of non-verbal cues in communication, consistent technical interruption leading to further distraction on both parties, and the lack of environmental/ contextual input as opposed to in-person/ on-site interviews.

#### 4.4.3 The Interview Guide as Primary Data Collection Instrument

Piekkari & Welch (2004, 2011) suggest an interview guide in conducting a semistructured interview in IB qualitative research. On a practical front, the interview guide serves as a checklist and ensures that all the topics and sub-topics are covered during the actual interview. The interview guide also maps out the entire conversations and somewhat ensures that the entire conversation will be on course within a finite time allocation.

Appendix 2A and 2B illustrate a sample of the common interview guide used throughout the study. There were two versions initially sent out to the participants depending on whether they were selected to participate as actual study participants (SP) or whether they were recruited as subject matter experts (SME). The first version is intended for the key informants who are actual study participants (SP) representing the firms being studied. The second version is for key informants who participated as subject matter experts (SME).

#### 4.4.4 Consultation of Secondary Data Sources

Consistent with the recommendation of Marschan-Piekkari and Welch (2004, 2011) as well Eisenhardt (1989), secondary data sources were consulted both in the data

collection and analyses phase of this study. The consultation of top management and scientific journals, industry databases and reports, governmental records and archives, corporate websites, LinkedIn corporate pages, industry analyst blogs, news articles from reliable media and social media sources, as well as recorded interviews and podcasts was a key process in carrying out this study. The iterative nature of the data collection and analysis stages of this study has relied on the triangulation techniques made possible by these secondary data sources. In addition, secondary data sources that are specific to the global cannabis industry were also used to supplement the emergent insights from the interviews and later the presented findings in this study. Table 3 provides an inventory of key secondary resources consulted that are specific to the global cannabis industry.

Global Cannabis Reports Consulted			
		Publication	Average
	Publisher	Date	Page Range
The Cannabis Extraction Report	<b>Prohibition Partners</b>	July 2021	75-150
The European Cannabis Report 6th Ed	Prohibition Partners	March 2021	75-150
The North American Cannabis Report			
2nd Ed	<b>Prohibition Partners</b>	February 2021	75-150
The African Cannabis Report		December	
	Prohibition Partners	2020	75-150
Medical Cannabis in Europe: The GMP		December	
Standards Guide	Prohibition Partners	2020	75-150
Germany: Cannabis & CBD Consumer		December	
Report	Prohibition Partners	2020	75-150
The Latin America Cannabis Report		November	
	Prohibition Partners	2020	75-150
The Latin America and Caribbean		November	75 150
Cannabis Report 2nd Ed	Prohibition Partners	2020	/5-150
CBD: Supply Overview	Prohibition Partners	October 2020	75-150
The Pharmaceutical Cannabis Report	Prohibition Partners	October 2020	75-150
CBD: The Consumer Report		September	
	Prohibition Partners	2020	75-150
The Oceania Cannabis Report 2nd Ed	<b>Prohibition Partners</b>	April 2020	75-150
The European Cannabis Report 5th Ed	<b>Prohibition Partners</b>	February 2020	75-150
The UK Cannabis Report		December	
	<b>Prohibition Partners</b>	2019	75-150
The Global Cannabis Report		November	
	<b>Prohibition Partners</b>	2019	75-150
The Germany Cannabis Report	<b>Prohibition Partners</b>	October 2019	75-150
The North American Cannabis Report		September	
(1st Ed)	<b>Prohibition Partners</b>	2019	75-150
The Legal Cannabis Report	Prohibition Partners	August 2019	75-150
The European Cannabis Report 4th Ed	Prohibition Partners	June 2019	75-150
The Asian Cannabis Report	Prohibition Partners	May 2019	75-150

 Table 3

 Key Secondary Sources Consulted Specific to the Global Cannabis Industry

 Global Cannabis Reports Consulted

Cannabis Industry Podcast Reviewed			
Podcast	Number of Episodes	<b>Average Duration</b>	
Professionally Cannabis Podcast	50-60	35 mins -45 mins per episode	
The Cannabis Conversation Podcast	20-30	20-30 mins per episode	

<b>Cannabis Conferences &amp; Events Attended by Principal Author</b>			
	Dates	Location	
The 2020 Cannabis Public Policy Conference	October 16-17, 2019	Toronto, Canada	
Prohibition Partners Live	June 22-23, 2020	London, UK (Virtual)	
Santé Cannabis Forum Series	September 17-18, 2020	Montreal, Canada (Virtual)	
Prohibition Partners Live	November 17-20, 2020	London, UK (Virtual)	
Marijuana Business Conference & Cannabis Expo (MJBizCon)	December 2-4,2020	Las Vegas USA (Virtual)	
Montreal Cannabis Expo	September 14-15, 2021	Montreal, Canada	

Key Database Consulted		
Atalis	MarketLine	
Statista	Factiva	
Orbis	IbisWorld	
Statistics Canada	Bloomberg	

#### 4.4.5 Firm Selection Rationale

From the outset, the principal investigator's introduction of the dual asymmetry replication logic creates two distinct case groups that represent the asymmetrical contexts of cannabis operators. The coherence between the replication logic and the rationale of selecting firms that will belong in either the SLCO or MLCO grouping dictates the initial logic on why the five participating firms were selected. Hence, the firms were sampled with the utmost consideration on the coherence between the study's replication design and the actual context in which the cannabis lead firms are orchestrating their value chain activities.

Another logic that explains the rationale for firm selection relates to the alignment of the current day reality of cannabis global value chains orchestration to that of the GVC orchestration's theoretical prescription. It has been previously mentioned that this study aligns with the dynamic capabilities paradigm in which the lead firms orchestrate the value chain activities in relation to its capabilities and assets mobilization in all the streams of the fragmented and fine-sliced GVC activities. On the one hand, the SLCO grouping demonstrates how it is dynamically capable of orchestrating its GVC activities amid VUCA conditions in a single location - where the dynamics are more localized. On the other, the MLCO grouping is also capable of orchestrating its GVC across geographies where the dynamics are more amplified and varied from one location to the other. In essence, selecting firms that represent these case groups offers two differing contexts of GVC dynamic orchestration where the lead firm can execute its capabilities and perform assets mobilization dynamically; the latter consistently aligns with the dynamic capability paradigm.

From a practical standpoint, the firms selected represent a diverse portfolio that make up the contemporary global cannabis industry landscape. The monolithic stereotypical selection approach of a cannabis MNE in the character of publicly listed operators with multiple cultivation facilities across many countries completely misses the point of showcasing the actual portrait of the cannabis industry landscape – that which is a product of the in-vivo evolution of cannabis reform policies across the globe. Hence, the principal investigator opted to select a "mixed bag" composed of high performing cannabis firms to demonstrate how the nascent global cannabis industry is unique in terms of GVC composition and orchestration – to reflect the cannabis policies in effect across various jurisdictions.

What comes with the sampling diversification logic are the inherent firm specificities that capture the entire spectrum of the cannabis global value chain activities. These specificities are directly linked to the theoretical sampling strategy as detailed in sections 4.4.7 to 4.4.10. In essence, certain firm specificities were in mind when the study participants representing the firms were recruited. These specificities include the age of the firm, the location of GVC orchestration, GVC governance model, firm size, firm typology (viz. SME, MNE, publicly trading or privately owned), product specialization/ category, etc. In essence, the firm selection rationale was bound by the replication logic introduced by the principal investigator, the coherence with the GVC orchestration's theoretical prescription, and the motivation to demonstrate a diverse portrait of a nascent industry in the heels of cannabis policy reforms across various jurisdictions

#### 4.4.6 Sampling Strategy

This study hinges upon two levels of sampling strategy employing theoretical and snowball sampling (Yin, 2014) on a sequential fashion. The first level sampling was based

on theoretical sampling, while the second level was based on snowball sampling. These two techniques were strategically employed in each sampling level with full consideration of the advantages of using multi-level sampling approach as well as the pandemic's constraining effects on the recruitment process.

On the practical front, the use of multilevel sampling strategy was an ideal workaround on the recruitment constraints imposed by the pandemic. Given that the recruitment process in this study was all conducted online, a multi-level approach was necessary to better organize the recruitment process as well as optimize participant turnout and lead generation vis a vis in-person recruitment limitation. The following sub- sections describe the sequence in which theoretical and snowball sampling was used as the primary techniques in each level of the dual level strategy employed in the recruitment process in this study.

# 4.4.7 Sampling Strategy Level 1: Theoretical Sampling for Study Participants (SP) and Subject Matter Experts (SME)

This level of sampling selection strategy primarily involves creating a working list of potential study participants (i.e., participant leads) who represent the eligible firms for the study. Using the principal investigator's LinkedIn connections and network, a total of 86 potential SP representing 46 eligible cannabis firms were contacted. Out of the 86 target SP, 36 of them are either CEOs, founders, chairman or president of the firm of interest. The remaining 50 belong to the roles of senior VP, EVP, regional managers, country manager, director, and senior operations manager.

For the potential SMEs, recruitment emails were sent to 18 target participants who are either academics, industry analysts, industry researchers, senior management consultants, founders and CEOs of cannabis consulting firms, as well those who work for international organizations and government agencies.

These potential participants (SP and SME) were sent an introductory recruitment email providing an overview of the study. A copy of the REB approval certificate and sample interview questions were attached to the email. A follow-up email was then sent arranging the available interview dates and times to those recipients who responded with interest in participating to the study. 4.4.8 Sampling Strategy Level 2: Snowball Sampling for Study Participants (SP) and Subject Matter Experts (SME)

Right before the closing of each interview session with participants obtained from Level 1 strategy, the informants are further invited to refer a contact or recommend another person of similar role in their cannabis industry network who may be interested to participate. A follow-up email was also sent within the same day or the following day after the interview thanking the participant at the same time inquiring for potential referrals.

In most cases, the participant would send an introductory email to his network and industry connections regarding the study - copying the principal investigator in the email thread. The principal investigator would then follow up with the new potential participant once connection has been established in the initial introductory email.

#### 4.4.9 Study Participant (SP) and Subject Matter Expert (SME) Eligibility Criteria

For sampling strategy 1 and 2, an initial vetting process is conducted reviewing the potential firms as well as the backgrounds of the participants representing these firms. Background verifications are conducted by evaluating both the firm of interest as well as the professional experience of the informant representing the firm.

For a firm to be eligible, it must be involved in the value chain activities of the cannabis industry production for medical and/or adult-use regimes. These activities can either be located and operated in a single location (SLCO) or multiple locations of operations (MLCO). These value chain activities must include any combination or all the following cannabis production activities: R&D, cultivation, artificial synthesis, processing, manufacturing, extraction, supply, and distribution.

Majority of these value chain activities and firm eligibility were verified through the firm's websites, LinkedIn company profiles, as well as available company information in databases such as Atalis, Statista and Orbis. Local cannabis business registries, national cannabis regulatory agencies/authorities, cannabis business associations websites, and cannabis industry journals were also consulted in ensuring that the firms of interest fit the archetypal criteria within the SLCO and MLCO context. The latter was key to increase reliability of findings in the cross -case comparison later in the analysis as suggested by Yin (2014) For the sampling strategy level 2 in which snowball sampling was the key lead generator, the principal investigator conducts the firm eligibility and participant verification once the referring participant has initially established contacts between the investigator and the recommended person. On the back end, the principal investigator has been engaging in the vetting and background check process prior to sending a follow up recruitment email to the recommended person.

The potential SP's and SME's suitability to participate in the study is usually based on publicly accessible information primarily through LinkedIn and the company website where the participant's biography/ professional profile is available. Published research articles, blogs, relative social media postings as well as technical written work were also consulted in the vetting process for SME selection.

## 4.4.10 Identification of Recruited Firms Derived from Sampling Strategy (SLCO and MLCO)

Two case groups were identified as the grouping where the recruited firms will fall under. Each case group is defined by one key feature as it relates to the primary location of their GVC orchestration. Table 4 summarizes the case grouping of the selected firms and some key anonymized information where they are grouped in either the SLCO or MLCO.

The first group is the Single Location Cannabis Operator case group (SLCO). This group embeds firms that orchestrate most if not all their cannabis value chain activities in one country. There are three firms included in this group. Two of the three firms are located in Latin America while one firm is located in Asia Pacific. Majority of their GVC activities are orchestrated in one region that are either vertically integrated or relational type governance. These firms can also be characterized as small- medium enterprise with less than 200 employees in its facilities.

The second case group is the Multi-Location Cannabis Operator case group (MLCO). This case group embeds two firms that are primarily operate their GVC across multiple countries. These two firms are headquartered in North America where the GVC orchestration is geographically dispersed in Latin America and EU countries. The firms embedded in this case group wholly own their subsidiaries overseas. One of the two firms is publicly trading with vertically integrated value chain, while the other is a private

European focused firm (at the time of the interview) that orchestrates downstream activities of its value chain in the EU region. Table 4 summarizes the informant and company profiles that are embedded within SLCO grouping and MLCO grouping

# Table 4Study Participant and Subject Matter Expert Profiles

Summary of Study Participants		
Alias	Informant	Firm & Value Chain Operations Backgrounder
		Primary operations are located in Uruguay. Focuses on production
		of organic medical grade cannabis products. A particular feature of
		its value chain governance is the partnership with farmer network in
SLCO1	Founder	which established cultivation processes are standardized.
		Primary operations are located in Uruguay. Products and service
	Head of	offerings cater to overseas clients for cannabis nutraceuticals/
SLCO2	Operations	wellness, pharma, and food industry. The lead firm coordinates the
		full vertical integration of its value chain (i.e., seed to sale
		processes).
		Primary operations are located in New Zealand. Biotech firm
	Founder	focused on R&D of medical cannabis products. The lead firm
SLCO3		coordinates vertical integration of its value chain activities (i.e.,
		cultivation to market delivery)
		Headquarters is located in Canada. Market focus, core operations,
		and production are located in the EU zone. Cannabis pharmaceutical
MLCO1 CEO		firm engaged mostly in downstream GVC activities.
		Headquarters is in the United States and firm is publicly listed. The
		firm has corporate office in Canada. Market focus is mostly and EU,
		Latin America, and North America. The firm is focused on the
MLCO2	Anonymous	production and wholesaling of active pharmaceutical ingredients
		(API) such as THC and CBD as inputs for pharmaceutical,
		nutraceutical, and consumer brand medical cannabis products. The
		lead firm operates multiple vertically integrated cultivation facilities
		located in Colombia and Portugal.

Summary of Subject Matter Experts			
Alias	Role Description	Location	
SME1	Co-Founder of Top Tiered Cannabis Consulting Firm	UK	
SME2	Founder of Medical Cannabis Not for Profit Advocacy Group	Australia	
SME3	UN Independent Researcher	Spain	

#### 4.5 Analytical Strategy

This study utilizes the Gioia methodology (2013) as its primary analytical technique. The methodology is fitting with the overall objective of this study in exploring Clegg et al.'s (2019) VUCA framework as a theoretical lens in the context of a cannabis firm's global value chain orchestration across different regulatory frameworks during the first wave of the pandemic. Consistent with Langley and Abdallah (2011) as well as Gehman et al.'s (2016) recommendation, the theory-method fit in this study lies in the revelatory nature of the cases studied herein *that offer high potential for developing new insight into an understudied phenomenon*" (Langley & Abdallah, 2011: 147).

The theory-method fit of the Gioia methodology is clear in this study. Given that both the theoretical underpinning and the context of the cases being studied have received very few scholarly attention to date, the Gioia method is fitting, relevant, and revelatory in the context of this study. The following sub-sections describe the key analytical stages undertaken in this study consistent with the Gioia (2013) methodology

#### 4.5.1 Stage 1: First Order Analysis: Informant Centric Stage

This stage primarily involves the generation of open and first cycle codes, terminologies, and case-group coding consistent with the recommendation of Glaser and Straus (1976) as well as Miles, Huberman, and Saldana (2002, 2018). Once the interviews were transcribed, the resultant transcripts were processed together with the interview notes using ATLAS.ti.

The recommendations of Miles & Huberman (2002) and Miles et al., (2014) in the coding process was integrated in the organization of first order concepts. The distillation process at the coding level was done in an iterative fashion considering the interview

transcripts generated and analyzed from SP and SME point of view. The parsing of the interview transcripts and the cross-referencing of interview notes containing observations and interpretations of the actual interview was done simultaneously; hence, these two activities produced an initial first order of concepts.

The emergence of the first order concepts resulted from the distillation of 303 codes that include in-vivo and non-in-vivo codes, 28 category networks, 5 firm-specific code grouping, and 2 context-specific group coding. A key feature of these first order concepts is that it focuses on the informants' knowledge, experience, views, perspectives, interpretations, fears, anxieties, worries, and frustrations on the themes discussed during the interview. In short, the informants' emotional insights along with their rational/logical points of view have emerged in these first order concepts

#### 4.5.2 Stage 2: Second Order Analysis: Theory-Literature Centric Stage

This stage of the analysis is the consistent back-and-forth between the emergent first order concepts, literature review, conceptual frameworks, and notes on the review of related secondary sources. Essentially, the author asked the question: what does the theory and literature say in relation to what my informants just shared? Further, the author asked: what sense am I making with all these informant insights being interpreted in the realms of "the nascent concepts that don't seem to have adequate theoretical referents in the existing (IB) literature? (Gioia et al.,2013)."

The aggregate dimensions in this stage of the analysis would partially offer an explanation to the phenomenon under study but would need to be substantiated by *exemplars* or specific evidence from the informants themselves. These evidence or proofs are traditionally in the form of quotations from the transcripts, expressions, jargons, lingos, or memos directly extracted from the interviews.

Using ATLAS.ti., the functionalities of Code Co-Occurrence Explorer, Code Co-Occurrence Tables, Code-Document Tables, Code Networks, and Code Network Spinoffs were also used to visually and statistically analyze the codes generated and the frequency of keyword or phrase occurrence in stages 1 and 2 of the analyses. The outputs from these processes were also used as triangulating materials in supporting the emergent aggregate dimensions following the integration of 1<sup>st</sup> order concepts and 2<sup>nd</sup> order themes.

#### 4.5.3 Stage 3: Emergence of Data Structure

Gioia (in Gehman et al., 2016) colloquially states a guiding mantra in his methodology that if "you got no data structure, you got nothing (p.286).". The emergent data structure comprised of the first order concepts, second other themes, and aggregate dimensions will not only make visual and graphical sense, but such structure is pivotal and crucial in demonstrating the rigour of a qualitative research approach. Appendix 6 illustrates and adaptation of the emergent data structure that visually sums up the transformative process of the raw qualitative data to explanatory insights of the VUCA framework in the orchestration of a cannabis GVC. The elaboration of the emergent insights is accompanied by the generated propositions in the discussion section.

#### 4.5.4 Stage 4: Generating Propositions Through Cross-Case Analysis: Connecting Data Structure with Emergent Patterns

Given the pre-determined case groupings in this case as either SLCO or MLCO, a cross- case analysis was directly employed in this analytical stage. In the cross-case analysis, a bifurcation of emergent findings was expected since the dual asymmetrical replication design was chosen as the replication logic. In this stage of the analysis, particular attention was rendered on the contrasting findings on how the SLCO case grouping differs from the MLCO case grouping when it comes to dealing with the VUCA elements as they orchestrate their GVC within the period in question. Theoretical replication was therefore anticipated in the emergent conceptual patterns consistent with Yin's (2014) suggestion as well as the procedural recommendation of Piekkari & Welch (2004) in establishing causal meta-patterns across cases in IB research.

A multidisciplinary lens was crucial in order to execute a consistent and coherent leap of emergent concepts through an inductive-gestalt approach grounded in the data structure (Gioia et al. 2013). A particular feature of this stage of analysis is that the propositions generated would need to tell a narrative where an element of contrast is embedded in the relational dynamics of emergent concepts. The elaboration of findings in the analysis and discussion sections were all written consistent with the exploratory
objective of this study where the VUCA elements are the central variables of interest in the context of GVC orchestration.

## 4.6 Safeguards of High-Quality Research Findings and Output

Credibility, reliability, coherence and consistency, as well as resonance were the rail guards established by the author in ensuring the attainment of the highest quality and achievement of research excellence in this study. Not only that demonstrating scientific rigour in the entire research process was paramount, but the entire writing process was also carefully thought-out. A balance between simple and clear scientific writing style but evocative enough to resonate amongst management and IB research reviewers is key to a well-crafted research piece. To that aim, the author's exposure to various research traditions was handy in formulating an eclectic approach to ensure that the research findings were of high quality and are conveyed effectively.

## 4.6.1 Credibility

A credible study is a trustworthy study. Tracy (2010) defines qualitative research credibility as the *trustworthiness, verisimilitude, and plausibility of research findings (p. 842);* Lincoln & Guba, 1985). In this study, certain processes and techniques were crucial in establishing credibility of the findings – the first of which is the triangulation of research materials. Irrespective of emergent and sometimes serendipitous insights, iterative triangulation was consistently employed as a primary technique in making sure that the findings are trustworthy and dependable in this study. (Patton 2015; Piekkari & Welch 2004)

For instance, during the data collection phase, all the collected source materials (primary and secondary) were centralized and organized in a logbook - based on their relevance, contrast/ conflict, and consistency with the initial assumptions of the VUCA framework vis a vis the orchestration of a cannabis firm's GVC. This logbook primarily contains distilled and summarized textual information/notes whenever the author consults pertinent data sources during the data collection and analysis phase. The resultant logbook was used as a consistent reference material, working document, and key triangulating tool throughout the study.

