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**Building blocks: A historical sociology of the
innovation and regulation of exchange traded funds in
the United States, 1970-2000**

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A thesis submitted to the Department of Sociology

in conformity with the requirements for the degree of Doctor of Philosophy

The University of Edinburgh

2017

Declaration

I hereby confirm that this dissertation presented for the degree of Doctor of Philosophy (PhD), has been composed entirely by myself, is solely the result of my own work unless otherwise credited, and has not been submitted for any other degree or professional qualification.

Signed,

Sarah Marie E. Ruggins

Dated:

March 8, 2017

Acknowledgements

I wish to express my gratitude to the following individuals:

Dr. Donald MacKenzie, primary supervisor of this project, for his unwavering dedication, guidance, and patience over the years.

Mr. Leonard Ruggins, my uncle, for sharing his memories, advice, and laughter with me. Len, your experiences have been a continued source of inspiration - I dedicate this body of work to you.

Mr. Cliff Ruggins, my father and best friend, for being my biggest source of support and for consistently reminding everyone that it was you who taught me everything I know.

Mrs. Annie Leroux, my mother and role model, for teaching me the difference between stocks and bonds before I could spell stocks and bonds, and for being the kind of woman I aspire to be.

Mr. Brandon Cheverie, my husband, for selflessly encouraging me to chase my dreams, even though those dreams brought me to the other side of the world.

Abstract

Between 1993 and 2016, the U.S. exchange traded fund (ETF) market has proliferated from one product worth \$6.5 million USD to 1,455 products worth over \$2 trillion USD. Despite its dramatic growth, the ETF market has yet to be the subject of sociological inquiry even though fields such as the social studies of finance have begun examining the origins of index derivatives (Millo 2007), options (MacKenzie 2006), hedge funds (Hardie and MacKenzie 2007), and foreign exchange markets (Knorr Cetina and Bruegger 2002). Thus, the purpose of this dissertation is to provide the first historical sociology of ETF innovation in the United States, using an approach inspired by the social studies of finance.

This project empirically traces the emergence of the ETF by compiling an account of precursory strategies, concept development, regulatory negotiations, and early product marketing. The concept of *agencement* is used to frame the historical narrative of the ETF as a product of two distinct assemblages that formed in the U.S. between 1970 and 2000: first, the socio-technical integration between humans and their technologies that affected trading strategies, and second, the collaborative relationships that were formed between innovators and regulators. The mixed qualitative research consists of 36 interviews triangulated with archival records, documents sourced through Freedom of Information Act requests, private collections, and government files. Concluding analysis suggests that strategies foreshadowing the ETF began to emerge as early as the 1970s, and innovator-regulator collaborations were integral to early product qualification - a process not yet explored in literature on financial regulation.

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List of abbreviations

AMEX	American Stock Exchange
BGI	Barclays Global Investors
CBOT	Chicago Board of Trade
CFTC	Commodity Futures Trading Commission
CIPs	Cash Index Participation Units
CME	Chicago Mercantile Exchange
DOT	Designated Order Turnaround
ETF	Exchange traded fund
ETN	Exchange traded note
ETP	Exchange traded product
IPs	Index Participation Units
LOR	Leland O'Brien Rubinstein Associates, Inc.
NASDAQ	National Association of Securities Dealers Automated Quotations
OSC	Ontario Securities Commission
PHLX	Philadelphia Stock Exchange
SEC	Securities and Exchange Commission
SPDR/SPY	Standard & Poor's Depository Receipts S&P 500 ETF
TIPs	Toronto Index Participation Units
TSE	Toronto Stock Exchange

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Chapter One

Introduction

What is the most heavily traded stock in the world? Take a moment to make a guess. Apple? Google? The plausible answers to this question may seem straightforward with the prominence of global energy companies such as Shell, media and service providers such as Facebook, Nokia, or AT&T, financial institutions such as HSBC or Barclays, pharmaceuticals such as Pfizer, and other multinational corporations such as Microsoft or Coca-Cola.

Chances are that you have just named a corporation similar to the ones listed above. Apple and Microsoft, for example, are often thought to be the heaviest traded US-listed stocks as they have average daily trading volumes worth between \$3 billion and \$5 billion USD. But what if the most heavily traded stock in the world was not a corporation? What is there left to choose?

There is a stock that dwarfs even the largest global conglomerates with trading volumes worth almost \$25 billion USD every single day.¹ This stock is named the SPDR S&P 500² (most commonly referred to as the “Spider”, “SPDR”, or “SPY”), and it is a product called an exchange traded fund (ETF). Chances are that most individuals outside of finance have not heard of these, but exchange traded funds like the SPDR dwarf the largest corporations in the world when it comes to their asset inflows and the sheer volume traded every day. Since their

¹ Values in USD as of September 30, 2014. Data provided by Bloomberg & State Street Global Advisors. Retrieved from <https://www.spdrs.com/librarycontent/public/Why%20SPY%20Size%20Liquidity%20and%20Low%20Cost%20of%20Ownership.pdf>

² ‘SPDR S&P 500’ stands for Standard & Poor’s Depository Receipts that track the Standard & Poor’s 500 Stock Market Index. The S&P 500 is comprised of the 500 largest American companies listed on the New York Stock Exchange (NYSE) and the NASDAQ.

development in the United States,³ ETFs have become some of the most heavily traded products in the world and represent trillions of USD in global investments.

ETFs were officially launched in 1993 when the Securities and Exchange Commission (SEC) granted exemptions to the Investment Company Act of 1940 to permit their structure to trade on stock exchanges. While the ETF structure has changed dramatically between its initial design and modern day offerings, all ETFs have similar features. An ETF is an investment company that is bought, sold, and traded on a stock exchange just like a corporate stock and fluctuates in price depending on supply and demand in the market. Unlike a corporate stock, however, ETFs pool the assets of investors and invest in various stocks: ETF holdings are most commonly referred to as its 'basket' or 'portfolio'. Purchasing one ETF share gives an investor exposure to every investment in the ETF's basket. Initially, ETFs were only permitted to track designated indexes such as the S&P 500, meaning that an ETF had to replicate accurately the index constituents in its basket and mirror the returns of the index (minus any operating expenses). These index-replicating ETFs are the first formally recognized ETFs despite the fact that precursory products began entering the market (to varying degrees of success) as early as 1989.

It is helpful to think of an ETF as analogous to a bouquet of flowers: Each flower stem represents a different stock. To buy each flower stem individually and design your own bouquet from scratch would be a costly and time consuming endeavour, especially if you are not an expert in floral design. Thus, florists prepackage and sell arrangements of flowers as bouquets. Purchasing a bouquet is a cost-effective and convenient way for individuals to purchase flowers, just as ETFs are a cost-effective and convenient way for investors to access a variety of stocks,

³ Canada launched the first successful ETF in the world in 1990 (Chapter Seven), though was inspired by a failed futures-backed product created by the Philadelphia Stock Exchange (Chapter Five). As the US market has greatly eclipsed all other markets in both size and rate of innovation, this project focuses on the US market as the primary innovator of the ETF.

bonds, commodities, currencies, futures, and combinations thereof.

Since its initial launch, the ETF industry has expanded rapidly: The availability of ETFs in the United States alone has expanded from one ETF worth \$6.5 *million* USD in 1993 to 1,455 ETFs worth \$2.1 *trillion* USD in 2015.⁴ Since their explosive growth in the US, sizeable ETF markets have developed in economies around the world with heavy trading occurring across North American, European, African, and Asian-Pacific markets.

While early ETFs were only permitted to track stock indices, as of 2008, ETFs were allowed to invest in commodities and currency futures as well as physical commodities and currencies.⁵ In the same year, the SEC permitted ETFs to be actively managed - that is, to hire investment advisors to develop custom portfolios that do not track designated indices. Currently, the type of ETFs available in the global marketplace are seemingly endless: ETFs may invest in domestic stocks or bonds, sector-specific stocks, international stocks or bonds, stocks *and* bonds, commodities, currencies, futures, and even other ETFs.⁶

Despite the recent interest around rulings that permit many new styles of ETFs and the implications these rulings have in current markets, this project seeks to tell the origin story of the ETF. To date, no sociological analysis or history of the ETF has been provided in the social sciences. Of the plethora of books and media that focus on the U.S. ETF industry, none provide a wholly accurate analysis of the precursory innovations and infrastructure that enabled this

⁴ As of April 2015. Figures are compiled from the Investment Company Institute Research & Statistics Centre. Retrieved from http://www.ici.org/research/stats/etf/etfs_04_15

⁵ The majority of ETFs in the US are regulated by the SEC under the Investment Company Act of 1940. ETFs that invest in the futures on commodities or currencies are regulated by the Commodity Futures Trading Commission (CFTC) under the Commodity Exchange Act (42 Stat. 998, 7 U.S.C. 1). ETFs that invest in physical commodities and currencies are regulated by the SEC under the Securities Act of 1933 (48 Stat. 74, 15 U.S.C.).

⁶ There are also synthetic ETFs that do not invest in physical assets, yet seek to mimic the return of physical ETFs. Synthetic ETFs achieve similar returns to physical ETFs by investing in swaps and other financial derivatives instead of the physical stocks. They have been popular for they give investors access to illiquid (thinly-traded) markets, hard to access markets, and investing strategies that would be too expensive for physical ETFs to employ (such as inverse or leveraged index returns).

product to first emerge. In addition, much of the information available to the public is not correct. For example, some of the large investment companies in the United States and Canada state that the Toronto Stock Exchange produced the first ETF in the world in 1990.⁷ However, as the SPY ETF is arguably the most well known ETF, it is commonly (though incorrectly) referred to as the first ETF even though it launched in 1993.⁸ A quick glance at some of the most popular investment books and newspaper articles reaffirms these industry claims as the authors equate the launch date of these products as the beginning of the ETF industry.⁹ While this project does not dispute that the ETFs produced by the Toronto Stock Exchange and the SPY ETF were the first of the modern day ETFs (for they exhibit the ETF structure most commonly seen in markets today), their launch did not mark the inception of industry. Instead, as this project will show, the first ETF was launched in Philadelphia in 1989 - one year before the Canadian ETF and four years before the SPY. The environment surrounding the emergence of early ETFs and their immediate precedents is little known outside professional circles. More so, few academic studies have focused on how the Philadelphia ETF emerged and none have addressed the sociological importance of the ETF as a financial innovation.¹⁰ Thus, the purpose of this project is to introduce the ETF to a sociological audience - particularly those with an interest in innovation and regulation - by tracing how the initial concept materialized and through what regulatory processes it was refined into the first formal ETF product.

⁷ BlackRock's Learning Center lists the Canadian ETF, TIPS, as the first ETF in the world (BlackRock 2017).

⁸ Educational material provided by three popular ETF providers reference the SPY as the first ETF: refer to Vanguard (2017), Invesco PowerShares (2017, 2), and Fidelity (2017). Another popular provider, Deutsche Bank, does not provide ETF history prior to 2003 (Deutsche Asset Management 2017).

⁹ Publications such as the Wall Street Journal (2006), the Wall Street Journal Personal Finance Guide (2017), the ETF Database (2015), and authors such as Ferri (2009), have all listed the SPY as the first ETF in the world.

¹⁰ The existing literature on the ETF industry is outside of the sociological discipline and will be covered in Chapter Two.

Sociology and the ETF

Sociology has long been interested in cultural and normative explanations of groups and their economies. Finance, however, emerged gradually as a specialized system within the economy and sociology has only recently begun to investigate its effects. The world has become increasingly financialized as governments, banks, and corporations rely more and more heavily on financial networks, products, and rhetoric as a mode of stabilization and organization.

Financial transactions now take place without money or commodities ever physically changing hands as the process of financialization has been mirrored by exponential advancements in technology. These innovations take many forms: stock tickers, computing systems, trading screens, analyst reports, automated trading algorithms, telephones, regulatory frameworks and processes, and financial models all constitute financial technology that affects the way in which human beings participate and construct the financial realm.

Events such as the global financial crisis in 2007-2008 and the European sovereign debt crisis from 2010 onwards have brought increased attention to the activities that constitute finance and the foundation that these activities provide for the modern state and societal organization. In response to the explosive growth of (and reliance on) financial activity, sociologists are questioning where this system of finance came from and what processes were responsible for its growth since the twentieth century.¹¹

How are we to think sociologically about financial actors and artefacts? Traditional sociology conceptualizes an economic actor as a purely human entity, whether it be an atomistic individual

¹¹ See Knorr Cetina and Preda's (2014) edited volume, *The Oxford handbook of the sociology of finance*, for a collection of recent sociological literature on the history and activities of financial markets.

(in the neoclassical tradition) or a group of human beings acting as a collective. Applying this economic concept of the human actor to studies of financial sociology, however, is difficult because the integration of human decision making with technological devices means that human beings are not isolated entities: A human being cannot participate in the financial realm without the use of computing technology and the deployment of large scale networks of other humans and their technologies. Thus, to understand what makes financial activity possible, this project argues that it is useful to move beyond a human-centric economic sociology and examine the relationship between human activity and technological capability.

Recently, Michel Callon has advocated that *agencement* is useful in understanding financial actors and the processes responsible for the deep integration of finance into modern market societies. *Agencement* refuses to distinguish between human beings and technological equipment: Instead, *agencement* refers to the assemblage of humans and equipment and the unique form of agency - the *socio-technical actor* - that this assemblage presents. The socio-technical actor is a clear departure from the human-centric agency favoured by economic sociology and is, as this project will suggest, a useful framework for studies concerning the construction of financial artefacts such as the ETF.

With the above in mind, this project seeks to understand why a financial product called the ETF emerged and how it quickly rose to prominence as one of the most prolific financial products in recent decades. This project will thus involve a thorough examination of the conditions, strategies, and arrangements that preceded the ETF. Examining various assemblages - and more specifically, *agencement* - means that this project will focus largely on socio-technical relationships: The fusions of human beings and their technologies - whether it be rules and regulations, computing technologies, or communications - that create the financial actor that

shapes (and is shaped by) the marketplace. These relationships will be studied to uncover the extent to which socio-technical entities such as regulatory rulings and trading technologies were integrated into the development of the ETF.

Throughout the following chapters, the ETF will be framed as a product of two relationships: First, the socio-technical relation between humans and their technologies, and second, the relationship between financial innovators and financial regulators. Chapter Two offers a literature review where both new and old sociological and economic approaches to financial innovation and regulation are addressed. The shortcomings from each approach will be used to provide a basis for advancing assemblages and *agencement* as a viable alternative to understanding the emergence of innovation (and the regulation of that innovation) in the financial marketplace. Chapter Three outlines the research approach and organization, and provides justification for the mixed methods approach chosen.

Chapters Four through Eight present the substantive research findings. Chapter Four will examine how the introduction of computing technology enabled market participants to develop new ways of participating in the financial markets. As technology developed and markets expanded in the 1970s and 1980s, traditional stock picking gave way to the trading of equities baskets and futures and options on entire indices. For the first time in history, actors were able to group stocks and derivatives into a basket and trade the entire basket simultaneously. With the popularity of such strategies exploding into the 1970s, regulators began to frame the markets in a manner which encouraged efficient technological solutions over the gentleman's agreements of the decades prior, primarily through regulatory overhauls such as the 1975 Exchange Act amendments. In these reforms, the SEC mandated electronic communications networks, intra-agency systematization, and encouraged the use of trading technology as a means to increase the

efficiency and liquidity of the markets. Analysing this transition will demonstrate how the rise of computing technology reconstructed financial agency from human-centric to something realized by an individual in participation with electronic devices: In other words, a socio-technical *agencement*. This chapter will demonstrate that as the financial marketplace was becoming increasingly technological in structure, what constituted financial activity was drastically redefined. These socio-technical relationships created, for the first time, an environment where strategies that foreshadowed the ETF could emerge.

Chapter Five is a case study of the first ETF in the world, a product called the Cash Index Participation Unit (CIPs) that was pioneered by the Philadelphia Stock Exchange (PHLX) in 1989. This chapter will begin with an overview of the response of the Securities and Exchange Commission to the 1987 market crisis, focusing on how regulatory solutions encouraged socio-technical relationships between humans and technology. Of notable focus will be the SEC requests for increased experimentation into basket products as a solution to the illiquid and poorly hedged markets of the decade prior. Chapter Five will demonstrate that the first ETF, the Philadelphia Cash Index Participation Unit, was a result of two factors: The unique environment created by the rise of computing technology in the decades prior and the regulatory response to the 1987 crisis. The lawsuit and delisting of the CIPs contract due to disputes over regulatory jurisdictions between the SEC and CFTC will be analysed as an event that contributed to the redefinition of the ETF product in subsequent years. The concluding analysis will explain in what ways innovators and regulators participated in defining CIPs as the first exchange-traded product, setting a precedent for ETF product development moving forward. This analysis will challenge traditional conceptualizations of innovators and regulators as competing bodies and

instead demonstrate how they formed productive collaborations to become co-constituents in the CIPs' emergence.

Chapter Six will examine the role that financial theory played in the construction of early ETF products such as Leland O'Brien and Rubinstein's SuperTrust. To begin, the work of Harry Markowitz and Modern Portfolio Theory will be analysed for its role in readjusting the goals of money managers away from traditional stock-picking and aligning them with index and basket strategies. The SuperTrust project will be the subject of focus for two reasons: First, the product was adopted directly from financial theory, even quoting theory as a precedent in its initial application, and second, it was the first exchange-traded product to receive exemptions from the 1940 Exchange Act regulations. As these exemptions form the basis of ETF legitimacy in the markets today, the approval process will be analysed as a product of socio-technical assemblages between innovators, regulators, and their devices. The purpose of this chapter is to analyse how the construction of early ETFs was a result of the real-world adoption of theoretical constructs.

Chapter Seven presents a case study of the innovation flows of ETF design between the United States and Canada. While the first product concept - the CIPs - emerged at the Philadelphia Stock Exchange in 1989, its failure due to regulatory barriers inspired Canadian developers at the Toronto Stock Exchange to refine the product for Canadian investors. After receiving approval from Philadelphia to adapt their product structure, the Toronto Stock Exchange launched their refined version of the ETF product, called the Toronto Index Participation Units (TIPs), in 1990. In 1993, the SPY ETF (discussed above) was adapted from the TIPs and launched on the American Stock Exchange (AMEX). Throughout these structural refinements, the same concept - an index-tracking basket - was maintained. This chapter will present a case study on the development of Barclay's Global Investors iShares ETFs in both

Canada and the United States. Barclay's translation of iShares from Canada to the U.S. will be presented as an example of how innovation flows and the assemblages that enable them impact real ETF development. In conclusion, a discussion of bricolage and its implication in the refinement of ETF design will be presented.

Chapter Eight will explore the factors that enabled the ETF industry to proliferate at an unprecedented rate after its lackluster start with the failed CIPs (Chapter Five) and SuperTrust (Chapter Six) ETFs. In this chapter, three events will be analysed to determine the extent to which they enhanced the growth and depth of the ETF marketplace. First, the historical shift from commission to fee-based advisory structures will be analysed as an event that created demand for discount advisory operations - 'mom and pop' investment shops - and cost-efficient retail products such as ETFs. Second, the regulatory amendments to the Unlisted Trading Privileges legislation will be discussed as these amendments greatly enhanced the competitive relationship between the AMEX and NYSE, resulting in a multitude of new ETFs being brought to market and the eventual failure of the AMEX to keep pace with ETF innovation. Third, these events will be analysed for their role in assembling something known as the registered investment advisory (RIA) channel, a channel that created a strong demand for ETFs and catalyzed the explosive growth of the ETF marketplace for small, retail investors. This chapter will conclude with a discussion about the organization of the retail channel and its impact on ETF innovation.

Chapter Nine provides a summary discussion of the empirical and theoretical analysis conducted throughout the chapters. In conclusion, the state of the current U.S. ETF industry will be discussed and opportunities for future research outlined.

To reiterate, the emergence and proliferation of ETFs should be of interest to those in the social sciences concerned with the nature of financial activity - such as the conditions that facilitate and regulate innovation. It is in this field that this project hopes to make its largest contribution by asking three questions: What factors instigated precursory innovations and concepts? Under what conditions was the ETF formally defined and regulated? What caused the rapid proliferation of the ETF after a series of failed attempts and disappointing trading volumes?

Chapter Two

Literature Review

The purpose of this project is to construct the first historical sociology of the US exchange-traded fund (ETF) market. The goal of this research is to contribute to the empirical robustness of *agencement* as a sociological mode of inquiry by determining the extent to which technical innovations informed - and were informed by - common market behaviour. Additionally, this research questions in what ways regulators and innovators move beyond their traditionally dichotomized institutional relationships to affect innovative practice in financial markets.

Inspired by the actor-network tradition, this research analyses how the ETF emerged out of networks of material and semiotic relations referred to as *agencements*. To accomplish this, understanding the history of how social and economic study has approached the study of financial markets over time is imperative. This will introduce the newest field in the study of markets, the social studies of finance and its socio-technical actor. Following this discussion, the prominent literature on financial innovation will be analysed and grey areas concerning institutional relationships will be addressed. Of particular prominence will be the literature on the regulation of innovation, for it implies that the regulation of innovation is a competitive process in which an innovative concept is transformed into a bounded product. Last, the prominent literature on financial regulation will be addressed. As this is a particularly broad field, focus will be placed on capture theory and theories of joint regulation, for they offer the most popular approaches with which to understand the relationship between innovators and regulators. To conclude, the concept of *regulatory agencement* will be introduced in order to contribute to the regulatory scholarship.

Does economics + sociology = economic sociology?

The Parsonian divide

The historical relationship between sociology and the study of markets is complex. As this project seeks to contribute to a burgeoning field of literature, the social studies of finance, the discussion of the emergence of this field and its relation to traditional economics, sociology, and economic sociology is imperative. Moreover, analysing where financial artefacts come from entails analysing how we are to think of the market itself; questioning innovation and regulation involves reflecting on how the study of the market has evolved over time and what it means to participate in the financial realm today.

Beginning in the 1960s, the Parsonian divide between economic and sociological explanations of market behaviour resulted in a delineation between the institutional and individual explanations of economic structure.¹² As summarized neatly by Stark: “You, economists, study *value*; we, sociologists, will study *values*. You will have claim on the economy, we will stake our claim on the social relations in which economies are embedded” (Stark 2000, 1, emphases added). As a result of this divided approach, sociological inquiry focused on the institution as the value creator in economic markets¹³ and economic inquiry focused on the instrumental rationality and individual choices between means and ends as the primary explanan for broad market arrangements.

In earlier decades, Weber’s (1922) economic sociology sought to provide an action-based explanation for social phenomena as an alternative to the institutionally focused sociology of the

¹² Refer to Stark (2000) and Camic (1987) for a detailed description and history of the ‘Parsons’ Pact’ between economics and sociology.

¹³ For case studies using this approach, refer to Salisbury (1962), Firth (1967), Swetnam (1973).

time. This sociological framework sought not to privilege the individual at the expense of the social, and certainly not to reduce social action to individual rational choice, but provide a framework to understand social phenomena in terms of the purposive action of the individuals composing it. In other words, Weberian economic sociology sought to extend sociological analysis to understand collective arrangements in terms of individual action. As individual action is itself a result of specific motivations, understanding *why* individuals choose to act, Weber argued, is the most appropriate method in which to understand the social collective in which they are involved.

Despite Weber's attempts to extend institutionally focused sociological analysis to "...the subjective understanding of the action of the component individuals" (1922, 15), the divide between the individual and social accounts of economic structure remained largely entrenched in sociological narratives. Resultantly, "one of the most important developments in modern social science...[was] the race to fill the void created by mainstream economics' failure to do research on economic institutions" (Swedberg 1997, 161). The major development to bridge the divide between these two accounts is attributed to Mark Granovetter, whose work was largely inspired by Polanyi's (1957) substantivism¹⁴ and conceptions of market societies.

New economic sociology

¹⁴ Substantivism was a departure from the prevalent formalist approaches of the time. Formalist models suggest that economic principles (e.g. rational decision making, utility maximization, etc.) may be successfully applied to non-market societies (for example, see Firth 1961). The substantivist model introduced by Polanyi suggests that these economic principles cannot successfully be applied to non-market or pre-industrial societies because these societies are not organized by the same principles of rational choice and profit maximization.

Granovetter's theoretical and empirical work sought to address the inadequately deep exploration of institutions in economic research.¹⁵ Attempting to go beyond the dualistic accounts between individualistic accounts of behaviour and the structure of social institutions, Granovetter introduced the social network as a specific sociological concept in order to demonstrate how social actions are necessary to explain economic action and should not be left on the wayside in economic assumptions.¹⁶ Granovetter argued for the social construction of economic institutions and inspired economics and sociology - and the newly coined 'new economic sociology' - to explore both economic and non-economic goals of actors. Perhaps most notably, his work on social networks introduced the concept of embeddedness in order to depart from individualist accounts of economics by embedding accounts of economic action within networks of social and normative relationships.

Granovetter's theory advanced three major claims: first, that weak ties¹⁷ in interpersonal relations are a crucial means by which information is able to diffuse across a large social distance (Granovetter 1973; 1985); second, that economic institutions are social constructions that arise from individual actions, and individual actions are bound by the social worlds they occupy (Granovetter 1992); and third, that the economy is embedded within these networks of interpersonal relations, making the sociological viewpoint a crucial element in understanding economics (Granovetter 1985). Using this approach, the new economic sociology was able to

¹⁵ This is not to say that there were improper institutional studies at the time. For example, Douglass North (1990) had produced exceptional economic research that sought to explain institutional change during this time though it was not yet a popular area of exploration.

¹⁶ "...the pursuit of economic goals is normally accompanied by that of such non-economic goals as sociability, approval, status, and power" (Granovetter 1992, 270).

¹⁷ The strength of ties may be considered "...a combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services" that characterize interpersonal relationships (Granovetter 1973, 490).

suggest how networks among individuals and their social collectives spread information to reduce economic uncertainties and construct stable markets.¹⁸

While Granovetter's approach was a crucial development to bridge the gap between individual and social accounts of economic events such as the construction and transformation of markets, its theoretical framework remains too narrow and empirically fragile to account for the development of ETFs.¹⁹ For example, while Granovetter is able to explain how weak ties facilitate the flow of information between individuals and social networks (1985, 482), his theory does not clearly explain how coordination is then achieved between the various networks. That is, largely omitted is an explanation of how mutual expectations within social networks are affected by larger social structures such as political arenas and other bodies examined by institutional theory.²⁰

Moreover, Granovetter's theoretical interest in the structure of social networks, while vital, prevents him from achieving a more holistic approach to examine the forces that play a role in constructing financial markets. Specifically, his focus on the role of human agency in information transfer prevents him from addressing the extent to which financial artefacts may also be constructed by technical devices. Said another way, Granovetter's concept of the 'actor' remains highly human-centric: His account of networks rests solely with human capacity and does not distinguish between technological apparatus that may effectively contribute to or alter the realm of possibilities for information flows and decision making capabilities.

¹⁸ Refer to Granovetter's work on the strength of weak ties for a detailed analysis of how information transfer between networks occurs (1973), or Harrison White's extensive work on markets and social structure (2004). Granovetter has credited White's early work as inspiration for his work on the strength of weak ties.

¹⁹ A prominent empirical critique of Granovetter's work comes from Fligstein and Mara-Drita: "The major limitation of the network approaches is that networks are sparse social structures, and it is difficult to see how they can account for what we observe in markets" (1996, 657).

²⁰ Granovetter critiqued that economic institutionalism was insufficient and not practical for his framework because "all members of...institutions are interpreted as the efficient outcome of rational individuals pursuing their self-interest" (1990, 94).

Last, Granovetter does not explain the conditions under which ‘the economic’ itself becomes embodied; instead, his theory of embeddedness suggests that the economic is placed within larger social, human-centric networks. This framework prevents him from addressing the extent to which the *socio-technical* actor has economizing effects (Çalışkan & Callon 2009), whether it be a foreign exchange trader interacting with their computer, or an analyst making decisions based off of economic reports. For purposes of this project, a framework that explains how the economic is not simply embedded within the social, but constructed by the joint achievement of both the social and technological is necessary as the role of financial technology becomes increasingly prominent in financial markets.

To reiterate, this *socio-technical* concept is of crucial importance for the construction of financial artefacts: while inherently social, markets are often very dependent on new technical innovations that provide alternative or previously unimagined pathways for agency to be expressed. While Granovetter’s account stays true to his goal of creating a multi-layered approach to lessen the gap between individual behaviour and social networks in economic sociology, the narrow - albeit robust - theoretical framework and human-centric concept of agency prevents it from being a suitable approach to explain the very technical construction of financial devices such as ETFs.

Departing from Granovetter’s concept of the network is the institutional theory of Neil Fligstein and his proposed concept of strategic action fields.²¹ Strategic action fields are the fundamental units that govern social life, where actors (individuals or social groups) act in order to organize their competing interests and goals: a field may be framed at any social level, whether at the interpersonal, institutional, state, or global level. These fields see “actors interact

²¹ See also: Bourdieu (2005) and White (2001) for prominent literature on field theory.

with knowledge of one another under a set of common understandings about the purposes of the field, the relationships in the field (including who has power and why), and the field's rules" (Fligstein & McAdam 2011, 3). Fligstein uses fields to explain how social relations between institutions and states are key to understanding how markets emerge, similar to institutional theory within organizational studies that stresses how new arrangements emerge because of organized interests.²²

Fligstein's approach is distinctive in that it brings a previously under-represented element into the sociological analysis of markets: Politics. Fligstein (1996) conceptualizes 'markets as politics' to demonstrate how markets and politics are mutually constitutive by forming competitive relationships to create hierarchies. In introducing politics into his sociological analysis, Fligstein is able to detail how markets emerge in the struggles for dominance between meso-level interest groups such as communities, political bodies, and firms.

Strategic action fields are used to illuminate how each unique field of organizational interest creates a unique arrangement, resulting in a plurality of social relations across various social fields. Strategic action fields are made analogous to Russian nesting dolls in Fligstein's publications to represent the large variety of ways in which institutional interests and states come mutually to constitute new markets depending on the boundaries of the field in question: there may be fields within fields, or one broad field encompassing all other arrangements, or one field comprised of very specific characterizations depending on how theorists conceptualize the parameters of their research.²³ This approach thus departs both from neoclassical economic

²² See Chandler (1990) and Gerlach (1992) for literature on organizational theory.

²³ "All collective actors are themselves made up of SAFs [strategic action fields]. When they interact in a larger political, social, or economic field, that field also becomes a SAF. In this way, SAFs look a lot like Russian dolls: open up a SAF and it contains a number of other SAFs" (Fligstein & McAdam 2011, 3; see also Fligstein & McAdam 2012); "The boundaries of SAFs are not fixed, but shift depending on the definition of the situation" (Fligstein & McAdam 2011, 4).

theory, which stresses how markets trend towards one maximum-efficiency arrangement, and also from Granovetter's concept of network relatedness. Fligstein's analysis provides for a multiplicity of distinct arrangements depending on the field in question.

Fligstein's field theory was developed in order to remedy the stratification of contemporary sociology into competing theories, research subfields, and specialized perspectives: As he writes, sociology has "...distinct 'theories' (or, perhaps more accurately, theory contests) for social movements, organizations, religion, culture, and so on" (Fligstein and McAdam 2011, 2), leading to an increasing inability of the discipline to comment on the overall social structure of markets. Because of this stratification, much of the work undertaken in economic sociology cannot sufficiently account for the emergence, stability, *and* transformation of markets. For example, Giddens' (1984) concept of structuration offers a method to examine how the mediation between actors and pre-existing social structures guides social life, but is unable to explain the type of action that occurs within a particular field when it undergoes radical transformation. The field theory of DiMaggio and Powell (1983) focuses on explaining why stability occurs and is prolonged within fields.

While institutionalists are able to explain why stability occurs in fields through conformity to common social rules, Fligstein seeks to move beyond their explanations and emphasize the role of power and interests in bringing about new fields or bringing established fields into turmoil. In the above scholarship, none focus on theories of power and interests and how these work to bring about *transformation*. Distinctively, Fligstein's field theory moves away from those institutional theories that study the stabilization of fields in order to emphasize how fields are always in continuous flux as actors jockey to improve their positions within the field. These dynamics lead Fligstein to conceptualize fields as composed of incumbents, challengers, and governance units

in order to illuminate that social collectives change in reaction to strategic decision making and the quest for status.

Despite the development of strategic action fields as an answer to calls for a more holistic economic sociology that can encompass market emergence, stability, and change, Fligstein's approach is still not deep enough to explain the construction of a highly technical financial market. Notably, the theory of fields does not examine in enough depth how the institutions jockeying for hierarchical stability are themselves constructed. Resultantly, field theory is unable to address underlying processes that affect the formation of meso-level decision making processes. Without examining the socio-technical relationships that form the possibilities of an institution's agency, a fuller picture of the processes that are responsible for a market's construction is not possible. While Fligstein may offer an empirically broader approach to economic sociology than Granovetter, and one that is more expansive in its inclusion of political aspects and focus on structural change, his field theory remains subject to similar critiques: there remains a lack of attention to the technical infrastructure that makes social coordination and expressions of agency possible.

The social studies of finance

It was not until Michel Callon's work that the concept of *agencement* was applied to economic sociology to understand financial markets through 'market devices': a market device refers to the "material and discursive assemblages that intervene in the construction of markets...Instead of considering distributed agency as the encounter of (already 'agenced') persons and devices, it is always possible to consider [agency] as the very result of these

compound *agencements* (Callon, Millo, and Muniesa 2007, 2).²⁴ While there is no fully adequate French to English translation for *agencement*, it is often translated to mean ‘an assemblage of various components’. As MacKenzie points out, however, ‘assemblage’ may have too passive a connotation, because Callon’s usage of *agencement* also includes *agence*, or agency (MacKenzie 2009, 20-21).

The passivity of ‘assemblage’ will also be invoked within this project, for there exist socio-technical arrangements that are not necessarily agency-producing *agencements*. Assemblage theory, like *agencement*, demonstrates that the totality of an arrangement produces something that the underlying elements could not produce on their own: in other words, that the whole is greater than the sum of its parts. Unlike *agencement*, however, assemblages do not produce agency.

By adopting agency into its translation, *agencement* comes to denote the productive power of arrangements and how they influence the possibilities for action: “*Agencements* denote socio-technical arrangements when they are considered from the point [of] view of their capacity to act and to give meaning to action” (Callon & Çalişkan 2005, 24-25). Thus, *agencement* positions social theorists to conceptualize a market as an ‘achievement’ (Çalişkan & Callon 2009, 371) rather than an *a priori* product of social networks. *Agencement* illuminates how human beings along with technological equipment become socio-technical actors that can construct and give meaning to markets. Callon’s socio-technical actor thus provides a deeper understanding of what constitutes agency than the human-centric actor described in Granovetter’s and Fligstein’s theories.

²⁴ Deleuze had previously used the term *agencement* for different purposes, though his concept will not be examined in this project.

Financial artefacts have not been a historically popular topic in economic sociology, though have recently become of interest to a subfield called social studies of finance. Studies on option markets (MacKenzie 2006), index derivative markets (Millo 2007), foreign exchange markets (Knorr Cetina & Bruegger 2002), stock markets (Muniesa 2004), derivatives exchanges (MacKenzie & Millo 2003), the New York Stock Exchange (Beunza and Millo 2015), and securities analysts (Beunza and Garud 2007) have been conducted to determine where these markets come from and how they are constructed, whether it be through economic theory, technical devices, or financial engineering. As these sociological projects detail, a financial product is not just a technical exercise, nor is it an *ipso facto* result of social networks as the traditional theorists may advocate. The emergence of new products and markets cannot be explained solely by the role of self-interested actors attempting to exploit market inefficiencies, nor are they the result of purely institutional power struggles. Financial markets and their artefacts must be considered an achievement precisely because it takes the unique intersection of these complex processes - the social in joint venture with the technical - to construct an artefact in its entirety.

Many emerging studies emphasize *agencement* as a useful concept for understanding what constitutes particularities of modern financial markets. Beunza & Stark (2004), for example, conduct an ethnographic study of an investment bank's interpretive communities and demonstrate that such communities cannot exist independently of the use of technological instruments and the particular physicality of offices that facilitate discussions.²⁵ Hardie & MacKenzie (2007) describe how a hedge fund is an entity comprised of arrangements of technical devices (calculative tools such as the Turkish yield calculator) and the distributed

²⁵ See also Hardie & MacKenzie (2012).

cognition of actors that makes trading possible.²⁶ Millo (2007) discusses how the construction of index-based derivatives involved the struggle between innovations in the derivatives market and the establishment of new jurisdictional authorities for the SEC (Securities and Exchange Commission) and CFTC (Commodity Futures Trading Commission).

As the research examining financial *agencement* reveals, a market device cannot be disassociated from the socio-technical relationships within the network comprising it: human beings, technologies, and semiotic networks are intertwined into an irreducible relationship that illuminates how a financial entity may possess multiple ontologies depending on the arrangements of elements that comprise it (Callon 2005; Callon & Muniesa 2005; Callon et al 2007; Lépinay 2011). Framing economic sociology using *agencement* moves beyond both Granovetter's and Fligstein's economic sociology: First, *agencement* moves beyond Granovetter's concept of embeddedness to provide a more holistic understanding of the type of conditions and socio-technical relationships that are responsible for the emergence of a financial market or device. In conceptualizing agency as the result of the fusion of human beings and their devices, the market is not simply embedded in social networks, but constituted by the distinctive forms of agency that only socio-technical arrangements make possible.

While the multiplicity of possible arrangements is reminiscent of Fligstein's multiplicity of fields, *agencement* and assemblages offer an alternate approach for they both bring individuals *and* devices into the analysis. That is, *agencement* moves beyond Fligstein's strategic action fields by focusing on the construction of the social networks that seek hierarchical stability. In

²⁶ Derived from Hutchins (1995), distributed cognition is crucial to the literature discussing financial *agencement*. Distributed cognition emphasizes that learning occurs not solely through an individual, but through the individual's participation with others as well as artefacts. For example, a student trying to solve a maths problem may speak with other classmates or a teacher while also making use of a pen and paper or calculator. Knowledge is not derived purely internally, but through interactions with social and material artefacts. For an example of how this concept is applied in the social studies of finance, refer to Hardie & MacKenzie's (2007) paper on hedge funds.

“...envisaging institutions as socio-cognitive prostheses” (Çalışkan & Callon 2009, 380), *agencement* is able to move past the competitor-incumbent structurations of markets to demonstrate how each institution is itself a result of socio-technical constructions. These constructions, such as technological innovation and the distributed cognition of actors, offer a deeper understanding of what relationships come to constitute the boundaries of markets and trajectories of innovative practice. Thus, examining ETFs as an *agencement* is distinctive for it directs sociological inquiry to examine the oft-invisible socio-technical relationships that are responsible for their existence.

Bringing the ETF into the sociological field of study - the social studies of finance in particular - will be beneficial for this product has not yet been explored sociologically. The majority of literature on the ETF is strictly quantitative and, not surprisingly, produced by scholars working in the field of business studies, finance, and economics. For example, recent literature focuses on developing and testing various performance measurements of ETFs (Charupat and Miu 2011; 2013; Svetina 2010),²⁷ ETF volatility (Madhavan 2012), trading strategies using ETFs (Tse 2015; Mohamad et al 2015; Li et al 2012; Diaz-Rainey and Ibikunle 2012), and asset allocation.²⁸ Of the literature that discusses the history of ETFs, many do not provide a complete or wholly accurate narrative of where the concept first emerged (see Chapter One), with the exception of two works by former AMEX senior vice president, Gary Gastineau (Gastineau 2010; Gastineau and Weber 1999).²⁹ Thus, a historical sociology of the ETF will

²⁷ Performance measurements include data such as ETF tracking error and pricing efficiencies. These will be discussed in later chapters.

²⁸ There are several peer-reviewed journals that are relevant to those interested in ETFs and asset allocation, such as the *Journal of Asset Management and Portfolio Management*. The bulk of literature regarding ETFs and asset management or portfolio construction are industry publications such as *Barron's* or *Institutional Investor*.

²⁹ Gastineau has developed an exceptional history of early ETF developments such as index participation units and the SPY ETF, though his accounts are marketed to specialist audiences in finance and provide a technical history of product development.

offer a useful contribution to the social studies of finance and provide an introduction to a product that is yet to be represented in sociological discourse.

Financial innovation

Introductory literature

Innovation takes many forms in finance, though may be generally understood as the introduction of new products, services, production processes, or organizational forms (Dale and Wolfe 1998). The motivation for innovation,³⁰ the environmental conditions that affect innovation,³¹ the pace of innovation,³² the diffusion of innovation,³³ and the welfare effects of innovation³⁴ have all been researched at length and offer both theoretical and empirical approaches.³⁵

In the last thirty years, an interdisciplinary field called innovation studies has developed that ties together economics, science and technology studies, business studies, and sociology. This field of literature may be divided into economic, systemic, and meso-level accounts of innovation (Castellacci et al 2004). In these accounts, "...the functioning of markets merges with

³⁰ Scherer and Ross (1990); Duffie and Rahi (1995).

³¹ Refer to Cohen and Levin (1989), Cohen (1995), Campbell (1988), and Dale and Wolfe (1998) for research into the environmental conditions that encourage innovation.

³² The pace of innovation is often related to the availability of technology, macroeconomic conditions, regulatory environment (White 2000; Ben-Horim and Silber 1977), and tax laws.

³³ Tufano (1989), Saloner and Shepard (1995), Molyneux and Shamroukh (1996), Sinha and Chandrashekar (1992); Akhavein, Frame, and White (2005).

³⁴ Van Horne (1985), Tufano (1989), and Diaz-Rainey and Ibikunle (2012). Literature in this field has increased dramatically since the financial crisis in 2007.

³⁵ Literature on financial innovation offers both empirical and theoretical approaches. For example, the works by Berry, Levinsohn, & Pakes (1995), Bresnahan (1986), and Petrin (2002) each attempt to quantify the benefits surrounding the emergence of particular innovations, while Ross (1976) and Allen & Gale (1994) attempt to link the emergence of innovations with theories of investor demand.

that of the innovation process” (Callon 2016, 29), making innovation inseparable from market activity (Malbera 2006; 2007).

Macroeconomic studies of innovation tend to focus on the role of innovation in economic growth. For example, new growth theory has constructed models demonstrating how endogenous growth is driven through R&D and rent-seeking by profit-maximizing firms (Romer 1990; Aghion and Howei 1992; Nelson and Winter 1982). Economic accounts of innovation are often inspired by Schumpeterian theory (1934; 1939). Other approaches tend to adopt Schumpeter’s hypothesis that it is large firms and those with considerable market power who are the most efficient innovators. Specifically, large firms are able to provide a wider range of products than their smaller competitors (1950).³⁶ The complexities of microeconomic accounts of innovation have also inspired systemic approaches that emphasize innovation systems. Innovation systems theory examines how institutional organization and education affect economic performance and innovation (Castellacci *et al* 2004, 9-11).³⁷ Network analysis at the firm-level has also been popular in empirically demonstrating how collaborative networks have a positive correlation to firm innovation (Ahuja 2000; George, Zahra, and Wood 2002; Stuart 2000; Vinding 2002).

While fruitful, these approaches are not structured to take into account how the firms themselves develop their interests and how their innovations are conceptualized and formed into material artefacts. Thus, a similar critique may be made to the innovation studies literature that was made to Fligstein and Granovetter’s institutional theory: The current literature comprising innovation studies is not rich enough to take into account the socio-technical processes that construct the environment required for innovative artefacts to develop and to inform

³⁶ Scherer (1984) has reached the opposite conclusion: Smaller firms are able to innovate more rapidly for they lack many of the competitive pressures that large firms face. This will be discussed in later chapters.

³⁷ This approach is often used comparatively across countries. Refer to Cooke (1992) or Nelson (1993) for representative empirical studies.

institutional-level decision making. This makes the above literature from innovation studies inadequately deep for studies such as this one which analyse how artefacts materialize and are attributed their specific characteristics in highly technical financial markets.

The framework of bricolage provides a useful alternative to the above literature for it analyses how innovations emerge out of existing material and semiotic infrastructure. Unlike the institutional literature on innovation and studies of financial engineering - which often imply that innovative products begin as a pre-defined project and actors use a set of purpose driven tools to construct it - bricolage is a process constituted by the gathering and recombination of existing resources. As such, a bricoleur translates the original purpose of their artefacts in order to serve new ones. In the words of Levi-Strauss, the bricoleur's universe "...is the contingent result of all the occasions there have been to renew or enrich the stock or to maintain it with the remains of previous constructions or destructions" (1966, 17).

As a meta-framework, bricolage subscribes to the human-centric conception of agency which provides an incomplete account of how agency forms and is expressed in the financial markets. Bricolage describes actors manipulating and shaping their environments. While this is not problematic in itself, it does deny the unique socio-technical agency that is illuminated when one considers how a human being simultaneously shapes and is shaped by their devices. Thus, while bricolage is able to adequately account for how innovations first emerge, it falls short when examining the relationship between human beings and their objects.

The literature in innovation studies represents the institutional processes through which financial innovation occurs. However, a crucial aspect of the innovative process also includes the regulation of innovation, for this process makes the difference between an innovative concept and formally defined product. Institutional research has been crucial in analysing the struggles

that are involved in the construction of new financial markets, such as the struggles between innovators and regulators. The regulation of financial innovation is most pertinent to this project because the ETF emerged immediately after well-publicized struggles between innovators and regulators. Most prominent of this literature are the papers authored by both Merton and Miller, which will be examined in depth.

Miller's cat and mouse game

Miller (1986) argues that financial innovation is catalyzed by changes in financial regulation and governmental tax policies. As Miller posits, there is particularly strong pressure to innovate around prohibited, profitable transactions and interest-rate ceilings for the immediate benefit of the innovation is realized in the form of tax money saved (1986, 461).³⁸ Miller's account of innovation may be visible in the ETF case study: For example, the American market crash in 2000 led to policy decisions that cut interest rates, creating a favourable borrowing environment that may have catalyzed the expansion of financial firms and their products. From 1999-2001, for example, the total number of ETFs created by US firms and listed on US markets increased from 30 to 102. Empirically supporting Miller's theory that innovation occurs in reaction to policy are Tufano (1995) who demonstrates how American low-par stock development resulted from changes in state securities tax, Silber (1983) who discusses capital controls, and Kane (1977,

³⁸ Miller (1986) develops a striking example of this by documenting the rise of the Eurobond market in response to the US government's 30% withholding tax rules in the 1960s. The Eurobond market was developed by moving the center for dollar-denominated bonds from New York to London. This development also succeeded in bypassing the SEC's burdensome new-issue prospectus requirements, thus illustrating his point that innovations arise in reaction to tax or regulatory requirements.

1984, 1988) who discusses dynamic regulation.³⁹

However, Miller's account brings innovation and regulation into a dichotomous and conflicting relationship. This position leads him to make claims such as: "the contribution of the CFTC to progress and innovation...has almost always been to slow it down and impede it"; "Important regulatory...obstacles must be overcome"; and "...the existing [tax and regulatory] burdens were increasingly binding...the innovative wave then triggered was much like a snake bursting through its old skin" (1986, 468-471). While Miller acknowledges that regulatory policies may indirectly inspire innovative practices, his argument is framed so as to dichotomize the relationship between regulators and innovators much in the same way that Fligstein conceptualizes competitor-incumbent roles: Regulation inspires innovations insofar as the regulation is unduly restrictive to market participants. In response, innovation is catalyzed to correct the burden imposed by the regulation.

This creates a cat and mouse scenario explaining the impetus for and regulation of financial innovation. In this style of game, action is characterized as a contest involving constant pursuits as each player attempts to either capture or evade capture. The cat - in this case, the regulator - is unable to achieve a lasting capture of the mouse - the innovator - who is able to constantly evade and outwit their opponent. In this game, there is no endpoint as participants cannot reach a lasting agreement (Gibbons 1992). For every policy introduced by a regulator, the innovator has a profit-incentive to readjust their strategy in order to evade constriction. In Miller's approach, regulators and innovators are ultimately non-cooperative. This promotes a competitive narrative between starkly defined, isolated entities in discussions of the regulation of innovation. Indeed, the cat and mouse game has been used as an analogy in much literature on the regulation of

³⁹ Dynamic regulation refers to the process of regulation-induced innovation and innovation-induced re-regulation. For a discussion on this dynamic, refer to Herring (1999, specifically 294-297).

innovations⁴⁰ such as convertible bonds (Cockerill 2000), shareholder rights (McCafferty 1996; Nadeem 2008), and mortgage-backed securities (Giman 1996).

Merton's feedback loops

Merton's work on the relationship between financial innovation and regulation (1990; 1992; 1995) shares a similar sentiment to Miller's in that it constructs a dichotomous - though less severely so - relationship between innovators and regulators. Akin to Silber's work on the emergence of innovations (1975, 1983), Merton theorizes that innovation occurs in order to remedy market inefficiencies (e.g. asymmetries in information), leading to more complete markets.⁴¹ Interestingly, while innovators and regulators may be working opposite one another in the short run - as exogenous rules often are imposed to control innovators over the short term - the resulting adaptations in innovative practice are fed back into future regulatory frameworks, and so on, creating a different regulatory dialectic than Miller's over the long term. Merton argues that "...the long run role of regulatory change as an exogenous force for financial innovation is limited" (1990, 268) because successful innovations are slowly incorporated into the regulatory framework, entangling the initial disparate innovation and regulation into an interdependent relationship moving forward.⁴² This conceptualization paints a more complementary picture of the innovator-regulator relationship by constructing a 'feedback loop' of interaction.⁴³

⁴⁰ Cat and mouse analogies have most recently been replaced by the more aggressive narratives from capture theory, which will be discussed later in this section.

⁴¹ "...innovations may improve efficiency by expanding opportunities for risk sharing...lowering transaction costs and by reducing asymmetric information and agency costs" (Merton 1995, 463).

⁴² See also: Merton (1995) for detailed analysis of this feedback loop.

⁴³ Throughout the literature, the *diffusion* of innovations (separate from the *emergence* of innovations) is most often treated dialogically; innovators and adopters of innovations participate in a communicative discourse instead of a linear one-way transfer of information as participants sift through information (Rogers & Kincaid 1981). Many

This feedback loop inspires a more plausible account of the dialogical relationship between innovators and regulators than Miller's for it allows conceptualizing innovation as a dialectical process. By framing innovation through an innovation-regulation feedback loop, Merton is able to demonstrate how innovations need not be designed solely to circumvent regulation. Instead, innovations develop to exploit any inefficient and unintended side effects of policy, possibly enhancing financial regulation in the long term.⁴⁴ Nevertheless, Merton too is guilty of constructing the innovator-regulator relationship as a divided one between opposing interest groups. To illustrate: Merton's depiction of 'innovation spirals' portrays financial innovation as opportunistic and socially optimal as the innovation corrects the negative side effects of regulatory constraint. Meanwhile, his depiction of regulators as clumsy and uncoordinated leads Merton to claim that "...it is wholly unrealistic to expect financial innovation to proceed along a balanced path" (1990, 270) due to the ever present regulatory disruption. Innovations correct regulation insofar as they are allowed to spiral through the regulatory framework: "a single minded policy focused exclusively on [protecting the balance between innovation and infrastructure] could derail the engine of innovation and bring to a halt the financial system's trip to greater efficiency" (1990, 270). Though the severity of the divide between innovators and regulators is lessened in this instance, where regulators and innovators intersect in the innovative process remains unclear.

theorists explain how the diffusion of innovations occurs through herd behaviour (Shiller 2000), bandwagon effects (Allen & Gale 1994), innovation spirals (Merton 1990; 1992, 268), and chain reactions (Miller 1986).

⁴⁴ Swaps have been explained by Miller as innovations designed to evade capital control restrictions to prevent domestic capital flight, though Merton offers an alternative conceptualization by demonstrating how swaps were designed in order to reduce the unintended side effects of such capital regulations on risk and diversification (Merton 1990, 1995).

Socio-technical innovation

As evidenced in the above literature, there exists a dichotomy between innovators and regulators though the severity of this divide varies. Despite the variations, the majority of the literature on innovation is able to fit within the realm of strategic action fields: the relationship between regulators and innovators is thought to be a political-economic struggle for dominance and stability. The limitations of these approaches, however, make it necessary to construct a richer account of how innovators are themselves constructed by socio-technical elements. This will help to move away from the institutional and human-centric depiction of relationships and agency.

A primary goal of socio-technical analysis is to understand the actors and devices that construct meaningful action and the processes under which they come together.⁴⁵ Applying socio-technicality to financial innovation will help analyse how devices equip human cognition and how, in turn, the resulting calculative agency creates new potentialities. In this project, socio-technical analysis will be used to understand how innovations originate and how they are transformed from concepts to stable objects. First, this will involve analysing how the introduction of electronic trading technologies influenced the ability of traders to experiment with new strategies and how these experimentations, in turn, created an environment where ETFs first became possible. Second, the relationship between regulators and innovators will be examined to understand how their interactions negotiated the ETF into a tradeable security. Last, the socio-technical equipping of the regulatory apparatus will be examined to understand how regulators partner with their devices to construct and shape policy.

⁴⁵ Cochoy offers an excellent analysis of how assemblages are able to unite market participants (2007).

The preeminence of innovators and technical infrastructure, while crucial to the materialization of the ETF, are not the only significant factors in the ETF's historical emergence. Ultimately, the regulation of financial markets, participants, and products are of equal worth in the historical sociology of financial artefacts for they mediate the tensions between formal rules and organization on one hand, and the transience and fluidity of the innovative process on the other. Financial regulation - specifically, the regulation of innovation - will thus be the subject of the following section.

Financial regulation

Introductory literature

The concept of responsibility in financial markets is not considered 'as granted', but instead ought to be defined by the multiplicity of devices that construct it.⁴⁶ Frequently, financial regulators come to the forefront of popular media during periods of market turbulence as they often force decisions as to who is to act, when, and under what circumstances. Perhaps most importantly, regulatory bodies are important mediators between innovative concepts and formally defined securities, making them a crucial participant in the qualification of new financial products.⁴⁷ Thus, examining the innovation of artefacts like the ETF necessitates

⁴⁶ Refer to Laurent (2012) for a representative study on how responsibility has been constructed in the nanotechnology market.

⁴⁷ It is imperative to make a distinction between the qualification and construction of a financial artefact as they each illustrate a varying degree of intervention imposed on the development of financial products. Qualification refers to how an object is attributed qualities throughout its development (Callon et al 2002; Callon and Muniesa 2005), whereas construction - like engineering - refers to how an object of regulation is explicitly designed.

discussions on the relationship between regulatory structures and the actors that introduce products, systems, or services that challenge the existing regulatory framework.

Financial regulation exists in order to protect consumers,⁴⁸ oversee the integrity and organization of markets,⁴⁹ and to maintain the competitive equality of institutions (Dale and Wolfe 1998). The sweeping deregulatory policies of the 1980s and the process of globalization has caused exponential increases in integration between regulators and those they regulate. Financial governance is no longer equated solely with government and financial actors are no longer a clearly defined entity. The horizontal and vertical integration of firms has proliferated the cross selling of financial services and new types of business being conducted by domestic, transnational, and international agreements. In this new decentralized era, understanding the relationship between financial regulators and the bodies they regulate is paramount to understanding how new artefacts develop.

Institutionally focused literature has been helpful in examining the meso-level struggles that are involved in the construction of new financial markets such as the struggle between regulators and innovators. The literature from new political economy echoes these sentiments by suggesting that regulations are the result of such power struggles between interested parties (Bryan & Rafferty 2006). Emerging literature from new political economy is attempting to strengthen institutional analysis by bringing renewed focus to the relationship between politics and financial markets. Of particular prominence in regulation theory has been the work on capture, which has been growing in popularity since the 1950s.

⁴⁸ For example, regulatory penalties exist to deter excessive risk taking that would harm investors. The US has prohibited broker-dealers from trading penny stocks in retail accounts unless strict conditions are met (Securities Exchange Act Rule 15g-2).

⁴⁹ This includes anti-money laundering and market manipulation legislation (USA PATRIOT ACT Section 352; FINRA Rule 3310).

Capture theory

Generally, regulatory capture may be defined as when an “...agency is more responsive to the desires of an entity that it is supposed to be regulating than it is to the general public” (Financial Crisis Inquiry Commission Report 2011, xviii). The concept of regulatory capture originally began as theoretical observations about governmental corruption as early as Aristotle.⁵⁰ Discussions on what constitutes corrupt ruling transitioned into a more subtle discourse concerning the trade-offs that exist between public and private interests beginning in the 1950s, and inquiries spread rapidly into the 1970s as discussions advocating for deregulation in the US peaked. The deregulatory efforts in the ensuing years further encouraged exploration into capture and in what ways private interests were being favoured in regulatory overhauls.⁵¹ As Novak states, “...linked between the scholarly development of the capture thesis and the more general resurgence of interest in competition and private enterprise...were being forged” (2013, 31).