The second technique employed to reinforce credibility is validation by juxtaposition of all the raw interview transcripts and the generated analyses output using ATLAS.ti. The interview transcripts from both the SME and SP were the key documents of refences in this technique. There was a consistent back-and-forth and apposition between the transcripts, the generated codes, code networks and diagrams, and code co-occurrences, as well as code frequencies in the juxtaposition process. This validation process was the author's adaptation of Piekkari & Welch's (2004) description of a roof in the IB case study architecture. In this technique, the author primarily asks: "*am I capturing the realistic essence of what my participant is (literally and implicitly) sharing*?"

## 4.6.2 Reliability

The question of reliability in this study is addressed in two ways. On the one hand, reliability can be established with respect to the adherence to the case study protocols during the data collection and analysis stages (Yin, 2014). On the other, reliability (and its applicability) with respect to multiple case study findings can be called into question given that reliability as a criterion rarely applies to qualitative studies (Piekkari & Welch, 2004).

In this study, reliability can be superficially established given how the author executed the data collection phase and systematically employed analytical techniques and procedures in a step-by-step manner all throughout the research process. The use of standardized recruitment email templates, participant recruitment procedures, secondary sources, and qualitative data treatment steps via ATLAS.ti all followed specific steps and sequence as described in preceding sections. Hence, reliability at this level is attained.

A counter argument posits that the reliability with respect to the uniform adherence to the procedures alone cannot account for a uniform manifestation of findings given the replication design employed in this study. Where contrast and conflict are expected in the emergent propositions in the present study, reliability with respect to similarity of each case's findings are inherently low at best. The author's experience in considering the multiplicity of contexts and varying regulatory frameworks where the participating cannabis firms orchestrate their GVC would render different outcomes that are unique and idiosyncratic to each firm. Add into this the dual asymmetry replication design within a longitudinal approach and we can see the limitation (or inapplicability) of reliability (in terms of similarity of findings) as an outcome criterion in the present study.

#### 4.6.3 Coherence & Consistency

Coherence and consistency as key pillars of this study's outcome. This criterion has been established through a systematic delineation of the conceptual framework in alignment with the literature. Likewise, the research design, replication logic, and the analytical strategy all interweave in achieving an exploratory purpose on how firms orchestrate their GVC amid the heightened VUCA elements in the time of a global pandemic.

The way the primary data was collected and treated, triangulated with the secondary sources, and then interpreted and analyzed using a data structure all followed a systematized process. While critics will argue that the methodology of this study has become mechanical, it can be equally argued that by being mechanical in the process, coherence and organization of all the moving elements of the research project is attained.

Consistency is tied to coherence in this study. If all the steps and processes were organized and implemented in a coherent fashion, such coherence can be attained by following the procedures previously outlined consistently. The use of various tools (viz. logbooks, observational journals, triangulation workbooks) along with standardized templates (recruitment emails, interview booking procedures, etc.) all the deliver the desired processual reliability and technical consistency in this study as described by Huberman and Miles (2002)

## 4.6.4 Resonance

A qualitative report that resonates is the one that yields impact. More importantly, a resonant qualitative research is the one that "meaningfully reverberates and affects an audience (Tracy, 2010; p. 844)." The transferability of the findings both at the theoretical and practical fronts is one way of achieving this study's resonance (Tracy, 2010). What is crucial however is how resonance is achieved in the research process. In the following analysis and discussion sections, the author turns the reader's attention on how VUCA might be perceived, acted upon, and in most cases considered a surmountable challenge from a cannabis business standpoint. From a policy making standpoint, VUCA in the

cannabis industry is like the pandora's box awaiting the gates of parliaments. From a patient's perspective, VUCA impacting the production of a very important medicine is another delay in their equitable access and hindrance to their universal human rights to proper health care. Finally, from an IB and management research perspective, the VUCA framework might be another theoretical/ exploratory frontier. These scenarios further discussed in the later sections of the study exemplify how resonance and impact are attained in this study.

## **CHAPTER 5** WITHIN-CASE ANALYSES

The within-case analyses present how firms in the SLCO and MLCO case groups orchestrate their cannabis value chains. The key distinguishing feature of single location versus multiple locations value chain is highlighted. An initial mapping of the cannabis value chain in each context is offered as an approximation based on the participants' response and primarily triangulated with the firm's business model and secondary sources. The firms' responses to the VUCA elements are presented underscoring the contextual asymmetry between single location operators and multiple location operators.

Another element of the data presentation highlights how the firms in each context have managed the operational continuity of their value chain activities during the first wave of the Covid-19 pandemic (circa March 2020 – November 2020). A natural experiment that occurred would have induced the intensification of the VUCA elements considering the orchestration of a cannabis GVC in a nascent and already turbulent industry landscape. As such, capturing the responses of firms in each context will bring about more nuanced approach on how firms deal with VUCA from the perspectives of an SLCO and MLCO in orchestrating their value chain activities; hence further emphasizes the asymmetry in terms of the firm's operational approach within each context.

## 5.1 Within- case Analysis I: Single Location Cannabis Operators (SLCO)

# 5.1.1 Describing and Exploring the Cannabis Global Value Chain: Single Location Cannabis Operator (SLCO) Perspective

In exploring and describing the orchestration of the cannabis value chain from an SLCO perspective, it is important to highlight the key stages where value chain activities and their corresponding processes are performed. Thus, the cannabis value chain can be partitioned into six stages of activities to illustrate the "how" of the cannabis value chain orchestration in the SLCO and MLCO context. These stages are stylized based on participant responses and triangulated using the firm's business model as accessible via the

firm's website. In the broadest sense, these stages are divided into: (1) Pre-cultivation Activities, (2) Cultivation Activities, (3) Post- Harvest Activities, (4) Market Delivery Activities, (5) Distribution Activities, and (6) Post – Distribution Activities. Table 5 summarizes the key features of each GVC stage of activities along with descriptions on what processes are specific in each stage based on participant's responses when asked to describe their day-to-day operations in their cannabis production.

Figure 8 illustrates the value chain mapping of the activities orchestrated by the participating firms within one country of operations. SLCO1 and SLCO2 operate in Uruguay, while SLCO3 operates in New Zealand. Note that by single location, it is meant that most (if not all) of the orchestration of the cannabis value chain and its related activities are performed in a single country or state. The term single location is coined (and synonymous) in this study to single state or single country operators.

In the following segments, the four key areas of focus that constitute the main themes of the within-case and cross- case analysis of this chapter is described. These four areas of focus were selected given the sample firms' direct involvement in these activities; and thus, are integral part of the firm's business model. More importantly, these four key areas offer the initial springboard in answering the preliminary part of the research question that is: "how do cannabis firms orchestrate their value chain activities?". The latter part is nuanced by the two distinct context of the SLCO and MLCO.

## Area of Focus I: Pre-Cultivation Stage in SLCO GVC

Amongst the SLCO interviewed, the pre-cultivation stage primarily includes the R&D component as well as compliance and regulatory activities. Both SLCO2 and SLCO3 have indicated R&D focus on cannabis genetics/ strains as well as formulation, while SLCO1 emphasized R&D processes and technologies that focus on organic cannabis farming. The differences in these foci could be related to the governance model of their value chains. A vertically integrated value chain can easily transfer and implement R&D findings straight to the cultivation and post- harvest processes, whereas as non-vertically integrated GVC would have to consider transferring this knowledge and/ or translate it to something useful to its suppliers or cultivation partners. Hence, a contrast in R&D focus is prominent.

The contrast in the R&D focus amongst the firms also manifest on their focus on which regulatory compliance certificates they would like to pursue relative their cannabis cultivation and post-harvest processes. The obtention of compliance and regulatory certificates is a key pre-occupation of the interviewed firms as pre-cultivation activities. These certifications (i.e., GMP, GACP) ensure compliance to international standards and strict guidelines across countries. Attainment of certification therefore guarantees high quality product that is marketable at an international scale.

Financing activities were also highlighted in the pre-cultivation activities wherein distinct responses were elicited in relation to the governance model of a GVC.

"...I think finding capital, local capital was really difficult on the private sector there. I think Uruguayan investors are largely conservative and what they're missing and obviously cannabis is a very risky investment.... we had a lot more luck from foreign investors, the ones that are familiar with the industry or they perhaps knew up us, you know, in our experience and expertise. Government institutions in Uruguay like we actually received some government grants for our project that hopefully will receive some more of that in coming years." (Interview with SLCO1)

"...so, starting with that, I mean, SLCO3 has had 33 million dollars invested in it so far to build what we believe is a world class, vertically integrated medicinal cannabis facility... And there are a number of other companies that have what, whilst they've raised least capital, are also fairly sophisticated." (Interview with SLCO3)





#### Area of Focus II: Cultivation Stage in an SLCO GVC

The variation is evident when it comes to the cultivation activities in the SLCO case group. SLCO1 does not directly cultivate any cannabis variety while SLCO2 and SLCO3 are mainly involved from the genetics, breeding, actual cultivation, as well as harvesting component of cannabis farming. SLCO1 does not own any greenhouse facility while SLCO2 and SLCO3 both own and run their greenhouse facility in-house. While SLCO1's business model reflects a relational type of governance model, both SLCO2 and SLCO3 reflect a hierarchical/vertically integrated cannabis value chain all orchestrated in a single location/ country.

Looking in-depth on the governance models in the cultivation stage of the cannabis value chain, SLCO1 leverages on the relational aspect of its governance model where it partners with local farmers, thus forming a network of partner cultivators. The partnership is built by inviting small scale local farmers to become members of their farm network. Specific farming standards and cultivation techniques are taught to interested farmers with the overall goal of harvesting small batches of organically grown CBD -dominant cannabis strains. Consistent with the firm's mission of integrating sustainable farming techniques, control on the crop quality is attained through small batches of harvested produce.

SLCO2 and SLCO3 have their cannabis value chain fully integrated. Specific to the cultivation stages, both firms confirmed during the interview that their target crop yield harvest is on track for Q2 –Q3 of 2021. Respondents from both firms indicated that the full integration of their cannabis production (referred to as seed-to-sale) is a key feature of their business model.

To sum, the SLCO sample offered two models in governing the cultivation stage of the cannabis value chain. One firm leverages on the relational governance model in which tacit knowledge are passed along to the participating small-scale farms within its partner cultivator network. Another model emphasizes full integration of the cultivation and farming processes in-house that confers control advantages, but at the same time exposure to a higher degree of operational risks vis a vis the constant changes in the regulations surrounding the medical cannabis regime within the single country where SLCO2 and SLCO3 operate.

## Area of Focus III: Post- Harvest Stage in an SLCO GVC

The post-harvest stages of the cannabis GVC in the SLCO context highlights the divergence of approaches as a function of each firm's governance models. Tight production and manufacturing controls emerged as key features of most vertically integrated value chain as opposed to non-vertically integrated. For instance, respondents from SLCO2 and SLCO3 indicated that patented technologies and unique product customization exclusively offered to their client within post-harvest stages all hinge upon the vertical integration of its value chain activities starting from the pre-cultivation all the way to the post harvest stages.

The key element highlighted in the post- harvest stage of the value chain activities is the control in all the processes once the crops are fully grown and are ready for harvest. Be they extraction specifications for medical grade cannabis oils, or customized drying and tincture techniques for THC or CBD dominant dried flowers, SLCO2 and SLCO3's vertical integration model highlights high levels of control and application of its in-house R&D outputs in almost all the processes of the post-harvest stage.

Non-vertically integrated value chain as a distinguishing feature of SLCO1's model underscores a lean and agile model that is capable of mitigating manufacturing risks albeit there is less control in the series of post-harvest activities as compared to SLCO2 and SLCO3. Another distinct feature of the SLCO1 model is that post-harvest activities are outsourced to manufacturing partners within and outside Uruguay. The outsourcing strategy is aligned with the firm's relational type value chain model in which post-harvest activities are executed elsewhere relative to the availability (or lack thereof) of manufacturing technology and the existence (or absence) of extraction or manufacturing facilities in bringing its organically branded products both in the domestic and international markets given this industry void. ," ...I guess one other thing is that there's still no company here in Uruguay that's been given the final approval to start manufacturing...there's still no company yet in Uruguay that has is operational in the manufacturing side. So, it's unclear really as to what they, how they even go about that, you know, whether companies will be allowed to provide services also to other cultivation....we will probably outsource our drying and processing and manufacturing also here in Uruguay. But where it is, there's no precedent with that here. So, we've got to try and figure out how to how to do that ourselves, really, because it's still it still doesn't exist, that part of the value chain." (Interview with SLCO1)

The series of activities in the post- harvest stages of the cannabis value chain within the SLCO context highlight the divergence on what control capabilities are enabled and what governance models offer agility and leanness relative to the existence (or absence) of postharvest technologies or processes. Vertically integrated governance models feature a higher level of control, customization, and production specifications, while relational type of governance is more risk averse and agile in terms of manufacturing and production risks.

#### Area of Focus IV: Distribution Stage in an SLCO GVC

There was a consensus amongst participants during the interview with regards to the distribution stage of the cannabis value chain from an SLCO perspective. All the respondents have the intention to distribute and deliver their products to international markets. There was however the nuanced difference between the distribution strategy of SLCO1 and SLCO2 as opposed to SLCO3. Firms that operate in Uruguay both intend to fulfill and target international market demands as priority, while the firm that operates in New Zealand primarily intends to fill in the domestic market demand first then enter international markets afterwards

"... So, we focus on more of the cultivation side of things, specifically on our unique cultivation model of small, standardized and sustainable farms that are producing higher quality natural organic cannabis. And then the idea is to partner with various partners throughout the rest of the supply chain then and produce the branded, SLCO1 branded products that we'd like to sell locally and also export in markets that obviously have the regulations as well." (Interview with SLCO1)

"...it is important to note that we are located in Zonamerica, which is a free trade zone, economic zone, which basically means we don't pay any import - export taxes here for what we do...So we are set up primarily to serve an international market because of this. And we are currently in discussions with

other Latin American countries, such as companies with operations in Brazil, Argentina, Colombia. And then we are also in discussions with a few companies throughout the EU and Switzerland, and then also down in Israel." (Interview with SLCO2)

"...And over the next few years, I mean, for us 2021 is about commercialisation. So, our first products will come to market at the beginning of quarter three 2021 and hit the New Zealand market first. And then we'll be working on export opportunities from there.... And we'll, we will be staging those into market and then we'll be progressively looking to export those products through distributor, distributor relationships to various parts of the world, particularly including Australia, some parts of Asia and Europe." (Interview with SLCO3)

The differences in the distribution strategy between the three SLCO firms can be explained by two factors. First, there is less market demand for medical cannabis in Uruguay. Second the regulatory frameworks surrounding the medical cannabis regime in the country is undergoing further refinement and development as compared to New Zealand. SLCO3 is amongst the first movers in the medical cannabis space in New Zealand following the recent legalization of medical cannabis in the country. The license that has been obtained by SLCO3 was mainly to manufacture pharmaceutical grade medical cannabis for local patients. Market delivery and distribution activities from the sample case group are influenced by local market dynamics as shaped by the domestic medical cannabis regimes and regulations in effect.

Given the priorities in the market delivery and distribution stages as well as the target markets by the firms in the SLCO case group, the distribution channels as well as the partnership/ alliance strategies will also vary. For instance, SLCO1 and SLCO2 builds partnerships with firms in the EU zone as well as Latin American countries where there is an established medical cannabis regime. SLCO1 has established partnerships in Colombia and Switzerland, while SLCO2 intends to partner with firms and establish its portfolio in Brazil, Argentina, Colombia, EU and Switzerland. Both firms intend to internationalize via non -equity entry modes such as exportation. SLCO3 on other hand has initially established white label supplier-ship agreement with a Canadian MLCO for interim supply provision intended for New Zealand market while waiting for the delivery crop and first batch of products by Q3 of 2021.

SLCO lead firms rely on partnerships and alliances in getting their products into their target market. More importantly, regardless of the governance model, SLCO firms have limited international reach at this point. It can be argued that the age of the firms and its market exposure may play a role in such limitation, but what remains to be seen is how these firms navigate the international cannabis landscape once their distribution fleets are in full tilt.

## 5.1.2 VUCA and GVC Orchestration in the Context of SLCO

## 5.1.2.1 Volatility in the GVC Orchestration of an SLCO

There was an understanding amongst the participants that volatility manifests through constant and dynamic changes in the regulatory environments of the cannabis industry. Volatility in the context of cannabis regulatory framework impacting the firm's value chain orchestration proceeds in a linear manner. Changes are unidirectional towards the refinement of the current regulations and policies, thus advancing forward as opposed to multi-directional or backward directions. Hence, the volatility implied in this section of the analyses has something to do with positive volatility as it relates to the iterations in the cannabis regulations within the countries of observation - that which firms attempt to navigate while adjusting their value chain orchestration strategies and modifying their business models in response to these changes.

For SLCO1, volatility in its value chain is a result of changes in the licensing and certification process in Uruguay's medical cannabis regime. The changes in these regulations directly impact the planning stages of the cultivation and harvest activities for the next season. These changes often halt the planning of the pre-cultivation and cultivation activities given how the firm is not able to ship out its products with the certification process being revised, and thus impacts the entire post-harvest and market delivery processes.

"...I think that's where it's really important for companies to kind of have that really agile and flexible start-up type of mentality where you can really change quickly, if need be, you know, or pivot your operation...you're often at mercy of changing paradigms, changing regulations. We're really lucky in that we keep super lean in a small team. We don't have any big infrastructure right now. So, we're able to really kind of. Yeah. Make quick decisions and quick changes if necessary. But obviously that can sometimes be tricky, especially when you've got to really, you know, it hurts when you you're planning..." (Interview with SLCO1)

"... So, you know, we're planning, for example, for this and next year's harvest. But we would have a plan A, Plan B, Plan C, you know, if plan A or Plan B don't work out, which often is the case." (Interview with SLCO1)

For SLCO2, the changes in the guidelines on what constitutes medical cannabis in the Uruguay context makes its production planning volatile. At the time of the interview, medical cannabis in the country is viewed as the one that pertains to pharmaceutical grade cannabis as opposed to the North American broad views on medical cannabis - that can include nutraceutical products or vitamin/ food supplements. Given the firm orchestrates a vertically integrated value chain, the volatility challenge is that at the local level- where the firm can tailor its cultivation and post-harvest activities compliant to local regulations, but it has to reconcile these processes to manufacture products in compliance to its client's regulations overseas. The disconnect between the client's international specifications on final output and what is locally allowed by the current medical cannabis regime poses risk and incurs additional cost in the customization process of the final product. And any changes in the Uruguay regulatory framework would mean another series of adjustment on the production processes to meet both the Uruguayan standards and the standards of the product's target market. The latter poses challenges on the exportation and market delivery activities since the outgoing products might end up not locally compliant but internationally acceptable

What is more volatile in the context of SLCO2 is that its entire facility was not yet fully operational at the time of the interview. Compared to SLCO1, SLCO2 is yet to expect its first batch of crop yield available by Q2 of 2021. Any regulatory change that consistently occurs with respect to the processing and exportation of CBD or THC dominant strains would negatively impact the overall planning and implementation of subsequent activities in the chain.

".... there have been some adjustments, and some are temporary, say, for example, at the beginning of the year farmers were not allowed to export any of their material that was not dried in the GMP facility and then up, and that was the policy up until a few months ago. And then they allowed it. The Ministry of Health stepped in and allowed some of those exports to proceed. And then now I believe we're in this limbo where the law is being worked out, in which situation going forward, what does apply? (Interview with SLCO2)

...they made an exception saying, hey, the last year or two of cultivation, we're going to allow you to sell it industrial. But they've yet to say that that is going to be the norm and the standard going forward, as far as I kno... we are still working these laws out down here for how to make this happen and how to work with what's going on with IRCCA. However, not everything is set in stone and there are a lot of things changing still. So, we have to be flexible with it." (Interview with SLCO2)

There was a general sense that the Uruguayan regulatory framework in the medical cannabis regime is catching up with its counterparts in North America and in Europe. And the catch-up process in these regulatory frameworks comprise of dynamic changes that impact the overall planning and execution of the two firms' value chain activities.

"... Obviously, the law that they originally created right at the beginning was quiet, it was very wide and broad, but it wasn't specific. It lacked a lot of details. And they've done a few iterations over the last five, six years to try and fix a lot of the problems that have arisen... there were two laws that that passed at the end of last year. One was to promote and facilitate more R&D in Uruguay. This is something we still need to see carried out. I think if Uruguay is going to compete on the international market, their sweet spot will be more in quality and R&D." (Interview with SLCO1)

As for SLCO3, changes in the current regulatory framework New Zealand impact the firm's orchestration of its value chain activities. The legalization of medical cannabis in New Zealand was very recent along with the founding of the firm in 2018. The firm was amongst the first movers in the country and the establishment of its vertically integrated value chain was in parallel to the refinements and amendments of the medical cannabis regulatory frameworks in the country. The parallel dynamics in the regulatory changes in New Zealand and the consequential adjustment in the firm's value chain would have amplified volatility in these two fronts.