Bernstein was the first to apply capture theory to the Securities and Exchange Commission: “Senators...expressed concern because pressure for the grant of broad discretionary authority to the SEC came not from supporters of the SEC...but from businessmen who feared that their activities would be hamstrung if the statutory standards became more specific” (1955, 52).

Similarly, Landis (1960), called for a reappraisal of the activities of US agencies such as The

⁵⁰ “...the true forms of government, therefore, are those in which the one, or the few, or the many, govern with a view to the common interest; but governments which rule with a view to the private interest, whether of the one, or the few, or the many, are perversions” [1996, 71; Book III].

⁵¹ Simon Johnson has related a wave of deregulatory policies in the US to the confluence of campaign financing and personal connections between Wall Street and Washington (2009).

Federal Trade Commission, The National Labor Relations Board, and the SEC in light of apparent conflicts of interest and *ex parte* proposals.⁵² Similarly, Stigler (1971), Posner (1974), and Peltzman (1976) examined how regulators were acquired by industry and used to further private interest.

Since the 2007 crisis, the capture thesis has been reintroduced with a sense of urgency from popular media. The former Chief Economist of the International Monetary Fund declared that “...it is all about capture...It is coming from Wall Street, Wall Street influencing the New York Fed, unduly having this excessive power in the Federal Reserve System” (Johnson 2013, 14). There exists a “...political balance of power that gives the financial sector a veto over public policy...The banks have been exploiting this fear as they wring favorable deals out of Washington” (Johnson 2009). Similarly, Senator Elizabeth Warren has observed that “any effort to increase or reform statutory regulation of financial products is met by a powerful industry lobby on one side that is not balanced by an equally effective consumer lobby on the other...With every agency, the fear of regulatory capture is ever-present” (Warren 2007). Most recently, a former SEC chairman attested to the ways in which industry lobbyists would pressure Congressional committees and the SEC to create favourable rulemaking for the financial industry, going as far as to refer to the process as a “blood sport to make a particular agency look stupid or inept or venal” (Levitt 2010). Moreover, the repeal of the Glass-Steagall Act (48 Stat. 162) that separated commercial and investment banking activities, exponential increases in the amount of leverage investment banks are permitted to use, agreements to allow banks their own private risk regulation and standard setting for leverage (SEC 2004, 69 Fed. Reg. 34428), and what Johnson refers to as “a light (dare I say *invisible*?) hand at the Securities and Exchange

⁵² For related studies, refer to Kolko (1963) and Becker (1958).

Commission in its regulatory enforcement” (2009) have all led to inquiries on the strength of industry influence in the US financial markets.⁵³

In this literature, as with the literature from the decades prior, capture occurs when private interests invade the public sphere and damage the functioning of the regulatory apparatus (Stigler 1971). Understanding the *agencement* of financial products necessitates understanding the relationship between these parties and under what conditions the relationship brings about an environment conducive to innovation.

New political economy

In light the financial crisis and the resulting public alarm over industry influence, the school of new political economy has worked to refine capture theory. Predominantly discussed in regards to banking regulation, regulatory capture has become synonymous with regulatory failure (Admanti & Hellwig 2013). Specifically, political economists have been studying how information and power asymmetries in governance lead to failure of new regulatory regimes. Goldbach (2015a; 2015b; 2016) argues that regulatory capture results when the regulated incentivize regulators to favour private interests, leading to a regulatory framework riddled with loopholes and thus eventual failure. Empirically, Goldbach (2015b) presents a striking case study on how global standard setting in banking regulation - specifically, the Basel II framework - failed because of the unchecked influence of powerful industry interests. The counterbalance for these interests lies with political influence, though the necessary checks and balances are often

⁵³ Kwak (2013) also develops a striking connection between deregulatory policies and industry influence in light of the 2007 crisis.

difficult to implement in a system that has been organized around the interests of industry elites (Germain 2010). In the same spirit, Baker analyses the structure of global financial regulations prior to the 2010 crisis, concluding that widespread private influence in global financial governance “nourished the financial boom” and also led to its startling demise (2010, 647).

Detailed refinements to the capture thesis have been advanced by Wagner (2010) and McCarty (2013) who construct the concept of information capture. Specifically, Wagner seeks to analyse information barriers and asymmetries in environmental regulation, building considerably on Stigler’s (1970) capture thesis. Information capture is “embedded participatory imbalances that emerge from the administrative legal system’s infinite tolerance of and even tendency to encourage information excess. Information capture allows strategic parties to effect considerable control over the agency’s priorities...” (Wagner 2010, 1431), notably by inflating costs to process the information required for public interest groups to participate in the rulemaking process. Similarly, McCarty (2013) and Barkow (2013) analyse how information capture allowed private interest groups to be unduly influential in the process of financial rulemaking.⁵⁴ In all cases, information capture becomes synonymous with the failure of the regulatory regime under analysis.⁵⁵

Weber (2012), McCarty (2011), and Lipson (2015) have advanced the concept of complexity capture which occurs when private industry is able to exploit the epistemic gap that exists between regulators and the regulated. Complexity capture also occurs when regulators are unable to keep pace with the complexities of the market they are charged with regulating. In complex and rapidly changing environments such as financial markets, regulators do not have the capacity

⁵⁴ For an excellent overview of the relations between traditional capture theory and new concepts of information and complexity capture, refer to Becker (2016, 213-241).

⁵⁵ Moschella and Tsingou (2013) provide an excellent case study examining how the 2010 financial crisis was partially a result of oligarchical institutions with veto-power capturing the regulatory process in the US.

to adequately oversee all activities and so often depend on private industry for information and expertise. As Weber states, financial markets are particularly prone to this form of capture for they are “authentically complex, rather than merely complicated or difficult to understand” (2012, 645). Within this framework, regulators are often fighting a losing battle to have access to same amount of information as those operating ‘on the ground’.

Using the complexity thesis, Lipson (2015) argues that regulatory failure and financial crisis occurs in three stages: first, the concentration of power in a few institutions leads to the ‘too big to fail’ dilemma where regulators and the regulated become increasingly reliant on one another;⁵⁶ second, the complexity of financial transactions, market structure, and regulatory rulebooks becomes overwhelming and prevents efficient regulatory function; and third, regulators become captured by private interest when regulators become unable to keep pace with the expertise and resources of the regulated.

Similar to the literature from the decades previous, the literature on regulation from new political economy maintains a dichotomy where captured regulation is bad because it works contra the public interest, and self-determined regulation is good because it works for the public interest. Defining strong and weak forms⁵⁷ of regulatory capture has been helpful in demonstrating how capture exists in degrees rather than extremes (Carpenter and Moss 2013, 11-14), though the dichotomy between captured and unobstructed regulation remains pervasive.

This dyad between regulators and the regulated is problematic on two fronts. First, the commonly used references - ‘regulators and the regulated’ and ‘public and private interests’ - are

⁵⁶ Refer to Alessandri and Haldane (2009) for a case study on the growing interdependence between British banks and the state.

⁵⁷ Strong capture “violates the public interest to such an extent that the public would be better served by either (a) no regulation...or (b) comprehensive replacement of the policy”; Weak capture “...occurs when special interest influence compromises the capacity of regulation to enhance the public interest” (Carpenter and Moss 2013, 11-12).

neither stable nor homogeneously defined concepts. The literature has not been able to develop clear definitions of what constitutes public versus private interests in historical case studies. Moreover, it is extremely difficult to prove in what ways regulatory policies – especially deregulatory policies - favour private over public interest *ex ante*, so these claims are even more difficult to substantiate.

Similarly, the literature often conflates governance with government. Globalization and increasing complexity is blurring the boundaries of who can act as a financial regulator. There is no longer an entrenched divide between public and private regulatory efforts as public-private regulatory efforts and self-regulatory organizations spread. That is, governance no longer equates to government (Dixit 2009), making the public versus private interest dichotomy misguided. To complicate matters further, private regulation is often accepted as a better alternative than formal law in rapidly changing and expertise-driven industries such as the financial industry.⁵⁸ Despite the realities of modern regulatory frameworks, the bulk of the literature continues to erect inflexible boundaries between regulators and the regulated without examining in what ways these entities become entangled. The lack of definitional clarity of these concepts and the entrenched divide between them hinders the ability of the literature to advance alternative conceptualizations of these relationships.

Second, the literature implies that regulators are synonymous with public interest and the regulated with private interest, leading to claims that regulatory failure is related to the degree of private interests embedded in the legislation. However, negative policy outcomes are not necessarily proof of captured regulatory processes as the literature seems to suggest. In all, there

⁵⁸ One can look to the following quote as an example of this mindset: “The most effective defense against fraud...is counterparties’ surveillance. JP Morgan thoroughly scrutinizes the balance sheet of Merrill Lynch before it lends. It does not look to the SEC to verify Merrill’s solvency” (Greenspan 2007, 256).

exists a lack of clarity in this body of literature that prevents it from fully synthesizing the trade-offs that exist in the construction of the regulatory apparatus and the impact this has on innovative practice.

Again, this project seeks to explore where the interests of regulators and innovators intersect in the innovative process. To that extent, this project will question whether or not it is possible for regulator-innovator relations to develop without exploitive capture by private industry. To assist in developing this framework, it is necessary to move beyond capture theory.

Joint regulation

The concept of joint regulation offers a more plausible solution to capture theory and is directly pertinent to the questions raised by this project. A theory on joint regulation was first advanced by Reynaud (1979) to examine how consensus flows from the opposition of social actors instead of a common morality and unified social arrangement.⁵⁹ This literature defines the consensus building in regulation as “the coexistence of several sources of constraint...that weigh on the actors in charge of solving conflicts and enforcing rules” (Lazega, Mounier, and Tubaro 2011, 47). Since Reynaud, joint regulation has become a popular framework with which to analyse collective bargaining agreements (Wright and Brown 2013; Gold 2001) and environmental policy (Hanf and van de Gronden 1998), but has yet to be applied to the regulation of financial markets.⁶⁰

⁵⁹ Reynaud’s concept of joint regulation was developed to provide an alternative to Durkheim’s work on the unifying effect of the institutional system: Joint regulation “...starts not from some general regulation of society by social values [Durkheim’s conscience collective], but from the production by social actors of an overall body of joint short-term rules which are neither coherent nor continuous” (Reynaud 1979, 316).

⁶⁰ I am currently unaware of any research that applies the concept of joint regulation to the governance of financial markets. This is not to say that such research does not exist.

Joint regulation offers a more plausible approach to examining financial regulation than capture theory primarily in its depiction of the environments in which consensus may be reached. Joint regulation challenges the notion that markets in turmoil cannot produce meaningful and well-negotiated regulatory frameworks: If “...the most frequent relations are relations of mistrust, tolerance or respect, emphasizing to different degrees one or the other, but always taking into account the other’s power” (Reynaud 1979, 316), decision making is able to occur through negotiated compromise and concessions, not only through corrosive relations of capture. Joint regulation also offers a narrative where stark delineations between regulators and the regulated are mitigated in favour of bilateral discussions, consensus building, and conflict resolution. This echoes the sentiments advanced by Merton’s dialectical account of the regulation of innovation, where a feedback loop weaves the initiatives of the regulators and innovators together over the long term.

While a meaningful step forward, joint regulation is not without its shortcomings. Notably, determining the dynamics of what constitutes captured versus free decision making is quite unclear. Perhaps most importantly, the concept of joint regulation can dissolve rather easily into capture theory if there exist large imbalances of power between negotiators (Lazega *et al* 2012). Cooperative agreements may be rejected when a participant has an incentive to defect, so it becomes essential for regulators to have first mover advantage in order to instill incentives large enough to stabilize joint initiatives.⁶¹ Because joint regulation often deteriorates into a ‘capture or be captured’ thesis when faced with information and power asymmetries, structural solutions to reduce the temptation for parties to deviate is often the focus of such studies.

⁶¹ Refer to Ayers and Braithwaite (1992, 162) for a discussion on regulatory strategy and intervention.

Gaps in the literature prevent a full understanding of financial regulation - specifically, the regulation of innovation. It is the goal of this project to advance a dialogue about how the dichotomy in regulation literature between regulators and the regulated, or the public and the private interest, does not fully encapsulate how the construction of financial artefacts occurs. Again, the goal is to explore a more integrated account of how financial actors build relationships to qualify and legitimate innovative financial products. As the literature on capture theory and joint regulation collapse too freely into a dichotomy of public versus private interests without analysing how those interests themselves become embodied, this project proposes that *agencement* is the most inclusive framework with which to understand the regulation of financial innovation. Specifically, *regulatory agencement* will be used to depict a participatory and highly integrated form of responsibility between regulators and innovators.

Regulatory agencement

As discussed previously, *agencement* refers to the assemblages of human beings and their devices that create meaning and make action possible. *Agencement* highlights how a financial artefact or market must be considered an achievement instead of an *a priori* certainty. Similarly, *regulatory agencement* attempts to bring regulatory bodies into this analysis to demonstrate how their mediation of innovation processes is a crucial aspect of socio-technical innovation.

To remedy this lack of clarity surrounding the traditional divides presented in regulatory literature, this project seeks to redraw the conceptual boundaries slightly. Moving forward, there will be a deliberate attempt to construct a narrative about the regulation of innovation as an issue between regulators and innovators, not between public and private interest or regulators and the

regulated, for the following reasons: It is possible for regulators to unproblematically incorporate private interest into policy making, blurring the demarcation between public and private. It is also possible for regulators to be the regulated, in the case of self-regulatory organizations or bilateral agreements between public and private industry. However, the one thing a regulator cannot be is the constructor of financial innovations, specifically, financial products. By their very nature, regulators are tasked with the monitoring of financial innovation and cannot be the originating source.⁶² Thus, this project will move beyond the popular discussion of regulators-regulated and the public-private, instead focusing on the relationship between regulators-innovators. While a minor shift in the conceptual boundary, this reorientation will permit the research to fill a grey area in the regulatory literature by addressing in what ways regulators and innovators construct a relationship, find points of intersection, and negotiate points of divergence.

Regulatory agencement will advance three distinct themes in order to aid in the empirical investigation of regulator-innovator relationships. First, this approach will illuminate how regulators participate with their internal devices to bring about new states of affairs. The participation with devices will include the interpretative process of rules such as The Securities Exchange Act of 1934 (Pub.L. 73–291, 48 Stat. 881), the influx of technology and its impact on regulatory organization and decision making, the relationship of regulatory departments within the SEC and how the distributed cognition of actors advances policy construction, and how the unique relationship with all of these devices binds the regulator with their devices to create new expressions of agency and discourse.

⁶² As part of this research, industry professionals from both regulatory bodies and private financial firms were asked: “Is it possible for financial regulators to be considered financial innovators? Why or why not?” 100% of respondents agreed that it is impossible for regulators to be considered innovators. This will be discussed in detail in later chapters.

Second, *regulatory agencement* will focus on the points of intersection between regulators and innovators during the development phases of a financial innovation such as the ETF. Understanding innovators and regulators to be co-participants in financial innovation will challenge the existing framework that depicts these bodies as continually opposing forces. By reframing the conceptual orientation, commonly analysed dichotomies will be circumvented in order to analyse points of intersection between the regulatory and innovative processes. As this project will show, innovative processes are not a simple matter of whether market participants and technologies challenged regulatory rules, captured the regulatory arena, or were constrained by regulators. By examining how the relationship between regulators and innovators guided the ETF from a concept to a defined product,⁶³ the ways in which regulators participate in the introduction of innovations to the market will be analysed.

Lastly, *regulatory agencement* will contribute to the understanding of how regulators participate in the qualification process of innovative financial instruments. That is, this framework will examine how regulators attribute qualities that convert concepts into formally defined financial instruments. As stated previously, regulators are important mediators between an innovative idea and a formally defined financial instrument. *Regulatory agencement* will examine what exactly is involved in the mediation: how regulators participate with rules and policy, interested actors, and technical equipment to bring about a new environment where the new innovation is a clearly defined, legitimate entity - a socio-technical *agencement*.

⁶³ This concept is similar to Beccarini, Beunza, Hoepner, and Ferraro's (2016) use of cognitive (mis)alignment. Whereas Beccarini et al used cognitive alignment to explore shareholder engagement, this paper focuses on innovator-regulator mediation of product concepts.

Conclusion

Addressing the missing pieces

Synthesizing the sociological and economic literature that relates to financial innovation, and the regulation of that innovation, is an overwhelming task. To maintain an appropriate scope, this project will address two areas of bias or omission that emerge from the above scholarship. First, there exists a pervasive focus on human-centric agency without an adequate analysis of the role that technology plays in enabling new, extended expressions of agency. Second, the overwhelming focus on institutional decision making fails to succinctly analyse how institutions develop their interests, organizational structures, and relationships.

As discussed, the histories of traditional economic and sociological disciplines were distinct, with economics focusing on the rational decision maker and sociology focusing on institutional arrangements. This intellectual divide inspired the theories of economic embeddedness and organizational fields, which arose to incorporate individual, social, and political aspects into the emerging field of new economic sociology. However, this literature remains focused on human-centric conceptions of agency and does not adequately address the power that technological equipment has to expand the ways in which agency may be expressed. This is particularly problematic when the object of study is highly technological, such as a financial market.

Interestingly, the literature on innovation focuses primarily on technological innovations, but does not analyse in what ways technology and its users become entangled to project new forms of agency and redefine what constitutes a financial actor. The literature on regulation focuses more on strictly divided, stable actors than how these actors are themselves agenced. In the regulatory literature, questions still remain about how regulators themselves are constructed

and in what ways their agency is expressed and altered in participation their devices such as rules, internal organizational structures, technological processing, and inter-departmental relations. Understanding in what ways socio-technical arrangements influence the internal cognitive processes and external competitive environment is crucial to understanding where innovative concepts come from, how they are mediated into formal instruments, and finally, disseminated throughout the marketplace.

The lack of attention to socio-technical forms of agency is deepened by the predominant focus of the literature on institutional relationships, which has constructed the research narrative around institutional interests and power struggles. In the innovation literature, market participants are constructing using oppositional formulations: cat versus mouse, oppression versus the free market, innovators versus the regulatory apparatus. This is not problematic *per se*, as this structuring enables competitive relationships to be analysed, but a richer analysis of the intersections between these groups is needed.

The literature on regulation also falls victim to this division in its conceptual framework. Capture theory reduces discussions down to a dichotomy between public and private interests without being able to clearly define what exactly those interests constitute or where they intersect. As a result, this framework has a tendency to define regulators and the regulated as stable and unchanging entities throughout the innovative process. In reality, these bodies are fluid and transitory as they continue to shape and be shaped by their devices, relationships, and networks.

Relatedly, the regulatory literature does not question the resoluteness of the boundaries it has entrenched between regulators, the regulated, the public, and the private. More so, there is no clear method in which to analyse how these boundaries may be broken down to find common

points of intersection. This institutional bias leads to strict divides between bodies without accounting for the extent to which their material and semiotic frameworks may be integrated. A more integrative account of the relationship that exists between regulators and innovators is needed if the *agencement* of the ETF is to be fully understood.

This project seeks to make two contributions to the literature. First, this project will advance the empirical robustness of socio-technical analysis by examining how innovative financial products must be considered *agencements*. This will be achieved by developing a theme that illuminates how innovators and regulators become equipped with socio-technical artefacts. Second, this project will develop a theoretical alternative to the existing regulation theory by constructing a theory of *regulatory agencement*. This theory will assist in breaking down the common assumption that innovation is in an antagonistic relation to regulation, and will focus instead on how regulators are co-constitutive in innovative security design. This second theme will illuminate how innovators and regulators are able to mediate the transition from an innovative product-concept to a formally defined, bounded artefact. Taken together, these two guiding themes - socio-technicality and innovator-regulator relationships - will demonstrate how ETFs ought to be understood as a socio-technical *agencement* and will contribute to the growing literature on the social studies of finance, in which there has been no research on ETFs.

Chapter Three

Methods

The launch of exchange traded funds in the United States inspired the development of a new financial industry that quickly proliferated across North American, Asian Pacific, and European markets. This project is concerned with determining the extent to which the ETF is a product constructed from socio-technical forms of financial agency, two themes of which are (1) the socio-technical agencement of human beings and their devices and (2) the regulatory agencement of innovators and regulators. This chapter will begin with an overview of the guiding themes and research questions, followed by a discussion on research design and strategy. The collected data will be summarized before concluding with a discussion on the organization and presentation of the research findings.

Research themes and questions

As discussed in Chapter Two, the conceptual scheme used to analyse ETFs is *agencement*, which arises from the relationships forged among human beings and their textual, semiotic, and technological devices. The decision to use *agencement* as a conceptual framework came from the preliminary research that showed the subtle yet pervasive involvement of many complex financial processes. The multiplicity of processes involved in the development of ETFs directed focus to the role of relationships in constituting financial artefacts. As a result, this project is not solely focused on documenting one process such as technological innovation. Instead, this project seeks to illuminate the subtle socio-technical relationships that affected decision-making

behaviour and to what extent these relationships had a transformative effect on the financial infrastructure they were operating within.

Preliminary research has demonstrated that there are two important relationships in the construction of ETFs: The socio-technical agencement of actors and their devices that led to technical innovation and changes in market behaviour, and the relationships that developed among regulators and innovators during this process of innovative change. The research has been guided by these two themes and research questions have been developed in response to each theme.

Socio-technical innovation

The first theme identified in preliminary research was the relationship between human beings and their technical devices that were the source for structural change in financial markets.

Examples of this process in the financial markets are numerous: The shift from auditory to visual trading environments (from trading floors to screen-based trading) meant that financial actors were fusions of human beings and their devices. The market was slowly becoming materialized in the trader's monitor, and the market could only be accessed by participation with the monitor. Electronic systems closed time gaps in data transmittal, making participants increasingly attuned to the visual data on the screens - technology became the apparatus through which decisions were made and possibilities negotiated. This increasing participation with technical apparatuses brings individual agents and their technological devices into one *agencement* where previous human-centric actions (e.g. manual stock trading) were combined

with technology to provide extensions and new forms of possibility such as automated, large-batch stock trading.

The socio-technical theme was used to illuminate the *agencement* of actors and their equipment and to examine the extent to which socio-technical relationships were responsible for the construction of ETFs. For example, the preliminary research found that the trading strategies that foreshadowed ETFs began in the early 1970s with a strategy called program trading.⁶⁴ This strategy then evolved into a strategy called basket trading⁶⁵ in the 1980s, which then transformed into index participation units⁶⁶ in 1989, and culminated with the first ETF with 1993. These new and innovative trading strategies seem to have been inspired by technological developments relating to computing and automated trade technologies that made large trades easier and quicker to complete.

While many various trading strategies foreshadowing ETFs have been documented by financial scholarship such as prominent trade publications, they remain largely unexamined by sociological scholarship. Currently, there is room for growth in the research of financial technology and its effects on the trading strategies of market participants. In addition, the relationship between informal trading strategies and the development of financial products remains largely unexplored. As a result, the first theme - socio-technical innovation - was chosen

⁶⁴ Program trading is the practice of buying or selling a group of securities at the same time. Program trading was defined by the New York Stock Exchange as any one trade involving fifteen or more stocks with an aggregate value over one million US dollars. These trades were placed as one single order yet typically involved manually buying or selling approximately one hundred different securities to fulfill the order. See Auerbach & Hayes (1986, 121) for common program trading strategies in the 1970s.

⁶⁵ A basket trade is a single order that automatically traded an entire portfolio of stocks. Basket trading offered an improvement upon program trading as the securities in the basket traded as a single entity – there was no need to break the initial trade into its individual components.

⁶⁶ Index Participation Units were developed by the American Stock Exchange, Philadelphia Stock Exchange, and the Chicago Board Options Exchange from 1987 to 1988. These were sophisticated basket products whose purpose was to track and replicate the performance of a specific index such as the S&P 500 using a combination of securities and futures contracts. All were liquidated shortly after launch due to complex structures that were difficult to understand and regulatory confusion over who was to regulate them.

in order to contribute to this relatively new field of sociological scholarship. The primary question used to guide research and analysis along this theme was: To what extent are socio-technical relationships between human beings and technological equipment responsible for the emergence of exchange traded funds?

Regulatory agencement

The second theme examines the relationship that exists between regulators and innovators. Regulatory devices - the elements that formally construct notions of responsibility in financial communities - are of crucial importance to the qualification⁶⁷ of financial products for they force decisions as to who is to act, when, and under what conditions. More importantly, regulatory structure is a necessary bridge between innovative socio-technical processes and formally defined products. Preliminary research for this project examined the developments that led to the first formal structuring of the ETF product and found that regulatory frameworks played an indispensable role in shaping the socio-technical infrastructure of financial innovation.

Early research unearthed four major developments that related to ETFs: First, the 1975 amendments to the Securities Exchange Act of 1934 that placed a heavy focus on innovating technologies, products, and trading strategies;⁶⁸ second, the jurisdictional conflict between the SEC and CFTC over index innovations and the development of the first formally defined index baskets; third, the developments relating to the structure of index baskets that led to amendments of the Investment Company Act of 1940 and structuring of the first ETFs; and fourth, the 1994

⁶⁷ In this project, qualification is used to describe how an object of regulation is attributed qualities through regulation. See Callon et al (2002) and Callon and Muniesa (2005) for how qualification is used in other approaches within the social studies of finance.

⁶⁸ These amendments may also be cited as the "Securities Reform Act of 1975" in financial literature.

legislation to amend procedures relating to Unlisted Trading Privileges (UTP) in order to promote the ETF structure and market competition for the product.

These events contributed to the development of the second narrative of this project as they focus the analysis on the extent to which the regulatory relationships influenced the emergence of ETFs. The questions used to construct a line of inquiry around this theme were: Is the impetus for financial innovation to find loopholes in regulation as the literature suggests, or do innovators and regulators have a more co-dependent relationship? If it is the case that innovators and regulators are co-constituents of the ETF's innovative process, to what extent could the relationship be considered an *agencement*?

Design, strategy, and data collection

Project parameters

While the first modern ETF in the world was created and launched in Canada⁶⁹ and sizeable ETF markets now exist in every major financial sector in the world, the American market experienced the fastest and largest proliferation of ETFs and pioneered the majority of ETF-related innovations over the past 25 years. In addition, crucial innovations that foreshadowed the first ETF emerged from US exchanges such as the Philadelphia Stock Exchange (PHLX).

⁶⁹ These products were called the Toronto Index Participation Securities (TIPs) and predated the American ETF product by three years. The first TIPs tracked the Toronto Stock Exchange 35 index (TSE-35) and was launched in 1990. This product rolled into another product, the iShares CDN LargeCap 60 ETF, in early 2000.

Geographically, this project will focus on the American financial markets because of their large contribution to both the number of ETF products and the notional value of these products.⁷⁰

Within the American markets, financial exchanges permeate many niches and have materialized markets that range from the historic to the relatively obscure. The traditional giants of American markets were legacy exchanges such as the American Stock Exchange (AMEX), the New York Stock Exchange (NYSE), and the Chicago Mercantile Exchange (CME), to name but a few. In the 1970s, specialized exchanges such as the Chicago Board Options Exchange (CBOE) opened, with many smaller yet highly competitive electronic communications networks and trading pools opening in the decades that followed.

My preliminary document analysis has revealed that the PHLX, AMEX, and NYSE were the frequently mentioned financial exchanges in relation to ETFs.⁷¹ Specifically, ETF-related innovations were most often attributed to the AMEX with great competitive influence from the NYSE. As a result, the analysis of the NYSE-AMEX relationship became crucial to understanding the emergence of the ETF. For example, as will be covered in Chapter Eight, the NYSE and the AMEX had a history of gentlemanly accord guided by the unspoken rule that one shall not interfere with the business of the other. For years, this agreement ensured friendly competition until the AMEX, through their own brand of relationship-building and marketing, became the sole listing exchange of ETFs. As ETFs began to grow in popularity into the late 1990s, the NYSE was forced to invoke rarely-used legislation to begin offering AMEX-listed ETFs for their members. What followed was likened to a war between two superpowers as each exchange attempted to strategically subvert the other in order to attract traders to ETFs.

⁷⁰ As of December 2013, the US ETF market constituted 72% of the global net assets in ETFs. Data provided by ETFGI for the Investment Company Institute. Retrieved from http://www.icifactbook.org/fb_ch3.html

⁷¹ Preliminary documents surveyed are official governmental and regulatory reports, press releases, newspaper articles, and prominent trade publications.

Following the leads from documents and interview data, this project focuses on the developments within the PHLX, AMEX, NYSE, and the authority responsible for their oversight - the Securities and Exchange Commission (SEC).

While the first modern ETF was not launched until 1989, evidence shows that precursory technological infrastructure began entering the marketplace as early as 1970, with the earliest ETF-style product launched in 1989. Thus, to develop an appropriate analysis of the environment that the ETF emerged from, it became necessary to analyse back to the dates when trading technologies began to infiltrate the market and impact the trading strategies employed by market participants. Thus, taking into account the developments in financial technology, trading strategies, and legislation - and for pragmatic reasons of time and resources - and the selected time period will span the years 1970 to 2000. This timeframe encompasses the specific processes that effectively contributed to the financial infrastructure - both semiotic and material - that created the conditions felicitous to the construction and proliferation of exchange traded funds. While ETFs have indeed undergone many changes since 2000, both official reports and empirical data indicate that the years between 1970 and 2000 offer the most substantial developments in the relations forged between technology, institutions, and regulators.

Project structure

This project has been structured as a case study and will focus on constructing a strong historical narrative about the forces in the US that influenced ETF construction. The ETF case

study will be used to represent an instance of the broader phenomenon⁷² of the role of regulation and technology in processes of financial innovation.

Generally, the critiques of the case study approach typically argue that the case study has a tendency to exclude important processes that lead to a larger and more complete narrative (Campbell and Stanley 1966, 6-7).⁷³ This project remains sensitive to these critiques and attempts to address them in two ways: First, by examining in what ways technology and regulation influenced financial innovation in the 1970s to 2000s, and second, by examining the validity of the socio-technical actor (as opposed to the human-centric actor) in financial sociology. This approach will demonstrate how ETFs were the result of a larger market narrative that emphasizes the importance of socio-technical relationships between actors and their devices and the possibilities that these relationships may bring forth. In this project, the case study approach will aid in discovering how complex processes of decision-making affected but one element of the larger market over time.

The particularistic focus of a case study may prevent a researcher from making meaningful applications from their research to broader society. Indeed, the definition of case study in the Dictionary of Sociology includes the statement "...a case study cannot provide reliable information about the broader class" (Abercrombie et al 1984, 34).⁷⁴ While indeed some case studies are unable to produce knowledge that may be widely applicable, this is not to discredit their value for case studies provide the preliminary data without which the study of total

⁷² See alternative definitions of the case study in Black & Champion (1976, 89-94), Nachmias & Nachmias (1976, 42), and Feagin, Orum, & Sjoberg (1991, 2-24).

⁷³ While Campbell's early work claimed that case studies are "illusory" and "of almost no scientific value" (Campbell and Stanley 1966, 6-7), his later writings reveal a softened position that the knowledge from case study research "...is the only route to knowledge - noisy, fallible, and biased though it be" (Campbell 1975, 191).

⁷⁴ Refer to Eysenck (1976) for an example of scholarship critical of the case study approach. Refer to Flyvbjerg (2006) and Walton (1992) for a rebuttal.

complexes of social action is not possible.⁷⁵ Case studies focusing on a particular phenomenon - in this case, the construction of the US ETF market - are able to provide insights into the complexities of the social world that the participants are operating within, grounding theoretical explanations for social action and structures.⁷⁶

Interview data

Mixed qualitative methods using document analysis and semi-structured interviews were chosen for this project. To begin, individuals who held important roles in bringing the ETF to market and those who could help begin a ‘snowballing’ process for potential interviewees were selected for interviews. Keeping in mind the answers I have solicited from interview participants and the nature of my research topic, I am confident that this project remains under the Level One ethical guidelines from the School’s Research Ethics Committee. All participant accounts remained anonymous unless their preferences were clearly recorded to be otherwise.

Participant suitability for this project was determined based on their role in the development and oversight of technical infrastructure, trading strategy and products, exchange operations, and regulatory mechanisms. The individuals selected were considered decision makers in their field, often being C-suite executives, department leaders, or recognized innovators. Due to the geographical concentration of American financial centers, most contacts were found to reside near Chicago, Washington, New York, and the State of California. Initially, the majority of

⁷⁵ For example, Santos and Rodrigues (2009) have critiqued MacKenzie and Millo (2003) and MacKenzie (2006) for their sociological analysis of options. Notably, the authors argue that these cases are too isolated to be relevant to the general market. Despite its particularistic focus, MacKenzie’s case study on Black-Scholes has gone on to generate substantial interest in the performativity of financial models providing a hypothesis that can be tested in other cases.

⁷⁶ Refer to Glaser, Barney, & Strauss (1967) for discussions on grounded theory.

interviews were organized to occur in-person. However, as many of the participants are still actively involved in the markets and travel extensively, many interviews had to be conducted through Skype or telephone.

Online questionnaires were also constructed so exceptionally busy interviewees could work through the questions in their own time. These questionnaires were distributed in addition to oral interviews for some participants whose background was not fully known.⁷⁷ By receiving a detailed professional history of a participant before the oral interview, questions that would be most applicable and useful could be developed. I initially believed that an exploratory narrative is best fulfilled by developing an authentic conversational rapport with participants instead of relying on carefully constructed responses to formal questioning, though this formal questioning yielded extremely useful, detailed results.

Interviewees were selected after conducting a preliminary document analysis of newspaper articles and prominent trade publications from the time period in question. Individuals identified as decision makers in their field were first chosen - these were individuals that often gave interviews or were referenced for their leadership and specialist knowledge. These historical articles were particularly useful in identifying individuals from the PHLX, as their index participation units were launched with great interest from the financial community. In addition to media publications, the 1987 market crash reports commissioned by the NYSE, AMEX, and SEC were consulted and the prominent authors and exchange executives contacted. The 1987 crisis was chosen as a crucial event in the history of the ETF for it appears to be the tipping point for basket-style innovations: The studies commissioned after this crisis were influential in encouraging legislators to promote basket products as a remedy to the poorly understood

⁷⁷ This situation often occurred when potential participants were recommended to me by other interviewees.

program trading strategies of the time. Last, firms that were recognized innovators in the period in question were chosen. This includes the firm that created the SuperTrust and SuperShares products which, while short-lived, were the immediate precursors to the launch of exchange traded funds in the United States.

The majority of interviews were scheduled to occur before archive visits and extensive document analysis took place. There are a multitude of informal discussions that occur between innovators or regulators before official releases, proposed rules, and product applications are presented. The decision to place the interviews before extensive document analysis was to help illuminate these lesser-known processes that construct the decision-making of financial participants. For example, I aimed to determine the extent to which new financial technologies encouraged financial actors to experiment with their trading strategies, and in turn, how these new strategies impacted the relationship between regulatory and market networks. It was the goal to gain a deeper understanding of the events in question in order to most accurately represent the subtle yet pervasive relationships not accounted for in official documentation.

In total, 36 interviews were conducted for this project. Of the 36, 21 were semi-structured oral interviews, 9 were electronic (e.g. formal online questionnaires; questions sent via email), and 6 were informal discussions with participants who did not wish to be recorded or attributed. Interviews lasted from 30 minutes to 3 hours, with the average length being 72 minutes.

Care was taken to ensure there was diversity in participants' areas of expertise. These areas of expertise were categorized as follows: Trading,⁷⁸ financial technology, securities law,

⁷⁸ Individuals with experience in institutional trading, specialist posts, program trading strategies, spreadsheet trading, index arbitrage, index derivatives (options and futures), and ETF trading were contacted.

indexing and modelling, product development,⁷⁹ and exchange operations.⁸⁰ The majority of participants had professional experience in the 1980s and 1990s, and all could be included in two or more of the expertise categories. Of those who had career experiences dating back to the 1970s, the lack of specificity surrounding daily events was problematic. Of the individuals who spoke to their experience in the 1970s, all were still in their early career stages so general, non-technical information was often provided. Because of the general nature of these interviews, a greater reliance on document analysis was needed to bolster the oral histories from the 1970s.

Document collection

The document analysis component of this project was used to investigate how the decision-making processes of rule makers was intertwined with that of the innovators. The analysis focuses primarily on formal documents, speeches, and reports by the American Stock Exchange (AMEX), New York Stock Exchange (NYSE), Philadelphia Stock Exchange (PHLX), and the Securities and Exchange Commission (SEC). Most of the documents pertinent to this project reside in the NYSE Rulemaking Archives (covering the years 1996-2015), NYSE Historical Records Collection (covering the years 1792-2014), the National Archives and Records Administration (NARA) in Maryland, and the SEC Historical Society Archives (covering the years 1792-2015). Some of these documents are digitally archived and may be accessed without

⁷⁹ Individuals who worked on the development of the following products were consulted: Philadelphia Sector index options (SECTORs), Cash Index Participation Units (CIPs), Equity Index Participation Units (EIPs), the Americus Trust, Toronto Index Participation Units (TIPs), the SuperTrust, Morgan Stanley's World Equity Benchmark Shares (WEBs), Deutsche Bank's CountryBaskets, State Street's SPDR ETF suite, iShares' ETFs suite (formerly of Barclays Global Investors), Dow Diamonds ETF, PowerShares QQQ, and Standard & Poor's Dow Jones index concepts.

⁸⁰ Experts in exchange operations include former specialists, exchange executives and board members, and members who led exchange committees on modernization, technology, and development.

special request. Others, such as the NYSE-commissioned Katzenboch Report on the 1987 crisis, are physically archived so appointments were made to pull the records. To obtain SEC documents not available in the archives - particularly, communications between the SEC, PHLX, and AMEX, which were of crucial importance to this project - eight Freedom of Access to Information Requests⁸¹ were filed. Knowledge of these documents came from interviews with individuals who referenced their existence. For any SEC rulemaking documents or releases not available in online archives, the SEC Publication Office was contacted and asked to provide copies.

The document analysis was extended to cover data relating to the construction and design of ETFs. For example, the design of ETFs relies heavily on arbitrage mechanisms to keep the price of an ETF tied to its corresponding index.⁸² There have been sociological papers on arbitrage as a financial mechanism, but none in the social sciences that discuss it as a technical apparatus related specifically to ETF products.⁸³ To offer a contribution in this area, individuals involved with institutional trading desks and known arbitrageurs with the AMEX and PHLX were contacted, interviewed, and asked to supply any relevant documents in their personal archives to support the research. This process greatly assisted in finding documents that relate to the technical systems that developed alongside ETFs and precursory products. Documents relating to

⁸¹ These Freedom of Information Act requests (FoIA) took over seven months to be approved by the SEC Information Officer due to backlogs. Once my requests were accepted, files were transferred from the SEC to the National Archives in Maryland, where they continue to remain uncatalogued. As a result, some records of interest are yet to be located by myself, NARA archivists, or SEC staff, though their existence has been confirmed.

⁸² Arbitrage is the act of simultaneously buying and selling similar assets in different markets or in different forms to profit from discrepancies in prices. For example, if Market X is quoting Stock A for \$10, and Market Y is quoting the same Stock A for \$8, you could purchase Stock A in Y while simultaneously selling Stock A in X, yielding a \$2 profit from the price differential.

⁸³ Refer to Hardie & MacKenzie (2012), Beunza et al (2006) and MacKenzie (2003) for literature on the sociology of arbitrage.

the technical development of ETF mechanisms were used to analyse to what extent socio-technical elements were influential for the emergence of the ETF.

As mentioned previously, the features of official reports represent exceptionally narrow interpretations of the processes under question. Before a rule or amendment is drafted into legislation by regulatory bodies, there are numerous informal phases such as consultations, mediations, and even pilot projects with interested parties. By the time that a decision is reported in an official document, it has reached a ‘final’ stage of implementation. In order to address this issue and provide a more holistic understanding of the decision making processes involved prior to official confirmation, the document analysis will also cover speeches by members of the exchanges and regulatory committees (available through the NYSE archives), letters interchanged between their offices (available through the SEC Historical Society Digital Archives), and trade publications that work independently from these institutional regimes (most of which are available in online databases).

Supplementary documentation to support the interview data took numerous forms. The majority of ETFs in the United States are regulated by the Securities and Exchange Commission (SEC) under the Investment Company Act of 1940 and the Securities Exchange Act of 1934, which was heavily amended in 1975.⁸⁴ ETFs that invest in futures of commodities or currencies are regulated by the Commodity Futures Trading Commission (CFTC) under the Commodity Exchange Act. ETFs that invest in physical commodities and currencies are regulated by the SEC under the Securities Act of 1933. The history of these pieces of legislation - including amendment proposals, call for comments, proposed rules, and final rules - from the 1970s onward were surveyed. In addition, applications, regulatory precedents, regulator commentary,

⁸⁴ The sweeping amendments to the Securities Exchange Act of 1934 are popularly known as the Securities Reform Act of 1975.

SEC hearings, and amended applications for products that foreshadowed the ETF structure were analysed from physical archives, online databases, and interviewees' personal records. For example, an ETF precedent - the Americus Trust - is discussed in Chapter Six. As part of the interview research, I was invited to speak with an individual who was heavily involved in approving the Americus Trust within the SEC. Recall data from this participant was compared with SEC records and the Federal Register to confirm dates, product structure, and its use as a precedent for ETF-style products such as the SuperTrust (Chapter Six). As some early products had as many as five amended applications⁸⁵ and multiple hearings before the SEC before receiving regulatory approval, the legal teams on both the regulatory and applicant sides were contacted.

Marketing material was also beneficial to this research as many of the early products had begun circulating concept brochures to their target audience well before the product was launched. By tracing the marketing history from concept brochures to formal advertisements, the qualification process of the product was further illuminated. In addition, marketing materials from the late 1970s to early 1990s show a direct shift in target audience for basket products from sophisticated institutional clientele to the retail investment advisor community. Analysing the progress in the documented history of the ETF and its precursory products was a crucial supplement to participant accounts of early product development. The documents chosen for analysis were also a vital triangulation mechanism that linked recalled history with formal documented history and product development and marketing.

Throughout the process of data collection, recall data from the oral interviews was recorded and transcribed in full. Any electronic questionnaires that were received were collected and

⁸⁵ Leland O'Brien and Rubinstein's (LOR) SuperTrust product and Deutsche Bank's Country Baskets product each submitted five amended applications before the SEC before approval was granted.

organized in the same manner as the oral data. As the period of interest dates as far back as 1970, it was imperative to be aware that subjects may have been incorrectly describing events and relationships. As a form of best practice, recall data from interviews was triangulated with documented events and recollections from other individuals not in direct relation with one another. This often took the form of supplementing participant accounts of common trading strategies that occurred in various exchanges with documented evidence such as exchange reports and trade publications. To provide an example: Interviewees from the PHLX mentioned that they held meetings with executives from the Toronto Stock Exchange (TSE) about the PHLX's failed index participation unit project. As a form of best practice, executives from the TSE were later contacted to corroborate the events. Materials were then accessed at the physical TSE archives that described how product developers at the TSE used the PHLX products as inspiration for Canadian ETFs.⁸⁶ These events were then analysed to determine whether or not information saturation was achieved.

In summary, a mixed qualitative method was chosen for this project because it encouraged a strong exploratory narrative. Leads found in primary document analysis uncovered individuals who were considered innovators in their field, prompting an initial list for interview requests. The results of the first round of interviews led to previously under-explored documents and still other relevant individuals. I am confident that this mixed-methods 'snowballing' process permitted the conceptual schemata of the project to be fulfilled because of the method's ability to uncover multi-layered processes of innovation.

⁸⁶ The original application for the TIPs and the ensuing communications from the relevant regulator, the Ontario Securities Commission, were provided by the Toronto Stock Exchange archive staff at my request. The documents reference the PHLX Cash Index Participation Units, though none discuss the actual meeting between the Toronto Stock Exchange and the PHLX. Refer to Chapter Five for a discussion.

Data organization and analysis

Interview transcripts were entered into a web-based qualitative data program and relevant passages coded. Once the coding process was complete, popularly recurring themes and events were isolated and examined in detail. For example, each interviewee identified as an innovator was asked where their inspiration for an ETF or a precursory product came from. The collected responses were quite similar no matter the product or piece of technology in question: Inspiration for ETF-related innovation was most often attributed to institutional trading strategies, the transition to fee-based and discount investment, competition for niche products, and new technologies. Responses such as these were collected, coded under a heading such as ‘innovation impetus’, and used to organize the upcoming chapters thematically. Other coding categories that were useful in organizing the data were those relating to the interview participants themselves. Categories such as areas of expertise (e.g. options, specialist/trading, regulation, securities law, automation, indexing, marketing, retail), product experience (e.g. CIPs, TIPs, SPDR, WEBS, CountryBaskets), and institutional associations (e.g. SEC, NYSE, AMEX, PHLX, BGI) ensured that interview data was not weighted to prioritize the innovator or regulatory experience, but to provide - as best possible - an equal weighted representation of industry experience across decades.

It is important to note that the following chapters are not organized in strict chronological order. As this project examines the extent to which the development of the ETF may be considered an *agencement*, relationships are one of the most important subjects of analysis. Thus, chapters have been organized around the transformative relationships of the period in question,

such as the relationship between new financial technologies and trading strategies, and how such processes of relationship building created an environment conducive to the ETF's emergence.

Chapter Four

Constructing a socio-technical environment

Introduction

The ETF did not emerge *ex nihilo*, but was rather created through a unique combination of socio-technical processes including - though not limited to - technological innovation, theoretical developments, repositioning of the regulatory apparatus, and the human beings that underpin all of these entities. Specifically, this chapter will analyse how the introduction of computing technology enabled market participants to develop new ways of participating in the financial markets, establishing an environment felicitous to ETF-style creations. As technology developed and markets expanded in the 1970s and 1980s, traditional stock picking and exchange floor trading partially gave way to the trading of equities baskets and futures and options on entire indices: because of technological developments, actors were able to group stocks and derivatives into a basket and trade its entire contents simultaneously for the first time. With the popularity of such strategies exploding into the 1970s, regulators began to frame the markets in a manner which encouraged technological solutions over the gentleman's agreements of the decades prior, primarily through regulatory overhauls such as the 1975 Securities Exchange Act amendments. In these reforms, the SEC legitimized electronic communications networks,⁸⁷ intra-agency systemization, and encouraged the use of trading technology as a means to add efficiency and liquidity to the markets.

⁸⁷ Electronic communication networks are commonly referred to as ECNs in financial literature.

Analysing this historical transition will demonstrate how the rise of technology reconstructed financial agency from human-centric to socio-technical, or, a unique form of agency realized by humans in participation with electronic devices. This chapter will demonstrate that as the financial marketplace was becoming technologically equipped, financial activity was drastically redefined. New socio-technical relationships between traders and technology created, for the first time, new trading strategies that provided the foundation necessary for the emergence of the first formally defined basket products. The resulting products became crucial precedents to the ETF.

The first section of this chapter will discuss the early attempts at block trading and how the introduction of the NYSE's Designated Order Turnaround (DOT) system affected this strategy. Second, the influence of DOT on basket trading and, later, index mutual funds, will be detailed. Third, the launch of index derivatives and program trading (specifically, index arbitrage and portfolio insurance) will be examined. Last, the relationships between these developments and the SEC will be analysed to demonstrate how technological solutions were becoming institutionalized into the regulatory framework, creating the infrastructure necessary for the technological reframing of market activities to increase exponentially into the following decades.

Building blocks

The emergence of block trading

In the 1960s, brokers and asset managers were stock pickers,⁸⁸ carefully choosing individually stocks to buy and sell based on the belief that they could identify mispriced securities and exploit them for a profit. Simply stated, brokers would search for ‘winners’: underpriced corporate stocks, purchasing shares and selling them off when the price increased to a fair value or above. Foundational to this method of investing was the belief that skilled brokers could ‘beat the market’ and achieve above-average returns for their clients based on their skills in identifying mispriced securities.

During this time, a large-scale trade was referred to as a ‘block’. A typical block trade would consist of a buy or sell order for one stock and average between the thousands and hundreds of thousands of shares. Before electronic trading technologies were introduced, a client’s broker would typically have to work over a period of days or weeks, depending on the size of the block, to execute a client’s block trade in its entirety. This process was lengthy, labour intensive, and costly for both the broker and client as the price of the security would fluctuate with the market, leaving them exposed to risk until the trade was completed. There was also the chance that brokers could inadvertently drive up the price of the stock by their own trading activity, costing their clients more than anticipated.

In this period, there was no automated trading technology to facilitate the movement of a block. For example, if a client requested to purchase 50,000 shares of stock XYZ with their local broker, the broker’s office would send the trade request to their firm’s booth at the AMEX through telephone or teletype. The firm’s booth clerk at the AMEX would then relay the trade information to the broker on the floor of the exchange by using hand signals or writing the trade on a trade slip. If the order was written instead of signed by hand, the paper would then be sent

⁸⁸ The act of ‘stock picking’ also includes choosing amongst various mutual fund managers based on the manager’s stock picking track record. For common strategies employed during this time, refer to Barber et al (2001).

by conveyer belt to the trading floor where the floor broker would receive it. The floor broker would gesture back to the firm's clerk that the order was received and bring the order to the specialist post that handles the XYZ stock. The specialist would time-stamp the order and place it in their rack of open orders until the trade could be executed. Again, this process could take days depending on the size of the order and liquidity of the stock: if XYZ is being thinly traded, 50,000 shares may not be able to be purchased at once, leading to several transactions over several hours or days. When each trade is executed by the specialist, the specialist's clerk confirms the trade with the firm's clerk by delivering a confirmation slip via the AMEX's pneumatic tubing system. Simultaneously, the AMEX data clerk would enter the relevant trade details so that the sale will show up on the ticker and reflect the most recent price of XYZ.⁸⁹

Through the 1970s, markets expanded and blocks grew significantly⁹⁰ as institutions began entering the market and investing substantial capital: institutional stock ownership in NYSE-listed stocks grew from \$11.1 billion USD in 1949 to over \$721 billion USD in 1973 (NYSE Fact Book 1974, 52). To trade these increasingly large blocks quickly and attract more institutional clients,⁹¹ brokers began using their firm's capital to take the opposite side of the trade to immediately execute the block:

⁸⁹ This process does not include the back-office operations. Operations included the buy-side and sell-side brokers comparing their records of the transaction. Each would stamp their respective copies of the trade, exchange the stock certificate for a cheque, and record the change in ownership of the stock. If the stock changes ownership several times in a trading day, a clearinghouse would be tasked with identifying and transferring ownership from the first seller of the day to the last buyer of the day. All trades occurring between the originating seller and terminal buyer are cancelled out by the clearinghouse. See Weiss (1993, 69-72) for a detailed description of this process.

⁹⁰ Block trades greater than 10,000 shares increased from 6.9% of the AMEX's average daily volume in 1970 to 34% in 1985 (American Stock Exchange Fact Book 1991.). Similarly, blocks increased from 3.1% of the NYSE's average daily volume in 1965 to 29.2% in 1979. (NYSE Historical Fact Book 1965-2003).

⁹¹ 'Institutional investors' may include private pension plans, investment companies (e.g. mutual funds), insurance companies, private trust funds, foundations, and educational endowments. For a complete list of institutional investors by type, refer to the Federal Reserve Bulletin (October 1974) or SEC Institutional Investor Study (1971).

If you wanted to *really* sell stock...you wanted to trade with an investment bank because they would buy stock using their capital whereas, unless an order is on the other side...there's no trade (Interview 16).

For example: if a mutual fund manager placed an order to purchase 50,000 shares of XYZ, their broker would sell them 50,000 shares immediately at a predetermined price. In this scenario, the broker would assume the risk of having to later buy the 50,000 shares of XYZ they sold to the mutual fund manager.⁹²

For the largest blocks, brokers would sometimes take days to buy enough stock to cover their short sale⁹³ to the mutual fund manager, risking market fluctuations that would impact the share price. If the price of XYZ were to increase from the price negotiated with their client, the broker would have to absorb the loss. This strategy benefitted the institutional clientele who were guaranteed a set price whether or not the broker drove up the price by introducing the trade to the market. However, despite the advantages of brokers acting as dealers - taking both buy and sell positions on behalf of their institutional clients - block trading remained expensive and time consuming into the early 1970s. Notably, as blocks steadily increased in size and frequency, the ability of specialists to quickly make markets was compromised.

Specialists were charged with orchestrating all trades in their given market. As such, specialists were most often occupied with facilitating small, frequent trades of a few hundred shares or less. While these trades were typically easy to execute, the influx of large blocks to the specialist post stressed their ability to focus on both the small, repetitive trades and the

⁹² The examples using XYZ stock are adapted from a case study analysed in Miller et al (1986, 95-97).

⁹³ A short sale is the sale of a stock by a seller who does not own the stock. In this case, the broker does not own the stock they sell to their client at the time of the transaction. If stock prices fall from the price the broker negotiated with their client, the broker will be able to repurchase the stock at a lower price at a later date, realizing a profit. The opposite is true if prices rise.

movement of large blocks that required more concentration.⁹⁴ If the market they were trading in did not have adequate depth - if it did not have enough buyers and sellers to absorb the trade - the introduction of a large block had the potential to severely disrupt prices (Kraus and Stoll 1972; Litzenberger et al 2012). The SEC Institutional Investor Study (1971) confirmed that the introduction of a block trade almost always resulted in large and unstable price swings, requiring extra care to facilitate the movement of blocks. As a result, blocks began being introduced throughout an extended period of time instead of all at once: as imbalances often occurred at market opening from the outstanding trades the day before, specialists would often delay the opening of a stock to broadly disseminate any remaining imbalances or blocks (Stoll 1988). However, the simple presence of the broker would alert floor traders to the fact that there was a block trade even before the activity appeared on the tape: “Familiarity with the trading techniques of specialists or floor brokers... facilitates the trading activities of the floor trader... Evidence is consistent with the hypothesis that floor trading accelerates price movements that would otherwise have taken place more slowly” (Smidt 1985, 78 in reference to the Report of Special Study of Securities Markets of the SEC 1963).

Technological solutions to block inefficiencies: NYSE and AMEX

To address the issues that came with block trading, the NYSE and AMEX - both having a substantial amount of their business in the 1970s flowing from institutional clientele - began developing technologies that would automate the process to make block trading faster, easier, and less risky to all involved parties.

⁹⁴ Large blocks “...required more care to avoid disrupting the market and causing wide price swings” (Miller et al 1989, 82).

The NYSE launched the first electronic delivery service - the Designated Order Turnaround (DOT) system - in 1976.⁹⁵ DOT was used to transmit orders from brokerage firms to the designated specialist on either the AMEX or NYSE trading floor. Originally, DOT was used to group dozens of small orders of a particular stock - typically orders of 100 shares or less - into larger batches so the specialist did not have to oversee as many transactions. This freed up the specialist's time to concentrate on moving the institutional blocks that often took longer to execute and required more skill in reading the market.

The use of DOT immediately increased the speed of trading on the NYSE. 'Turnaround time' is a common unit of measure that is calculated by the exchange to measure performance of specialists: time begins when the specialist receives an order and ends when they send a report of execution. With the advent of DOT, turnaround times dropped from several minutes to a NYSE-mandated standard of two minutes, further dropping to 0-15 seconds by 1992.⁹⁶ The NYSE allowed the DOT system to handle increasingly large trades due to its early success in lowering turnaround times. The largest trade that DOT was permitted to handle in 1977 was 500 shares; in 1988, this number rose to 99,999 shares (NYSE Working Paper 93-01).⁹⁷

During this period, the AMEX was also developing trading technology to assist specialists in increasing their trading capacity by automating trade transmission and reporting between the exchange and brokerage firms. In February 1976, the AMEX allocated \$55,000 USD to develop a Post Execution Reporting (PER) system. PER, like DOT, came online in March 1977 and enabled trades to be sent from a member firm's local office directly to the relevant AMEX

⁹⁵ Refer to Keith and Grody's (1988) piece for a substantial overview of the NYSE's automation projects during this time.

⁹⁶ The NYSE-set standard turnaround time was lowered from two minutes to 60 seconds on April 1, 1993 (NYSE Constitution and Rules 1992, Rule 103A).