With New Zealand's nascent cannabis industry, many changes and iterations are expected by the firm in terms of regulations, and thus the firm has embedded some flexibility in its value chain as well as its business model. There was an emphasis on the firm's focus on implementing a value chain model consistent with current the medical cannabis regime as well as an openness to expand its product offering from medical/ pharmaceutical grade products to nutraceuticals - pending the legalization of cannabis' adult-use.

"...because we're very interested in the dynamics between what happens when you have a medical scheme or medical cannabis regulations and then when you also have recreational regulations in the same jurisdiction. We do know that it has an impact on the market dynamics and the obvious one being that some consumers may shift from a prescription pathway, which is enabled through the current medicinal cannabis scheme in New Zealand that was enacted this year. They may shift from that regime into effectively an over-the-counter style of accessing products for medicinal purposes..." (Interview with SLCO3)

## 5.1.2.2 Uncertainty in the GVC Orchestration of an SLCO

Uncertainty in the orchestration of a cannabis firm's GVC in a single location/ state was perceived by the participants in the context of an emergent industry where important dimensions such as market size, supply-demand dynamics, and clarity of rules and regulations in delivering products into the markets are not fully understood, let alone clear. The limited industry knowledge in these aspects constitutes the source of uncertainties both in the Uruguay and New Zealand context of the medical cannabis landscapes. These uncertainties are dealt with in various ways such partnerships in order to build knowledge capacity.

> "...You know, we're making sure we have a number of different plans and options, potential partners that we can partner with, you know, for things like that uncertainty. So, yeah, so those are probably the biggest risk... we look at the different potential options of maybe selling on the nonmedicinal...we're also looking at other options where potentially partner with other companies that do have their facilities approved and maybe be doing like some part of the process you know repackaging or something there that potentially may let us get that approval or selling them our product and then selling it exporting kind of thing." (Interview with SLCO1)

> "... So, the strategy with Company  $X^{*1}$  was to bring products into New Zealand under our own label that were already formulated and manufactured in Canada. And that would allow us to... exercise the distribution-distributor relationships that we've formed already domestically. So, we could begin distribution and of course, start to start to generate some early revenue, it's still on a pre-revenue business at this juncture. So, there was a good sound strategy behind that collaboration." (Interview with SLCO3)

<sup>&</sup>lt;sup>1</sup> Name of the company anonymized

SLCO 2 and SLCO3 highlights in their corporate websites that their in-house R&D capacity that is robust, advanced, and are easily translatable and transferrable from one set of value chain activities to the other. SLCO1 leverages on the relational type of governance in which constant information exchange was an inherent effect of the governance model. In a related recent development, SLCO1 has signed a framework agreement with a Colombian medical cannabis firm where a key element of the framework agreement is the collaboration between the firms in the development of cannabis genetics and the replication of SLCO1's cultivation techniques in Colombia.

Another narrative that has emerged regarding uncertainty was the entanglement of the of operational and market uncertainty to the volatility in the rules and regulations surrounding the manufacturing of medical cannabis products vis a vis product market value.

> "...The biggest uncertainty for us is whether we'll be able to export or not, or I guess more specifically, exports as for medicinal use. There seems to be now some potential opportunities to export for non-medicinal use. But really, for us, it's not too attractive because we we've kind of done everything we need to be able to comply with importation requirements of medical cannabis...so that's kind of the biggest uncertainty is if and when we'll get the green light from the Ministry of Health to be able to export our product... ...another uncertainty was this this new change in the license, the licensing and how this may affect our model. And if we're going to be delayed in getting our license and potentially not being able to start our next cultivation season in time. So those are some of the challenges right now. And yeah, I guess one other thing is that there's still no company here in

> Uruguay that's been given the final approval to start manufacturing."

(Interview with SLCO1) For SLCO2, the impending changes in the regulations on the licensing of medical cannabis pose planning uncertainties - specifically on the pre-cultivation and cultivation activities. The implication of the changes in the Uruguay context by recognizing medical cannabis not only as a pharmaceutical product in one category but also as food supplements and nutraceuticals as another would have significant impact on the cannabis plants being cultivated. As such, this uncertainty tied to the regulatory volatility that may leave SLCO2 in limbo if the planning stages of the pre-cultivation and cultivation of the plant is not properly done SLCO3 highlighted a narrative of compounded uncertainty in relation to the New Zealand's legalization of medical cannabis followed by the referendum for adult-use cannabis within the same year. A sense of amplified uncertainties emerged such that: (1) there is the uncertainty that relates to the shift (or vacillation) in consumer's access paths from medical path via pharmacies towards dispensaries if adult- use gets legalized, (2) permit and licensing requirement uncertainties for both the medical and adult-use regimes would surface if adult-use referendum passes, and (3) there is uncertainty in the market size, market dynamics, and the related market growth trajectory within the medical cannabis regime compoundable if adult-use passes the referendum.

"...I think is really interesting about our industry is because every market in the world has different regulations. It's very difficult even to benchmark from other countries. We could look at Canada and try and adjust Canada's prescription numbers of patient numbers and adjust for population here in New Zealand. But the reality is your regulations are very different to ours.... the regulations different as they do in most of the parts of the world. So, we found that incredibly challenging...

... I don't think anybody quite knows the size of the market and nobody quite knows what the dynamics will be if the referendum passes and why the reform takes place. But we can only assume that the market would get bigger and legal producers like ourselves would have a larger target addressable audience to serve." (Interview with SLCO3)

Although a couple of weeks after the interview, the referendum to pass the legalization of adult-use cannabis did not gather enough votes (i.e., lost the referendum), it was clear that the level at uncertainty at this point has eventually decreased. This leaves the firm able to continue with its initial plan on prioritizing and focusing on the medical cannabis regime and the orchestration of its GVC for this specific market (O'Brien, 2020)

Two key observations on how uncertainty was perceived by firms in orchestrating their GVC on the SLCO grouping emerged. First, uncertainty was perceived as it pertains to the interaction between the meso- level variables (markets, industry dynamics, supplydemand, etc.) with the firm's internal mechanisms on their GVC orchestration. Along with this, firms dealt with uncertainty in these instances as a function or in alignment with their governance models. Second, there is the entanglement of volatility with uncertainty in an almost simultaneous fashion. To a certain level, all of the samples in the SLCO case grouping attributed uncertainty to volatility. Under this assertion, any change in the external and internal environment (such as changes in local regulations) would have a predictable implication on the uncertainties in the GVC orchestration (such as uncertainties on exportation, licensing, or permit requirements) as perceived by the informants.

## 5.1.2.3 Complexity in the GVC Orchestration of an SLCO

Two opposing views emerged when participants were asked regarding the complexities of orchestrating the GVC of within the context of SLCO. The first view suggesting that GVC complexity can be mitigated by outsourcing processes has been shared and practiced by SLCO1 when asked to describe the overall complexity of the value chains of the Uruguayan cannabis industry. The second view suggests that in the context of a nascent industry and consistent changes in the regulatory environment, internalization through vertical integration mitigates the complexity in orchestrating a GVC.

SLCO1's relational governance model was an option in order to simplify processes and activities in its GVC orchestration. This is achieved by outsourcing its cultivation activities to farmer network thereby reducing the inherent complexities if done by the lead firm alone. Partnering with manufacturing partners or other service providers that will be involved in the transformational process of the dried flowers or biomass is another simplification strategy employed by the firm.

SLCO1's choice of a relational governance model is compatible with its outsourcing strategies. Further analysis suggest that advantages and disadvantages are inherent in this strategy. On the one hand, outsourcing strategies embedded in relational governance model confer advantages when it comes to resource allocation, cost efficiency, transfer of risk, expertise and knowledge sharing, as well as alliance/ partnership formation. On the other, one of the key disadvantages pertains to the reduction (or loss) of control in the outsourced processes as well as the high switching costs associated should the lead firm change suppliers/ service providers later on.

The complexity in the operational aspects of its value chain as well as the final set up of its manufacturing facility will be dependent on the impending changes on the licensing and certification of medical cannabis products as nutraceuticals and food supplements in addition to pharmaceutical grade cannabis products. Changes in the current regulations would result to less complexities in manufacturing its products customized for its overseas clients that which is the case for SLCO2.

"...So that's the complexity that we have here and now what we're working through is trying to see how much the Uruguayan government is going to force foreign clients to comply to that. ...for our company, it is the most complex I have ever seen in my life - dealing with a pharmaceutical grade product. Now, again, if laws change here and things open up and we get to do nutritional supplements, then that complexity level goes way down, and we would be able to probably fulfill a client's product." (Interview with SLCO2)

In New Zealand context, if both the medical and recreational regimes are legal in a particular jurisdiction, a firm is ought (or must) to focus on either regimes or not on both in order to reduce complexities in orchestrating the GVC down the road – especially for vertically integrated value chains

"...we've we have predetermined that we will only focus on medicinal cannabis for a number of reasons. But the primary one is that we have a very clear purpose that underpins our business...

... whilst the plant is the same, the markets are very, very different. And so, we've put a very strong, unwavering focus on the medical application of the plant and the way that we expect to create shareholder value and actually create societal value as well, is by investing in the development of novel therapeutics that harness the potential of this plant and newly efficacious ways..." (Interview with SLCO3)

To sum, the firm's governance model exerts significant influence on how it will deal with the complexities of orchestrating its GVC. Volatility in the form of regulatory changes is intertwined on how complex the orchestration of the GVC might become. The strategies formulated and employed by sample firms in dealing with the complexities in their GVCs hinge upon the impending regulatory changes and dynamic challenges being faced at the micro (firm), meso (market) and macro (national) levels of the cannabis industry landscape.

## 5.1.2.4. Ambiguity in the GVC Orchestration of an SLCO

Two key observations were notable when it comes to ambiguity in the value chain orchestration of the SLCO samples. First, there were two types of strategies employed in relation to the governance model of the firm in question: (1) trial-and-error and (2) wait-and-see strategy. Second, ambiguity was entangled with volatility and uncertainty within a simultaneous triadic dynamic- relative to the national cannabis regulatory frameworks. More

specifically, the respondents' perception of ambiguity interacting with volatility and uncertainty was linked to the impending changes of the medical and adult-use regulations in both Uruguay and New Zealand.

For SLCO1, experimentation was an ideal option for SLCO1 given its previous cultivation experiences it can benchmark on - whereas wait-and-see strategy was ideal for SLCO2 and SLCO3 since these firms do not have any prior experience in the cultivation activities and onwards during the interview. What is interesting in the emergence of these two strategies is to identify if the wait-and-see strategy can be considered as a precursor of the experimentation strategy in the context of newly established/ founded firms within a nascent industry. The sequential implementation of these two strategies could be another dimension of analysis for the construct of ambiguity that which has not been fully explored within the scope of the VUCA framework.

Ambiguity is related to uncertainty and volatility in an interdependent manner when it comes to orchestrating a firm's vertical value chain activities. Hence, ambiguity in the orchestration of a GVC is perceived and dealt with as a function of the firm's governance model, its relative age and experience in orchestrating a value chain, as well as a potential sequence of strategies that firms can employ vis a vis a nascent cannabis industry. The link between ambiguity, uncertainty, and volatility was identified where the interplay of the three elements is nuanced by the changes in the regulatory frameworks in relation to (or disconnection from) the firms' value chain orchestration strategies in order to meet the client's product specifications abroad.

## 5.1.3 GVC Operations Before, During, and After Wave-1 of the Pandemic: SLCO Perspective

When respondents were asked regarding the impacts of the first wave of the pandemic vis a vis their firms' daily operation, all three SLCOs shared a common concern on how volatility, uncertainty, complexity, and ambiguity were intensified as firms continue to operate amid a pandemic. While concerns were evident amongst all respondents, they were nevertheless optimistic that as Uruguay and New Zealand exit the first wave of the pandemic, their respective firms will emerge out of the turbulence and get back to business in the closest-to-normal way possible.

The shared concerns on the intensification of VUCA elements manifesting through specific issues in the daily operations from an SLCO perspective are highlighted in this section. Table 5 summarizes the responses from the SLCOs and forms the baseline on the author's presentation of the VUCA intensification relative to the GVC orchestration issues and challenges.

The experiences of SLCO1, SLCO2, and SLCO3 highlight the manifestation of increased volatility, uncertainty, complexity, and ambiguity during the first wave of the pandemic. The intensification occurs dynamically at the macro, meso, and micro level specific to the accompanying disruptions of the pandemic vis a vis GVC orchestration. At the macro level, international travel restrictions and cross border GVC activities have put the global industries and its activities into a standstill – specifically that of logistics and distribution. At the meso level, the public health measures that were imposed have triggered contractions on the movement of goods and mobilization of manpower significantly impacting midstream GVC activities- specifically that of production and manufacturing. At the micro level, firms had to either pivot their operations model, shut down their operations temporarily, or improvise on operational contingency plans – all of these to control the adverse impacts to firms GVC internal orchestration. Consistent with the literature, exogenous shocks such as global pandemic may compound what has already been volatile, uncertain, complex, and ambiguous as seen the sample cases of SLCOs. The former will be further discussed in the subsequent chapters.

## Table 5

## Aggregate Salient Points on GVC Orchestration During the Pandemic's First Wave Single Location Cannabis Operators (SLCO)

## PRE- LOCKDOWN WAVE 1

- Most SLCOs were engaged in risk mitigation strategies in their value chain operations before the pandemic hit. Risks were mostly related to the changes in the regulations surrounding medical cannabis in the country of operations. The negative impacts of regulatory changes to the actual manufacturing and production processes were the usual pre-occupation of the participating SLCOs.
- Firms in Uruguay were concerned on the recent changes in the regulations concerning what constitutes medical grade cannabis. These regulations and impending changes will have an impact on the manufacturing process of cannabis products vis a vis the established processes and procedures of the SLCOs
- Two primary risks emerged as perceived by SLCO3 (1) the market size and demand for medical cannabis has not yet been ascertained but has been estimated at the time of interview so the implications on the value chain processes was significant especially on the first batch of yield and (2) if adult-use in NZ would be approved via referendum, the firm would have to re- assess its product offerings/ portfolio to cater to the wellness/ nutraceutical clientele. The implication would be revising their manufacturing processes and resource allocation to optimize yield and efficiency vis a vis expected increase demand albeit the specific increase is unknown in terms of actual numbers.
- The over- arching value chain strategy employed were mostly reactionary depending on the regulatory changes within the jurisdiction where the SLCO operates.

## INTRA-LOCKDOWN WAVE 1

- Most SLCOs resorted to business model and value chain pivot strategy when stringent public health measures such as lockdowns were implemented. These measures had direct impacts to their production and operations. The impacts of these severe measures were immediately felt by the firms that manifested in the perturbations in their value chain activities.
- Concerns on continuity and stability in their value chain activities given the level knowledge the firm has in navigating production challenges and the probability of change in terms of their production output versus market demand during the pandemic. The idea of oversupply and under demand in the local markets were significant concerns since all exportation activities and international orders were either put on hold or halted due to travel and transportation restrictions imposed during the lock down periods.

## POST -LOCKDOWN WAVE 1

- A bottleneck and backlog of production issues were the primary concerns after the first wave of the pandemic. These concerns are amplified as the firm transitions back from the pivot strategies back to its pre-pandemic processes.
- For SLCO1 and SLCO2, the issues of delays on post-harvest and manufacturing vis a vis the implementation of new medical cannabis regulations are key concerns. SLCO3 faces the same challenge with the looming changes following the recreational use referendum results at the time of the interview.
- All SLCOs are optimistic on the stabilization of the demand and supply post pandemic which has implications on the stabilization of the value chain activities. The expected stabilization was viewed short-term depending on the whether the country of operations enters wave 2 of the pandemic.

## 5.2 Within- case Analysis II: Multiple Location Operators (MLCO)

## 5.2.1 Describing and Exploring the Cannabis Global Value Chain: MLCO Perspective

There are two key distinctions when it comes to the orchestration of the cannabis GVC in an MLCO context. First, the key activities in the GVC can be further fine-sliced and fragmented. As such, these fragmented activities can be dispersed or clustered across locations. With such dispersion or clustering, there are key regions/ locations where fragmented activities are dispersed or grouped as either upstream, midstream, or downstream activities.

Second, the GVC governance model of the firm can be a function of the mechanisms in place for the strategic control of the resources and processes that can exert influence in the organizational context (Pralahad & Doz, 1981; Bartlett & Ghoshal, 1999). In other words, the classification/ typology of an MNE has direct relationship to the type of GVC governance model it will adopt. The strategic management literature suggests the type of MNE that the MLCO identifies itself (or resembles itself to be) from an operations standpoint. As such, the MLCO can either be multi-domestic, global, or transnational as an MNE. These three main typologies of an MNE exert significant influence on a firm's GVC governance choices (Ghoshal, 1987; Bartlett & Ghoshal, 1999).

On the one hand, MLCO1 concentrates the orchestration of its downstream activities across European countries where each subsidiary has its unique function in the overall GVC map, hence would fall under a multi-domestic MNE category. In such instance, there is moderate to high pressure to respond and integrate locally, at the same time a relatively low pressure to global integration. MLCO2 on the other hand can be categorized as a transnational MNE given the high interdependencies amongst its subsidiaries as well as high pressures on both global integration and local responsiveness Pralahad & Doz, 1981; Ghoshal, 1987; Bartlett & Ghoshal, 1999). The latter manifests in the establishment of multiple vertically integrated cannabis facilities in Latin America and Europe.

Figure 9 illustrates the GVC mapping of the activities orchestrated by the participating MLCO in multiple locations. The simplified diagram illustrates the aggregate

responses when asked to provide a description/ backgrounder of the firm during the interview. These responses are then triangulated with available secondary sources to arrive at an approximation of an MLCOs GVC mapping. Analyzing the GVC mapping from an MLCO perspective is thus complex given the intricacies of the orchestration in more than one location. -that which will highlight the key differences in the GVC orchestration, as well as nuance the asymmetries between these two contexts. Thus, dials back to the goal of highlighting a dual asymmetry replication design as the VUCA framework is introduced later.



Figure 9. Cannabis Value Chain Mapping of MLCO. Source: Author's Own Elaboration

## Area of Focus I: Pre- Cultivation Stage in MLCO GVC

The R&D and product development activities between MLCO1 and MLCO2 are nuanced areas focus where the two firms invest in pre-cultivation activities in relation to their location choice, extensiveness of their product portfolio, as well as their GVC governance model. In MLCO1's GVC mapping, the firm concentrates its product development efforts in the German, Danish, and UK locations. More specifically, the development of its products for the Danish market is done in collaboration with local pharmaceutical firms in order to comply with Danish regulations. While in Germany, the firm holds particular licenses and permits to trade and wholesale medical cannabis products that are compliant with local processing standards.

MLCO1's orchestration of its pre-cultivation activities especially in product development has a specific focus on specialization of curated CBD products. The firm introduces other successful products from North America to European markets, as well as curating in an in-house online marketplace. There is no specific set of upstream GVC activities where MLCO1 is fully engaged with - given the firm's focus on downstream activities. As such, its R&D activities are performed in partnerships with external researchers and R&D houses. Hence, with the firm's GVC modular governance model, the choice of focus on downstream activities are aligned.

With a vertically integrated GVC dispersed across various geographies, MLCO2 stands out as the typical model of an MNE as described in the IB literature. It orchestrates and locates/ co-locates its GVC activities mostly amongst its wholly owned subsidiaries.

MLCO1 has obtained its EU-GMP certification for its Malta facility at the time of this study's writing. MLCO2 has multiple certifications obtained given the fragmented and dispersion of its GVC activities across geographies. Hence, when it comes to compliance and regulatory activities, additional certifications/ licenses are necessary for MLCO2 to orchestrate the full suite of its GVC activities across domestic and international jurisdictions.

Another nuanced set of activities in the pre-cultivation stage was the financing activities in the context of an MLCO. At the time of this thesis writing, MLCO1 is a privately-owned firm while MLCO2 is publicly trading that is publicly listed. The type of firm being privately owned and publicly listed has significant impacts on the financing

activities – especially in the movement of capital from one jurisdiction to the other in order to finance cannabis related activities. Recall that there are currently few jurisdictions where the financing of cannabis related economic and business activities are legal if not highly regulated. The location choice for the financial HQ of an MLCO is therefore crucial to financially sustain the entire GVC activities across jurisdictions and maintain a smooth flow and transfer of capital from one subsidiary to the other.