⁹⁷ This data refers to limit orders, which that must be executed at a specific price or better. DOT was permitted to handle market orders of up to 299 shares in 1977, growing to 30,099 shares in 1988. A market order is an order that is filled upon entry on the trading floor as there are no price restrictions.

specialist on the trading floor. For example: if a client of a brokerage firm's office in Florida placed an order to buy 100 shares of XYZ at the market price, the stockbroker would write out the order and give it to their teletypist who would then enter it into the firm's computer. The firm's head office would receive the trade almost immediately. The firm's head office computer system⁹⁸ would then automatically compare the trade request with a list of security symbols and see that XYZ is traded on the AMEX and is of an appropriate size to be sent through PER.⁹⁹ When PER received the trade, the system automatically printed the order at the specialist's post, bypassing the need for trades to be received by teletype or telephone, signalled to the floor broker, walked to the specialist, and sent back to the firm's booth for confirmation. Confirmations were sent electronically from the exchange back to the firm's local office.

The introduction of PER was considered a success and the AMEX quickly permitted larger trades to be submitted electronically. PER was originally introduced with the ability to facilitate orders of 100 shares or less; in the same year, its capacity was expanded to handle market orders of 200 shares and limit orders of up to 400 shares (Bruchey 1991, 81). However, issues still remained that hampered the ability of specialists to move large blocks of stock: the "biggest problem will be communication between floor brokers and booth clerks - we're working on various systems of moving paper and voice communication between these two" (AMEX Automation and Facilities Planning Report, quoted in Bruchey 1991, 82). To remedy these issues, AMEX brought two more electronic trading technologies online: the Open Automated Reports System (OARS) in February 1979, and the AMEX Options Switch (AMOS) in February

⁹⁸ The computer system that handles the routing of orders between member firms and exchanges is the Central Messaging Switch (CMS), which was developed and used by both the NYSE and AMEX. The CMS forwards all orders to the relevant exchange.

⁹⁹ For a detailed description of this computing process and the hardware/software innovated for this purpose, refer to Weiss (1993, 134-144).

1979.¹⁰⁰ OARS processed all market orders that arrived outside of trading hours, matched them electronically, and calculated the imbalances in buy and sell orders for each AMEX stock. OARS was launched with the ability to handle trades of up to 200 shares and was almost immediately expanded to facilitate trades of up to 500 shares. AMOS was similar to PER in that it was designed to automatically route limit orders for options trades between member firm local offices and the specialist trading post.¹⁰¹

As with the DOT system, PER, OARS, and AMOS greatly improved the ability of specialists and floor brokers to absorb the extra volume flowing from the entrance of institutions and their block trades into the marketplace. The amalgamation of trades and automatic order matching freed specialists to focus on the difficult task of moving blocks instead of becoming distracted by the small and routine orders that made up most of their day. As a former specialist and former Governor of the NYSE states:

Brokers ran around the floor with fists *full* of orders. SuperDOT eliminated much of the execution risk...[trading technologies] saved on both execution costs and transaction costs (Interview 2).

However, there still remained issue-specific risk attached to block trading: the isolated exposure to one company made the investor susceptible to company-specific risks such as surprise announcements, takeovers, or other unanticipated events.

¹⁰⁰ AMOS was approved for development in December 1977 but was not functional until 1979.

¹⁰¹ The NYSE and AMEX were not the only two exchanges to pioneer electronic trading technologies. The Philadelphia Stock Exchange (PHLX) launched a similar system called the Philadelphia Automated Communication Execution (PACE) system in 1976, which will be discussed in Chapter Five. The Midwest Stock Exchange launched MAX in 1981, and the Cincinnati Stock Exchange launched NSTS in 1978. Refer to Domowitz (1990, 170) for a complete list of regional automated systems.

Placing blocks in baskets

Increasingly, brokerage firms were transmitting orders from their desks to the exchange floor through computer systems. With a push of a button, a portfolio manager could replace an entire portfolio by automatically sending orders to the various specialists or odd lot dealers¹⁰² that handled the stocks: if a change in economic outlook required the substitution of ten different corporate stocks handled by five different specialists, the computer program would automatically route the orders to the relevant specialist post and wait to receive electronic confirmation within minutes. While individual investors were still most likely to buy or sell stocks one at a time in blocks, institutional clients wanted to trade entire portfolios or groups of stocks at once if market circumstances changed (Miller et al 1991, 82). This shift from block trading to portfolio-based trading was known as ‘basket trading’.

With the advent of technology that automated trading processes - making it faster and less expensive to place large trades - brokers began gathering stocks with similar characteristics into groups with the assumption that the stocks would behave similarly under various market conditions. These groupings of stocks - referred to as ‘baskets’ - could be combined with others to construct portfolios that would be diverse enough to avoid company-specific risk or to target a specific investment goal. For example, an investment manager might wish to construct a well diversified portfolio of stocks for a client. Using this strategy, the investment manager would create a basket of stocks that performs best in bear markets (Basket A) and a basket of stocks that performs best in bull markets (Basket B). With the push of a button, the investment manager may place an order to buy or sell all of the constituent stocks in A or B depending on the market

¹⁰² Odd lot dealers are brokers who will gather all of the odd lot orders of securities from outstanding orders and combine them into round lots. They will then execute trades in round lots.

outlook: if markets are trending up, they may initiate a basket trade to increase the weight of Basket B relative to A, or purchase a new basket, Basket C, to introduce new qualities into the client's portfolio.

Brokers used new computer software to assist them in calculating optimal portfolios: by inputting return parameters, investment goals, and volatility forecasts into systems such as the AAT, a Lotus 1-2-3 based portfolio optimizing package, brokers were presented with optimal basket portfolios.¹⁰³ These basket trading technologies began to emerge in the early 1970s and grew out of the early automation and institutionalization of block trading that required the movement of multiple, large lots of stock. Beginning with the technology that enabled baskets to be constructed, and ending with technology that helped construct portfolios based on baskets themselves, traditional stock selection strategies transitioned to portfolio-based strategies that were conditional on the integration of computational ability with human judgement. In other words, this period of time in the markets was characterized by a shift in agency from predominantly human-centric to socio-technical: the introduction of trading technology not only equipped individuals with new strategic abilities, but shaped their desires to use such abilities by providing improved methods to manage risk, cost, execution, and speed.

Indexing and program trading

Index mutual funds and the first program trade

¹⁰³ AAT - Asset Allocation Tools - was the name of the software developed by William Sharpe. This program incorporated Modern Portfolio Theory and statistical analysis to create what were calculated to be optimal portfolios for any given scenario. This will be discussed further in Chapter Six.

The growing interest in portfolio-based strategies transitioned into index-based strategies as research about active versus passive management performances proliferated.¹⁰⁴ With the introduction of index mutual funds in the mid 1970s,¹⁰⁵ the interest in index-based portfolios was growing. Brokers were increasingly asked to execute hundreds of block trades at once in order to replicate an index. Trades of this nature were called ‘program trades’. Program trades were defined by the NYSE as “...any trade involving 15 or more stocks with an aggregate value in excess of \$1 million [USD]” (Kaufman 2011). The AMEX expanded on this definition to include the stipulation that stocks had to be worth at least \$1 USD per share (AMEX Fact Book 1991). All program trades being routed through the DOT system - later, the upgraded SuperDOT system - were sent through dedicated lines identified by unique mnemonics so the specialist could easily recognize the trade as a program.¹⁰⁶

The fact that brokers began placing themselves on both sides of block trading in the late 1960s was crucial in bringing about program trading. As index funds were becoming increasingly popular, and the performance of index funds is measured from their date of inception on how accurately they replicate an index, index fund managers needed a way to guarantee a purchase of an entire index in one day. Brokers - oral histories have suggested that Salomon Brothers may have been the first - began guaranteeing index fund managers that their fund would own the entire index at the closing prices of their inception date. The broker’s

¹⁰⁴ This transition from active to passive management, while facilitated by technology, was largely rooted in theoretical and empirical observations. These will be discussed in detail in Chapter Six.

¹⁰⁵ The first index-based mutual fund was the Vanguard Index Trust (ticker: VFINX). This fund is comprised of the S&P 500 index constituents and was launched on August 31, 1976.

¹⁰⁶ The identifying information for these trades was catalogued in the NYSE’s System Order Database (SOD). Under the ACCTYP field was the type of trade the specialist was dealing with: program trade, index arbitrage, principal, etc. Under NYSE Rule 115, specialists were not able to disclose any information on orders except to exchange officials.

promise to the index fund manager to purchase all of the index constituents simultaneously was the first program trade (Miller et al 1991, 98) and likely occurred in the mid-1970s:

It was around 1973, or 1974...when index funds began to call us up and read us a list of stocks - 200, 500, 1,000 of them - so we let them log on to our computer, and it would print away. And when it didn't come out fast enough, [Salomon Brothers' block desk manager] would start yelling: "Where's the damn program? We've got a program today!" (Glynn & Hansell interview for Institutional Investor 1988, 5; quoted in Miller et al, 1991).

The broker's promise to their institutional clients to facilitate a program trade was subject to the same risks as their promise to their client to facilitate a block trade. Notably, both scenarios meant that the broker was forced to later buy the stock(s) they shorted to their client, leaving them open to the risk that prices might rise before they had the chance to settle their accounts. However, program trades covered hundreds of stocks at once and were thus subject to less risk from price fluctuations than one stock alone, making program trading more attractive than trading blocks. In addition, brokerage houses were able to charge large commissions on each trade constituting the program:

When I was a stock broker at Merrill Lynch, we charged high commissions. Everyone charged high commissions. You couldn't go anywhere...Basically, we were colluded together, charging the exact same thing so there was no benefit for you to go elsewhere (Interview 9).¹⁰⁷

As the pioneer of an early electronic trading platform confirms:

There was a symbiotic relationship between the market makers at the investment banks and the fund managers to keep trading commissions and trading going from one to the other at high levels (Interview 16).

¹⁰⁷ Commission rates and their link to ETF development will be discussed in Chapter Eight.

Without brokers being able to act as dealers for their clients, program trades would not be feasible due to the time, cost, and risk associated with facilitating each one of these trades individually. With brokers acting as dealers for their institutional clients, institutions received the benefit of guaranteed execution and brokerage firms received the benefit of substantially increased order flows and commissions.

Index derivatives and refinements in program trading

Into the 1980s, there was a sharp increase in the trading of large blocks and equity baskets as trading technologies made inexpensive, fast trades more accessible. While the entrance of institutions' block and basket trading was injecting steady capital into the markets, the liquidity of the stock markets was being negatively affected: that is, with the rapid introduction of large equity basket and block trades, there were often insufficient counter trades to absorb the blocks and baskets efficiently (Interview 6). In addition, investors were looking for a strategy to hedge their equity baskets so as to offset any potential risk they were exposed to in the cash market. As a result, index derivatives were approved for trading in 1982 and found rapid success. In response to these new products and the technology that underpinned them, two new trading techniques developed: index arbitrage and portfolio insurance.¹⁰⁸

The first index derivative was a future launched on the Kansas City Futures Exchange in 1982 that was based on the Value Line Index. Soon after followed the Chicago Mercantile Exchange (CME) with a future on the S&P 500 index which quickly became the heaviest traded

¹⁰⁸ Refer to the NYSE-commissioned report by Nicholas deB. Katzenbach (1987) for a detailed description of all the program trading strategies that were known to have been employed prior to 1988. These include - but are not limited to - duration averaging, dynamic hedging, portfolio insurance, and index arbitrage.

contract on the exchange (Miller et al 1991, 101). In 1983, the first index option was launched on the Chicago Board of Options Exchange (CBOE) and was based on the S&P 100 index, quickly followed by the AMEX's option on the Major Market Index.¹⁰⁹ Futures on the Major Market Index (MMI) were also launched in 1983 and the MMI became the first index with both futures and options contracts.¹¹⁰

These derivative products were made possible by new computing technology that enabled the rapid calculation of data. As a former exchange executive who oversaw the development of index options states:

Computers were used to calculate indexes and disseminate quotes and last-sale information as data-feeds to vendors...Computers supported all our calculation and dissemination of our information to the world (Interview 13).

Electronic technologies increased the number of indices available to the derivative exchanges as well. As an index provider attests:

As different trading venues have become more electronic...more systematized, it does grant a slightly easier access to the calculations of indices. There's no question that as marketplaces become more electronic, they generate more trading data...which allows us to capture more and calculate more (Interview 18).

The introduction and explosive popularity of index options and futures led to new and novel uses of program trading techniques, one of which was index arbitrage.¹¹¹ Put simply, arbitrage is the

¹⁰⁹ The rise in index-based derivatives was not without conflict. In 1983, Dow Jones sued the Chicago Board of Trade to stop its issuance of index futures products using the Dow Jones' name. The lawsuit stated that Dow Jones did not want to be associated with futures "...partly out of fear that the investing public may associate Dow Jones with the highly speculative futures market" (The Board of Trade of the City of Chicago v. Dow Jones & Company, Inc., 1983).

¹¹⁰ For an illustration of how these index derivatives are calculated, refer to Miller et al (1991, 101-105).

¹¹¹ Arbitrage was greatly influenced by finance theory (MacKenzie 2001; 2003; MacKenzie and Millo 2003). The relationship between theory and practice will be explored in Chapter Six.

simultaneous purchase and sale of similar assets: it is a practice where traders will “...attempt to take advantage of spreads that periodically develop between equities,¹¹² futures, and options markets by buying in the lowest-priced market and selling in the highest-priced market” (U.S. General Accounting Office Report on Financial Markets 1988, 4). For example, if the stocks in the S&P 500 index were trading at a discount relative to the S&P 500 futures contract on the Chicago Mercantile Exchange (CME), an arbitrageur would purchase the constituent stocks on the NYSE whilst selling the futures contract, knowing that the prices in both markets would converge at the futures contract expiration.¹¹³ In fact, arbitrage was the primary mechanism through which equity derivatives stayed linked to the underlying market.¹¹⁴

Into the mid-1980s, options and futures based on indices were attracting more volume and the arbitrage practice grew with help from computing systems:

If you look at it, the index options products were *exploding*. I mean...lots of mainly institutional traders were trading them and they were just getting bigger and bigger. Computers were also necessary because of the calculations and the rapid computation of prices...obviously, you didn't want to have to do it manually (Interview 13).

Brokerages such as Miller Tabak Hirsch + Co. coordinated the use of technology and highly experienced floor brokers in order to simultaneously trade the stocks in the Major Market Index alongside the Major Market Index options. As a former employee of Miller Tabak Hirsch + Co. states in their book:

¹¹² The term “equities” may be used interchangeably with “stocks” and “shares”.

¹¹³ Index arbitrage was also implemented if the price of stocks was higher than their corresponding futures contract. However, restrictions on the short selling of stocks - Securities Exchange Act ‘Uptick’ Rule 19a - made this position risky. See also Carlson (2007).

¹¹⁴ Arbitrage reduces discrepancies between futures and cash markets by increasing prices in the market where purchases are made and decreasing prices in the market where products are sold.

[The firm's traders] used the DOT system...for the smaller stocks, bypassing the floor brokers and going directly to the specialist themselves. As most NYSE floor brokers had never before been involved in a program, it was extremely important to find brokers with the right frame of mind to be able to quickly delegate a group of stocks to the proper posts (Miller et al 1991, 105).

With the advent of index derivatives and increasing coordination between trading floors and trading technologies, firms were able to easily monitor options, futures, and cash market levels and exploit arbitrage opportunities across them.

The technology involved in index arbitrage was vitally important to its emergence and the institutions it attracted. Generally, a successful arbitrage trade requires recognizing the environments in which discrepancies between similar markets arise. For example, volatility is known to create arbitrage opportunities as it causes similar markets to move independently from one another rather quickly and with a large increase in volume. Next, index arbitrage required an identifiable trigger point: that is, a point where the divergence between the assets would make a trade profitable.¹¹⁵ Last, arbitrageurs required the ability to identify discrepancies and execute trades between the prices in derivative and cash markets within seconds, as prices tend to normalize extremely quickly.

To successfully execute a program trade of this nature, index arbitrageurs used computer systems that were programmed to track prices in stock and futures markets and alert traders when a profitable arbitrage opportunity arose. Once an index arbitrage opportunity was identified, member firms of the NYSE would use the newly upgraded SuperDOT system¹¹⁶ to exploit the price divergence:

¹¹⁵ Transaction costs were also factored in to the price divergence to discern trade profitability.

¹¹⁶ Regional specialists used the Intermarket Trading System to conduct index arbitrage: "The ITS became a means that regional specialists could arbitrage the primary market" (Interview 4). The ITS was the original software that linked eight member exchanges (NYSE, AMEX, PHLX, Boston, Cincinnati, Chicago, Pacific, and the NASD OTC) so that participants could see the bid/ask prices at all venues and seek the best price at other exchanges for eligible

Prior to [DOT/SuperDOT], baskets of stocks were traded by having pre-printed tickets at the stock booth at the NYSE and sent out to the pits as corresponding index trades were made or at expiration. As a result, indexes like the Value Line 1500 were usually traded using optimized baskets. By using the SuperDOT, traders were able to execute strategies quicker and more efficiently (Interview 4).

‘Portfolio insurance’ was a second technique that emerged from program trading technology and index derivatives. Portfolio insurance limited downside risk in bear markets while protecting gains if stock prices rose, guaranteeing a minimum price of an investment.¹¹⁷ During falling markets, investors were urged to decrease the weight of stocks relative to cash in their portfolios in order to limit losses; during rising markets, the weight of stocks in the portfolio was increased to capture the most gain.

Most portfolio insurers traded in index futures and not the stock market for three reasons. First, insurers could buy and sell stock index futures much more inexpensively than they would be able to purchase the hundreds of stocks that underlie the index. Second, many of the institutions that provided portfolio insurance were not authorized to trade stocks on behalf of their client accounts, making futures markets their only option (Brady Report 1988, 7). Third, trading futures meant that portfolio insurers could be protected from losses on stock prices without actually owning the physical stocks. Using futures - typically a more liquid market - insurers could freely place large buy and sell orders without worrying about the liquidity crunches that the stock markets could be subject to.

listed securities. The ITS was legislated in 1975 and became active in 1978. See Clary (2003) and Lee (1993) for a detailed account of this system’s development.

¹¹⁷ Portfolio insurance will be discussed in greater detail in Chapters Five and Six. There are many forms of portfolio insurance, such as buying put options or dynamic hedging. These are discussed in detail in the Report of the Presidential Task Force on Market Mechanisms - commonly referred to as ‘The Brady Report’ (1988).

With early program trading, computers were able to facilitate and increase the speed of human decision making by alerting brokers to trading opportunities and allowing them to put a program into effect within seconds. Portfolio insurance made use of computer models to calculate the optimal stock-to-cash ratios at various market prices: for example, the typical portfolio insurance model suggested that for every 10% decline in the market, client portfolios should sell upwards of 20% of stock (Brady Report 1988, 29).

When the market hit a predetermined level, the broker would initiate the portfolio insurance strategy: “You push a button and bam, there it goes! There’s absolutely no regard for values, just strategy” (Interview in Auerbach & Hayes 1986, 121).¹¹⁸ However, these models were not run continuously because the transaction costs involved with the continual re-optimization of client portfolios would be expensive, even in the futures market. Thus, the models were run at the broker’s discretion - either periodically or during large market fluctuations - and the broker would use the results to make the rebalancing trades in large batches (Garcia 1987; Carlson 2007).

Traders and technology: Socio-technical extensions to agency

The introduction of electronic technologies to the financial markets throughout the 1970s and 1980s occurred rapidly and greatly transformed participants’ desires for particular strategies and the manner in which trading was done. A glance at the historical introduction of electronic technologies that made trading faster with less execution risk saw traders experiment with

¹¹⁸ This is echoed in the Brady Report that describes how portfolio insurers bought and sold “without primary regard to price” (1988, 41).

moving increasingly large volumes and types of stocks simultaneously. The ability to move large blocks with increased speed led to grouping these blocks into baskets, and trading all of the basket's constituents with the push of a button. As the popularity of basket trading surged, portfolio modelling software was introduced which made basket construction user-friendly and the monitoring and rebalancing of client portfolios easier. As technologies such as the DOT improved the ability of specialists to facilitate the movement of large institutional trades, more institutions became attracted to the market and requests to trade the constituents of entire indices began crossing trading desks. Experiments into program trading around indices required an increased reliance on computers to monitor prices, calculate index levels, and notify brokers to any substantial changes that could be an opportunity for profit.

As discussed, there were three primary strategies that emerged in the 1970s and 1980s from the experimentation with trading technologies: block trading, basket trading, and program trading. The shift from block to basket trading was made possible by technological solutions that reduced execution risk and increased the efficiency of traders to monitor market activity and execute increasingly large volumes of stock without disrupting prices. Basket trading eventually grew into trading thousands of stocks simultaneously, and when combined with the growing prominence of modern portfolio theory,¹¹⁹ the first index mutual fund was created. With the advent of index derivatives, experiments into program trading flourished - requiring computer software to monitor prices and alert traders to price discrepancies within seconds - and products such as portfolio insurance cascaded into the market.

The transition from manual (human-to-human) trading to computer-assisted trading drastically changed the types of trades that could be made (from basic block trading to index

¹¹⁹ The impact of finance theory on ETF-era developments will be discussed in Chapter Six.

arbitrage) and the products that were available (index mutual funds, portfolio insurance, and portfolio optimizing software). With the introduction of trading technology, increasingly large and diversified stock trades began occurring and the desire to conduct such trades increased as technology became more integrated in the market. Throughout the 1960s to 1980s, a shift from individual stock picking to portfolio-based solutions began occurring as technology enabled new strategies which, in turn, inspired new products such as the index mutual fund.

Perhaps most notable in this transition is how trading technology was integrated into the market structure and began shifting the process of trading from human-based agency to socio-technical agency. Once computers were introduced to enhance the trading process, strategies emerged that were constructed around computing capabilities. In addition, the cognitive process involved with trading became increasingly reliant on computing technologies that, for example, calculated second-by-second arbitrage opportunities for program traders, or the optimal stock-to-cash ratios given real-time market levels for portfolio insurers. The more stocks within an index, the less likely it was that human calculations could keep pace with price fluctuations - without computing technology to monitor market levels, and automated systems to trade thousands of stocks with the push of a button, program trading would not be possible.

It is crucial to note, however, that this does not mean that human agency was being replaced with technology, nor does it mean that human beings simply used technology to assist them when convenient. The historical transition from human to socio-technical trading is unique in that human beings and their technologies were co-constitutive in the development of the financial strategies and products discussed above. Without the DOT system, for example, ordering thousands of trades at once would be impossible, just as without a trader's expert capability to read the markets and decide the exact time to deploy a trading strategy, trading

technology would be useless. Traders and their technologies gradually entered a relationship where each extended the capabilities of the other, introducing a new form of socio-technical agency that enabled new basket-style products to flourish. It was not just the traders' use of technology that extended their agency, but the fusion of human decision making with technological capability that produced new abilities and ways of thinking about the market.

Certainly, it remained the trader's prerogative in the 1980s to make the ultimate decision as to whether or not to initiate a trade: the rapid embedding of technological solutions in financial markets does not necessitate technological determinism. Throughout the automatizing process in the 1970s and 1980s, financial markets began reflecting socio-technical forms of agency: computer systems were developed by traders who, in turn, used such systems to create strategies and products that were reliant on the early computing infrastructure. As a result, humans and their technical devices began acting as one market participant so that a 'financial actor' was redefined from a purely human decision maker to a socio-technical one: the socio-technical *agencement* that occurred was irreducible back to its constituting elements. It was this shift, in addition to regulatory reframing - discussed below - which greatly transformed the marketplace into an environment where complex index-based products such as the ETF were possible.

Reframing Regulation

The confrontation with automation

From the 1930s to the 1970s, the regulatory culture within the American financial system experienced relatively little restructuring. In response to the debilitating 1929 market crash that

unearthed massive manipulations and fraud,¹²⁰ congress established the Securities Exchange Commission (SEC) as part of the Securities Exchange Act of 1934 (15 U.S.C. 78c(a)(3)) in order to provide governance over securities transactions and exchanges and rehabilitate the financial markets in the eyes of the investing public. Resulting from the 1929 crash, a lengthy depression that saw industrial production decrease by over fifty percent (Bruchey 1991, 24) gripped the American markets. However, the post-war optimism of the 1950s saw a recovery of the American financial system and skepticism over the regulatory authority of the SEC was expressed by some of America's largest corporate managers.¹²¹ In response to this skepticism, the SEC focused on maintaining the status quo and institutionalizing itself by gaining the continued support of Congress, forcing little regulatory intervention until the 1970s.

The first major regulatory actions that the SEC took in this period were in regards to new trading technologies. While the transition to technological solutions appeared to occur relatively unimpeded, the SEC had been struggling to find ways to assess and incorporate these developments into their regulatory frameworks as early as 1969. As a former attorney with the SEC recalls:

All of a sudden, these products were coming about...and we had to start thinking about the current reality of life as opposed to what it was in 1940. Most of the statutes in the '30s and '40s - you came up with a statutory scheme and that was more or less it. (Interview 22).

¹²⁰ Such as the fraud by companies such as Kreuger & Toll Inc., who created a pyramid scheme to gain a monopoly of the match market; McKesson & Robbins Inc., who fabricated financial statements; and Richard Whitney's embezzlement scheme. Refer to the U.S. Senate Resolution No. 84 (and later, No. 56) that created the Pecora Commission. This Commission was tasked with investigating the fraud that precipitated the 1929 crash. Available online through the U.S. Senate online library:

<https://www.senate.gov/artandhistory/history/common/investigations/Pecora.htm#Outcome>

¹²¹ For a detailed discussion on the institutionalization of the SEC and the corporate skepticism of the SEC in the decades prior, refer to Teed (2013), Bealing et al (1996), and Merino (2003).

Instinet was proposed to the SEC in 1969 as an electronic system that would enable institutions to trade blocks directly with one another through computer linkages. As Instinet would facilitate anonymous institution-to-institution trading, there was no need for traditional exchange participants such as brokers or specialists: institutions would simply enter their offers, acceptances, or counter offers, and the block trades would be cleared through the Bank of New York (SEC Memorandum on Instinet and Exchange Registration, 1983; Instinet Press Release 1983).

As the first system of its kind, Instinet challenged the legal definition of an exchange - a definition that had remained unchanged since the 1934 Securities Exchange Act was drafted:

Any organization, association, or group of persons, whether incorporated or unincorporated, which constitutes, maintains, or provides a marketplace or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by an exchange (Securities Exchange Act Section 3(a)(1)).¹²²

Specifically, the SEC attorneys within the Division of Trading and Markets were apprehensive to categorize Instinet as an exchange because it was not clear that Instinet was a facility that performed the common activities of an exchange (SEC Division of Trading and Markets Memo 1969). Specifically, Instinet was for-profit, unlike the exchanges of the time. In addition, the purpose of Instinet was to automate the block trading process that brokers would traditionally use: just as firms would typically canvas potential clients to arrange block trades, Instinet would utilize computers so institutions could automatically trade blocks anonymously without going

¹²² Refer to Lee (1998) for an exceptional overview of how we are to understand what an exchange is and how this concept has developed over time.

through a traditional exchange. Because of this, legal teams argued that Instinet fit better within the 1934 Securities Exchange Act definition of a broker:

The term “brokers” means any person engaged in the business of effecting transactions in securities for the accounts of others (Section 4(a)).

After deliberations over which definition was most appropriate, Instinet was registered with the SEC as a broker-dealer (Securities Exchange Act Release No. 8661, 1969),¹²³ though many uncertainties remained. As discussed in an inter-agency memo: “...it is unclear how many [subscribers] have access to Instinet trading facilities...Two new [Instinet] services may be either operating or in the works...The size of orders subject to the guarantee is not certain...” (SEC Memorandum on Instinet and Exchange Registration 1983). The degree of uncertainty surrounding new automating technologies was overcome by developing a new rule that would require any further automated trading platforms to register as an exchange, which would allow increased regulatory oversight than would be possible if they were registered as a broker-dealer: “Allowing private development of these systems subject to minimal and irrelevant regulation as a broker-dealer appears inappropriate” (Securities Exchange Act Release No. 14674, 1978; SEC Memorandum on Instinet and Exchange Regulation 1983).¹²⁴

This new rule¹²⁵ required any new automated systems to be registered and monitored by the SEC as exchanges, giving the SEC enhanced surveillance over their activities (Securities Exchange Act Release No. 8661, 1969). As a result, electronic platforms such as PACE,

¹²³ See also the SEC Division of Trading and Markets Memo (1969). The Division of Trading and Markets was the first to protest Instinet’s registration as an exchange due to the resemblance of its purpose to that of a broker-dealer.

¹²⁴ Specifically, the Market Surveillance staff of the SEC “maintains a continuous watch of transactions on the stock and options exchanges and reviews reports of large block transactions...it also monitors financial news tickers, financial publications and statistical services” of registered exchanges (43rd Annual Report of the SEC 1977, 168).

¹²⁵ SEC Rule 15c2-10 was proposed to be written into the Securities Exchange Act of 1934.

SCORE, and MAX - while strikingly similar to Instinet - were regulated as exchanges instead of broker-dealers. This, however, did not abate the regulatory confusion over how integrate new technologies into the existing legacy frameworks: “Why are these exchanges? ...I can’t offer any easy answers” (SEC Memorandum on The Regulation of Instinet 1983).

This provisional rule stood until the 1975 Securities Exchange Act amendments were passed and exemptions to the definition of an exchange for automated platforms were introduced so that many innovative automated trading technologies could apply with the SEC for a no-action letter (Securities Exchange Act §240.3(a)(1)). Alongside the exemptions, the SEC outlined simple standards for new automated systems, indicating the preferred characteristics of the platforms they were likely to approve.¹²⁶ The inclusion of exemptions to the definition and minimum standards in 1975 was one of the earliest attempts by the SEC to be more flexible in its approach to governing technological-based solutions in the market. As a former SEC attorney tasked with granting exemptive relief to these innovations explains:

Without broad exemptive policy...[regulation] starts becoming very creaky and very anti-innovative. It eventually causes both competition to come to a halt and to have the true interests of investors to have modern products available to them in a modern way defeated. So for us, in part, [granting exemptions] was implementing the way the Act was designed to be (Interview 22).

As a result of the amendments, entities that had problematic negotiations with the SEC over their introduction of automated technologies were finally granted exchange status for their systems: platforms such as the Cincinnati Stock Exchange’s National Securities Trading System (NSTS) came online in June 1978 after years of struggle over definitions and applicability of rules

¹²⁶ Automated systems must be “A) non-discriminatory in admitting order entry subscribers; B) Of no burden on competition; C) Consistent with the National Market System; and D) in the public interest and consistent with the best interest of investors” (Securities Exchange Act, Rule 11Ac1-3).

regarding exchanges and broker-dealers. Without the SEC providing exemptions to their historical definitions, the earliest automated trading platforms that were so crucial in assisting basket and program trading strategies to proliferate may have been registered as broker-dealers, impacting their ability to introduce new technologies for exchange-style trading.

The 1975 Securities Exchange Act amendments

The amendments of 1975 were the starting point of a heightened focus on the adoption of innovative technologies: the legislators who voted in favour of the amendments - notably, the specifications relating to the National Market System and automated trading platforms - understood that they were voting in favour of "...a system in which the nation's securities markets would be linked by the maximum use of computers and communications technology... [Congress] merely wished to encourage the acceleration of a process already well under way by having the SEC remove impediments to its further development" (Bruchey 1991, 63).

The regulations to encourage innovation consisted primarily in removing barriers to entry for new products, strategies, and technologies. For example, the mandate for a National Market System¹²⁷ resulted in the development of the Intermarket Order Routing System, whose platform consisted in a national market where participants could see the bid/ask prices at seven exchanges¹²⁸ for eligible securities. While the intermarket system could not guarantee traders the best price, exchanges attracted volume by guaranteeing trade execution (Lee 1993), enhancing

¹²⁷ The National Market System was an agreement to establish an electronic link between exchanges that enabled participants to see the bid/ask prices across all venues. For detailed information on the development of the National Market System, refer to Clary (2003), Exchange Act Release No. 14661 (43 FR 17419), Exchange Act Release No. 15058 (43 FR 36732), and Mendelson (1979).

¹²⁸ The American, Boston, Cincinnati, Chicago, New York, Pacific, and Philadelphia stock exchanges were the original participants.

the efficiency of markets through competition just as the SEC originally intended. This competition was further enhanced through regulatory changes in 1978 that sought to include OTC markets in the intermarket linkage (SEC statement, *supra* note 5, at 4358, 1978).

Moreover, 1975 legislation paved the way for unlisted markets such as the Island ECN and NASDAQ to launch their independent trading systems for rule 19c-3 securities.¹²⁹ In 1980, SEC took the final step to remove off-board trading restrictions for newly listed securities (Rule 19c-3 Adoption Release, *supra* note 17 at 49-53), allowing firms in NYSE and AMEX to make over-the-counter markets¹³⁰ in eligible securities. These developments were consistent with the SEC's regulatory purpose: "...not to force structural change but instead provide a regulatory environment in which alternative systems may be implemented and used where market forces prefer them over traditional means" (SEC Commissioner Ketchum, 1989).

The regulatory shift to encourage the adoption of technological innovation inspired new products and strategies such as index futures in 1982. When the Chicago Mercantile Exchange was approved to launch the S&P 500 index futures in 1982, a practice that became known as 'exchange futures for physicals' developed where investors exchanged stock positions for positions in index futures, hedging their portfolios and creating new arbitrage strategies. The SEC's encouragement of index trading contributed, in part, to high volumes of trade that created a derivative equity market with enough liquidity to accommodate institutional investors and their new program trading strategies: "...because index futures and index options create greater liquidity, institutions can trade billions of dollars of synthetic equities at a lower cost, and with

¹²⁹ An example of the off-board platform was the NASDAQ-developed Computer Assisted Execution System (CAES), an automated execution system for NASD inter-dealers. NASDAQ routed firms' orders for listed securities through CAES to receive automatic executions against third market makers. In 1979, SEC only permitted the trading of stocks listed after April 26, 1979 - referred to as Rule 19c-3 securities.

¹³⁰ Over-the-counter (OTC) markets are markets where the trading of stocks, currencies, or commodities happens directly between two participants instead of over a centralized exchange.

greater efficiency, than institutions can trade in the underlying stock market”¹³¹ (Kerr & Maguire 1988, 997).

The shift in regulatory outlook that began occurring in the 1970s was perhaps best summarized by one of the SEC’s commissioners:

Beware of luddites...Their response to the markets’ problems would involve turning back the hands of time and freezing our markets in a 1950-ish environment...The future lies in innovation: in innovations that adapt markets and regulations to changing patterns of demand and technology (Grundfest 1988, 12-15).

Procedural and theoretical reformations

Concomitant with the 1975 Securities Act amendments was a sweeping internal reorganization at the SEC. This reorganization incorporated new technological and cognitive approaches to regulation and assisted in reframing the regulatory focus on technological-based solutions to market issues.

Prior to the technological turn in the 1970s, the SEC offices were paper based and struggling to keep pace with their bureaucratic workload. Described as a “procedural mess”, SEC division offices were known to have “piles, *piles* of paper, five feet high all over the place” containing files with applications that had been waiting over a year to be reviewed (Interview 22). As an innovator’s private counsel states:

[The SEC] can delay consideration for a very long time even before getting to formal proceedings. I’ve dealt with things that were, quote-unquote, ‘in

¹³¹ In 1988, the combined markets for index futures and index options traded approximately \$25 billion per day. Stocks traded on the NYSE amount to an average \$8 billion per day (Kerr & Maguire, 1988).

discussion' for three plus years. Lots of people will give up when faced with those types of delays (Interview 29).

Of the files with applications that had been started, there was no organized system to look up precedents or applicable statutes. This resulted in disorganization, slow processing times, and a staff that relied on using no-action letters to regulate instead of exemptive orders.¹³² Prior to the 1980s, it was not unusual for a file, on average, to take three months to be issued a no-action letter from the point it was picked up by a staff attorney, though often this process was much longer. No-action positions were almost always taken in respect to files that would typically need exemptive relief because it was faster to find a relatable precedent than bring a file to the (very reluctant) Commission and ask for a full hearing - a requirement for any exemptive order. As a former SEC attorney explains:

Originally all exemptive orders...had to go through the SEC and have an actual hearing and you went to the Commission and the Commission voted...Mind you, they didn't really want to hear it. You have a group of five folks who are very, very busy and who do not want to be involved in administrative stuff (Interview 22).

Because of this, innovators that should have been applying for exemptive relief were applying for no-action letters and "seeing how much they could get away with" (Interview 22) instead of forcing regulatory intervention through exemptive orders.¹³³

In response to the growing political role of the SEC, top management was changed and began to introduce new systems and ways of theorizing the role of the regulatory apparatus in the

¹³² No action letters are generated by the SEC in response to a proposed plan of action that has been submitted by a regulated member. No action letters state that the SEC will not take legal action against the member if they decide to continue with their proposed plan. Exemptive relief is required when a regulated member must be exempted from SEC rules. This often occurs for new products that do not fit the current definitions outlined in SEC legislation.

¹³³ This point is of particular importance to The SuperTrust development and application process, which will be discussed in Chapter Six.

US markets: “It was like...housekeeping 101” (Interview 22). Within the SEC, the introduction of computing systems impacted internal organization and decision making:

When I came back to the SEC in '87, there were two computers in the investment management division. One of them was in [an executive's] office, and she didn't know how to use it...If that was '87, by '92 everybody in my division had a computer, and I prohibited them from giving their secretaries things to type longhand (Smythe interview 2011).

Specifically, computers were used to create databases so staff attorneys could see a product's initial date of filing, response letters, applicable precedents, and other related information. This led to the streamlining of processes - specifically for new product applications - and was crucial to hastening the innovative process surrounding basket and derivative instruments. As a securities attorney states:

The biggest development [in ETF history] has been the development of the streamlining of the processes... and clearing up what products the SEC will and won't approve is something that's been very important to the industry (Interview 29).

This process streamlining occurred in tandem with a gradual change in perception about the role of the regulatory apparatus in the American markets:

You see, the SEC was changing. The whole nature of communications was changing...It was so blindingly apparent that this whole notion that you were going to sit there like some apparatus and control information was being blasted to shit by reality (Interview 22).

Faced with internal challenges over how to govern the rapidly changing structure of the financial markets, the SEC began relaxing its approach from a stamp-based paper process to an ideas-focused process (Interviews 22, 29). The SEC directors also began encouraging their

division staff to be more flexible and think outside their rule-based processes to find solutions to institutionalized problems - specifically, how to account for and integrate technological solutions in the regulatory framework.¹³⁴ Internally, computing technologies made the approval processes faster and more efficient, albeit only after a steep learning curve (Smythe interview 2011). Computing technologies increased attorneys' capacity to review files and spend more of their time theorizing about the impact of exemptive orders instead of churning out as many no-action letters as possible (Interview 22). Gradually, regulatory thinking shifted and traditional beliefs that the SEC could have centralized control relented. In its place, greater writ was passed to various divisions of the SEC and managers promoted critical thinking instead of strict adherence to rules. While this strategy would assist the SEC in navigating one of the most prolific eras of financial innovation in recent history, it also caused conflict with other regulators and within its own Commission. These conflicts will be discussed in Chapters Five and Six.

The shift in internal processes towards standardization and streamlining occurred alongside a conceptual shift in the role of regulation from that of a paper-pushing process to a forward-thinking, solution focused process. Mirroring this shift was the increased flexibility the SEC granted to technological innovators through the 1975 Securities Act Amendments, where their desires for particular technological characteristics were formally expressed. Internal streamlining, focusing on solutions to inefficiencies, and flexibility in rule interpretation were integral to repositioning the SEC as a regulator that embraced and encouraged technological innovation.

Culminating with the Securities Act Amendments of 1975, the SEC successfully positioned itself as a regulator that encouraged innovative practices in efforts to enhance fair competition,

¹³⁴ This process was not without conflict. For a detailed overview of the conflict between the various SEC divisions and how this impacted product development, refer to Chapter Six.

technological innovation, and new product strategies. Alongside these developments, the AMEX created the New Product Development division, headed up by Nathan Most and Steven Bloom, and the NYSE quickly followed suit by appointing a head of Product Development and Strategy. This was the start of a new regulatory era for the American exchanges that led to the most explosive new product growth and technological innovation in decades, successfully - albeit gradually - shifting the markets away from legacy arrangements to competitive relationships and innovative product designs. In short, this era of regulatory repositioning began to frame the markets technologically, further encouraging the socio-technical transformation of products that were efficiently able to increase liquidity, trading size, and transparency - key characteristics of the first ETFs.

Chapter Five

“If you aren’t the biggest, you have to be different, and we were the best at different”: Regulatory conflict, financial crisis, and the first ETF¹³⁵

Chapter Five will analyse the regulatory climate in the United States between the 1970s and 1990s. Particular focus will be paid to the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) and their handling of the October 19, 1987 market crisis (also known as Black Monday). Of primary analysis will be the ongoing disputes between the SEC and CFTC and how the sustained conflict affected the development of the first ETF product concept.

This chapter will begin with a brief overview of the market crash on October 19, 1987 before moving on to discuss the regulatory climate that existed between the SEC and CFTC and how each regulator reacted to the crisis. Next, it will be demonstrated that the first ETF in the world, the Philadelphia Stock Exchange’s Cash Index Participation Unit (CIPs), was a result of two factors: first, the socio-technical environment created by the rise of computing technology in the decade prior, and second, the response of regulators to the 1987 crisis. The regulatory treatment of the CIPs innovation - such as the SEC-CFTC lawsuit and subsequent delisting of the CIPs - will be discussed for its role in establishing an important precedent for basket product developers moving forward. The concluding analysis will explain how innovators and regulators participated in constructing the first formal definition of an exchange-traded product. This analysis will challenge traditional conceptualizations of innovators and regulators as competing bodies and instead demonstrate how they were co-implicated in the ETF’s agencement.

¹³⁵ A former Executive Vice President at the Philadelphia Stock Exchange explains how the exchange remained competitive against giants such as the NYSE. (Interview 6).

The 1987 Financial Crisis

*October 19, 1987*¹³⁶

From 1982 until the crash at the end of 1987, stock markets in the United States were performing strongly, with their growth largely attributed to the flood of international¹³⁷ and institutional investors into the market that increased buying pressure (Katzenbach 1987). However, markets rallied so strongly up to 1987 that analysts began commenting that stock prices were dangerously overvalued and were no longer at sustainable levels (Anders and Garcia 1987; Carlson 2007). Between January and August 1987, for example, the Dow Jones Industrial Average (DJIA), an index of the 30 largest stocks trading on the NYSE and NASDAQ, increased by 44 percent, igniting concerns over a market bubble.¹³⁸

Prior to the fall in October, institutional investors employed portfolio insurance strategies in order to guarantee a minimum value for their portfolios.¹³⁹ In 1987, the Chicago Mercantile Exchange reported that 93% of the trading in their S&P 500 index futures were done by institutions, accounting for the vast majority of S&P 500 index futures volumes on the exchange (Market Reform Hearings 1989, 105; Benson 1991, 1195).

¹³⁶ The events that unfolded in October of 1987 have been covered in depth by innumerable sources in popular media, academia, and private industry, so only pertinent details will be discussed in this project. For an excellent synthesis of the full events in October 1987, refer to the Brady Commission (1988), Shiller (1989), and the Federal Reserve Board's Finance and Economics Discussion Series on the 1987 crisis (Carlson 2007).

¹³⁷ Refer to the US Commerce Department's historical figures on foreign investment levels for detailed data on the early 1980s influx of foreign investment into the US markets, available at: www.commerce.gov/economicindicators.

¹³⁸ Asset bubbles are "an economic development in which the price of a class of...assets (such as houses or securities) rises to a level that appears to be unsustainable and well above the assets' value as determined by economic fundamentals. Bubbles typically occur when investors purchase assets with the expectation of short-term gains because of rapidly rising prices" (Congressional Budget Office 2012, 2).

¹³⁹ Portfolio insurance will be discussed in detail later in this chapter as well as in Chapter Six.

The events that precipitated the drastic fall on Monday, October 19 began in early October when popular media began commenting on the unsustainably high performance of the financial markets. Concurrently, the federal government announced there was a substantial trade deficit, which devalued the US dollar and increased interest rates, causing markets to begin large scale sell-offs beginning on October 14. As stated in a testimony presented to the U.S. Senate Banking Committee, the Federal Reserve Chairman, Alan Greenspan, stated:

The bull market of 1987 had brought stock prices to levels which stretched to incredulity...Something had to snap. If it didn't happen in October, it would have happened soon thereafter (1988).

On October 16, the DJIA dropped 4.6% (108.35 points), incurring the largest one-day loss in its history, while the US Treasury Secretary stated he was considering de-valuing the US dollar in order to alleviate the larger-than-expected trade deficit. Between Wednesday, October 14 and Friday, October 16, index arbitrageurs became more active, moving from 6.2% to 13.4% of total selling volume on the NYSE (CFTC Final Report 1988, 38).

When markets opened on Monday, October 19, the Dow crashed by 22.6% (508 points). There were reports of traders racing one another to the trading floors to sell their stocks as news of market crashes in Asia began to surface in the early hours in New York: "There was so much psychological togetherness...It was a little like a theatre where someone yells 'Fire!'" (Andrew Grove interview, in Bernhardt and Eckblad 2013). As institutions using portfolio insurance strategies represented a substantial portion of the markets, their programmes hastened the speed at which the October 19 crash occurred: "An initial price decline started a vicious circle by causing portfolio insurers to sell, causing further price declines, causing portfolio insurers to sell

again, and so on” (GAO Crash Report 1988, 42; Shiller 1988).¹⁴⁰ For example, when the NYSE opened on Monday, October 19, the S&P 500 futures contract was 21 points below the value of the S&P 500 Index, attracting arbitrageurs who accounted for over 60% of the total volume traded on the NYSE that day (Benson 1991, 1202; SEC Report 1988, 2-36; CME Committee of Inquiry 1987, 18-29). As stock prices fell from the incoming arbitrage trades, portfolio insurance programs began triggering sales, which further decoupled the S&P index futures and cash market.¹⁴¹ The Chicago Mercantile Exchange reported that upwards of 45% of its total volume on Monday, October 19 was constituted by program selling (Brady Commission 1988, Section III-19), while the NYSE reported over 60% of its total volume was a result of program selling (SEC Report 1988, 2-39). In response to the increased selling pressure being experienced on the NYSE, portfolio insurance programs repeatedly prompted sales in both the futures and stock markets, escalating the crash.

As discussed in Chapter Four, portfolio insurance guarantees a minimum value of a portfolio, often through the use of index futures or options. If markets fall, portfolio insurance programs will suggest that the weight of stocks be decreased by selling a pre-determined percentage of the portfolio: if stock prices drop, institutional investors will sell their stocks and purchase index futures, though some institutions preferred to shift their stock investments to bonds (SEC Report 1988, 1-2). In periods when the market falls rapidly, portfolio insurance strategies have been argued to exacerbate the downward trend as they will flood the market with orders to sell, often without the demand to fill them (SEC Report 1987, xiii).¹⁴²

¹⁴⁰ Cascade theory explains this effect, though there have been doubts that October 19, 1987 was a true cascade. For a discussion of cascade theory, refer to Benson (1991, 1198-1200).

¹⁴¹ Refer to Appendix A for a breakdown of the average basis error between the underlying and futures markets in October 1987.

¹⁴² In opposition to this claim, empirical studies were conducted that demonstrate how program trades, manual trades, and arbitrage trades have near-identical effects on price movement (see Hasbrouck 1996). Other studies suggested that the contagion of fear amongst investors impacted price movements more substantially than program

As sell orders began to flood the market, technical systems became overwhelmed; brokers stopped answering the phones, and liquidity crunches meant that specialists could not execute their orders. In addition, capital restrictions meant that specialists could no longer take offsetting positions to stabilize their markets: specialists were heavy buyers of stock early on Monday, October 19 as they attempted to regain control of their designated stocks. However, as conditions worsened and systems became overwhelmed, specialists had to abandon their defensive positions as their purchases could not keep up with the pace of the crash and the incoming flood of sell orders (SEC Report 1988, 4-8). For example, one institution in particular sent a total of \$1.1 billion USD in block trades to the floor of the NYSE on October 19, overwhelming the ability of the specialists to adequately make markets in those designated securities (Carlson 2007, 9).

Technical systems were also unable to process the sheer number of trades being sent through in these conditions. On the NYSE, for example, trade confirmations were being sent over one hour late (Brady Commission 1988, III-21), leaving investors uncertain as to whether or not their orders had been filled. Eventually, the NYSE had to shut down its DOT system (Chapter Four) in hopes of abating the downward price spiral being sustained by program trades. The NYSE continued to prevent index arbitrageurs from using the DOT system until markets opened on Wednesday, October 21.

In hindsight and in reaction to multiple reports on the events of 1987, the NYSE has admitted that closing the DOT system on October 19 may have contributed to the crisis as the DOT was a crucial mechanism for arbitrageurs to trade. Without DOT, arbitrageurs were unable to exploit the difference between the futures and stock markets, which led to a further decoupling of prices and restricted liquidity. Typically, as portfolio insurance providers push prices down in the

trades, despite the fact that over 33% of institutional traders blamed program trading for the crisis (Shiller 1987, 11-12).

futures market through their repeated sales, index arbitrageurs would exploit the opportunity to buy discounted futures and sell their stocks. Arbitrage would typically help lessen the severity of the crash because exploiting price differentials between the stock market and the futures market (e.g. selling the higher priced index and buying the lower priced index) would bring the two divergent prices closer together and stabilize them at close levels. However, the NYSE's refusal to allow arbitrageurs to trade on the DOT system ended up exacerbating the crisis.¹⁴³

The events of October 1987 set the stage for lengthy reports from the futures and stock market regulators as they sought to address not only their own misunderstandings, but the growing public alarm over the use of complex program trading strategies. As a former NYSE specialist explains:

I was on the NYSE floor for the 1987 crash and not only did the regulators not understand portfolio insurance, the people that bought insurance and the firms that sold it did not understand it (Interview 4).

Due to the misunderstandings surrounding the complexities of popular program trading strategies, the majority of reports analysing the 1987 crisis focused on the futures markets and index-based trading. Looking at the environment prior to the crash, it is clear to see why: since stock index futures were introduced in 1982, the daily trading volume in S&P 500 index futures grew to over two times the average daily dollar volume of trading on the NYSE (SEC Final Report 1988, 3-17). As discussed in previous chapters, this rise in futures trading resulted in part from the entrance of institutions into the market which, by the time of the 1987 crisis, were responsible for 80% of the total trading volume on the NYSE, 50% of which were block and

¹⁴³ Refer to the Brady Commission (1988, III: 22-26), SEC Report (1988), and Carlson's Federal Reserve Report on 1987 (2007, 10-11) for further details on the decoupling of prices between the futures and cash markets on October 19.

program trades using indexed assets (Edwards 1988, 236). As the influx of institutions created substantial pressure on the stock markets, most institutions transferred their buying and selling to the futures markets which was less expensive and offered greater liquidity. This transfer of institutional funds to futures markets, in turn, drove up arbitrage strategies between futures and cash markets and proliferated the use of futures products and strategies leading up to October 1987.

Regulatory conflict and crisis responses

SEC-CFTC jurisdictional disputes

Understanding the regulatory climate prior and in response to the market break of October 19, 1987 is crucial to understanding the development of the first ETF, the Philadelphia Stock Exchange's (PHLX) Cash Index Participation Units (CIPs). Central to the development of this product were the Commodity Futures Trading Commission (CFTC) and the Securities and Exchange Commission (SEC), both of which were heavily involved in proposing solutions in the wake of October 19. The major regulatory conflict in the decades leading up to the launch of ETFs were the SEC-CFTC territorial disputes that were ignited by innovations in index derivative trading. These disputes make visible the problems markets had in dealing with innovative product design on their own, and illustrates the extent to which regulatory processes encouraged the qualification of the first formally defined, publicly traded index basket products.

Beginning the late 1970s, institutional traders pioneered program trading, index options, and EFP (exchange of futures for physicals) to capture broad markets and hedge their portfolios.

During this time, regulation for options and futures was divided between, respectively, the SEC and CFTC. As previously discussed in Chapter Four, the Securities and Exchange Commission was established by an act of Congress in 1934 as a response to the 1929 market crash¹⁴⁴ and had exclusive jurisdiction over options and securities that traded on registered exchanges and the over-the-counter markets. The role of SEC regulation is to guarantee full disclosure on securities products in order to allow investors to make their own decisions regarding value (Work of the SEC, 1986):

The whole shtick of the SEC is that people should be allowed to pay what they want. If somebody wants to buy a Lexus instead of a Toyota...that should be your privilege, as long as you know what you are paying (Smythe interview 2011, 27).

The SEC held authority over securities and options on securities, reasoning that "...a call option on a security is a 'right to purchase' a security, and both put and call options on securities are considered instruments 'commonly known as securities'" (§5,6,10,15,19, and 23 of SEC Act of 1934). In 1974, the US Congress offered to give the SEC authority over the entire futures industry. The SEC declined, and Congress created the CFTC to oversee futures trading in the United States.

The CFTC was founded when Congress passed the Commodity Futures Trading Commission Act in 1974. The CFTC "...retained exclusive jurisdiction over futures and options contracts on both commodities and currencies...and was permitted to sanction futures on securities indexes and options on futures indexes" (Kramer 2004, 437). The CFTC was created in order to replace its regulatory predecessor, the Commodity Exchange Authority, who had less authority and independence than the CFTC as it was an agency operating within the US Department of

¹⁴⁴ Refer to the U.S. Government Accountability Office Staff Study (1934).

Agriculture.¹⁴⁵ At the time of its founding, the CFTC brought the trading of all futures contracts related to commodities under its jurisdiction, including futures contracts on financial instruments¹⁴⁶ and options on commodities. Unlike the SEC, whose purpose is to monitor the full disclosure of securities products, the role of the CFTC is to analyse futures contracts to ascertain whether they have a valid economic purpose.¹⁴⁷ In 1978, the Futures Trading Act was legislated by Congress and required the CFTC to maintain extensive communication between itself and the SEC:

The Commission shall maintain communications with...the Securities and Exchange Commission for the purpose of keeping such agencies informed of Commission activities that relate to the responsibilities of those agencies, for the purpose of seeking the views of those agencies on such activities, and for considering the relationships between the volume and nature of investment and trading in...securities and financial instruments under the jurisdiction of such agencies (S.2391, 92 Stat. 866, 1978).

Beginning in the late 1970s, trading strategies where market participants would trade in futures and stock markets interchangeably began to flourish while jurisdictional authority for these instruments remained divided between the SEC and CFTC. Developments relating to index trading in the stock and commodities markets and the approval of options and futures trading on such indices problematically blurred the boundaries of regulatory authority: new strategies had

¹⁴⁵ The authority for the regulation of the trading of futures was officially transferred from the Commodity Exchange Authority to the CFTC on April 21, 1975. The history of the trading and regulation of futures pre-CFTC is particularly complex, dating back to 1848 with the creation of The Chicago Board of Trade. Pre-CFTC history will not be discussed in this project. For a detailed timeline on the regulation of futures prior to 1974, refer to www.cftc.gov/about/HistoryoftheCFTC.

¹⁴⁶ The first futures contract on financial instruments was the Chicago Mercantile Exchange 90-day U.S. Treasury Bill. This was approved for trading by the CFTC on November 26, 1975. However, the first futures contract on a foreign-currency financial instrument was introduced by the Chicago Mercantile Exchange in 1972 before the CFTC was founded.

¹⁴⁷ The CFTC was founded with a special division that reviews newly proposed futures contracts - the Division of Economic Analysis - in order to judge the value of proposed contracts. The SEC has no such division, as it does not examine the economic viability of securities products. Refer to Benson (1991, 6-7) for a detailed discussion.

options being used to achieve the same results as futures, making the divisions of authority unclear and highly problematic for the regulation of index innovations. For example, the Philadelphia Stock Exchange's proposal to begin trading index options was received favourably by the CFTC but was ultimately rejected by the SEC because options were only permissible on securities - indexes represented a grey area. At the same time, the CFTC legislated the index arbitrage practice called EFP (exchange of futures for physicals) to be permissible in futures markets, causing divergent regulatory cultures and unclear boundaries for what constituted legitimate and illegitimate index activity.

While the SEC would typically have jurisdiction over the trading of stocks and stock indices, the introduction of futures on indices - and further still, options on the futures of stock indices - were subject to exclusive CFTC oversight. As a result, multiple conflicts ensued between the SEC and CFTC over their relative jurisdictions into the 1980s despite the legislative ruling that the CFTC was "not [to] supersede or limit the jurisdiction" of the SEC "...unless such transactions involve the sale thereof for future delivery conducted on a board of trade" (CFTC Act amendments 1974, Section 201).