Access to capital comprise a large portion of an MLCO's financing activities and is one that is challenging as indicated by MLCO1 during the interview. Despite these challenges in accessing capital in the cannabis space, MLCO1's acquisition of its German subsidiary in May 2020 may indicate the firm's healthy financial condition and the firm's relatively stable access to capital. Indeed, not only had the firm been balancing the financing and orchestration activities to run its manufacturing facility in Malta during the interview, but the firm has also been expanding its operations and piercing the EU market zone simultaneously. While access to MLCO1's financial data remain limited given the firm's privately-owned status, MLCO2's financing activities from publicly accessible documents indicate healthy balance sheet as per its August 2020 filings (Securities and Exchange Commission, 2021)

#### Area of Focus II: Cultivation Stage in an MLCO GVC

MLCO1 does not cultivate cannabis, and cultivation-related activities are not part of its GVC mapping. The firm has no direct involvement in growing and harvesting the cannabis plant it uses for its manufacturing activities. In sourcing its key raw cannabis materials for its production, the firm employs a modular type of GVC governance. The firm has suppliers within the EU region such as Germany and UK that cultivate specific cannabis strains under standardized cultivation and harvest processes to match the input requirements for medical cannabis vis a vis the required certifications and licenses in manufacturing pharmaceutical product in EU region.

The outsourcing of the cultivation activities under the modular- type governance confers two key advantages for MLCO1. First, outsourcing cultivation activities is costeffective given that operating greenhouses and cultivation facilities in the EU zone requires significant amount of capital. Second, the modular governance model confers focus and expertise on any area the MLCO1 decides - and has sufficient resources to allocate into.

MCLO2 leverages on its vertical/hierarchical governance model in its GVC. A key feature of the MLCO2 GVC model when it comes to cultivation is the establishment of its two vertically integrated cultivation (clusters) facilities – one in Colombia and one in Portugal. From a location choice perspective, the governance model of the firm as it relates to location and co-location choices confers two key advantages. First, the labour cost in Colombia and Portugal are relatively lower compared to other countries in the region- this drives the production costs down especially if the firm aims to take advantage on the economies of scale. To put into cost perspective, the average cost of producing a gram of dried cannabis in Canada for instance would cost roughly 2.00 USD – 3.00USD while it would cost between 0.14 USD – 0.20 USD per gram to produce in Colombia<sup>2</sup>. The obvious difference is primarily driven by labour cost. Moreover, certain geographical features of the facility locations are key considerations in the cultivation of cannabis. Recall that cannabis is a "sunlight/ daylight loving plant" and having more than ten hours of sunlight in Colombia versus six hours or less in Canada translates to higher energy costs on the Canadian greenhouses to keep up with the sun/daylight necessary in the cultivation.

It is also noticeable that co-location of the R&D facilities with the cultivation as well as manufacturing facilities in one country/ jurisdiction are key features of MLCO2's GVC governance model. Co-location of the facilities for these activities not only offer a faster turnaround of applying R&D output to cultivation and manufacturing, but it also confers tighter control mechanisms especially when it comes to flow of information and transfer of tacit knowledge/ expertise.

Another key feature of embedding the co-location of facilities in the vertical/hierarchical governance model of MLCO2 is the inherent agility and flexibility it offers to the overall GVC framework relative to the jurisdictional regulatory frameworks where these facilities are located. By choosing to co-locate facilities in Colombia and Portugal, the firm can localize its response should there be any changes in the regulations that surrounds the cultivation and production of cannabis related products. By clustering the upstream to midstream activities (i.e., pre-cultivation activities, cultivation activities,

<sup>&</sup>lt;sup>2</sup> Reflects MLCO2's estimate

as well as some post-harvest/ manufacturing activities) the firm is able to adjust its overall production activities if rules and regulations change. Such embedded agility is facilitated by the firm's direct control of the upstream -midstream activities in its GVC - that is localized in either Colombia or Portugal.

#### Area of Focus III: Post- Harvest Stage in an MLCO GVC

The post-harvest stages in the GVC mapping of an MLCO further extends the advantages of the firms' governance model choice as it relates to where the core manufacturing or production activities are located. In the context of an MLCO, there are variations expected when it comes to the definition and scope of post-harvest activities. Such variation may arise given that these activities can be further fine-sliced and dispersed/fragmented across jurisdiction and geographies as compared to SLCO.

Dispersion across jurisdictions may mean compliance to multiple regulations that define some processes differently from one location to the other. In other words, one jurisdiction may define a particular process (say extraction) differently from another jurisdiction and the accompanying conditions/ rules on such processes (say methods of extraction) vary from one jurisdiction to the other. Hence, with such capability of dispersion across jurisdiction comes potential variations on how these activities are defined and are performed in an MLCO perspective.

MLCO1's model of post-harvest activities focuses on downstream activities such as extraction, processing, manufacturing, and distribution. These activities illustrate tight and direct operational controls where most of these activities are performed in-house. The informant for MLCO1 indicated that most of its extraction, processing, manufacturing activities are located in its Maltese facility. When asked for the rationale on the firm's location choice, key considerations of locating the facility in Malta were highlighted. Whereas the firm specializes in downstream activities in its GVC model, the ownership advantage as it relates to MLCO1's model hinges upon in-house expertise in specific segments of manufacturing and processing, extraction, and strategic networks for the distribution of its finished products out of the Malta facility.

"...Malta basically allows us to create an EU-GMP environment for our products. And so, you know, that's the environment that allows us to operate. That was critical to the reason we set up there. I mean, the rationale was because there

was a lot of cheap labor, as well as high quality resources from certain manufacturing. So that made sense for us to deploy there. That was the background." (Interview with MLCO1)

MLCO2's vertical/hierarchical GVC governance model combined with the clustering of its pre-cultivation, cultivation, and post-cultivation activities confer tight controls across all the segments of these three core activities. Further, the inherent advantage of hierarchical governance when it comes to turnaround time in converting R&D output to either efficient cultivation practices or manufacturing/ processing innovation are the key features of the model. Hence, by vertically integrating its GVC activities in a clustered location, tight and close control of knowledge flow from one process to the other can be guaranteed. Any innovation injected in these processes and activities along the way renders beneficial to the onsite facilities in Colombia and Portugal where innovation application/ implementation would be more cost efficient and timely.

Publicly available documents consulted in summer 2021 indicate that MLCO2 currently has roughly 2 million square feet of licensed greenhouse facility in Colombia. Recent developments also indicate that the firm is also intending to open an outdoor cultivation facility/ open field cannabis farm across 73 million square feet of land in the same country. The firm's Portugal facility can house around 110 000 square feet of cultivation and R&D sites. These are the same facilities (in Colombia and Portugal) in which laboratories, R&D, and production areas are co-located with the cultivation areas. Consistent with the GVC innovation literature, any novel methodologies, new techniques, as well as process upgrading are more likely to be adapted to the cultivation and production sites almost instantaneously considering these are all housed in one facility (Turkina & Van Assche, 2018, Ambos et al., 2021). The transfer of knowledge, transmission of innovation, and implementation of new projects can be efficiently executed compared to a more fragmented, non-clustered, and geographically dispersed activities in the precultivation, cultivation, and post-harvest stages in the GVC. In essence, the firm's GVC governance choice dovetails with its co-location choice as it relates to the clustered flow of goods and knowledge transfer from upstream – midstream activities in Colombia and Portugal.

#### Area of Focus IV: Distribution Stage in an MLCO GVC

A key difference between MLCO1 and MLCO2 when it comes to distribution is how their distribution activities are determined by their product portfolio and markets of focus. Hence, the distribution strategies would have to align with the firm's GVC governance model vis a vis its target market - such that the most cost-efficient, fastest, and optimizable market delivery and distribution modes are employed. MLCO1 has specific focus on the EU markets in countries such as Denmark, Germany, and UK. MLCO2 focuses North America (various U.S states where cannabis is legal), EU (Germany), Latin America (Brazil, Mexico, Peru), and Oceania (Australia). The following sections broadly describe the sample cases' distribution strategies in its GVC mapping with key consideration on the target markets and governance model choices.

At the time of the interview, MLCO1 leverages on two key distribution channels for its product portfolio. The pharmaceutical grade/ prescription medical products are distributed in Denmark, Germany, and UK through pharmacies. The nutraceutical/ wellness product lines are distributed through the firm's in-house online (retail) marketplace that has curation features of other related CBD brands that target mostly UK consumers. These distribution strategies at both business-to-business (B2B) and businessto-consumer (B2C) level cast a wider net of market capture - all consistent with its modular governance model. At the B2B level, the firm does not own the actual access channel (i.e., pharmacy), while at B2C level, the firm in-houses the retail platform but uses third party logistics (3PL) partners within its network, thereby maintaining the key features of a modular governance type at the GVC level as well as the CBD supply chains.

MLCO2 distributes its products through downstream wholesaling and rebranding/ white labeling. For the European, Latin American, and Oceanic markets, the B2B focus of the firm's distribution activities hinge upon key wholesale distributorships in its pipelines amongst cannabis manufacturers, pharmaceutical firms, nutraceutical/ wellness firms as well as government and research agencies. For the North American market, specifically that in the United States, the firm distributes its wellness and nutraceutical products through distribution partnerships with health and wellness retailers, food supplement chains, as well as online retailers. Furthermore, consistent with the clustering strategy of the precultivation, cultivation, and post-harvest activities, the final output of the Colombian facility supports the demand for Latina American, North American, European, and Oceanic markets, while the Portugal operations primarily supports demand in the European market.

#### 5.2.1 VUCA and GVC Orchestration in the Context of an MLCO

## 5.2.1.1 Volatility in the GVC Orchestration of an MLCO

Volatility in the context of GVC orchestration of an MLCO was perceived by the participants as to that of positive volatility. The changes and dynamics viewed by the participants are those that relate to changes that will further improve existing local regulatory frameworks of the medical cannabis regime where the firm orchestrate its core GVC activities. These changes were viewed as beneficial rather than detrimental in view of the firms' current GVC model.

There was a divergence of answer when the respondents were asked about volatility as it relates to the daily production and GVC orchestration of the firm. Such divergence emanates from the regulatory frameworks in effect in Malta and Colombia. MLCO1 related positive volatility with considerable impacts to its operations, while MLCO2 perceived the absence or unlikelihood of volatility in the local regulations with net zero effect in its GVC operations.

MLCO1 indicated that recent changes in the EU CBD regulations have positively impacted the firm's products recognition and validity. Whereas previous rules did not recognize its CBD products under the EU novel food guidelines, the revised rules have since included MLCO1's products as duly recognized at the time of the interview.

For MLCO2, the Colombian regulations surrounding cannabis cultivation and exportation were "straightforward" and there have been no major changes on the regulations over the last two years. Consequently, since the establishment of the Colombian operations, there have been few GVC adjustments and operational modifications that the firm had to implement.

Publicly available documents consulted indicate the stability, consistency, and coherence of the Colombian regulatory framework vis a vis the MLCO2's establishment of cannabis cultivation and extraction facilities as well as completion of its exportation activities. Further, MLCO2's local competitors as well as the ASOCOLCANNA support the respondent's assertion on how stable regulations in the medical cannabis regime

translate to reduced volatility in the daily operations and GVC orchestration of cannabis firms in Colombia (Prohibition Partners, 2020)

Volatility in the regulatory frameworks would seem to be a lesser concern for the firms as far as its negative impacts to the GVC orchestration. MLCO1 viewed volatility as positively impacting the firms' overall GVC governance model with respect to regulations in its Maltese operations. MLCO2 indicated that a stable regulatory environment in Colombia contributed to a less volatile and smooth GVC orchestration over the last two years. Thus, this segment highlights that the central theme of positive volatility in the MLCO context translates to further improvement of the firms GVC orchestration vis a vis its governance model.

## 5.2.1.2 Uncertainty in the GVC Orchestration of an MLCO

For MLCO1, uncertainty was perceived of having less impacts in its GVC operations in Malta. The respondent added that more certainty than uncertainty was imminent in terms of increased production given how medical cannabis has been considered an essential good by most jurisdictions during the pandemic. In this sense, the respondent alludes to an increased demand of the products versus the limited supply in the pipelines while most travel restrictions and border closures were in effect. The latter will be further analyzed in the pandemic related segments of the analyses. As far as uncertainty with the current regulations are concerned, MLCO1 did not indicate any clarity issues and its impacts to the firm's operations in Malta.

A key element in understanding the perception of less uncertainty in MLCO1's response is the firm's managerial experience and expertise when it comes to the pharmaceutical regulations in the EU zone along with the firm's relationships with key governmental agencies across its subsidiaries. What comes with the firm's presence across jurisdictions is its vast network of regulators that render the firm astute on international cannabis regulations. Hence, when posed the question of uncertainty, anything related to the Maltese and EU cannabis regulations, no qualm was noticeable as the firm leverages on its network of regulatory expertise across jurisdictions

For MLCO2, its Colombian operations were more certain compared to its other facilities in EU. The respondent furthered that the firm specializes on Colombian

regulations that makes the cannabis industry easier to navigate. As such, the firm has solid experience on Colombian regulations.

Triangulating MLCO2's response with the CEO's recent statements on a podcast guesting and in an online conference, the firm indeed employs a specific group of regulatory and compliance specialists across jurisdictions with the most concentration in Colombia.

What is interesting for both the responses from MLCO1 and MLCO2 is that the firms' regulatory expertise mitigates the perceived external uncertainty that may potentially translate to its operational uncertainty. Both respondents indicated that given the nascency of the industry and its multijurisdictional GVC orchestration, the firm ought to invest in knowledge gathering and expertise build up on regulatory dimensions. MLCO1 attains such expertise through managerial regulatory experience and network amongst EU regulators and industry relations, while MLCO2 maintains a significant size of regulatory and compliance teams for its Colombian operations and other jurisdictions. Hence, uncertainty in the context of MLCO GVCs is less felt and less perceived as both firms leverage on regulatory expertise where the firm operates its main cultivation and processing facilities. Therefore, in the case of the MLCOs, an increased certainty on the regulations translates to decreased uncertainty when it comes to daily operations of the firm's GVC.

## 5.2.1.3 Complexity in the GVC Orchestration of an SLCO

For MLCO1, the firm's choice of modular governance is an effective strategy in simplifying complexity in its GVC. Cultivating cannabis in the EU region itself is a complex activity with many regulatory hurdles that need to be overcome to deliver cannabis dried flower or biomass into the EU market (Prohibition Partners, 2019). As such, MLCO1 downloads all these responsibilities to its EU supplier with full specifications of procuring pharmaceutical grade cannabis inputs that it will process. In this manner, complexity is simplified by MLCO1 through its governance model choice.

Moreover, by adopting a modular governance model in its GVC, the firm is able to specialize on downstream activities and functionalities. Secondary data consulted aligns with the outcome of MLCO1's governance model choice where the firm intends to seek expertise on extraction processes and technologies thereby conferring specialization and focus on this segment of the downstream GVC.

Another layer of complexity was indicated by MLCO1 during the interview given the developments on EU regulations regarding CBD as a novel food. At the EU level, CBD products are considered legal under the category of novel food<sup>10</sup>. However, at the country level, each member state must still legislate whether the country will abide by or implement these guidelines. In UK, Denmark, and Germany for instance, CBD products are allowed in the market provided that MLCO1 follows the local guidelines and rules outlined by each member state, as well as the applicable rules imposed by the territories/ provinces within these countries. In contrast, Lithuania prohibits CBD products in the domestic market (Prohibition Partners, 2019) Further, employing the wait and see strategy along with activating lobby mechanism are ideal.

"I mean, to a certain extent you just have to wait until those regulatory restrictions are lifted or are there in many case you are going to undertake lobbying activities with one specific area that you're after, but by at large you essentially wait for that piece of legislation." (Interview with MLCO1)

For MLCO2, complexity is dealt with by clustering the core activities of R&D, genetics, cultivation, and processing in one location/ facility. The firm's hierarchical/ vertical governance model not only facilitates the turn around of R&D outcomes to production, but it also simplifies manufacturing by processual internalization. Along with the inherent internalization, the clustered/co-located vertical integration confers control, computability, and predictability of the processes in complex systems of GVC orchestration. Whereas dispersion of MLCO2's core activities would create more complexity given that Colombia was the only viable country in the region where cannabis processing/ extraction can be performed (at scale), co-locating these activities was the alternative solution employed by the firm.

Recent remarks from the firm's CEO in a podcast guesting support the argument on co-locating or grouping core upstream-midstream activities citing the rationale that the transportation and exportation of cannabis processed products across Colombian borders are prohibited. Raw outputs such as dried flowers and biomass cannot be exported or transported outside. At the time of interview, the latter is still the case. Although at the time
of this thesis' writing, amending legislations have been drafted to allow dried cannabis flowers, cannabis/ hemp biomass, and the like to be exported. MLCO2's workaround on the complexity both at meso and macro level was to co-locate or group the core upstreammidstream activities. The inherent advantages of vertically integrating and grouping core GVC activities have resulted to simplification of the GVC complexities as evident in MLCO2's approach.

#### 5.1.2.4. Ambiguity in the GVC Orchestration of an MLCO

A unitary theme emerged when respondents were asked regarding the ambiguity or gray areas in orchestrating its GVC across multiple locations. For both MLCO1 and MLCO2, locating or co-locating core GVC operations – specifically R&D activities in mature markets or pioneering jurisdictions in cannabis regulations was key in reducing the meso-level ambiguity and its impact on the GVC operations of the firm.

For MLCO1, the focus on the German, UK, and Danish markets not only responds to the needs of the biggest addressable markets in Europe, but it also allows them to bolster their R&D capacity as well as experiment on the mature markets in the EU region. The firm's core engagement in R&D partnerships in these countries confers the advantage of knowledge build up. It also offers a unique position for the firm to gauge the markets and identify its unknowns through experimentation.

In the context of MLCO1's GVC, experimentation is executed at two fronts. First, the experimentation in upstream activities is carried out by partnering with external R&D firms to take advantage of knowledge transfer and spillover, as far as product developments and scientific research are concerned. The firm leverages its presence in Denmark given the country's pioneering and fertile cannabis ecosystem in Europe (Hanway Associates, 2020,2021). With such approach, ambiguity in the upstream GVC activities is reduced and opens further opportunities for the firm to translate knowledge spillovers to internal innovation in its GVC -specifically in developing and introducing new pharmaceutical-grade medical cannabis products to the market. Publicly accessible documents support the observations in which the firm's active presence in the Danish cannabis ecosystem confer a win-win scenario to the firm's R&D.

The second front in MLCO1's market experimentation is embedded in the distribution activities within the far downstream segment of its GVC. MLCO1 recently acquired an online marketplace of CBD wellness products/ nutraceuticals for its UK client base. The platform has curation features where the firm introduces "best -seller CBD brands" and other CBD products from the North American markets to its UK clients. The potential of the firm's online marketplace is twofold as far as product distribution is concerned: (1) experimentation by introducing new products thereby facilitating trial-anderror, and (2) market data generated by this platform can be leveraged upon by the firm for product development for its UK markets as well as for emergent markets. This two-fold potential is especially crucial as more countries in the EU zone revise/ amend their cannabis related policies such as France or Italy. The latter will be key if or when the firm intends to pierce these markets and build up on its expertise as it further internationalizes to neighbouring markets – such strategy is consistent with the classic Uppsala model.

For MLCO2, the Colombian cannabis regulations are clearer and easier to navigate as opposed to that in EU. The maturity of the Colombian cannabis regulation in comparison to the nascent and dynamic EU cannabis rules confers clarity and convenience vis a vis MLCO2's GVC orchestration. The latter translates to a smoother GVC orchestration especially in the cultivation and extraction activities in the firm's GVC. By the fact that MLCO2 co-locates the core upstream- midstream segments of its GVC, ambiguities in terms of knowledge transfer are reduced and innovative capacities from R&D outputs are optimized. Since the firm's GVC establishment, the Colombian model has served a GVC template that the firm replicated it upon entering Portugal. Such templating from the Colombian model is a key example of the Uppsala model adaptation where the firm leverages on the build up of its expertise on cannabis cultivation and extraction and brings such expertise when it sets its GVC footprints in Portugal. In the context of a nascent industry where the level of ambiguity is relatively high, MLCO2's internalization through vertical integration from the Colombian operations rendered advantageous as the firm internationalizes.

Publicly available firm documents consulted support the resemblance of Colombian operations to that of the Portuguese operations with a key difference on the ability to produce and process dried cannabis flower. Colombian regulations currently do not allow dried cannabis flowers for both processing and exportation, while Portuguese regulations permit the dried cannabis flowers to be exported and processed. In essence, MLCO2's acquired expertise in the mature Colombian operations is being templated by the firm in its Portugal operations. The co-location choice was pivotal in building up the firm's internalized GVC expertise in the Colombian markets that it leverages on as the firm expands overseas. Table 6 summarizes the key points on GVC orchestration from an MLCO perspective vis a vis VUCA elements.

## 5.2.3 GVC Operations Before, During, and After Wave-1 of the Pandemic: MLCO Perspective

Orchestrating a GVC amidst a pandemic across jurisdictions was considered unprecedented and challenging from an MLCO perspective. What has made the orchestration even more difficult was the high variation on the public health measures implemented in multiple jurisdictions where the firms operate with different severities/stringency levels and timelines. Both MLCO1 and MLCO2 indicated that the manufacturing and market delivery activities were the most impacted during the first wave of the pandemic. The same activities have been considered by the respondents as key bottleneck areas as soon as Malta and Colombia began easing restrictions upon exiting the first wave of the pandemic. A sense of optimism and positive outlook were both shared by the respondents upon closing the Covid-19 segment of the interview.

GVC orchestration and operational continuity were far more complicated from an MLCO perspective. Both MLCO1 and MLCO2 indicated the inherent challenges experienced in its production and market delivery activities vis a vis the travel restrictions that were implemented. Both firms have also triggered its business / operational contingency plans where one firm triggered at a localized approach and the other triggered at a globalized scale. Exiting the first wave of the pandemic was more complicated in the case of MLCO2 given the scale of its production and the size of the back logs compared to MLCO1.Table 6 summarizes these responses and observations from MLCO1 and MLCO2.

### Table 6 Aggregate Salient Points on GVC Orchestration During the Pandemic's First Wave Multiple Location Cannabis Operators (MLCO)

### PRE- LOCKDOWN WAVE 1

• Prior to the pandemic, MLCOs were focused on risk mitigation in countries of GVC operations particularly in Europe. The primary risks addressed were those related to regulations that surround CBD and cannabis nutraceuticals, specifically the novel food regulation that was amended at the time of interview. The changes in the regulations had implications how GVC processes and the introduction/ registration of the CBD products to the target market.

### INTRA-LOCKDOWN WAVE 1

- Intra pandemic, the public health measures were implemented at different time periods across the countries where the MLCOs operate, the activation of the business/ GVC contingency plan was the central action/ measures undertaken by the firm. These measures particularly included close monitoring of the supply chain along with back up plans on alternative production location.
- Immediate impact on the MLCO's GVC operations. MLCO1 had delays on machine installations in its Maltese facility while MLCO2 had delays in shipping its products from Colombia given airport closures. MLCOs have planned for these eventualities where alternative (re)location/ sourcing choices were part of the business/ GVC contingency plans.
- Adherence to public health measures that vary from one country to the another to control contamination in the production facility was one of the key GVC challenges faced by the firm's vis a vis the harvest deadlines as well as post-harvest and production targets & deadlines
- A multi-domestic approach as opposed to centralized approach was applied in planning and implementing contingency strategies but at the same time aligned and consistent to the overall a centralized business contingency plans as per HQ.
- Classification of medical cannabis as essential product during the pandemic was notable. There was a direct impact on the supply side vis a vis the demand and the available inventory when most governments allowed cannabis dispensaries to be opened.

### POST -LOCKDOWN WAVE 1

- Continuous re-adjustment of the centralized contingency plans in alignment with current local public health measures was a key feature of the post wave 1 mitigation strategies employed by the MLCOs
- MLCOs face higher levels of complexity in GVC orchestration upon exit from wave 1 and entry to wave 2 where timelines vary greatly from one to the other. There is high timeline variability between relaxing public health measures and restrictions upon exit from wave 1 then re-applying new set of measures when entering wave 2 of the pandemic,
- There were significant impacts for MLCO2 to adjust its GVC processes vis-à-vis how countries in North America, Latin America, and Europe were relaxing and then re-applying these measures across different timelines of post wave 1 entering wave 2 of the pandemic.

The cross-case analyses juxtapose the SLCO group with the MLCO group. It underscores a high-level comparison and contrast of findings that dials back to the research question on how firms orchestrate their value chain activities within two inherent asymmetric conditions. Hinging upon the dual asymmetry replication design where a theoretical replication is intended, the key dimensions of contrast examined are: (1) the four areas of focus in the value chain activities (2) the perceptions of VUCA elements, and (3) the three phases of the pandemic's first wave (viz. pre, intra, and post-lockdown) as VUCA's intensifying elements.

The chapter wraps up with the summary of the key points that highlight the difference how the two case groups orchestrate their value chain activities within the four key areas of focus and the observed themes of the VUCA framework. Consistent with the overall goal of contrasting the contextual dimensions of the firm, the chapter transitions to Chapter 7 where the VUCA framework is put into question – is it a quadratic or an overlapping framework?

#### 6.1 GVC Orchestration in a VUCA Environment: Juxtaposing SLCO with MLCO

### 6.1.1 Contrast in Pre-Cultivation Activities

SLCOs operate in countries where the regulatory environments are more dynamic as opposed to the locations where MLCOs orchestrate its core GVC activities. The latter can be characterized by stable regulations in a sense that firms can engage in upstream activities with lesser concerns "if the rules change". As such, the R&D and product development aspects of the upstream activities can be efficiently executed by MLCOs if we look at conducive environments conferred by the locations where most of the precultivation activities are located. When it comes to the control over R&D and product development outcomes, SLCOs can leverage on the faster turnaround of these outcomes as processual or product innovation. By operating in a single location, these firms can easily download potential improvements and apply these up and down the streams. However, the caveat remains that given these locations have frequently changing regulations - either due to a very nascent local industry or calibration of existing regulations to meet international ones, the constant changes may mean there will be a disconnect between the local rules and international regulations that which may hinder innovation turnaround.

MLCOs employ clustering/ grouping or co-location of its pre-cultivation, cultivation, and post-harvest activities in a particular geography to facilitate faster turnaround of R&D and product development. Regardless of the governance model, the fact that MLCOs have presence in countries where regulatory frameworks are relatively stable further contributes to a more efficient transfer of knowledge across subsidiaries especially amongst those in the EU region.

Financing activities highlight a key difference between an SLCO and MLCO. Considering the relative size as well as the age of the firms, SLCOs' financing is less demanding and selfsufficient. In contrast, MLCOs capital needs are more intense; hence, financing activities are relatively more robust.

#### 6.1.2 Contrast in Cultivation Activities

SLCOs demonstrate tight control and oversight on cultivation activities. At the same time, SLCOs are agile and nimble should adjustments arise. The size of the SLCO and the single location operations facilitate the implementation of changes/ modification in the cultivation activities are faster and more optimized. Such nimbleness and agility are beneficial given the changing regulations where the SLCOs are located. Being nimble is a rational response to cope with volatile regulatory environments as is the case for SLCO1, SLCO2, and SLCO3.

Moreover, employing a relational governance model in the context of SLCO1 has corollary effects as far knowledge transfer and value chain upgrading is concerned in the Uruguayan context. By facilitating the dissemination of knowledge and granting equitable access to training and technical know-how of cultivating cannabis, value chain upgrading (be it functional or processual) of all suppliers/ service providers in the chain is an imminent outcome of SLCO1's cultivation/ outsourcing model – the latter is consistent with the GVC literature.

For MLCO2, agility in the cultivation activities is built-in by clustering/grouping the cultivation activities to that of post-harvest activities in one facility. Should external shocks arise, the consolidation of its cultivation and post-harvest activities in Colombia and Portugal renders an insulation to these shocks. Moreover, the grouping / clustering of these activities into two separate geographies confer consistent knowledge transfer and spillover that is contained and adjustable to the specificities of the jurisdictions where it is located. Value chain resilience is also built-in by establishing these two facilities across two continents. Whereas the new Portugal facility can either be the back up for the Colombian facility, or become a gateway facility for EU THC demands, or specializing on geographically indicated genetics -establishing additional facilities in the context of MLCO1 render it advantageous in the long run.

Economies of scale and scope are inherent benefits of vertical models when it comes to cultivation activities. Whereas customization and specialization in terms of cultivation processes (such as organic farming or customized strains and formulation) are inherent in the non-vertical governance model. Against the backdrop of (un)stable regulatory frameworks, the location choice where to operate a facility by scale or operate through specialization, the choices of SLCO and MLCO are fitting in the current context of cannabis regulations where the firms are located.

### 6.1.3 Contrast in Post-Harvest Activities

For SLCO, value is added in the post-harvest stages either by outsourcing to specialist manufacturers or manufacturing customization through vertical integration. Given the firm size along the single location of firms in this case group, value creation and capture are relatively straightforward in its value chain. Likewise, control and oversight are inherent in vertical governance, while flexibility is inherent in non-vertically integrated model.

For the MLCOs, two emergent features are plausible depending on the governance model vis a vis location choice of post- harvest facility; that which are less likely attainable by an SLCO. First, MLCOs leverage on low labour cost, skilled workforce, as well as conducive and stable regulations in locating their post harvest activities. By doing so, value is created are captured by low-cost and high-volume production for vertical model, while specialization is attained with a modular governance models.

Second, MLCOs can form supplier and partner networks across countries that it can integrate in its GVC down the road. Specific to the EU markets where regulations vary at a country/

provincial level, MLCOs are more apt in gaining further knowledge from (as well as transfer to) its partners in the country of operations. In this regard, modular models have more affinity to building this kind of relationship as opposed to vertical models.

### 6.1.4 Contrast in Distribution Activities

SLCOs are less likely to build its own distribution pipeline as opposed to MLCOs. While this can be considered an obvious business choice for an SLCO, a deliberate choice in partnering with distributors and partners is ideal for two main reasons. First, in the Uruguayan context where the demand and market size for medical cannabis is relatively small amid changing regulations, distribution of products overseas is ideal. The same is true for the New Zealand context where the market size is not yet fully gauged, and where medical/ pharma grade cannabis can only be accessed through pharmacies. Second, while market delivery and distribution command higher added value in the chain, it also commands expertise that which is not the SLCO's current primary strength.

MLCO are more likely to establish quasi-direct distribution pipelines. As a result of a downstream focused GVC model, MLCO1 is able to establish its online marketplace for CBD products with curation features. MLCO1 leverages on B2B as well B2C distribution strategy. MLCO2 is currently white labelling CBD products of an acquired brand that is directly sold through wellness stores and other retailers. It also leverages on its B2B platform as wholesaler and bulk seller of CBD and medical cannabis products across Europe, Latin America, and Asia Pacific. In essence, international reach is among the embedded characteristics of an MLCO GVC model. As such, internalizing market delivery and distribution pipeline are inherent elements of the downstream activities irrespective of cannabis value chain governance model.

Consistent with the GVC literature suggested by Gerrefi et al. (2005,2020) Shih (1992) and Mudambi (2007), value is added in each stage of activity as it progresses from one stage to the other leading to the final product/output. Hence, the concept of upstream and downstream of activities also apply where value adding activities mostly lie on the upstream as well as the downstream end of the activities. Capturing the nuances in these high value adding activities and its progression is a rich area of exploration in the cannabis GVC from an SLCO and MLCO perspective. Furthermore, these value adding activities can also be mapped based on the location where these activities are performed. As such, the aggregate cannabis GVC can also be explored

and described from an SLCO and MLCO context relative to location choice. This would offer a stylized mapping of Figure 10 as an adaptation of the smile curve of the cannabis global value chains following Shih's (1992) original model (Mudambi, 2007, 2008).

Overall, the four key areas of focus in the cannabis GVC have been contrasted. The key differences between and SLCO and MLCO have been highlighted consistent with the dual asymmetry replication logic. The emergence of nuanced differences has emerged by the manner in which firms orchestrate their value chain activities within a single location or multiple location context. As we transition to the next segment, further contrasts will be highlighted vis a vis the perception of VUCA in GVC orchestration from an SLCO and MLCO context.



Figure 10. Smile Curve of the Medical Cannabis Global Value Chain. Source: Adaptation from Shih (1992)

### 6.2 Contrast in the Perception of VUCA: SLCO vs. MLCO

### 6.2.1 Contrast in Volatility

SLCOs perceive volatility in terms of the regulatory changes in the countries where the firms operate. The consistent changes of the regulations brought about by calibration of existing medical cannabis regulations in Uruguay, as well as the development of the nascent medical cannabis industry in New Zealand contribute to the decreased predictability on how the firm will proceed with its mid-term to long term production planning. The situation is more pronounced in the case of SLCO1 and SLCO2. In view of such volatility, SLCOs embed elements of agility and pivot strategies in its value chain activities to the point of drafting back up plans just so there is some room for flexibility should regulations change.

There is a weakened perception of volatility from an MLCO perspective. This is partly attributed to the regulatory frameworks in Colombia, Portugal, and Malta where the core value chain activities are located. What has been highlighted is that the location choice of setting up its core cultivation and processing activities in more mature and stable jurisdictions mitigates the impact of meso-level changes to the firm's value chain activities.

Agility and resilience are built in the value chain models of the MLCO. This is evident by sourcing out through multiple input suppliers via modular governance for MLCO1, while MLCO2 co-locates its core upstream and midstream activities to two separate locations. The latter is advantageous for back -up production, efficient R&D turnaround, as well as activation of multiple hubs for different specialization. Value chain strategies for both SLCO and MLCO contribute to a nimbler/ pivotable operations, enhanced slack building, and increasing capacity thereby insulating or hedging against imminent regulatory volatility.

### 6.2.2 Contrast in Uncertainty

SLCOs perceive uncertainty as closely related to, if not entangled with volatility. The regulatory changes have direct implications on the knowns and unknowns of the value chain activities. For SLCOs, the changes in the rules are directly connected on the how the firms are going to establish the next steps for production planning as well as exportation of its outputs. In some cases, the impending impacts of impending regulatory changes will add up on the current market unknowns as well as to whether the firm will expand the product portfolio to cater if other segments of the market emerge.

SLCOs deal with uncertainty in two ways relative to the governance model of choice. Vertical models leverage on intensive information gathering capacities in-house at the regulatory level, while non-vertical model leverages on partnerships with firms in more mature markets and jurisdictions – consistent with the knowledge sharing inherent in relational type governance.

MLCOs on the other hand perceive more clarity as a positive side effect of stable regulatory environments where the firms orchestrate their core value chain activities. The concept of "straightforward rules" in the Colombian, Portuguese, and Maltese context translates to further clarity on the planning, execution, and expansion of the firm's value chain activities in these jurisdictions. Simply put, MLCO perceives less uncertainty because there is less volatility in the regulatory environments where the firms operate.

Although there is less uncertainty perceived, MLCOs seek to reduce uncertainty and acquire more knowledge and expertise in relation to the governance model. Vertical model leverages on internal R&D capacities specifically on compliance and regulatory research. Non-vertical model seeks partnerships and then eventually integrates or acquires these partners in its value chain thereby increasing its expertise down the stream.

### 6.2.3 Contrast in Complexity

Complexity was perceived by SLCOs as a side effect of volatility. In the current regulatory environment where the firms operate, changes in the rules translates to reduced complexity as is the case for the firms in Uruguay. As for the firm in New Zealand, the imminent amendment in the country's medical and adult-use cannabis regulations will add further complexity on how its product portfolio might look like if the firm opts to expand its offerings.

"Now, again, if laws change here and things open up and we get to do nutritional supplements, then that complexity level goes way down, and we would be able to probably fulfill a client's product ...." (Interview with SLCO2)

SLCOs deal with complexity relative to its governance models. Given the constant regulatory changes expected, the subsequent adjustments in the production and operations would need to be implemented synchronously in a timely manner. Hence, by vertically integrating all the processes and activities, computability and predictability is attained. For non-vertical model, simplification is attained by outsourcing some of its activities. Complexity is reduced via outsourcing especially on activities that are inherently intricate and resource intensive.

MLCOs perceive complexity in a larger scale of orchestrating its core value chain activities across multiple countries. In the context of MLCO, the meso- level complexity is perceived in the orchestration of dispersed value chain activities that need to be performed sequentially vis a vis the specific regulations in effect where these activities are performed. There is less of a concern on whether the changes in the local regulations might change. Hence, issues on regulatory compliance in the specific jurisdictions where they operate is less evident.

MLCOs seek to simplify complexities in its value chains through its governance model choice. For the vertical model, grouping or co-locating the core value chain activities simplifies the orchestration by complying to only two regulations (Colombia and Portugal) for its core value chain activities as opposed to more. The latter confers a containment effect whereby there will be two sets of regulations to comply to that are (more or less) equivalent to the regulations in the region. For the non-vertical model, the choice of input suppliers within the region reduces complexity. Partnerships and acquisitions of established value chain actors/ firms is an internalization strategy employed to reduce the complexity the global value chain. Moreover, the obtainment of international certifications such as EU -GMP, GACP, etc. also confer simplifying effects as far as the standardization of the core value chain activities across facilities is concerned.

### 6.2.4 Contrast in Ambiguity

The construct of ambiguity in the context of SLCO is perceived in tandem with volatility and uncertainty. As previously observed, a triadic relationship emerged between volatility, uncertainty, and ambiguity in most of the value chain activities in the confines of current regulatory frameworks in Uruguay and New Zealand. This instance could be a unique feature of an SLCO context where regulations form the baseline of the value chain

plans. Compliance to the dynamic and evolving parameters translates to increased uncertainty and ambiguity if the cannabis value chain is orchestrated in a single location.

SLCOs deal with ambiguity either through experimentation (such as trial and error in its cultivation processes) or integrating R&D outputs to its cultivation and post-harvest processes. Specific to SLCO3 is the firm's engagement in ongoing clinical trials in the country where the firm leverages on its advanced R&D capabilities.

For MLCOs, ambiguity was perceived less in relation to the jurisdictional regulations where most value chain activities are orchestrated. For MLCOs, ambiguity was less nuanced and there was no indication of its entanglement with the construct of volatility and uncertainty. The co-location choices of the core value chain activities within mature jurisdictions facilitate acquisition of knowledge and expertise for vertical models of MLCO. Experimentation through partnership in the upstream activities further resulting to knowledge transfer/ spillover, as well as trial-and-error in introducing new products in the distribution activities describe another ambiguity reducing strategy employed in the context of an MLCO.

To sum, variation exists in perception of the VUCA constructs from an SLCO and MLCO perspective. These apposing nuances and contrasting subtleties were embossed by using the dual asymmetry replication design. Further, the variations highlighted contrast one another and are experienced at the macro, meso, and micro levels vis a vis the governance models employed by the two case groups. Along these contrasts are the overlapping perceptions or simultaneous occurrences of the VUCA elements where SLCOs perceive more overlaps than MLCOs. The latter may explain why some elements are more amplified while some are less obvious from the perspective of a single location operator versus a multiple location operator

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### 6.3 GVC Orchestration During the First Wave of the Pandemic: Contrasting SLCO with MLCO

6.3.1 Pre-lockdown Juxtaposition: SLCO and MLCO

Most SLCOs were engaged in risk mitigation strategies in their value chain operations before the pandemic hit. These risks were mostly related to the changes in the regulations surrounding medical cannabis in the country of operations. The negative impacts of these changes to the actual manufacturing and production processes were the usual pre-occupation of the participating the SLCO case group. In the Uruguay context, firms were concerned on the recent changes in the regulations concerning the certification process for the exportation of medical cannabis as nutraceuticals/ food supplements. In the New Zealand context, the impending results of the referendum to legalize adult-use was a significant point of interest as it will shape the patient access path in seeking medical cannabis. This in turn will impact how SLCO3 might re-consider its product portfolio from purely pharma-grade medical cannabis to adding nutraceutical products in it.

For the MLCOs, changes in the regulations surrounding the CBD regulations in EU categorized as novel food was a topic of particular focus but was not viewed as any type of imminent operational risk per se. There was a general sense that right when the case numbers began to rise in the EU region, most MLCOs were conducting business as usual. The same situation was described by MLCO2 as it pertains to the Colombian operations. In essence, MLCOs were less pre-occupied in their value chain operations before the pandemic emerged. MLCO1 was focused on getting the Malta facility set up, while MLCO2 was focused in getting the Portugal greenhouse ready for the cultivation calendar.

#### 6.3.2 Intra-lockdown Juxtaposition: SLCO and MLCO

SLCOs have experienced the implementation of stricter public health measures such as lockdowns earlier than MLCOs. New Zealand and Uruguay were among the first few jurisdictions that moved swiftly in implementing elimination and containment strategies earlier on. These measures have had pre-emptive impacts on the value chain operations of the SLCO case group. SLCO2 and SLCO3 were both completing the construction of their greenhouse and manufacturing facilities and the firms did not have any operational continuity plans in place when the first wave began to worsen. As such, ad-hoc plans were put in place. SLCO1 was in full swing of its harvest season when the sequence of public health measures were implemented – specifically voluntary national lockdowns. It had to pivot some of its operational processes for its activities in order for the crops to be fully harvested on time.

MLCOS triggered their operational contingency plans when the national lockdowns were implemented. Employees were ordered to work from home, while access to facilities were restricted to those who were necessary to maintain and monitor the crops. Specific to MLCO2 was a global work from home order across all its operations and immediate reduction of staffing levels. Delays in facility set up as well as pile up of goods to be shipped out were the notable aberrations in the orchestration of the value chain activities in the MLCO context.

### 6.3.3 Post-lockdown Juxtaposition: SLCO and MLCO

A bottleneck and backlog of production issues were the primary concerns amongst SLCOs after the first wave of the pandemic. These concerns are amplified as the firm transitions back from the pivot strategies back to its pre-pandemic processes. In the Uruguay context, the issues of delays on post-harvest and production/ manufacturing vis a vis the implementation of new medical cannabis regulations are key concerns. New Zealand firm faces the same challenge with the looming changes following the recreational use referendum results.