Enhanced SEC-CFTC communication was integral in the years leading up to 1987, for new trading strategies emerging from basket trading and the proliferation of futures and options contracts led to products that were not easily confined into either the SEC or the CFTC jurisdiction. Questions over the suitability of existing legislation for these new products and the boundaries between the SEC and CFTC began increasing tensions between the two regulators. The SEC, in an attempt to prevent the CFTC from gaining jurisdiction over stock options, proposed amendments to the Securities Exchange Act that would give the SEC exclusive jurisdiction over any transaction involving a security. However, in September 1981, the CFTC

approved the trading of options on futures contracts. As a result, options - products traditionally under the jurisdiction of the SEC - were now subject to CFTC authority if they were tied to futures. Furthermore, in 1982, the CFTC approved the trading of futures on stock indexes¹⁴⁸ and in 1983 expanded its jurisdiction by approving options on stock index futures.

SEC-CFTC conflicts occurred over the emergence of innovative products that involved either an element of futurity on stocks or options on futures. Of particular prominence were the regulatory disputes over the trading of government instruments such as Treasury bills and GNMA forwards, which were heard in multiple courts between the late-1970s to 1980s.¹⁴⁹ For example, the SEC and CFTC conflicted over the trading of futures on securities - Treasury bills, in particular (847 F.2d 673 (11th Cir. 1988)). While Treasury bills are considered securities and thus governed by the SEC, futures are to be exclusively regulated by the CFTC,¹⁵⁰ leading to confusion as to what institution ought to have authority over Treasury bill futures. Using the definition of a commodity in the 1974 CFTC Act, the courts decided that Treasury bills, whilst securities, fell under CFTC jurisdiction because Treasury bill contracts were being traded on a designated futures exchange.¹⁵¹

Regulation by the Commission of transactions in the specific financial instruments...which generally are between banks and other institutional

¹⁴⁸ The first futures contract on a stock index - The Value Line Index Average traded on the Kansas City Board of Trade (KBOT) - was approved by the CFTC on February 16, 1982.

¹⁴⁹ Regulatory disputes over GNMA (Government National Mortgage Association) products include: *Abrams v. Oppenheimer Govt. Securities Inc.* (1984), *Board of Trade of City of Chicago v. SEC* (1982). Regulatory disputes over Treasury bill authority includes: *Paine, Webber, Jackson & Curtis, Inc. v. Conaway* (1981), *Fisher v. Dean Witter Reynolds* (1981), and *W. Floyd Messer, Sr., Individually, Plaintiff-appellant, v. E.f. Hutton & Co.* (1988).

¹⁵⁰ “[t]he Commission’s jurisdiction over futures contract markets or other exchanges is exclusive and includes the regulation of commodity accounts, commodity trading agreements, and commodity options” (CFTC Act amendments 1974, Section 201). However, this section also includes the stipulation that CFTC oversight is not to “supersede or limit the jurisdiction” of the SEC.

¹⁵¹ During this time, futures were trading on thirteen exchanges, of which the Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT) were the most prominent. Treasury bill futures were traded on the CBOT. Some futures exchanges were subsidiaries of stock exchanges, meaning they were subject to joint SEC-CFTC jurisdiction, which further escalated regulatory conflict.

participants, is unnecessary, *unless executed on a formally organized futures exchange* (CFTC Act 1974, at 5859, emphasis added).

The CFTC was also supported by the Commodities Exchange Act, which defined a commodity, in part, as:

...all other goods and articles...and all services, rights, and interests in which contracts for future delivery are presently or in the future dealt in (7 U.S.C. §2, 1988).

Following this definition, anything could become a commodity by having a futures contract placed on it - commodities no longer were defined as traditional agricultural products (7 U.S.C. §2 *Supra* note 17, 1988).¹⁵² By having futures contracts on Treasury-bills, and trading those contracts on a designated futures exchange (the CBOT), Treasury bills became commodities under CFTC legislation.

SEC-CFTC disputes continued and a jurisdictional agreement, the Shad-Johnson Accord, was passed into law as a joint effort of the Securities Acts Amendments of 1982 and the Futures Trading Act of 1982. Under this accord, the CFTC was granted exclusive jurisdiction over any futures contracts, including futures on stocks, stock indices, commodities, and options on futures. The SEC maintained exclusive jurisdiction over securities and options (on securities, certificates of deposit, stock indices, and foreign currency) and was granted a consulting role in the approval of stock index futures contracts. Under the Shad-Johnson Accord, the CFTC could not legislate on new stock index futures contracts unless the SEC was in full support.¹⁵³

¹⁵² The only exception to this definition was for onions, which were regulated separately under Section 13-1 of the Commodity Exchange Act.

¹⁵³ The SEC had their own criteria governing their willingness to consult and approve on futures contracts on stock indices. Lindsey (1997) provided SEC testimony before the U.S. House of Representatives on this issue.

Despite official legislation and joint studies¹⁵⁴ that depicted the SEC and CFTC being on cooperative terms, disputes continued as the SEC tried (and failed) to extend its powers by merging with the CFTC and, later, petitioning for jurisdiction over all securities-related financial products¹⁵⁵ and the trading of stock index futures.¹⁵⁶ As SEC Chairman Ruder testified at the Financial Market hearings, “[n]either as a matter of regulatory efficiency nor as a matter of public confidence does it make sense to maintain separate authority over the stock index futures and the stock markets” (Brady Report 1988, vi). Disputes were so common that Congress was presented with a bill to merge the SEC and CFTC into one agency in hopes to end the conflicts that were thought to be impeding the innovation of hybrid financial products.¹⁵⁷

These differences in regulatory approach would be emphasized in the response of each the SEC and CFTC to the 1987 market break, eventually coming to a head with the introduction of a new product, Cash Index Participation Units (CIPs), from the Philadelphia Stock Exchange (PHLX) in 1989. In what follows, exchange-sponsored reports, SEC reports, and CFTC reports on the 1987 break will be analysed and points of divergence analysed. The following reports were selected as they were the most influential in shaping the regulatory response to the 1987 market crash, creating the infrastructure necessary for the CIPs to emerge.¹⁵⁸

¹⁵⁴ Refer to the Federal Reserve Board, CFTC, and SEC Joint Study (1984) for an example of joint discussions on the development and regulation of stock index derivatives.

¹⁵⁵ See Schick (1988) for a discussion of the benefits of the SEC campaign for extended jurisdiction.

¹⁵⁶ Refer to the Financial Market Regulatory Reform: Hearings Before the Subcommittee on Telecommunications and Finance of the House Comm. on Energy and Commerce (1987-1988) for testimony against granting the SEC authority over index futures. Refer to: The SEC, Treasury, Greenspan motion for testimony in favour of granting the SEC authority over index futures (22 Sec. Reg. & L. Rep. No. 13 at 459, 1990).

¹⁵⁷ A bill (H.R. 4477) was introduced on April 6, 1990 by Dan Glickman (D-Kan.) and Dennis Eckard (D-Ohio) to merge the SEC and CFTC into a single agency called the Markets and Trading Commission. It was not successful.

¹⁵⁸ Of the many reports written by exchanges and government bodies, the most widely discussed are the Brady Commission, the CFTC Final Report, the SEC Report from the Division of Market Regulation, the General Accounting Office report, the NYSE Report by Nicholas Katzenbach, and the CME Report. Of these, only the NYSE Report, SEC Report, and Brady Commission make recommendations for changes in policy.

SEC responses to the 1987 crisis

The responses of the SEC to the 1987 are numerous and include both oral addresses and official studies. Most prominent of these studies was a report published in February 1988 by the Commission's Division of Market Regulation entitled *The October 1987 Market Break*. In it, the Division reconstructed the stock, options, and futures trading environment as it existed in October 1987, analysed how the trading in October impacted market facilities and participants, offered suggestions for how to solve problems in market systems, and constructed methods to reform markets moving forward. An overwhelming theme of this study, and studies from the futures markets regulators such as the CFTC and CME, is the close attention paid to derivative index strategies. The results of these studies, whilst largely in agreement with one another, diverge quite strongly in their opinions of how other market regulators handled the crisis.

The SEC Division report did not assert that index-based trading and hedging strategies were the source of the crash in October 1987, but suggested they were responsible for hastening the speed at which the crash occurred:

... futures trading, and strategies involving the use of futures, were not the 'sole cause' of the so-called market break. Nevertheless, the existence of futures on stock indexes and the use of the various strategies involving 'program trading' (i.e. index arbitrage, index substitution and portfolio insurance) were a significant factor in accelerating and exacerbating the decline (1988, 3-11).

Interestingly, the Division's report went one step beyond clearing the product of responsibility for the crash, concluding that index-based trading was beneficial to the efficient functioning and liquidity of markets: "The Commission believes that in normal times the derivative index markets perform an important economic function. They provide a means by which institutions

may adjust their portfolios quickly and efficiently” (Ruder 1987, 17), and suggested that market reforms focus on expanding the capacity of index futures markets and basket trading strategies as a means to increase liquidity. As SEC Commissioner Ruder stated, “Given the increased role played by stock index futures in our linked markets, block trading of the futures market would provide valuable added capacity” (1988a, 10) and “...index trading is a beneficial force” (1987, 17).

However, the Division exercised caution in advocating index products. While index-related trading was not shown to directly cause the 1987 crash, they suggested that index trading was instrumental in the rapid transmission of investor reactions to stock prices, which “...may have condensed the time period in which the decline occurred” (Ruder 1987, 13). This statement was supported by the Brady Commission¹⁵⁹ as well as previous SEC studies done on other volatile days in 1987 - notably, January 23 and September 11 and 12.¹⁶⁰ These earlier studies, in addition to the October 19 report, brought the SEC to the conclusion that index trading dramatically increased the speed at which investor reactions and sentiments could be translated into market prices, exacerbating market declines such as was seen in 1987. As a result of the link between volatility and index-based strategies, the Division’s report on October 19 suggested reforms that would reduce volatility and volume during periods of market crisis. In order to lessen the impact of index and program trading on volatility, the Commission looked for ways to increase the capacity of financial markets and concluded that trading technologies ought to be supported and encouraged by all financial regulators.

¹⁵⁹ The Brady Commission discussed how institutional selling in futures markets (specifically, portfolio insurance sales) and index arbitrage accelerated the decline as they accounted for 40% of the total S&P futures volume on October 19. This introduced substantial downward pressure on prices.

¹⁶⁰ Refer to the Division of Market Regulation’s Report on the Role of Index Related Trading in the Market Decline on September 11 and 12, 1986 (March 1987). The SEC Report on the events of January 23, 1986 were presented in confidence to the Congressional Oversight Committee and were never made public (SEC Final Report 1988, footnote 28).

Ultimately, the Division concluded that basket trading and index-based trading strategies were not the source of the 1987 market break, nor were they detrimental to the efficient functioning of markets in normal periods. However, the SEC leaders argued that vigilance was needed in governing the development of complex index-based strategies,¹⁶¹ which they suggested increased volatility in times of crisis. Crucially, however, they concluded that such concerns could be largely alleviated by developing adequate technological infrastructure. In short, index-based trading strategies were overwhelmingly argued to be in the best interest of the American markets. Thus, the SEC leadership routinely maintained that they would actively avoid any situation that would limit the use of such strategies and products (Ruder 1987, 17; 1988a; 1988b).

Throughout the 1987 report, discussions of automation and trading were intimately linked, as popular trading strategies were conditional on technologies that were quickly becoming foundational to market infrastructure. The Division's analysis showing the positive effects of index-based trading on liquidity and market functioning also implicated the automated technologies which made such strategies possible: in advocating for the increased use of block trading in index futures markets, the Division dually advocated for the advancement of computing and telecommunication infrastructure that would be able to absorb the increased capacity that these trades would bring. In the wake of the 1987 crisis, the Division concluded that automation was a positive and necessary force in the financial markets and began to incorporate this position in their public rhetoric. Indicative of the sentiment towards technology at the time, SEC Chairman Ruder publicly remarked that the "automation of quotation, routing, execution,

¹⁶¹ The SEC expressed concerns that the growing complexity of index-related products and strategies were a challenge to govern. Specifically, SEC Chairman Ruder warned that while hedging strategies using futures and options were beneficial, they also increase the possibility of manipulation (1987, 17-18).

clearance, and settlement systems is inevitable” (1988a, 13), and that the Division of Market Regulation fully supported technological development that would expand the capacity of markets to handle increased block trades: “...our job is to assure that the markets enhance the capacities of their automation facilities so that markets do not falter due to lack of physical capacity” (Ruder 1988a, 7). In reaction to the 1987 market break, the SEC confirmed that all exchanges with automatic order routing and execution systems would be required to increase the number of trades their systems can handle in case of unexpected volume surges.¹⁶²

However, the support for increased automation from the SEC was not without concern. As discussed in the Division’s 1987 report, a reliance on automation puts a market system at risk if there were to be a technological blip or breakdown. As the report noted, the liquidity crunch experienced by institutions trading in the futures markets on October 19 required them to transfer their trading to the stock market, leading to volumes that quickly overwhelmed the capacity of specialists and technological systems. Indeed, the subsequent shut down of the DOT system by the NYSE was found by numerous studies to further exacerbate this crisis. In order to address the risks of increased technological reliance, the study proposed that markets increase their coordination. Enhanced inter-market coordination between, for example, the futures markets and stock markets, would provide a more stable environment that could absorb heavy increases in volatility and order flow volume in times of crisis such as those that happened in October 1987.

Ultimately, the authors of the 1987 SEC study suggested that successful market reform could be achieved by expanding market capacity by improving the capacity of automated systems and

¹⁶² The SEC requested that the following automated systems be upgraded in response to the October 1987 crisis: the American Stock Exchange’s PER system, Cincinnati Stock Exchange’s NSTS, Midwest Stock Exchange’s MAX, Pacific Stock Exchange’s SCOREX, Philadelphia Stock Exchange’s PACE, and the National Association for Securities Dealers’ SOES.

increasing coordination amongst markets.¹⁶³ To implement their suggestions, SEC leadership began to widely promote the concept of basket trading and began incorporating a rhetoric emphasizing baskets and indexes into the majority of their public addresses throughout the following years. This approach was echoed by institutions such as the CFTC and NYSE after their studies were published.

CFTC responses to the 1987 crisis

In examining the aftermath of the events of October 1987, the CFTC final report¹⁶⁴ took a similar stance to the SEC in claiming that the crash was not caused by index derivatives: “October 19 was not initiated by trading in index products nor did it principally emanate from such trading” (CFTC Final Report, 1988, 81), and “A detailed examination of the trading data... does not provide empirical support for the theory that hedging in the futures market [portfolio insurance] and index arbitrage activities interacted to cause a technical downward price spiral of stock prices” (CFTC Final Report 1988, 137).

Despite taking similar positions on the magnitude of index strategies and program trading that occurred in the crisis, the reports generated by the securities and futures industries maintained a combative rhetoric that echoed their historical struggles for authority. As SEC Commissioner Grundfest acknowledged in a statement, “New York has been busy pointing its finger at Chicago, and Chicago has been busily pointing its finger at New York” (1988, 25).

¹⁶³ Examples of increased coordination amongst markets post-1987 were the expansion to the National Market System’s intermarket trading system, which electronically linked eight stock markets across the United States (refer to Lee (1993) for discussion), and the increase in SEC-CFTC joint initiatives to combat volatility. These SEC-CFTC initiatives were constructed with input from the Federal Reserve Board beginning in February 1988.

¹⁶⁴ The CFTC released an interim report on stock index futures on November 9, 1987, a follow-up report on January 8, 1988, and a final report on February 1, 1988. Moving forward, only the final report will be referenced.

However, it was not just the NYSE that was involved in finger pointing. The SEC report itself stated that "...the existence of futures on stock indexes...were a significant factor in accelerating and exacerbating the decline" (SEC Final Report 1988, 11), hinting that the CFTC was in part to blame. The CFTC (and to a lesser extent, the Chicago Mercantile Exchange¹⁶⁵) took a defensive stance in regards to their regulatory regime and purpose, arguing that their surveillance methods for futures markets were adequate and that futures trading could not have been the sole cause for the crash. In addition, the CFTC argued that SEC surveillance was falling short: "Improving data collection capabilities in other markets, particularly regarding stock market trades...would greatly expedite any subsequent studies of markets" (CFTC Final Report 1988, 9).

In rebuttal, the SEC testified that the CFTC's regulatory regime and systems of trading were to blame for the crisis: "[T]he Commission is recommending that the CFTC and futures markets make express, strengthen if necessary, and effectively enforce" various prohibitions and "the Commission...recommends that block trading procedures similar to those used in the stock markets be considered as a means of increasing the futures markets capacity" (SEC Testimony 3 Feb 1988, 4-5).¹⁶⁶ In these disputes, the role of the products and strategies was not the issue; rather, the role of regulators in governing index-based derivatives and program trading strategies came to the forefront of discussions.

Due in part to the ongoing conflict between the SEC and CFTC, the Katzenbach Study (commissioned by the NYSE) and the Brady Report both recommended merging the SEC and CFTC. As was stated in the Brady Commission, "...failure of the [primary and derivative market] segments to perform as one market contributed to the violence of the market break in October 1987...", and, at the very least, the SEC and CFTC should "...differently divide the

¹⁶⁵ The Chicago Mercantile Exchange (CME) commissioned a report by Miller, Hawke, and Scholes (1988).

¹⁶⁶ For additional detail, refer to the U.S. General Accounting Office report (1988).

responsibilities they now share over the cash and futures markets for securities” (1987, 59). The Katzenbach Study recommended that “interrelationships among exchanges need to be dealt with either by regulatory agencies or by agreements between the exchanges that are approved by regulatory authorities”, and that exchanges ought to develop coordinated contingency plans in the case of future emergencies (Edwards 1988, 239-240; Katzenbach 1987). Other analysts agreed that coordination between markets was the only way to move forward, stating that “an essential first step is to open a constructive dialogue between stock and futures exchanges on all aspects of trading and operations” (Edwards 1988, 249).

Proposed solutions to market inefficiencies

In all of the studies commissioned concerning October 1987, two weaknesses were identified: shortcomings in the efficiency and capacity of computer systems, and issues relating to intermarket (specifically, SEC-CFTC) coordination. In all studies, recommendations were made that would encourage baskets of stocks that would trade as a single unit, believing such a product would solve the issues surrounding high-leverage, ill-defined hedging and arbitrage practices of the time. Perhaps most illustrative of the sentiment of these commissions was what Joseph Grundfest, SEC Commissioner, told a CATO Institute Policy Forum on 20 July, 1988:

Suppose you want to buy or sell a basket of stocks in today’s equity market. As a practical matter, the basket would be broken down into a series of, say 400, individual securities transactions on the floor of the exchange and, if someone wanted to buy the exactly the same basket that you had just sold, he would also have to engage in 400 transactions on the floor of the exchange. If we operated our used Volkswagon [sic] markets according to the same plan, VW sellers would drive their autos onto dealers lots where the cars would be stripped down to fenders, doors, and engine blocks, and when a buyer walked onto the lot the dealer would reassemble the VW piece by piece...If that doesn’t seem

like a particularly wise way to buy and sell VWs, I suggest that it may also not be the wisest way of buying or selling market baskets of equities.

As a result of the events of October 19 and the research commissioned thereafter, basket trading was heralded by regulators as a solution to the problems markets faced: poor liquidity, high leverage, poorly understood strategies, and waning public confidence in the transparency and security of markets. As a result of these beliefs, strong statements from legislators and policy analysts arose: “we know now that it often makes perfect logical sense to trade portfolios as portfolios (or baskets) and not as individual securities” (Grundfest 1988, 13); “...we believe the concept of basket trading deserves the Commission’s...attention” (Report by the SEC Division of Market Regulation 1988, 3-17); “market systems must take full advantage of the benefits that derivative markets offer” (Edwards 1988, 249); and “...the development of market basket trading might help address [market concerns]...while the merits of any particular design of a basket trading system remain to be tested, I continue to believe that experimentation in this area is desirable” (Ketchum, 16 June 1989). With the regulatory rhetoric quickly incorporating terminology relating to the positive characteristics of baskets and index-style derivative products, movements to appropriately define and legislate basket products at the SEC began alongside experiments in product development at the PHLX.

The PHLX and the first ETF product concept

History

Founded in 1790 in a coffee shop, the PHLX is the first and the oldest stock exchange in the United States, dating back to when the centre of American commerce and the Presidential house resided in Philadelphia. The completion of the Erie Canal, which made it faster for ships to reach New York than Philadelphia, changed the course of development as commerce and financial organization began to materialize in New York, culminating with the creation of the NYSE a few years after the Philadelphia exchange was founded. The NYSE quickly eclipsed the size and volume of stocks traded on the PHLX by the early 1800s. Later, in the 1970s, the Chicago Board of Options Exchange (CBOE) became the primary market for a new product called standardized options, resigning the PHLX to a competitor for the options marketplace and actively searching for new products to improve its dwindling market share.¹⁶⁷

Beginning in the 1970s, financial markets were undergoing one of the most innovative periods in history, characterized by intense competition amongst exchanges for a share in the rapidly expanding markets.¹⁶⁸ As a former exchange Vice President summarized:

It was an exciting time to be involved in what I would consider to be an incredibly innovative period for the markets in the United States...Certainly there were collaborations in the US among competitive exchanges on regulatory matters, rules and regulations, market structure issues...but seriously competitive on the product side and the technology development side. (Interview 6).

In order to maintain its competitiveness, the Philadelphia Stock Exchange focused on differentiating itself from the much larger NYSE, AMEX, and regional exchanges through

¹⁶⁷ During this time, the AMEX, CBOE, NYSE, PHLX, and the Pacific Stock Exchange (PSE) were the only exchanges that traded options and index options. U.S. treasury securities were only traded on the CBOE, and foreign currency options traded only on the PHLX. As discussed, all options trading is regulated by the SEC.

¹⁶⁸ Refer to Appendix D for the distribution of NYSE stock trades amongst U.S. exchanges between 1976 and 1992.

pioneering niche financial products that relied on innovative technological and organizational infrastructure. As a former SEC and PHLX executive recalls:

It was hyper competitive! Everyone was trying to gain market share and trade new products, and for an exchange like the Philadelphia, it was their lifeblood. If they could not innovate and trade new products and figure out how to stay alive, they would go under. Only a few exchanges had survived [from the early 1900s] and that was based on some sort of niche or innovative process (Interview 13).

Technological infrastructure

Perhaps the most notable system developed by the PHLX was the proprietary technology called the Philadelphia Automated Communication Execution system (PACE). PACE would allow a broker-dealer firm to send small orders - typically under 1,000 shares - from their computers directly to the PHLX, who would guarantee automated trade execution and confirmation reports. In addition, PHLX guaranteed that broker-dealers who submitted orders through PACE would receive the national best bid and offer price,¹⁶⁹ incentivizing the routing of small stock orders to PHLX instead of the stock's primary market. Philadelphia systems were innovative for their time, and the advent of PACE preceded many other exchange systems. The subsequent systems - such as BEACON and MAC - escalated the trend of drawing order flows away from a stock's primary market (typically, the NYSE):

The New York Stock Exchange lost its power to have a monopoly over all order flow - and certainly over small orders - as all smaller orders were going off the NYSE... And that was all due to computers and our communication technology. (Interview 13).

¹⁶⁹ The National Best Bid and Offer (most commonly referred to as the 'NBBO') is the best price available for a security's buy and sell orders. As per SEC rules, brokers are required to fill client orders at the NBBO.

The advent of PACE allowed Philadelphia to differentiate itself from the larger NYSE and regional exchanges by providing a service previously unavailable to the broker-dealer community - automatic trade executions that were guaranteed to have the fastest turn-around time and lowest cost in the country:

You have to have a better mouse trap to get better order flow otherwise there's a huge inertia to the status quo. People don't like to reroute order flow if they're comfortable sending it to [the primary market]. That way you always have to look better and cheaper (Interview 13).

The PACE system, it will be shown, was a crucial development that allowed the PHLX to re-establish itself as a pioneer of the US financial markets and provided the infrastructure necessary for PHLX to launch some of the country's most innovative products.

Organizational infrastructure

Structurally, the PHLX operated with three trading floors and its own depository and clearing corporations. One of the trading floors was solely dedicated to the trading of stocks using a rule called Unlisted Trading Privileges (UTP).¹⁷⁰ In the original Securities Exchange Act of 1934, exchanges were free to list any security already trading on another exchange without applying for permission. In 1936, restrictions were imposed so that any exchange wishing to trade a security listed on another exchange would have to apply for formal privileges to do so from the SEC. This process, on average, took between 45 and 60 trading days to approve (Hall 2004, 1132). This legislative ruling intended to provide a competitive advantage to the primary

¹⁷⁰ The history of UTP legislation and its impact on ETF development will be discussed in detail in Chapter Eight.

exchange over any exchanges that choose to subsequently list the security in question.¹⁷¹ Simply stated, it was legislated that a security may not trade on any exchange other than its primary exchange, unless a secondary exchange formally applied for UTP (15 U.S.C. § 78l(a)). If a secondary exchange wished to exercise UTP for a security, they were required to submit a formal application with the SEC with the understanding that they may compete for order flow with the primary exchange, but would not be party to the benefit of listing fees.¹⁷²

By exercising UTP, the PHLX was able to list every stock that was traded on the NYSE and the AMEX in the 1980s. For example, the primary listing for IBM was in New York on the NYSE, but UTP allowed the PHLX to offer trading on IBM in Philadelphia as well. When asked how this was possible, a former PHLX department head commented:

With the use of technology. We built, through telecommunications, connectivity with the member firms around the country into their data centres. So we were one of the first exchanges to do that and you were able to reach our floor via the PACE system and send your order down there which made it more efficient, more cost effective, and, back then, what we called speedy executions of 20 seconds, 30 seconds (Interview 6).

The development of the PACE system and UTP legislation allowed the Philadelphia exchange to draw order flow away from the primary exchanges (NYSE and AMEX) and attract a clientele through the low fees and the quick, guaranteed executions that PACE offered:

It's like any other story in any other industry. [The NYSE and AMEX] were the biggest - they really felt like they didn't have to do anything to keep their market share. So we were quicker and faster. They were like the big ocean liner and we were like the speed boat (Interview 6).

¹⁷¹ "It is during these few weeks...that expectations are set about the competitiveness of the various markets for that security's trading, and will thus influence where orders for that security will be traded in the future" (Ketchum Congressional Testimony, *supra* note 26).

¹⁷² Examples of listing fees include one-time application fees and recurrent fees - such as an annual sustaining fee - that the exchange would charge a corporation to list stock.

As PHLX also owned its own depository and clearing corporations, the exchange had all of the services required to trade ‘in-house’, enabling them to offer competitive pricing even against the much larger NYSE. While PHLX was not privy to receiving listing fees on the stocks they traded using UTP, they were receiving fees from the use of their infrastructure and attracting a large clientele that were vocal throughout the development of many of PHLX’s proprietary products. These proprietary products allowed the PHLX to become a primary market for options and index-based products, eventually leading to the creation of the first ETF product called the Cash Index Participation Unit (CIP) in 1989.

Niche innovation

As discussed previously, index-based strategies in the options and futures markets were growing exponentially in the 1980s as technological capabilities enhanced the speed at which traders could access the market and conduct program trades. The popularity of index strategies combined with the growing community choosing to trade at the PHLX over larger exchanges created a unique environment at the Exchange that fostered innovation:

We were housed in a building where you had people from all walks of life that came to a trading floor to commit capital to the markets on a daily basis in a multitude of different products. It was a splendid place for the incubation of ideas... If you were paying attention to your members, it was easy to pick up ideas (Interview 6).

In the 1970s and 1980s, listed options were traded as monopoly products on the US exchanges: that is, there existed an allocation system that each exchange had to abide by. As the Chicago Board Options Exchange (CBOE) was the largest options exchange in the country, it often was

able to select the most popular stocks to place their options on. As a former PHLX executive explains:

Everyone picked their own [options] like a football draft. But obviously the CBOE had the advanced darts so they picked all the good ones - their market share stemmed from their monopoly trading of all the big names like IBM, General Motors, and Exxon... (Interview 13).