"You know, like right now, I'm not counting on all these bottlenecks to actually go away fully, I believe I'm going to have issues with H.R., like I mentioned, spacing out shifts. I believe I'm going to have supply chain issues ongoing that I'm just going to have to work on. I believe they're going to have travel restrictions on going all through this whole period. And so yeah, I know not looking for those to go away, I'm looking I just know that I have to deal with, and my team has to deal with them. We as a group have to come up and be creative and figure out how we're going to do it now. That said. Guess what? Everybody's doing it as well. We're all in the same boat, everybody's boat is presently sinking. And so, if I'm having transportation issues, so are other people, and so I don't feel that it's unfair or going to cause me any type of excessive competition hindrance because everybody's going to have this." (Interview with SLCO2) SLCOs were optimistic on the stabilization of the regulations along the demand and supply post-pandemic which has implications on the stabilization of its value chain activities. A strategy employed to attain the stabilization is the re-calibration/re-adjustment of its pre-pandemic value chain processes as a function of lessons learned from the first wave of the pandemic.

MLCOs had less of a concern as the countries where the firms operate exit the first wave of the pandemic. Deconfinement from the first wave of the pandemic were perceived by the MLCO as the return to normal. Specific to MLCO2 was the expected surge in product demand and increased production capacity to meet the surge. The latter was not viewed by the firm as an issue, but an eventuality that the firm had prepared and planned for as indicated by the respondent.

Overall, SLCOs indicated that the challenges following the deconfinement upon exit from the first wave of the pandemic are more pronounced vis a vis the orchestration of their value chain activities. The respondents attribute such turbulence to various factors – particularly the age of firms SLCO2 and SLCO3 relative to these kind of distinct challenges. Meanwhile, MLCOs demonstrate a level of control as the firms enter the postlockdown phases in the countries where they operate.

# Table 7 Aggregate Salient Points on Key Areas of Focus on Cannabis Value Chains Orchestration SLCO & MLCO

Pre-Cultivation Stages									
•	SLCO Lead firms carry out R&D and product development activities in -house. Governance model has direct implication on control and turnaround of R&D outputs to operational aspects/ processes in the pre-cultivation stages. Regulatory and compliance activities mainly depend on the activity stream of focus and the governance model choice- that determines the type of certification the firm will obtain or is eligible to. Financing activities and capital intensiveness depend on the governance model choice. Vertically/ hierarchical models require more capital versus non- vertical models. Cultivation was a key cost driver in accessing capital. Manpower training and transfer of knowledge was more resource consuming aspect for non -vertically integrated model	•	MLCO Lead firms carry out R&D and product development consistent with their governance model. Non vertically integrated conducts R&D with external partners. Vertical model exerts full control on in-house R&D and product development Regulatory and compliance activities are mostly concentrated where the core activities are located. The governance model and the MNE typology determine which kind of certification the firm is ought to obtain. Financing activities and ease of access to capital are influenced by the firm being privately owned or publicly listed.						
	Cultivation St	ages	8						
•	SLCO The firm's governance model choice has direct implications on how cultivation activities are carried out and how value is created and captured in these activities. Overall control and oversight to the processes and activities in the cultivation stages are inherent in vertical models and less so for non- vertical model. Knowledge transfer and knowledge proliferation across the GVC - outside the lead firm is more evident in the relational type of model than in vertical models.	•	MLCO The clustering and co-location of pre- cultivation, cultivation, and post- harvest activities within a specific location is employed within the vertical model. In a vertical model, control and oversight was inherent in the clustered activities but most specifically on cultivation activities. Clustering insulated an efficient turnaround of R&D outputs to both cultivation and post- harvest activities. Control and oversight facilitate knowledge transfer and innovation spillover within the GVC activities are consistent						
	Post-harvest S	tage	S						
	SLCO		MLCO						
•	Value is added in the post-harvest stages as direct implications of the firm's governance model choice. Vertical integration creates value through customization or developing unique product specificities that the firm captures through exclusivities and patenting within tight value chain controls. Non -vertical model creates higher value by specialization on post-harvest processes. Value is	•	Value is created and captured in the post- harvest as a function of the firm's governance model choice. The vertical model creates value through consistent scale production at low cost within tight controls. The value is then captured by bulk/ volume sales of its outputs thereby employing low cost-high volume production strategy.						

•	then created and captured within the GVC by specific product proposition or characteristics such as organic, sustainably farmed, or manufactured using advanced technologies There is inherent control in the post-harvest processes for vertical models while leanness/ agility is a key feature of non-vertically integrated models.	•	Modular type governance obtains input from supplier in the same region. The model choice enables the firm to specialize and leverage on a particular expertise (such as extraction technologies) that commands higher value in the downstream segments of the GVC. The (co) location choice where the transformation activities occur facilitate the flow of goods from cultivation to post-harvest The conducive regulatory environment of the chosen location contributes to the efficient execution of post- harvest activities			
	Distribution					
	SLCO		MLCO			
•	Partnership and alliances amongst distribution channels are leveraged upon irrespective of the governance model employed.	•	Governance choice exerts direct influence on the distribution model of the firm. Vertically integrated models leverage on traditional			
•	Depending on the regulations in effect, the go-to markets and distribution channel of choice varies highly. SLCO opt for more conventional channels such as pharmacies to deliver its products to the market. All SLCOs engage in B2B distribution as	•	distribution channels. Non vertical model has more latitude in crafting its own distribution channels as well as distribute external products through curation. The orientation of the firm on which region it			
	opposed to B2C.		will orchestrate its core value chain activities			
•	SLCOs have limited international reach to distribute		along with MNE typology determine which			
	its products at this point given the firm's age, cultivation capacity, as well as production output		regulatory environment are conducive to establish cannabis multinational firms.			

## Table 8 Aggregate Salient Points on the Orchestration Cannabis GVC Amid VUCA Conditions SLCO & MLCO

### Volatility

- Consistent changes in the regulatory environment require some level of flexibility in the operational aspects of the value chain.
- Agility and flexibility in the GVC manifest in different ways depending on firm size and MNE type when faced with volatility in its GVC operations. SLCOs are more likely to employ pivot strategies ahead of time given the size of the GVC that renders it agile, flexible, and nimble and thus pivoting is more efficient. MLCOs leverage on co-location strategies to embed agility and flexibility in their operations as well as their business contingency plans (BCP). Once the BCPs are triggered, (co)location advantages emerge based on geographical operations of their GVC.
- In the context of a nascent industry, SLCO and MLCO deal with dynamic regulatory frameworks and constant changes in policies by embedding flexibility and malleability in their internal GVC coordination processes and procedures at the same optimizing operation capacity amid volatile regulatory environments.
- For both SLCO and MLCO, the higher the likelihood of change, the higher the level of flexibility needed Uncertainty
- The newer the supply chain, the higher the level of uncertainty, the higher the information gathering capacity is needed for a firm's business model to navigate such uncertainty.
- In the context of a developing market where regulations are dynamic and unpredictability is high, there is more focus on short term operational strategies present in the business model of a new firm
- The ability to accomplish short and midterm goals in the business model provides a limited but accurate level of predictability. Despite the limited predictability, there is a moderate level of accuracy that can be expected and can guide the next steps of the value chain organization of the firm. With such accuracy, the level of knowledge can be incrementally advanced and some of the "fuzz" and confusion can be reduced as time progresses.
- In the context of a developing domestic market, the kind of uncertainty that has significant impact to the firm's value chain are those that the define market segmentation as well as the supply and demand dynamics.
- The dynamic regulatory environment significantly shapes the market size that in turn influence how the firm will orchestrate the value chain in view of the on the consistent changes in the regulations and the evolution of the market characteristics. In most cases, these regulatory changes bring about more operational uncertainties

### Complexity

- Offshoring and outsourcing strategies present in a business model increases production predictability in the context of a nascent value chain.
- Issues on access to resources and problems arising on the internalization of core activities in the value chain are more likely resolved by having access to external support that can either be outsourced or offshored as a function of firm size
- Once there is more clarity on the regulations, the business model can include elements of internalization and less of outsourcing in its value chains. This is under the assumption that the firm has developed an in-house expertise that will enable it to internalize amid dynamic changes in the value chain as result of the consistent modification/ evolution of the external regulatory frameworks.

### Ambiguity

- In the absence of a locally developed consumer market, knowledge level is low, and ambiguity is high. To hedge against ambiguity, alternative business models that contain elements of experimentation may narrow the knowledge level gap. Experimentation often takes place in developed markets where knowledge transfer (inter or intra firm) is not necessarily an expected immediate outcome.
- Wait and see strategy might be beneficial in certain cases of GVC adjustment where there is high external ambiguity and volatility relative to the size of the firm as well as the age of the value chain.
- In the case of a newly founded firm, experimentation would not be the first-choice strategy in reducing ambiguity in its GVC, but rather partnering with a more senior firm from mature industries overseas. The initial end goal would be increasing knowledge level and ambiguity reduction.

### CHAPTER 7 RESULTANT PROPOSITIONS AND EMERGENT DIMENSIONAL CONFIGURATIONS

What has emerged so far? This chapter presents the resultant propositions and emergent dimensional configurations of the VUCA framework in the context of cannabis GVC orchestration. Given that the "how" on firms' orchestration of their value chain activities have been presented, we now examine the theoretical aspects of this study. The latter leads up to configurational theorizing to educe novel theoretical dimensions that have emerged in response to Clegg et al. (2019) call to novel theorization in IB using the VUCA framework

### 7.1 Resultant Propositions

Resultant propositions emerged out of this study consistent with the prescriptions of the Gioia (2013) methodology. Table 9 summarizes an adaptation of the data structure following the Gioia method. A total of 303 simplified codes have been generated whereby the first order categories have been derived. The second order themes were then formulated consistent with the recommendation of the Gioia methodology (Corley & Gioia, 2013; Gioia et al., 2011) The aggregate dimensions bridge the emergence of the core propositions arising from the full cross-case analysis in this study.

The propositions offered herein also flesh out the dynamics between the macro level, mesolevel, micro-level, and individual level in the contexts of cannabis GVC orchestration. More specifically, the interaction between meso-level volatility and the micro-level volatility as the framework's hinge underscored by the emergent propositions. Whereas meso-level volatility is a generalized effect of regulatory changes in the cannabis industry across jurisdictions of operations, micro-level volatility is generalized as the changes, adjustments or course of actions that the firm undertakes and the inherent reactions (and/or interactions) to these changes as the firm orchestrates its value chain activities. This distinction is heavily observed and apparent in the emergence of the data structure as well as the within-case and cross-case analyses previously presented.

FIRST ORDER CATEGORIES	SECOND ORDER THEMES	AGGREGATE DIMENSIONS
<ul> <li>Constant regulatory changes</li> <li>Dynamic regulatory environments</li> <li>Rules always change.</li> <li>Dynamic changes</li> <li>Policy changes</li> <li>Regulatory issues and challenges</li> <li>Positive changes</li> <li>Negative changes</li> <li>Regulatory volatility</li> <li>Impacts of changes in the licensing and operations</li> <li>Operational adjustments</li> </ul>	<ul> <li>Volatility because of dynamic regulatory environments</li> <li>Constantly changing policies/ regulations that impact the daily operations</li> </ul>	DYNAMIC REGULATORY ENVIRONMENTS TRIGGER VOLATILITY
<ul> <li>Pivot strategies</li> <li>Nimble operations</li> <li>Flexibility in processes</li> <li>Business model pivot</li> <li>Location choice</li> <li>Co-location in mature jurisdiction</li> <li>Focus on European and Lat Am regions</li> <li>Predictability of change</li> </ul>	<ul> <li>Agility through pivot strategies and building nimble operations as well as flexibility in the processes.</li> <li>Predictability of change in mature jurisdiction</li> </ul>	AGILITY CAN BE BUILT-IN AS A RESPONSE TO VOLATILITY
<ul> <li>Nascent industry</li> <li>Developing markets</li> <li>Unknown market size</li> <li>Unknown supply-chain dynamics</li> <li>New supply chain</li> <li>We do not know when the rules are going to change (again)</li> <li>If rules change, we may not know what will happen next.</li> <li>No clear picture</li> <li>Unsure in exportation rules</li> </ul>	<ul> <li>Uncertainty in a nascent industry where there are unknowns in the market size, supply chain dynamics, supply-demand data can be resolved by gathering more information</li> <li>Uncertainty in a nascent industry</li> </ul>	KNOWLEDGE BUILD- UP AS RESPONSE TO UNCERTAINTY

Table 9Data Structure Adapted from Gioia (2013)

• • •	Unknown product market value Unfamiliarity with manufacturing processes Market size extrapolation R&D agreements and collaboration		where there are constant changes in exportation rules, licensing, and certification rules	
• • •	If the rules change, it becomes more complicated- depending on the change. Policy complexity Regulatory complexity Technical complexity Complicated manufacturing processes	•	Changing regulations induce market and industrial complexity that interplays with firm operational complexity	MESO – LEVEL COMPLEXITY INDUCED BY VOLATILITY
• • • •	Location choice Stable regulatory frameworks Straightforward rules Outsourcing to external manufacturers Vertical integration of activities Activity specialization	•	Location choice, vertical integration, and outsourcing as response to complexity	SIMPLIFYING EFFECTS OF GOVERNANCE MODEL AND (CO)LOCATION CHOICE
•	Experimentation in mature markets Wait and see strategy for emerging jurisdictions	•	Ambiguity reduction strategies	AMBIGUITY REDUCTION FACILITATED BY LOCATION CHOICE
• • • • •	VUCA intensification Risk mitigation Risk tolerance Risk avoidance Increased operational risk Operational risks and challenges Pre-covid lockdown Intra-covid lockdown Post-covid lockdown	•	Association of VUCA constructs to risk avoidance, risk tolerance, and risk mitigation during the first wave of the pandemic	VUCA PERCEIVED AS OPERATIONAL RISK FACTORS

### **Proposition 1**

# Meso (industry) level volatility increases micro (firm) level volatility in the context of value chain orchestration. In such a case, agility should be increased to stabilize value chain volatility.

Dynamic changes at the meso level such as consistent policy changes and iteration of current regulatory frameworks trigger micro level volatility in the context of value chains orchestration. Agility and flexibility thus need to be increased to stabilize value chain volatility.

Whereas changes in the rules and regulations and the variations of these changes are evident in every jurisdiction where the firm operates, these regulatory changes inherently increase the firm-level perception of volatility. The latter observation is salient in the orchestration of midstream and downstream sets of value chain of activities in the contexts of single location and multiple location operators. Recall that most cannabis policy reforms touch upon cultivation, transformation, and manufacturing of cannabis as either a medicine, nutraceutical, consumer packaged good, or a regulatable adult-use product. Likewise, these reforms prescribe the regulations on the distribution channels (e.g. pharmacies, dispensaries, online stores, etc.) where these products can be accessed by the end user (Decorte et al., 2020). Any regulatory changes in the form of amendments, iterations, or additional processes that need to be complied or adhered to by the lead firm imply some modifications in the internal value chain processes impacted by these changes in both the contexts of SLCO and MLCO.

When such volatility is perceived by the firm, the initial reaction is how to be adaptive and flexible to these regulatory changes in a way that makes the value chain operations more agile and nimble. Depending on whether the firm orchestrates its value chain activities in single or multiple jurisdictions/ locations, building agile value chain operations was observed from the two case groups studied. Embedding operational slack that facilitates pivoting or immediate low-impact changes deems to be beneficial for those in the single location context, while multiple location operators co-locate sequential value chain activities. The outcomes of agility are achieved in a way that there is less perturbation and negative impact in the overall orchestration of value chain activities amongst the lead cannabis firms.

### **Proposition 2**

# Volatility increases uncertainty when orchestrating value chain activities in the context of a nascent industry. Where there is presence of volatility at meso (industry) level, higher levels of uncertainties are perceived at micro (firm) level when orchestrating value chain activities.

The effects of constantly changing regulations pose higher uncertainties when it comes to industry conditions where the firms operate. The effects are more felt in a context where (a) the existing regulations are undergoing changes or (b) the cannabis industry mechanisms have just been borne out of legalization. Firms confined in a single location orchestrating their value chain activities perceive heightened uncertainty than those that operate in multiple and mature jurisdictions where regulations are more stable. Investing and internalizing R&D capacities are concrete ways firms reduce uncertainty. Hence, activities that increase knowledge sharing and knowledge building capacity help decrease the perceived uncertainties both at meso level and micro level. Alternatively building R&D external partnerships to hone the expertise and specialization in certain activities in the value chain facilitate knowledge sharing and thus building knowledge capacity as a response to value chain uncertainty.

### **Proposition 3**

Volatility at meso (industry) level increases complexity in the orchestration of value chain activities at micro (firm)level. Where there is presence of volatility at meso (industry) level, higher levels of complexities are perceived at micro (firm) level when orchestrating value chain activities.

Changes in the regulations complicate the value chain orchestration vis a vis the coordination of many moving parts in a cannabis value chain. In the context of single location operators, a domino effect is inherent if changes (both positive and negative) are implemented relative to how the activities are sequentially lined up. In the context of multiple location operators, a change in one country's regulations will impact how production is executed or how crops are grown in another location. To hedge against complexity, firms can opt to outsource these complex processes thereby adopting a non-vertical governance model. Firms that adopt a vertical model leverage on co-locating core activities and dynamic processes, so the transmission and application of changes are more centralized, simplified, and efficient. Firms that adopt a non-vertical model

leverage on outsourcing or externalizing the highly complex processes/ activities making the entire orchestration more computable.

#### **Proposition 4**

### Volatility at meso (industry) level and uncertainty at micro (firm) level increase ambiguity at micro (firm) level in the context of value chain orchestration.

Grey areas linger when there are consistent changes in the regulations as well as uncertainties in the context of orchestrating value chain activities. Single location operators are more likely to perceive ambiguity than multiple location operators. In most cases, single location operators are not able to extrapolate from precedential cases from other subsidiaries operating in other jurisdictions. However, they are more likely to resort to experimentation strategies such as trial and error techniques in their GVC activities in their own local operation. The latter fosters a more autonomous knowledge build-up and increases predictability, thus consequently reduces uncertainty and ambiguity - especially in the context of more mature jurisdictions.

Multiple location operations are more likely to benefit from wait-and-see strategy based on other subsidiary's experience when confronted with ambiguity vis a vis industry level volatility and micro level uncertainty. Hence, multiple location operators are more likely to "wait and see what happens" to a subsidiary/ jurisdiction as opposed to conducting experimental or cause- and-effect establishing activities in its operations in order to build knowledge and increase information gathering capacity.

### **Proposition 5**

# Volatility, uncertainty, complexity, and ambiguity are perceived risk signals in orchestrating value chain activities. An increase in VUCA indicates heightened perceived risk signals when orchestrating value chain activities.

VUCA is perceived as dynamic risks signals vis a vis the daily operations and orchestration of the value chain activities. The presence of these elements is perceived and translated by firms as operational risks and vulnerabilities irrespective of single location or multiple locations of operations. The only difference that may arise is that single location operators perceive VUCA more intensely considering the jurisdiction of their operation. Multiple location operators on the other hand perceive VUCA as inherent in fragmenting/ dispersing cannabis value chain activities across geographies; hence, are more apt in formulating mitigation or reduction strategies in view of VUCA as value chain activity risk signal (VCARS)

A VCAR signal is detected more in the SLCO than the MLCO grouping when further analyzed in the cross-case analysis. Where there are higher levels of volatility perceived with respect to the changes in the regulations, a ripple effect best predicts the subsequent series of responses that pertains to further uncertainty, complexity, and ambiguity vis a vis the impacts of these changes to the firms' daily operations and value chain activities.

The interaction of VUCA elements triggering VCRAS were also observed when the questions regarding the pandemic's impact on the daily operational activities of the firm was asked. Throughout the pre-lockdown, intra-lockdown, and post-lockdown series of questions, informants on both the SP and SME group referred to the operational risks associated with increased perceptions of VUCA especially when national lockdown measures were implemented. When data was further analyzed using ATLAS.ti, the code -occurrence and network analysis functions indicated high code co-occurrence frequencies between volatility, uncertainty, and complexity (VUC), and then uncertainty, complexity, and ambiguity (UCA) and, then finally VUCA to that of risk mitigation, risk tolerance, and risk avoidance.

### 7.2 VUCA Framework in the Cannabis GVC: Emergence of Novel Dimensional Configurations

A novel dimensional configuration of the framework was borne out of this study that depicts how volatility, uncertainty, and ambiguity are a set of interdependent constructs that can be perceived simultaneously at multiple levels. The interdependent model based on grounded theory situates the meso-level volatility triggering the micro-level interplay of VUCA elements that are then interpreted as a precursors of risk signals in the orchestration of cannabis value chain activities – see figure 11.



Figure 11. Emergent Dimensional Configuration of VUCA Framework in Cannabis GVC Orchestration

### Source: Author's Own Elaboration

From the outset, the emergent model reflects the assumptions that were grounded on informant responses where an overlap and interdependencies of the constructs emerged - albeit asked about the constructs separately and sequentially during the interview. An immediate observation was the entanglement of volatility with uncertainty and complexity, and then the interaction between uncertainty, complexity, and ambiguity. Further, the perception that macro and meso levels of volatility trigger responses that pertain to uncertainty and ambiguity at the micro level was prominent amongst the informants in the study participant group (SP) and subject matter expert group (SME). The latter was specific on the impacts of the cannabis regulatory changes to how the firms will deal with the imminent uncertainties, complexities, and ambiguities vis a vis specific activity such as cultivation, manufacturing/ extraction, and exportation in both SLCO and MLCO. Another set of responses pertain how these constructs taken all together would influence the firm's perception of risk relative to (co)location choice and value chain operational strategies.

The emergent model introduces the primary configuration of value chain activity risk signals (VCARS). The interaction between constructs that signal potential operational risks in the value chain activities was the emergent theme amongst all informants interviewed. A VCAR signal is activated once volatility (*if country X legalizes medical cannabis or if rules change in country X*) triggers perceptions of uncertainty (*in the form of unknown market size in country X or unknown value chain adjustments*), cascading to complexity (*how to integrate activities in country X or fragment*/ *co-locate production activities in nearby mature legal countries Y and Z*) and further to ambiguity (*when and how do we move the goods to and from countries X, Y, Z*).

In the context of the cannabis value chains orchestration at firm level, volatility is the point of departure triggering the other three elements (viz. uncertainty, complexity, ambiguity). What is specific in the emergent configuration is that volatility indicates a movement of forward linear fashion. This movement hinges upon the progression towards the legalization of medical and/or adult use of cannabis across the jurisdictions where the sample firms operate. Consistent positive changes characterize the evolution of regulatory frameworks in these countries of operation. In other words, the transition from the prohibitionist regimes of cannabis in most countries mark the ignition point of the VUCA machine vis a vis the establishment and organization and iteration of licit cannabis industries in these countries as time progresses. As the regulations continue to evolve and rules gets amended, and so does the perception of VUCA increasing amongst key stakeholders in the bourgeoning cannabis space. The latter illustrates the dynamic as opposed to the static nature of VUCA in the initial approximation of the framework in the IB literature.

A secondary configuration of the above schema highlights how meso-level volatility sets off the micro-level of interaction of the VUCA elements. The heightened perception of meso-level volatility (industry level) triggers micro-level interaction of VUCA elements where volatility (firm level) is the starting point on how value chain activities are re-configured, modified, or adjusted. These changes further heighten the perception of complexity and uncertainty that forms the volatility- uncertainty-complexity triadic reaction (VUCTR). The latter was initially observed amongst SLCOs and less salient amongst MLCOs. Consider SLCO2's response below.

"We feel that there are going to be policy changes that allow us to operate easier, better, faster, that are coming and opening up of new classifications of products and things like that. As it stands, yeah, it's pretty difficult to plan for even making a, let's say, a simple product that may only be authorized in one situation. You know, I can't plan a whole line around things. I have to begin with individual products and register them as a pharmaceutical product, because right now in Uruguay, you're only allowed to be making pharmaceutical grade products....

"...Now, where, if and when the laws change at which they should like the adjustments that have come with the farmers...And then those are the ones that we hope to work into. And so in the background, I have these plans that as soon as a law changes, we will be moving to implement these things...there is a lot of preplanning going ahead for what we hope will be a future situation." (Interview with SLCO2)

It is unclear at this point if uncertainty is triggered before complexity or vice versa, or if these reactions occur simultaneously. The question on whether uncertainty or complexity arises first may well be explained by how the GVC externalities (i.e. policy changes and dimensions of GVC framework) shape the characteristics of the meso level volatility. This then trigger the microlevel volatility vis a vis the firm's GVC orchestration specificities (i.e. product offering, production planning, etc.). In addition, key firm-specific factors such as GVC governance model choice, (co) location strategies, and the actual jurisdictions where the core GVC activities are orchestrated exert significant influence on whether perceptions of uncertainty or complexity gets heightened.

A tertiary configuration emerged at the micro level interaction as the uncertaintycomplexity- ambiguity triadic reaction (UCATR). The UCATR interaction in the context of cannabis GVC orchestration was primarily attributed to the properties of the cannabis plant being fitted for manufacturing under pharmaceutical standards where no precedence exists. This ambiguity simultaneously presents complexity on how such ambiguity can be circumvented vis a vis the lack of the actual know-how on how to execute such circumventions or course of actions. Consistent with the ambiguity literature, these unknowns of the unknowns are succinctly captured by SME2's response

> "...there is an ambiguity. The one that I noticed is that when you are trying to take a natural extract and move it into the pharmaceutical world...and in pharmaceutical, that's really hard to document and explain, they don't like that, they do not like to see that your ingredient list has five main ingredients, but this one extract that you've put in has one hundred and twenty-five lesser cannabinoids, some of which we don't know anything about....

> ...and to be honest, this is a natural product, and it is not. Now, are there other industries that are doing this; yes- poppies, creating morphine and heroin? Those are the ones we need to be modeling after at this point here in Uruguay." (Interview with SLCO2)

In all of the configurations described above, the interdependence between the VUCA elements is highlighted as a core observation. Whereas the emergence of the VCARS as a function of the VUCA elements' micro-level interaction as well as the VUCTR and UCATR triadic reaction describes the VUCA interplay in an actual GVC orchestration context, the overlaps between VUCA elements have also received scholarly attention by previous IB studies. For instance, van Tulder et al. (2019) takes particular stock in reviewing volatility and uncertainty as key VUCA dimensions that are commonly intertwined in the IB context. This intertwinement is commonly observed in studies where volatility of exchange rates (Grube & Samanta, 2003; Song et al., 2015), stock exchange and political environments (Beaulieu et al., 2005; Delios & Henisz, 2003; Desbordes, 2007, Neaime, 2006) heightens uncertainties for MNEs, and where volatility and uncertainty are defined as unavoidable risks (Vahlne et al., 2017)

While the connection to the IB literature of the study's resultant proposition is evident, the key feature of this study's resultant propositions relies heavily on the idiographic/ behavioural level of the VUCA dimension- that is the managers' reliance on their experiential toolbox, knowledge, and expertise on how VUCA elements are perceived. As such, where conventional IB studies look at VUCA dimensions mostly from a meso and macro point of view, the result of this study looks at the VUCA dimensions from a manager's individual point view intertwined with the meso and macro level of analyses. Managers and subject matter experts were more likely to leverage on their prior experience and previous training on orchestrating similar GVCs of related industries when perceiving and interpreting VUCA elements in their current cannabis GVC orchestration context - as opposed to the transaction cost economics rationale or risk benefit analyses off hand. Indeed, the intertwinement of the manager's idiographic experiences and with the nomothetic firm experiential learning comprise the VUCA interpretation apparatus that is used to formulate managerial decisions in dealing with VUCA elements in the context of GVC orchestration. The latter is explained in detail in Chapter 8.

This chapter presents the implications of the study's emergent findings at various fronts. The theoretical implication presents the central findings on the exploration of the VUCA framework in the context of the cannabis global value chains. The section focuses on what the findings in this study reveal about the theorization potential of the framework from an alternative lens in the IB context - where an invitation is extended to examine the framework and its elements more in-depth from a theoretical and empirical standpoint.

The managerial implication presents what the findings may mean from a strategic management and practical perspective. The implication highlights what the VUCA framework may offer managers as a complementary tool in evaluating multilayered environments vis a vis the orchestration of a firm's value chain activities. The policy implication highlights how the findings in this study is heavily and directly linked to the policy and regulatory changes from a broader perspective. The findings in this study compel policy makers to formulate balanced policy prescriptions and authorities and regulators to craft cannabis regulations that are refinable in a sound and judicious manner. The socio-communitarian implications take the social justice dimension of the VUCA framework specific in the context of cannabis - as a sacred plant, as medicine, as a symbol of marginalized and indigenous communities, and manifestation of activism and resistance surviving decades of prohibitionist policies.

### **8.1 Theoretical Implications**

Initial theoretical approximation from Clegg at al. (2019) adapted from Bennet and Lemoine (2014a, 2014b) suggests a quadratic view of the VUCA framework that lies on the dimensions of knowledge level and predictability of change. The conceptual framework applied in the global factory context posits that volatility, uncertainty, complexity, and ambiguity occur almost mutually exclusively. The latter would mean that the perception of each construct is independent from the other, and where an overlapping relationship between each construct or as whole may not exist. The model also addresses how the VUCA elements can occur simultaneously

at the macro, meso, and micro level but runs short on how the interplay of these constructs can evolve in various contexts. What is only known in such interplay is that cost determines the firm's actions when contractions occur in the context of the global factory.

The emergent findings in this study offer a dimension of VUCA that maybe foreign to the initial theoretical approximation of the framework. The principal outcome of the theoretical exploration set out in this study offers a dynamic, overlapping, and interdependent view of the VUCA framework - that although is not new, has received very few scholarly attention. Klein et al. (2019) refer to the macroenvironmental dynamism exerting strong influence on firms' risk management activities. Volatility was as key source of risk in internationalizing firms that which corresponds to the changes in the firm's external environment. Likewise, Miller (1992) delineates the multidimensionality of uncertainty and its interdependence with risk. Boyacigiller (1990) highlighted how complexity is also linked to uncertainty and risk amongst American multinational firms, while Buckley et al. (2007) points out that perceptions of ambiguity at the managerial level might influence a firm's FDI location choice. The latter ties up with how ambiguity is resolved in managerial decision making through path dependencies and managerial intentionality in the context of internationalization (Hutzschenreuter et al., 2007) as well as the accentuating effects of ambiguity to the perception of risk (Ghosh & Ray., 1997; Teoh & Foo., 1997) In essence, there is the inherent dynamism amongst these elements that may highlight interdependencies more than mutual exclusivity when presented to the managers whose risk analysis apparatus are a combination of managerial experiential thinking and organizational learning.

From an IB perspective, the intertwinement of VUCA with risk and risk perception has been proposed at various dimensions of the MNE. For instance, in the context of decision making amongst internationalizing firms (Boubakri et al., 2013; Buckley et al., 2018), as well as risk management (Fisch, 2011; Müllner, 2016; Tong & Reuer, 2007) where the constructs of VUCA (as an ensemble or some elements of it) have been touched upon by these IB studies. While these perspectives offer a hint on the overlaps of the VUCA constructs at the firm level, the overlap or intertwinement of VUCA elements at the idiographic level and its potential interplay and implication to IB and GVC orchestration is essential to further our understanding of the topic at hand. The dynamic interaction between VUCA elements with the perception of risk, or the natural entanglement of human affect to that of volatility, uncertainty, complexity, and ambiguity to the perception of risk is a known phenomenon in behavioural sciences. Specific to behavioural economics, cognitive psychology, and risk theory is the perception of risk as a subjective phenomenon. Kahneman (2017) and colleagues (1982), and Slovic (2010, 1987, 2004) and colleagues (1982) aptly explain how the idiographic perception of risk is associated to or closely linked to affect when changes, uncertainties, complexities, and ambiguities arise. In turn, affect and rationality form the risk analysis and judgment rendering apparatus via heuristics bias - that which influence how decisions are made when faced with dilemmas or decision-making situations (Kahneman,2017; Kahneman et al.,1982). This scenario is all but the daily realities shared by the participants interviewed in this study.

The idiographic managerial perception of risk cannot be divorced from the firm's nomothetic appraisal (Hutzschenreuter et al., 2007) and reaction to risk (Barkema & Drogendijk, 2007) be it internalizing or outsourcing a firm's value chain activities relative to a firm's GVC governance model or other scenarios. We also cannot sequester rationality from affect, as well as predictability of change from knowledge level. These elements form a feedback decision making loop influenced by the manager's experiential thinking as well as biases (Slovic et al., 2004; Hutzschenreuter et al., 2007; Nadolska & Barkeama, 2007). Previous knowledge and experiences form part of the risk assessment apparatus that may heighten or weaken the interpretation of risk signals manifesting as VUCA appraised from the environment by the manager or key decision makers in a firm. As such, the manager's idiographic behavioural dimension may help explain why the VUCA constructs appear interrelated and inseparable from risk perception. On the one hand, the reductionist approach can break down the VUCA elements and dissect the inner clockwork-like function of the framework that may exclude the behavioural aspect. On the other, a gestalt and systems-based approach may see VUCA elements in a spectrum and risk perceptions as dynamic interaction of VUCA's interrelated parts that considers individual behaviour and learning (Kahneman, 2017; Slovic 1982, 1987, 2010; Slovic et al., 2004). The latter forms a baseline of humans perceiving VUCA as risk signals and making decisions from such perceptions inductively for a firm.

From a GVC orchestration standpoint, the findings in this study may help us understand the idiographic (managerial) dimensions of risk perception vis a vis the operations of the daily value chain activities of a firm. However, the caveat on such extrapolation is that GVC orchestration is far more complex of an organizing and coordinating activity that is not concentrated to one entity and its linkages or nodes (Turkina & Van Assche, 2018), not performed in one geography, not understood in one context (regional, cultural or otherwise), does not solely rely on one key decision maker or stakeholder, and not focused in one activity stream (Kano et al.,2020). In other words, multifarious context influence and shape how VUCA is perceived in a GVC context. It is pre-mature at this stage to describe an actual implication of VUCA (theoretical or applied) to individual managers and how they interpret and react to VUCA as VCARS vis a vis GVC orchestration. While it is tempting to apply this study's findings in a one-size-fit-all manner, further studies are necessary. Nevertheless, scratching the surface of the phenomenon that which this study attempted, gives us a good indicator that GVC orchestration at the managerial and firm level requires an infusion of behavioural sciences in the theoretical repertoire to have a full grasp on how VUCA is perceived – both at the idiographic and nomothetic levels.

The central emergent findings in this study on the overlapping and interdependent view as opposed to the quadratic view of the VUCA framework (Bennet & Lemoine 2014a,2014b; Clegg at al.,2019) could be an antithesis to the established IB prescription on how these constructs can be observed and measured. What is known from the IB literature is that these constructs have received decent scholarly attention to date (van Tulder et al.,2019), but we are yet to arrive at a comprehensive explanation on how the ensemble of these elements play out in unison or dynamically in an IB or GVC context. What we are told is that they are part of the modern-day business reality, but the full understanding of its dynamics still eludes many managers in a globalized setting. Likewise, IB scholars are yet to formulate a parsimonious postulate that can elucidate the mechanism in which these elements operate. In future research or subsequent studies, we can perhaps inquire: are we using the appropriate approach in interpreting VUCA in the IB context? Are the VUCA constructs, illustrated in quadrants and understood as mutually exclusive fully capturing the realities of an MNE or the managers themselves? Should we consider looking at VUCA using alternative lenses of interdependencies that are grounded on managerial perceptions and organizational experiences? Indeed, the lacunae persist, more questions remain
unanswered, our understanding is still limited - and so the theoretical and empirical exploration should carry on.

#### **8.2 Managerial Implications**

From a strategic management perspective, the emergent findings in this study highlights the relevance of VUCA in three practical fronts. First, this study has highlighted that the managerial perception of VUCA elements exert direct influence on the firm's value chain orchestration strategy; more specifically on the value chain governance model choice vis a vis the regulatory environment where the firm operates. Second, the VUCA framework offers an alternative analytical tool in assessing the meso and macro environmental forces where the firms operate or where should firms (co) locate their value chain activities vis a vis the evolution of the cannabis legislation across many countries across the globe. Third, the findings in this study can be helpful for managers in other industries where the emergent dimensions of VUCA and what it means in terms of value chain activities can be applicable to. In other words, the findings in this study can also be applied and transferred to other industries.

Both the informants from the SP and SME groups agree how VUCA is at play when a firm decides to opt for vertical or non- vertical integration of its value chain activities within a single or multiple geographies. Specific to this argument is the value chain model of SLCO1 and MLCO1 where the relational and modular type of governance highlights the inherent and corollary effects of the model choice vis a vis the location where most of the value chain activities are orchestrated. The perception of volatility through regulatory changes influences how the firms designed its value chain model *inter alia* and the governance choice in orchestrating it. By outsourcing cultivation, volatility and complexity is reduced whereby the operational risks inherent in the cultivation process is being passed to the suppliers and service providers. The latter has significant risk attenuating effects should regulations change – which often happens. During the intra-lockdown periods the perception of risk in the cultivation activities evident through heightened VUCA was least observed in SLCO1 and MLCO1 precisely associated with the outsourcing of these activities to third parties. Simply put, these two firms have had less issues or challenges (manifesting as VUCA elements) to deal with in terms of the cultivation segment of the value chain activities as an effect of a non-vertical governance model.

VUCA analysis is a viable alternative or supplementary analytical framework in the environmental scanning process of (co) location choices for cannabis value chain activities or even

a firm's internationalization process. As a complimentary analytical tool to the PESTLE analysis (Aguilar, 1967) of the cannabis industry (Hibanada, 2020), the VUCA analysis of a particular geography and its current (or impending changes) to cannabis (or other) regulatory framework renders a multi-dimensional view for managers to use when deciding to establish or disperse its value chain activities. Additionally, the value chain mapping presented in this study can offer additional value chain analytical tool for firms contemplating to upgrade or integrate other ancillary industries in their own value chain models within a single or multiple location context.

Within the cannabis industry, the synthetic production of endocannabinoids from yeast fermentation has been gaining traction (Luo et al.,2019). At the same time, its value chain activities pose a higher level of VUCA in addition to a great deal of regulatory and scientific unknowns, pushbacks, and controversies within and outside the industry (Cumbers, 2021). The VUCA framework within this emergent sector's value chain can be of use for managers to gather insights and navigate another budding avenue of the cannabinoid landscape. Likewise, the VUCA framework and the findings in this study can offer insights to similar emergent industries such as the psychedelic sector and related biotech and ancillary sectors.

From an industrial development perspective, an implication of the global value chain mapping delineated in chapters 5 and 6 points to the potential formation of cannabis industry clusters. The existence of such industrial ecosystem has already been mapped in the European context (Hanway Associates, 2020, 2021) but less so in other regions such as North America and Latin America. Hence, the mapping of the cannabis value chains offered in this study at both SLCO and MLCO can further shed light on how these clusters can develop consistent with the traditional Porterian model (1985) or that of the recent findings by Turkina and Van Assche (2018) as it relates to innovation in industrial clusters.

#### **8.3 Policy Implications**

In December 2020, the United Nations Commission on Narcotic Drugs recognized cannabis for its medicinal and therapeutic use. Along with this recognition is the re-scheduling of cannabis as less harmful narcotic drug and other changes that were deemed historic and pivotal in the long-standing international debate on cannabis' legal status since the 1960's UN Convention on Narcotic Drugs (O'Brien & Brown, 2020; UNODC, 2020). At the time of this thesis writing, Mexico and Italy will have decriminalized possession of cannabis for recreational use. European countries such as Portugal, Spain, Netherlands, Luxembourg, Germany, Switzerland, and Malta are tentatively charting the legislation routes for adult-use regimes (Prohibition Partners, 2020). Most recently, the democrats in the United States senate are introducing a bill to federally decriminalize cannabis use (Prohibition Partners, 2021). Meanwhile, Rodrigo Duterte, the incumbent Philippine president has waged his war on drugs - including cannabis since 2016 that claimed almost 6000 Filipino lives- and counting. This is his battle cry to eradicate drug use in the country through extra judicial killings. (International Court, 2020; Rappler, 2021; Republic of the Philippines Commission on Human Rights, 2021)

The above scenario depicts an all but common theme in this study – macro and meso level changes have direct impacts on how VUCA is perceived, and how risk signals are activated at the micro level. More practically, how current policies and regulatory framework (and the changes in it) influence the orchestration strategies of a firm's value chain activities. The findings in this study offer a microcosm of a highly regulated industry landscape that is heavily reliant on policy reforms -that which sets the triggering point for the VUCA mechanism. Understanding how VUCA works even at the exploratory level of this study confers policy makers, politicians, regulatory authorities, as well as supranational and national organizations complementary awareness on how firms and organizations navigate *ex-post facto* any regulatory changes they enact.

In chapters 5 and 6, the value chain map and the adapted smile curve of the cannabis global value chain offered a general overview on how the activities are orchestrated across geographies where value is added as the goods flow down the value chain stream. By understanding the cannabis value chain mapping, policy makers can identify *inter alia* which segments and activities would necessitate further regulatory improvements and policy interventions. Likewise, the adapted smile curve offers insights where areas of potential country-specific economic upgrading are identifiable, as well as areas where economic policy and regulatory interventions can be applied.

For jurisdictions that are transitioning towards decriminalization or legalization (both at the medical and adult-use regime) or those contemplating to engage with the commercial prospects of the cannabis industry, the findings from this study can be a leverage point on what policy prescriptions are most apt. The latter in view of the country's geographic and location advantages as they eventually participate in cannabis related economic and commercial activities. Specific to developing countries such as the Philippines and similar jurisdictions where draconian drug policies hardly curb the drug issue - let alone arrive at a sound drug policy proposal (Global Commission on Drug Policy, 2019; Stothard & Sultan, 2021), this study illustrates the heavy intersection of drug policy reform facilitating the emergence of a lucrative regulatable industry. This work demonstrates that archaic cannabis prohibitionist policies not only hinder a country's economic prosperity; more importantly, these arcane policies deprive citizens their fundamental human rights to accessing cannabis as medicine.

#### 8.4 Socio-Communitarian Implications

At the heart of the cannabis legalization for both the medical and adult -use contexts lie the essence of community organizing and social activism. Much to the credit of community organizers, activists, NGOs, NPOs, and all those under the umbrella of social movements, the path towards legalization has been paved for by those who have (and others who still do) suffer directly (and indirectly) from decades of prohibition and ignorance on the plant (Global Commission on Drug Policy, 2019; Snapp & Valderrábano, 2020; Stothard & Sultan, 2021). These are the men, women, and children who have been (and still are) denied their fundamental human right in accessing cannabis as medicine. Most importantly, these are ones who have (and still are) incarcerated for cannabis related offences; whose voices and stories are painted as criminals and stereotyped as dregs of society. The latter of whom are mostly Blacks, Indigenous, and People of Colour as well as other marginalized members of our society (Browne, 2018; Fellner, 2009; Owosu-Bempah, 2018). The indigenous, urban, and rural communities whose deep entrenchment with cannabis for centuries represent the enduring wisdom and resilience of the plant. The socio-communitarian implications of this study are all dedicated in memory and solidarity to those marginalized and neglected peoples because of their belief, use, and connection to the cannabis plant.

Although conducted in the context of international business and academic research, it is my fervent hope that certain elements and findings in this study offer some insights on how participation in value chain activities spills over some innovative ideas reconciling the corporate IB world with progressive ideas, social enterprises, and socio-community innovation. For instance, credit is due for the governance model of SLCO1. The inherent embeddedness in its relational-type value chain governance model brings a wealth of local and indigenous knowledge sharing between the network farms and the lead firm, and thus foster sustainable farming and cultivation practices. Credit is also due to SME3 whose insights during the interview regarding the indigenous knowledge on the cannabis plant and his indefatigable research and activism on sustainable and equitable cannabis policies render the landmark success of the global cannabis community at the UN level. All this to say, may this study spur socially impactful ideas beyond the confines of IB and strategic management.

While further research is implicated to bring these ideas into reality, there are dimensions nuanced in this study that may point to sustainable, equitable, and inclusive cannabis value chain path. For example, the mapping of the cannabis value chains provides a potential intervention map where the models of cannabis cooperatives and fair trade can be introduced - similar to cocoa and coffee. With the value chain mapping iterated in this study, we can identify areas of indigenous appellation protection using Trade Related Intellectual Property Rights (TRIPS) clauses for the geographic appellation and indication of current and undiscovered cannabis strains specific to indigenous geographies (Riboulet-Zemouli, 2021). The same value chain mapping can offer insights on potential areas of benefit sharing and access obligations on indigenous cannabis strains under the Nagoya Protocol. Similarly, the aggregate global value mapping opens an avenue for intervention and oversight on human rights and workers rights abuse, environmental hazards, protection of cultural heritage, as well as health and safety regulations (Riboulet-Zemouli, 2021). To sum, identifying the implications of this research project was not only to explore a theoretical framework in a nascent industry, but it is also a socially impactful scholastic exercise - all wrapped in a challenging but rewarding dissertation journey during a global pandemic.

## **CHAPTER 9** CONCLUSION

In conclusion, the knowledge gap identified in this exploratory study prompted the research question: *how do cannabis lead firms orchestrate their value chain activities under the conditions of volatility, uncertainty, complexity, and ambiguity across various jurisdictions?* An aligned response between the IB literature and the results of this study suggest that in orchestrating its value chain activities across (or within) jurisdictions, cannabis lead firms : (1) stabilize volatility by embedding elements of agility and flexibility in its value chain models, (2) reduce uncertainties by increasing knowledge capacity, (3) simplify complexity by outsourcing partial or some components of value chain activities relative to value chain governance models, and (4) reduce ambiguity by employing wait-and-see as well as experimentation strategies in certain operations of their value chain activities. Emergent findings also suggests that volatility is the triggering point on the activation of VUCA elements, and that the VUCA elements interplay in an interdependent manner whereby the VUCA constructs can be perceived precursors of value chain activity risks signals (VCARS).

While the findings in this study underscore implications at the theoretical, managerial, policy, and socio-communitarian fronts, limitations in this study are inherent and inevitable. As such, these limitations are recognized and outlined in the following sections - along suggestions on future research directions and calls for additional research that leverages on this study's findings.

#### 9.1 Limitations

There are two key areas where the limitations in this study can be identified – the methodological and theoretical. At the methodological front, the interviews in this study were all conducted virtually that which carry inherent disadvantages and limitations as opposed to inperson or onsite interviews. The nuances and subtleties that could have been captured in an actual in -person interview and its environmental context were missing in this study. Hence, the contextual richness that usually accompanies qualitative research is deficient in this study.

Another methodological limitation is the actual case study period that which sets the longitudinal dimension of this study. On the hand, choosing the first wave of the pandemic is an ideal temporal setting for this study; but the same choice poses the questions relative to participant responses. The fundamental question is ought to be asked: would the participants educe similar responses if they were asked the same questions during the second, third, or even the fourth wave of the pandemic? Will similar findings emerge given how the public health measures in each country have had high variations (such as vaccine rollouts) vis a vis adjustments in the value chain operations of the firms?

The number of cases studied along the study design also pose important limitations in this study. Studying five firms out of the initial 86 target firms yields a low participant turnout. This puts a question on the generalizability of the findings across all the cannabis firms in various jurisdictions. Likewise, the same findings can be put into question had the study been conducted using literal replication (Yin, 2014) considering that the outcome is consistent but slightly varied from an SLCO and MLCO standpoint.

At the theoretical front, an important limitation would have been the finding's ability to hold true if the study was conducted in the context of more established and mature industries such as manufacturing or textile. Clegg et al. (2019) offered an initial approximation on the VUCA framework in the global factory context of industries and sectors that have had substantial maturities in terms of value chain structures and orchestrations. As apposed to the cannabis industry that is right at its infancy, such nascency and immaturity might have exerted a significant influence (either positive or negative) on how VUCA is perceived when firms orchestrate their value chain activities.

The central theoretical findings in this study views the VUCA framework as overlapping as opposed to quadratic. But then, the findings run short of explaining the relationship between the framework's dimensions of knowledge level and predictability of change to that of the overlapping -ness of the VUCA elements. In other words, where do the dimensions of knowledge level and predictability of change fit in the overlapping view of the VUCA framework as a theoretical dimension that emerged? And how do these dimensions (if they in fact do) influence the triggering/ activation of the value chain activity risk signals (VCARS)?

Indeed, the limitations addressed in this exploratory study identifies important areas that subsequent research can respond to and substantiate. More importantly, the limitations identified in this study indicates that more research needs to be done in terms of the theoretical and managerial implication of the VUCA framework.

#### 9.2 Future Research

This study calls for future research that can further explore the dynamics of the VUCA constructs under various controlled and measurable conditions. Specifically, how can we gauge and measure volatility, uncertainty, complexity, and ambiguity in the context of the global value chain orchestration? We can also look at the relationship of one construct to the other and how do these constructs interplay in a manner that can be quantified.

From a managerial perspective, VUCA is a construct least understood and studied in the field on international business and strategic management. Identifying the antecedents of VUCA in the context of globalization and firm internationalization renders a complementary tool for managers to navigate a turbulent IB landscape, especially in a post-pandemic context. Hence, future research on the applied/ managerial front is ideal.

From a theoretical standpoint, the GVC and IB literatures' transversality opens avenues for potential theoretical infusion with various disciplines. An ideal avenue of exploration would be looking at complexity theory (Turner & Baker, 2019) and how it might help us further explain the interplay of VUCA elements and its configurations from a complex adaptive systems (CAS) perspective.

Another route is Hibanada's (2021) work-in-progress proposal in looking at value chain innovation as a market shaping capability vis a vis the emergence of medical and adult-use cannabis markets in the EU region suggests a potential extension of (or extrapolation from) this study's findings. The in-vivo evolution and simultaneous developments of the cannabis markets (for medical and adult-use) in most countries in the region is indeed an interesting (and exciting) doctoral dissertation proposal where value chain innovation can be a key driver in the formation of emergent markets amid VUCA conditions. The latter infuses the works of Van Assche (2017b), Ambos et al. (2020), Clegg et al., (2019), Nenonen, et al. (2019) as well as Kjellberg and Olson (2017) and Kjellberg and Helgesson (2007) Finally, as this study lays a seminal work in studying the nascent cannabis industry, this study calls for future research that addresses what policy prescriptions and regulatory frameworks are conducive in a streamlined cannabis global value chain. As more countries trudge the path of cannabis decriminalization as well as legalization, identifying pitfalls in regulatory frameworks that hinder the efficient orchestration of cannabis global value chain activities opens a promising research agenda aligned with the findings of this study.

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## **Conflict of Interest & Anonymity**

• No incidents of conflict of interest has been identified in the entire completion of this dissertation work. This dissertation is compliant to all the policies and guidelines regarding participant anonymity and confidentiality as outlined by HEC Montreal's Research Ethics Board – see Appendix 4 for REB Certificate

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# HEC MONTREAL

Retrait d'une ou des pages pouvant contenir des renseignements personnels

## Appendix 2A Interview Guide Study Participants Version A

	When was the parent company (HO) founded?
	When did your company enter country X?
	Can you describe how your company expanded in country X2
	<ul> <li>Can you describe the nature of your company's operations in the bost</li> </ul>
	country?
Firm's Background	• Are you operating as joint venture, wholly owned subsidy, or an
Information	importer/exporter?
intormation	$\sim$ Are you publicly trading private start up or state owned/ state
	subsidized?
	$\sim$ In what segment of the cannabis industry does your company focus/
	specialize currently in country X?
Firm's Motivation to	What made your company decide to enter the bost country?
Internationalize	$\sim$ Vou can share the key factors that your company has considered to
Internationalize	enter the market in country X
	<ul> <li>How can you describe your company's operation in country X thus far?</li> </ul>
	How is the current regulation on cannabis affecting your company's operations
Transition Question	in country/region X?
Transition Question	<ul> <li>In what ways are these regulations affecting your company's operation</li> </ul>
	(nositive negative or both)
	<ul> <li>How would you describe the recent changes in the cannabis industry in your</li> </ul>
	country of operations?
	<ul> <li>Recent would mean the last 2 years or since your company entered</li> </ul>
	the country
	<ul> <li>Is/ Was your company expecting these changes to happen?</li> </ul>
	<ul> <li>From an operations standpoint in the company, what are the effects of these</li> </ul>
Volatility	changes?
	<ul> <li>How does your company respond to these changes from an operations</li> </ul>
	standpoint?
	<ul> <li>Can you share some examples of these responses?</li> </ul>
	<ul> <li>Are these responses also utilized/ implemented in all other</li> </ul>
	subsidiaries or the HQ in the home country?
	$\circ$ Can you share the variations/differences (if any) between the
	responses host country and HQ relative to reducing these changes that
	are occurring?
	<ul> <li>How would you describe the ongoing uncertainties in the cannabis space/</li> </ul>
	industry where your company operates?
	<ul> <li>You can share the uncertainties regarding the industry regulations,</li> </ul>
Uncertainty	legalization issues, the competition in the local market, or any
	uncertainty that is unique in that country of operations
	<ul> <li>From your company's point of view, what are the impacts of these</li> </ul>
	uncertainties /unknown factors to your company's day to day operations?

	<ul> <li>Can you share some actions that your company is undertaking or has</li> </ul>
	undertaken to obtain further understanding on these unknowns or to reduce
	these uncertainties?
	<ul> <li>Are these actions also utilized/ implemented in all other subsidiaries or</li> </ul>
	the HQ in the home country?
	• Can you share the variations/differences (if any) between the actions
	in host country and HQ relative to reducing these uncertainties?
	How complex is the cannabis industry in your country of operations?
	<ul> <li>What makes the cannabis industry in the country of operations</li> </ul>
	complex?
	<ul> <li>Can you share how this complexity is reflected (or not) in your company's</li> </ul>
	operations?
	<ul> <li>How does your company deal with these complexities from a daily operation</li> </ul>
Complexity	standpoint?
	<ul> <li>What are/ were the actions undertaken by your company to reduce these</li> </ul>
	complexities or simplify things?
	$\circ$ Can you share some processes/ methods that were utilized to
	simplify these complexities?
	<ul> <li>Are these processes/ methods also utilized/ implemented in all</li> </ul>
	other subsidiaries or the HQ in the home country?
	<ul> <li>Can you share the variations/differences between the</li> </ul>
	process in host country and HQ?
	<ul> <li>What gray areas of the cannabis industry in the host country does your</li> </ul>
	company see as a challenge?
	<ul> <li>Can you share any direct or indirect impacts these gray areas have to</li> </ul>
	your company's daily operations in the host country?
	How would you describe your company's efforts in seeking clarity or reducing
Ambiguity	ambiguity in these areas?
	<ul> <li>Could you share some initiatives aimed in addressing these gray areas?</li> </ul>
	• Are these initiatives also utilized/ implemented in all other subsidiaries
	or the HQ in the nome country?
	<ul> <li>Can you share the variations/differences between the initiatives in best country and HO2</li> </ul>
	Retween the time that your company has entered country V and the time
Operational rick	when the COVID-19 measures* were implemented in the region / country
strategies in the	what were the actions/ plans that your company was undertaking to reduce or
host country pre-	avoid the significant/urgent risks considering with your company's normal
COVID 19 lockdown	operations in the country?
**	• You can share operational risks that involve production, supply chain.
	regulatory/compliance, resources, sales, distribution, etc.
**the time when	Are these actions consistent/aligned with how the HQ is implementing these
the firm entered the	actions/ plans during the pandemic? What do you think best resembles the
host country up	similarity or difference in this case?
until the COVID-19	
measures were	$\circ$ * The COVID-19 measures that are being referred to are those ones
undertaken by the	that have direct impacts to the company's daily operations. Examples
local government	could be lockdown measures, temporary operations closures, border
	closures, reduced operations capacity, etc.

Operational risk strategies in the host country <i>intra- COVID 19</i> lockdown**	<ul> <li>Between the time when the COVID-19 measures* were implemented and the time when these measures were lifted/ relaxed in country X, what were the actions/plans that your company have undertaken in order to tolerate the significant/ urgent risks considering company's daily operations in the country?         <ul> <li>You can share operational risks that involve production, supply chain, regulatory/compliance, resources, sales, distribution, etc.</li> </ul> </li> <li>Are these actions consistent/aligned with how the HQ is implementing these actions/ plans during the pandemic? What do you think best resembles the similarity or difference in this case?</li> </ul>
** the time between the local COVID-19 measures were implemented and the time there was gradual lifting/ relaxation of these measures.	<ul> <li>* The COVID-19 measures that are being referred to are those ones that have direct impacts to the company's daily operations. Examples could be lockdown measures, temporary operations closures, border closures, reduced operations capacity, etc.</li> </ul>
Operational risk strategies in the host country <i>post-</i> <i>COVID 19 lockdown</i> ** ** the time when the COVID-19 measures were lifted/ relaxed up until the actual study interview	<ul> <li>Between the time when the COVID-19 measures* were lifted/ relaxed in country X, what were the actions/plans that your company have undertaken in order to mitigate the future significant/ urgent risks considering company's daily operations in the country?         <ul> <li>You can share operational risks that involve production, supply chain, regulatory/compliance, resources, sales, distribution, etc.</li> </ul> </li> <li>How would you describe these actions in terms of permanence in the coming 5 years?</li> <li>Are these actions consistent/aligned with how the HQ is planning these mitigating actions/ plans?</li> <li>*The COVID-19 measures that are being referred to are the ones that have direct impacts to the company's daily operations. Examples could be lockdown measures, temporary operations closures, border closures, reduced operations capacity, etc.</li> </ul>

## Appendix 2B Interview Guide Subject Matter Experts (SME) Version B- EN

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SME Background Information	<ul> <li>How long have you been formally/ officially involved in the cannabis industry?</li> <li>What segment/ area of the cannabis industry do you specialize in / are knowledgeable of?</li> <li>Can you describe your current occupation/ field of expertise/ specialty in this segment of the industry?</li> </ul>
Firm's Motivation to Internationalize	<ul> <li>What do you think are the key strategic advantages of a cannabis firm's internationalization to: *(1) Europe *(2) Latin America (3) USA (4) Canada?</li> </ul>
	* The countries in these regions are TBD depending on the participant's /SME host country of operations and SMEs territory of expertise.
	<ul> <li>How can you describe the current cannabis landscape in country X thus far?</li> </ul>
Transition Question	<ul> <li>How is the current regulation on cannabis affecting a company's operations in country/ region X?</li> <li>You can share a specific regulation or various regulations and elaborate</li> </ul>
	the impacts (direct/ indirect) to the firms from an operations perspective.
	<ul> <li>In what ways are these regulations affecting a firm's operations success in the short and long term (positive, negative, or both)</li> </ul>
	<ul> <li>In general, how would you describe the <i>changes</i> in the cannabis industry in country X over the last 2 years?</li> </ul>
Volatility	From an SME standpoint, how would you assess these changes thus far?
	<ul> <li>How do you think is the industry responding to these changes?</li> <li>Can you share some examples of these responses?</li> <li>Can you share the variations/differences (if any) between the responses your country and neighbouring country/ region as a response to these changes?</li> </ul>
	<ul> <li>How will you assess the volatility of the cannabis industry country X over the last 2 years?</li> <li>You can share your assessment at an industry level in general or in</li> </ul>
	specific areas of the industry such as segments (recreational and medical), supply chain, policy and regulation, social attitudes, etc.
Uncertainty	<ul> <li>How would you describe the ongoing <i>uncertainties</i> in the cannabis space/ industry in your country/ region?</li> </ul>
	<ul> <li>From an SME point of view, what are the impacts of these uncertainties /unknowns to local firms?</li> </ul>
	<ul> <li>Can you share some potential strategies that local firms might employ to have further understanding on these unknowns or to reduce these uncertainties?</li> </ul>
	<ul> <li>How complex is the cannabis industry in country X?</li> </ul>
	• What makes the cannabis industry country X complex?

Complexity	<ul> <li>Can you share how this complexity is reflected (or not) in the local firms' daily operations?</li> </ul>
	<ul> <li>How do you think a company deals with these complexities from a daily operation standpoint in country X?</li> </ul>
Ambiguity	<ul> <li>What do you think are the ongoing gray areas of the cannabis industry in country X?</li> <li>Can you share any direct or indirect impacts these gray areas have to a company's daily operations in country X?</li> </ul>
	<ul> <li>How would you describe the industry's or a firm's efforts in seeking clarity or reducing ambiguity in these areas?</li> <li>Could you share some initiatives aimed in addressing these gray areas?</li> </ul>
Transition Question	<ul> <li>With all the external factors of volatility, uncertainty, complexity, and ambiguity shaping the cannabis industry landscape in country X, what should firms look out for as important indicators that these external factors are being dealt with successfully?</li> </ul>
	<ul> <li>You can choose to elaborate one indicator or various indicators using the lenses of your expertise</li> </ul>
Operational Risk Strategies in the host country <i>pre-COVID</i> 19 lockdown	<ul> <li>Before the COVID-19 measures* were implemented in the region/ country, how would you assess the overall landscape of the cannabis industry relative to operational risks?</li> <li>You can share operational risks that involve production, supply chain, regulatory/compliance, resources, sales, distribution, etc.</li> </ul>
	What do you think best explains the similarity or difference of these strategies in this case relative to cannabis industries in neighbouring countries/ regions?
	* The COVID-19 measures that are being referred to are those ones that have direct impacts to the firm's daily operations. Examples could be lockdown measures, temporary operations closures, border closures, reduced operations capacity, etc.
Operational Risk Strategies in the Host Country <i>intra-</i> <i>COVID 19</i> lockdown	<ul> <li>During the COVID 19 pandemic when public health measures* were in effect, what were the actions/plans that the industry/companies have undertaken in order to tolerate the significant/ urgent risks in the daily operations of cannabis companies in the country?</li> <li>You can share operational risks that involve production, supply chain, regulatory/compliance, resources, sales, distribution, etc.</li> </ul>
	<ul> <li>What do you think best explains the similarity or difference of these strategies in this case relative to cannabis industries in neighbouring countries/ regions?</li> </ul>
	* The COVID-19 measures that are being referred to are those ones that have direct impacts to the company's daily operations. Examples could be lockdown measures, temporary operations closures, border closures, reduced operations capacity, etc.

Operational Risk Strategies in the Host Country <i>post</i> - COVID 19 lockdown	<ul> <li>By the time when the COVID-19 measures* were lifted/ relaxed in country X, what were the actions/plans that the industry / cannabis companies have undertaken in order to mitigate the significant risks in the future considering a company's daily operations in the country?</li> <li>You can share operational risks that involve production, supply chain, regulatory/compliance, resources, sales, distribution, etc.</li> </ul>
	<ul> <li>How would you describe these actions in terms of permanence in the next 5 years?</li> </ul>
	<ul> <li>What do you think best explains the similarity or difference of these strategies in this case relative to cannabis industries in neighbouring countries/ regions?</li> </ul>
	*The COVID-19 measures that are being referred to are the ones that have direct impacts to the company's daily operations. Examples could be lockdown measures, temporary operations closures, border closures, reduced operations capacity, etc.
	Thank you very much for your time and sharing your valuable insights for this study. Feel free to contact myself should you have any questions or concerns regarding this study. Likewise, should you have any recommendations or feedback on these questions, you are most welcome to share them with me and I would glad to integrate these recommendations going forward.
	Sincerely,
	Manolito