As the PHLX could not compete with the big names being traded on other options exchanges such as the CBOE, it became imperative to differentiate itself through niche offerings. The PHLX team was paying close attention to the increased volumes relating to index options and strategies relying on index-based trading. While options on broad market indices such as the S&P 500 were incredibly popular, the market was lacking more specific indices that would allow investors to express their outlook on particular sectors. In response to the popularity of broad indexing and the increasingly visible inability to target specific areas of the market through indices, PHLX began offering options on up-and-coming stocks and used these options to develop custom indices. These indices were often called sub-indices for they represented a specific sector of a larger industry. For example, the PHLX created the semiconductor index (ticker symbol: SOX), which was a subsector of the technology industry, and custom sub-indices on utilities stocks (ticker symbol: UTY) and gold and silver mining stocks (ticker symbol: XAU). These niche products filled a previously neglected area of index-related trading by allowing investors to gain exposure to sub-sectors of the larger market:

People wanted to get exposure. There was an obvious interest there. You could hedge it; you could get exposure to an industry in a much more efficient way... We believed in it so we supplied it and hoped there would be a demand. (Interview 6).

Creating a custom index also required the development of new technological infrastructure which would enable the rapid compilation of last-sale prices that comprised the index. Computer programs at the PHLX would be run constantly in order to calculate their indices and disseminate their quotes and last-sale information as a data feed to the Options Price Recording Authority (OPRA). As broad-based indices were licensed by the DOW and S&P and their data fed to the Consolidated Tape for dissemination to the public, PHLX's narrow-based indices were licensed and data fed through to the OPRA for dissemination to the options trading community.

The new index options - named SECTORS - were a resounding success as volumes steadily grew into the late 1980s and investors began looking to the PHLX indices as benchmarks of industry performance.¹⁷³ The advent of SECTORS raised the PHLX's status in the international community once again and enabled the creation of another options product that was the first of its kind in the United States. Foreign currency options (FCOs) were successfully launched on the PHLX after having to apply for Congressional approval in the 1980s.¹⁷⁴ Like SECTORS, PHLX was able to use FCOs to further legitimate itself as a niche product innovator and grow its reputation on the international stage. The launch of FCOs at the PHLX allowed the exchange to gain a monopoly over all listed foreign currencies and currency in the 1980s and expand beyond their geographical borders with the use of technological infrastructure:

International banks and corporations were able to access our trading floor to hedge their multi-currency risk and they did that either telephonically through floor brokers or by putting people on the trading floor... We had an office in London and in Tokyo that would market and educate in those parts of the world (Interview 6).

¹⁷³ Most of the PHLX SECTORS indices are still in use today as industry benchmarks.

¹⁷⁴ U.S. Congress passed the Futures Trading Act of 1986 (Pub. L. No. 99-641) that discussed foreign currency instruments under Title I (sections 2, 3, and 4). While Congress extended foreign currency option rulemaking to the CFTC, Congress was involved through floor debate and various committee reports (132 Congress Rec. 13,587-87; H. Rep. No. 624, 99th Cong., 2nd session.) These documents have been reprinted in the U.S. Code Cong. & Admin. News 6005, 6060-62 (1986). Refer to Glisson (1987) for an exceptional review of the legislative history of foreign currency derivatives trading in the United States.

The success of the PHLX's proprietary products, made possible through regulatory legislation such as UTP and technological infrastructure such as the PACE system, "created a lot of buzz and created the competitive juices to create new products such as the first ETF, which some consider the Cash Index Participations, CIPs, to be" (Interview 13).

Cash Index Participation Units (CIPs)

The inspiration for CIPs originated in 1985 when exchange executives began noticing the problems their members were encountering when trying to hedge PHLX's SECTOR index options. As PHLX was one of the leading national options exchanges in the United States, staff members were attentive to the needs of their members when it came to hedging: just as with portfolio insurance, traders that buy or sell in the futures and options markets will also protect (hedge) themselves from downside loss by making offsetting trades in the stocks that underlie the futures or options. For example, if an individual was trading options on IBM, they would also be trading the underlying IBM stock in order to hedge themselves against unexpected fluctuations in its valuation. While hedging is not problematic when trading individual stock options, it becomes much more complicated when entire indices are involved. Especially, PHLX executives noted, when the indices were made up of smaller, less liquid stocks such as the ones that comprised their SECTORs index options:

How do you hedge SECTOR index options? If you're a market maker or specialist you can obviously buy the underlying stocks. But oh my god, that's so inefficient and you're scrambling around. So we needed to create an underlying for an index option. We thought, 'there has to be some sort of instrument that could trade simply, like a stock' (Interview 13).

Of course, mutual funds that replicated indices had been around since the 1970s and would enable a trader to hedge against index options. The PHLX executives could simply construct a mutual fund that tracked their custom indices to provide their SECTORs options a hedge. However, the crisis in 1987 demonstrated the dangers of being invested in instruments such as mutual funds that could not be traded throughout the day.¹⁷⁵ As a product developer at the PHLX recounts:

What if I was an investor and I woke up with a bad feeling on the morning of October 19? If I have a mutual fund, I have to wait all day and redeem at the end of day and lose 22.5%. And why get out with a 22.5% loss? That's my life savings. We witnessed people's retirement savings get wiped out in one trading day. That's what the market crash of '87 pointed out - people were trapped with their mutual funds. (Interview 13).

As early as 1985, the PHLX team noted how their clients were missing an efficient way to hedge the SECTOR index options and discussions began about how to create a product that could give investors access to the underlying stocks in the indices. The crisis in 1987 reignited more urgent discussions at the PHLX over how to provide a more efficient and liquid hedge for institutional traders while also providing an investment product that was safer than mutual funds¹⁷⁶ for the average individual. As a result of discussions within the board of the PHLX and with the PHLX members, the PHLX team realized that the market was missing a critical product: a product that would allow access to a basket of stocks, like a mutual fund, but could be traded easily throughout the day, like a stock.

¹⁷⁵ Mutual funds are priced at the close of market every day, meaning that all buy and sell orders occur once daily at market close. Thus, a mutual fund is an instrument meant for long-term investment - not intraday trading - as investors are unable to buy and sell continuously throughout the day. For a more detailed discussion on the variances between mutual funds and ETFs, refer to Chapter Eight.

¹⁷⁶ 'Safe', in this sense, refers to the ability of investors to easily enter and exit their positions in the product.

The solution, for PHLX, lied in a product they called Cash Index Participation Units (CIPs). CIPs were developed in order to mimic all aspects of holding a portfolio of stocks: one CIP unit would act as a basket to hold a variety of securities, giving investors exposure to hundreds of stocks (and their imputed dividends¹⁷⁷) with a single purchase. CIPs were unique in that they could be traded intraday just like a stock, erasing the risk that existed in mutual funds of becoming ‘trapped’. Moreover, gaining exposure to an entire index with one purchase benefitted institutional traders that were looking for more efficient ways in which hedge index options in the stock market.

However, the CIPs basket did not contain physical stocks because the PHLX team did not want to struggle with purchasing the underlying components of the index, holding the stocks, and then converting the stocks into tradeable CIP units. Instead, the CIP product used futures to replicate the movements of physical stocks:

When you say, ‘we had a market sell off and we’re down 20 on the S&P’, it’s a number and people are fixated on trading this number up or down. Our CIP product is based on the number. Ultimately, you don’t need real stocks to underlie it (Interview 13).

By having imputed dividends calculated alongside the index valuation, investors holding CIPs would achieve the exact same result with CIPs as they would if they took the time to buy and sell each underlying stock individually.¹⁷⁸

¹⁷⁷ Investors in CIPs would receive dividends proportional to the dividends that would accrue if they were holding the physical stocks in the index. The dividend was paid by those with a short interest in the CIP, who had to provide 150% initial margin to guarantee their payments. Refer to (Shiller 1993) for further details on the CIP construction.

¹⁷⁸ CIPs have a zero net supply, meaning that for every long position there exists an offsetting short. While CIP owners may tender their contract for cash daily at 99.5% of the equivalent cash-index value, they may also cash out at 100% of the cash-index value on the four yearly dates that correspond with the futures and options expiration cycle (the third Fridays of March, June, September, and December). On these dates, every CIP unit will be cashed out for 1/10th the value of the underlying index. For an example of the relationship between CIPs and their underlying index pricing in equilibrium, refer to Kupiec (1990, 181-183).

As the first portfolio-in-a-share product in the US, the PHLX entered into multi-year negotiations with the SEC and Federal Reserve as to how CIPs should be defined and treated:

Think about it. You have a clean piece of paper. What is this product? It's neither fish nor fowl. It's neither derivative or underlying. It's not stock or options. It's something in the middle...everything was brand new (Interview 13).

The main goal of the PHLX team was to have the CIPs treated identically to stocks, meaning that the product had to receive the same margin treatment, trading rules, and exchange reporting requirements as stocks¹⁷⁹ even though the CIP would be issued by the Options Clearing Corporation - the industry standard in the issuance and guarantee of standardized options in the United States.¹⁸⁰ Moreover, the PHLX had to obtain licenses from the owners of the S&P 500 and Dow Jones indices, as they were the most popular indices in the United States and would be the indices that the first CIP products would track.¹⁸¹ Problematically, however, Standard & Poor's had already granted exclusive licenses to the CBOE for their S&P 500 index option product and the Chicago Mercantile Exchange for their S&P 500 index future contract. After threatening to sue the CIPs' developers, Standard and Poor's underwent a series of negotiations with the PHLX, asking the PHLX counsel to demonstrate how their product would be tangibly different from both an index option and index future (Interviews 1, 13, 27, 6). Unlike index options, the CIPs would have an expirationless contract, and unlike index futures, the CIPs were

¹⁷⁹ The PHLX team had to meet with the Federal Reserve as it was the body that controlled margin treatment of investment products. CIPs developers were able to convince regulators that CIPs behaved identical to a stock, securing the 50% margin treatment typically afforded to stocks. A 50% margin treatment means that if an investor purchases \$100 worth of CIPs, they are eligible to borrow an additional \$50 for investment.

¹⁸⁰ "We based the CIP on the fact that we would use the OCC as issuer and guarantor. That was innovative too, because it went beyond the OCC's comfort zone in listed options and brought them into a new product area" (Interview 13).

¹⁸¹ PHLX developers agreed that the best strategy would be to launch CIPs on the most widely recognized index in the U.S., the S&P 500. Once this product was launched, developers hoped to have CIPs on sub-indices to hedge their SECTORS products.

structured to be traded like a stock and would be regulated as a stock by the SEC. After being satisfied that the CIP was an instrument “totally and completely unique” (Interview 15) to anything that existed on the market, the S&P granted the PHLX a license for the use of the S&P 500 index on July 21, 1988.¹⁸²

The CIP is significant to the history of the ETF for two primary reasons. First, CIPs were the first formally defined and marketed product to emerge from the variety of program trading and derivative strategies in use in the stock market. While portfolio insurance was also a product that developed from program trading strategies, CIPs were the first publicly available product marketed to the average investor and institutional trader alike.¹⁸³ Moreover, the emergence of CIPs was the first portfolio-in-a-share product. As many in the industry have recognized, CIPs were “the first shot across the bow” (Interview 1) towards public acceptance of basket products and the proliferation of such products around the world.

Second, the approval of CIPs is significant for it was the first time that the SEC was required to formally define what, exactly, an exchange-traded product was. Prior to 1987, the SEC did not define basket and program trading as products, but as activities: program trading helped to constitute the markets through its various incarnations and could not easily be disentangled from the broader market activity as a concrete artefact. While program trading was a term encompassing a variety of market activities, CIPs separated itself from broader market activities in order to develop a specific rule-set that became marketable to the investment community. As CIPs was the first of its kind, the SEC, Federal Reserve, and product innovators at the PHLX

¹⁸² Refer to correspondence between Kurt D. Steele, Senior VP of Standard and Poor’s, and William Uchimoto, VP of PHLX dated July 21, 1988 (documents provided by interviewee).

¹⁸³ The shift in marketing basket instruments from institutional clients to the average retail investor will be discussed in Chapters Seven and Eight.

spent several years constructing new rule-books and negotiating the qualities of the product itself. As a former PHLX counsel explains:

There are a number of standards under Section 6 of The Exchange Act in 1934, which is the governing statute of the SEC, to review rule change filings by self-regulatory organizations like the PHLX. We had to help the SEC justify that all their rules were met in our filings (Interview 13).

As a result of lengthy deliberations that began as early as 1986, the SEC granted the PHLX approval to list two CIP products in March of 1988 - a CIP that tracked the S&P 500 constituents (ticker symbol: SNP), and a CIP that tracked the Dow constituents (ticker symbol: BIG).¹⁸⁴ In 1989, the PHLX CIPs - the first publicly available ‘portfolio in a share’ products - were launched on PHLX. Interestingly, within 24 hours of PHLX filing the initial product application, the AMEX filed an identical application, changing the product name from CIP to EIP (Equity Index Participation).¹⁸⁵ Under examination, the EIP application was identical to the CIP application, right down to a typo in the original CIP paperwork. Once PHLX developers realized what had happened, PHLX attorneys scrambled to place a copyright on the CIPs. The SEC attorneys, however, refused to allow the copyright request as they deemed it to be anticompetitive behaviour. After heated deliberation with the SEC, the PHLX legal team was “hosed down” and told to “knock it off” (Interviews 13, 1).

Two explanations have been given that account for the rapid transmission of the product concept from PHLX to AMEX: first, any applications with the SEC are immediately made public through the Federal Register and unable to be copyrighted by the innovating exchange; second, there was a story that an assistant at the PHLX mistakenly faxed the CIPs application to

¹⁸⁴ At the time, Dow Jones was not licensing its index. Thus, the PHLX created the “Blue Chip CIP index” as a stand-in.

¹⁸⁵ The AMEX EIPs were based on the S&P 500 index and the AMEX Major Market Index. While they never launched, the Chicago Board Options Exchange applied for an identical product referred to as VIPs (Value of Index Participations) that replicated the S&P 100, S&P 500, CBOE 50, and CBOE 250 indices.

the AMEX instead of the SEC (Federal Reserve Bank of Philadelphia 2003, 33). In any case, both the CIPs and EIPs were approved and began trading in 1988.

Defining CIPs

The process to bring the CIPs to market took a series of negotiations between the PHLX and the SEC regarding terms and definitions.¹⁸⁶ Perhaps most notably, the legislation of IPs came to represent the first time that basket products were formally defined in regulatory literature:

An IP is a present interest in the current value of a portfolio of stocks, is of indefinite duration, and entitles holders to receive cash payments equivalent to a proportionate share of any regular cash dividends paid on the component stocks in the underlying stock portfolio” (SEC Annual Report 1989, 43-44).¹⁸⁷

To provide an example of rule construction: the exchanges applying to list IPs (CIPs, EIPs, and VIPs) all petitioned the SEC to permit two special rules for their basket products. The first rule permitting the exchange to execute orders of basket products based on size-precedence and not the traditional time precedence, and the other permitting the short sale of IP baskets on a downtick, freeing them from the traditional ‘uptick’ rule in options trading.¹⁸⁸ In all cases, the products were required to demonstrate how they would contribute to the recovery and functioning of markets by mitigating the need for high leverage whilst remaining largely immune to liquidity crunches (Ruder 1989). Again, as the products were backed by much more liquid

¹⁸⁶ AMEX filed rule changes with the SEC regarding the listing of IPS products under SR-Amex-88-10; Philadelphia Stock Exchange filed rule changes with SEC under SR-PHLX 87-07; Chicago Board Options Exchanged filed rule changes under SR-CBOE-88-09. While all the IPs (EIPs, CIPs, and VIPs) are similar in structure, Kupiec (1990) provides an analysis of the subtle structural variations that did exist.

¹⁸⁷ See also: Securities Exchange Act Release No. 26709 (26 May 1989), and Kupiec (1990, table one) for full outline of characteristics.

¹⁸⁸ The uptick rule was implemented in 1938 and is governed under the Securities Exchange Act of 1934 (Rule 10a-1). The rule states that short sales are only allowed to be filled on an uptick.

futures, not physical stocks, investors could easily enter and exit their positions in CIPs. More so, as CIPs were traded on a stock exchange and not a futures exchange, the average investor would for the first time have affordable access to large market segments without the commitment of a mutual fund.

Regulatory conflict and the CIPs delisting

While the idea for a basket-style index product was being vetted by the PHLX as early as 1985, the market crisis in 1987 provided an impetus for further development that - when combined with the regulatory prompting for new and efficient product concepts - made the Index Participation Unit more palatable than before. However, the regulatory bodies did not have rules for how to regulate such a product, resulting in multiple letters being exchanged between CFTC and SEC executives as to whether the basket products were securities (subject to SEC regulation), or futures (subject to CFTC regulation).¹⁸⁹ Moreover, objections by the Investment Company Institute were raised as to whether CIPs should be considered an investment company - like mutual funds - or not.¹⁹⁰ Specifically, the ICI official statement was that "...the ICI does not object to IPs but argues that either IPs or the Investment Company Act of 1940 will need to be changed before IPS can be legally traded" (ICI quoted in Kupiec 1990, 184), and the CFTC argued that "similar to a futures contract, an IP is a contract that provides for the delivery (or

¹⁸⁹ See: Securities Exchange Act Release No. 26709 (11 April 1989); letter from Jean A. Webb, Secretary, CFTC to Jonathan G. Katz, secretary, SEC (29 April 1988).

¹⁹⁰ The Investment Company Institute argued that basket products should be considered an investment company in a letter from Matthew Fink, General Counsel of ICI, to Jonathan G. Katz, Secretary, SEC (19 December 1988). Also refer to: ICI v. SEC, No. 89-3315 (15 May 1989). Investment companies are subject to different regulations than securities (see Chapter Six).

cash value) of some underlying instrument at a future date” (CFTC quoted in Kupiec 1990, 184), making the products inappropriate for a securities exchange.

To reiterate, in 1989 the CFTC retained its jurisdiction over futures and options on commodities, futures on securities indexes, and options on futures indexes, while the SEC held jurisdiction over securities and options on securities. Because the CFTC retained their exclusive jurisdiction over commodities, where commodities were defined as any “...services, interests, or rights connected to the future delivery of goods” (CEA Section 201; Commodity Futures Trading Commission Act of 1974, No. 93-463), the PHLX was required to meet the approval of the CFTC as the CIPs were backed by futures.¹⁹¹ The PHLX did not do this. As a result, the Chicago Mercantile Exchange and Investment Company Institute sued the SEC to prohibit the securities exchanges to issue, trade, and clear the CIPs’ basket fund structure, stating that basket shares were futures contracts and could not be traded on securities exchanges before meeting CFTC approval (*Chicago Mercantile Exchange v. SEC*; 883F.2d 537, 7th Cir. 1989). Regulatory relations ultimately deteriorated:

There was no dialogue between the SEC and CFTC. The CFTC and the futures exchanges simply sued the SEC for approving a futures contract (Interview 14).

In addition, large mutual fund companies such as Vanguard and Fidelity filed amicus to the lawsuit alongside the major U.S. futures exchanges. The then-president of the PHLX, Nicholas Giordano, summarized his frustrations with being caught in the middle of a regulatory turf-war in a public statement: “the CFTC should stick to what it is good at...like regulating pork bellies” (Giordano 1990).

¹⁹¹ As discussed, the short position of the CIPs was not backed by physical assets such as stocks, leading to the CFTC challenge that CIPs should be regulated as a futures contract.

The United States Courts of Appeals found that basket products were indeed within SEC's definition of a security, though ultimately deferred to the CFTC's argument that these products were *also* futures and ought to be under the jurisdiction of the CFTC's Commodity Exchange Act (SEC Annual Report 1989, 69-70). After a failed appeals attempt, the courts concluded that the SEC "...had no jurisdictional basis to approve the trading of IP contracts on a national securities exchange" (SEC 1989 Annual Report, 44), and the products were liquidated by the SEC in 1989. As the former PHLX executives recount:

I was there at the 7th Circuit¹⁹² when the SEC was sued by the CFTC and the board of trade at the Mercantile Exchange. It was just horrible... We got an arrow in our back (Interview 13);

The SEC did a horrible job at defending its turf" (Interview 6).

Even though the futures exchanges won their arguments, most refused to list the CIPs as they did not want any competition that would overshadow their proprietary products:

They didn't want to see any ETF come to market. They saw us [the PHLX] as a threat...and they were right! (Interview 6).

While the CFTC approached the PHLX executives with an offer to list the CIPs as a future, the PHLX refused as they believed that the CIPs were best suited to stock markets and the average mutual fund investor (Interviews 1, 14). To list CIPs in the futures market would defeat the original purpose of creating a stock-exchange product and would not serve the originally intended audience.

¹⁹² The 7th Circuit refers to the United States Court of Appeals for the 7th Circuit, a Federal court overseeing the Central District of Illinois.

Socio-technical integration

Despite the short lived success of the IPs, their development marks an important contribution to the qualification history of the ETF. First, the regulatory response to the 1987 market break was successful in promoting the development of CIPs, whose purpose was to enhance market liquidity and offer average investors alternatives to mutual funds. Second, and perhaps most importantly, the legislation of CIPs represents the first time that basket trading was formally defined in regulatory literature. Prior to IPs being listed, SEC regulators often referred to basket trading as a broad strategy within institutional program trading, refusing to define a particular structure for baskets while at the same time encouraging innovations relating to the basket concept. IPs represented the first time that regulators were forced to detangle one particular instantiation of basket trading from a variety of institutional practices to bring it into the formal regulatory structure (Callon 2006). In defining CIPs, regulators aided in attributing particular characteristics to the product that influenced the permissible structure and beneficial qualities of other index products moving forward.

Interestingly, the first ETF attempt arose not out of an environment characterized by regulator-innovator conflict, but from regulator-regulator conflict - notably, the damaging SEC-CFTC conflict that erupted throughout the 1980s. The SEC-CFTC conflict embodies the cat-and-mouse imagery of the literature about regulatory capture, albeit with an important distinction. Instead of innovators attempting to capitalize on unintended side effects of policy and outmanoeuvre regulators, regulators were attempting to outmanoeuvre one another. This left the innovators of hybrid products - products such as the CIP that were structured using devices from both SEC and CFTC jurisdictions - at the mercy of the courts as the SEC and CFTC routinely

attempted to halt any competition between their respective markets and gain territory over one another.

The element that sustained conflict between regulators was also the element that enabled a collaborative relationship between the SEC and PHLX. As discussed previously in this chapter, basket and program trading encompassed a wide range of activities, none of which were concretely defined or regulated, due to both regulatory misunderstanding and the fast pace at which these strategies originated and transformed. The lack of clear definitions over emerging strategies created ambiguity over the effects and role of such strategies. Lack of clear jurisdictional authority of both the SEC and CFTC further ignited tensions between regulators as each attempted to control and expand their respective markets. It was these tensions that further encouraged the SEC and innovators to work closely with one another to develop products that would fit within the SEC jurisdiction.

The preliminary encouragement of basket products by the SEC in 1987 and sustained guidance from the SEC to CIPs product developers assisted the PHLX in creating the first formally defined basket product. However, the social and material infrastructure required for collaboration between innovators and regulators began developing as far back as the 1970s when both innovators and regulators began incorporating technology into their organizational structures. The socio-technical fusion of market participants and technological devices oriented both regulators and innovators towards exploiting the desirable characteristics that socio-technical *agencement* made possible: enhancements to liquidity, greater efficiency, and lower fees were some of the most popularly discussed characteristics, and as discussed in Chapter Four, many were legislated into the 1975 market reforms. The market crash in 1987 brought about suggestive rhetoric by the SEC leadership, who released numerous statements speaking about the

lines of experimentation the agency would encourage moving forward. Again, the product characteristics the SEC heralded as a solution to the 1987 crisis echoed the characteristics that socio-technical *agencements* made possible in the decade prior. As a result, basket products began being developed across numerous exchanges of which came the first ETF product, the PHLX CIPs.

Simultaneously, the sustained conflict over the jurisdiction of hybrid financial strategies further encouraged the SEC to collaborate with innovators to develop formal products that would fit within their regulatory framework. The SEC was able to develop a strong collaborative relationship with product innovators working to develop stock and options offerings, going as far as issuing a public release in support of the development of the PHLX CIPs. As two former product developers attest:

It was a more collaborative relationship [between the SEC and basket product innovators]...there were many positive comments by regulators and some positive work by everyone to make a better product that would benefit the investors as well as liquidity providers (Interview 31);

...the key regulators were skeptical yet helpful (Interview 7).

Skepticism from the SEC came from its primary purpose, which was to protect investors and assist in fostering a safe and transparent market environment (Smythe interview 2011). The aftermath of the 1987 crisis reaffirmed the necessity of thoroughly reviewing applications, meaning most misunderstandings between basket product innovators and the SEC were resolved through hearings in front of the SEC Commissioners so all divisions could participate (Interview 7).

This collaborative relationship was able to assist the developers of index participation products in getting informal regulatory guidance throughout the development process, which contributed to the structuring of the first ETF-style product:

Regulators tried to make investing in these products more like common stocks. Originally, the regulators were very keen...for the products to provide diversification and liquidity. (Interview 31).

The informal regulatory guidance provided by the SEC assisted in attributing qualities to CIPs, demonstrating an integrated regulator-innovator purpose: both parties placed investor protection and market stability (through enhanced liquidity and efficiency) as their primary inspirations for colluding in product development.

Conclusion

The PHLX found success with niche products such as their SECTORS and found a way to extend such offerings while also providing a desired product that was not available in both the institutional and retail markets. The failure of the CIPs project was caused by a breakdown in relations between regulators: while the SEC ultimately failed to protect the CIPs innovation, the relationship it developed with the PHLX set an important precedent for the next round of pioneers, the TIPs and SuperTrust developers, who both referenced the PHLX and SEC precedents in their product applications.¹⁹³

As discussed, the market shift in 1975 saw the SEC become a facilitator to particular forms of technological innovation and experimentation in the financial markets. With a renewed focus

¹⁹³ The TIPs and SuperTrust will be discussed in Chapters Six and Seven.

on stabilizing markets after October 19, 1987, the SEC encouraged basket products that would enhance the liquidity, efficiency, and transparency of markets using technological solutions. As a result, basket trading was first promoted by the SEC as a means to add liquidity to markets in the wake of the 1987 crash, though no formal definitions at the time existed. In 1989, Index Participation Units were launched by the PHLX (alongside similar products from the AMEX and the CBOE) and were approved by the SEC as products that embodied post-1987 objectives: CIPs were basket products that were developed in a manner that would encourage liquidity, rely on technical advancements in trading technology, and enhance the efficiency of trading for large institutional investors. As a result, the first formal definition of what a basket product constituted and its rules of trade were drafted into legislation,¹⁹⁴ concretely defining a basket product for the first time in history and demonstrating how regulators were important mediators between socio-technical innovation and formally defined products.

¹⁹⁴ Refer to rule changes PHLX filed with the SEC (SR-PHLX 87-07).

Chapter Six

Don't put all your eggs in one basket

Chapter Six will examine the role that financial theory and regulation played in the construction of early ETF products such as Leland O'Brien and Rubinstein's SuperTrust. This chapter will begin with an overview of relevant financial theories. Next, an analysis of the epistemic shift that occurred amongst financial practitioners will be analysed as this shift transitioned portfolio construction strategies from traditional stock picking to index-based investing. The role of theory will be analysed for its role in influencing the way in which market participants thought about, spoke about, and participated in the markets. Following this analysis, the Investment Company Act of 1940 will be briefly summarized as it relates to ETF legislation. This chapter will conclude with a case study on the SuperTrust product. The SuperTrust represents an important moment in ETF history for two reasons: first, the product was adopted directly from the financial theory of decades prior, even quoting theory as a precedent in its applications, and second, the SuperTrust the first exchange-traded product to receive exemptions from the 1940 Act regulations. As these exemptions form the basis of ETF legitimacy in the markets today, the negotiation process will be examined as a form of regulatory agencement. Interestingly, a key part of the negotiation process between innovators and regulators came down to attributes of financial theory and how theoretical constructs may be used to act in the best interest of investors.

Transitioning theory to practice

The purpose of this section is to describe how the active-to-passive shift in the financial markets occurred and the effects this shift had on the market environment. First, an overview of ‘active’ and ‘passive’ investment strategies will be provided. Second, prominent financial theories on portfolio construction will be analysed in order to understand the extent to which they inspired market participants to change their investment strategies from active stock selection to passive index investment. Third, examples of the real-world changes inspired by these theories will be analysed as they relate to early ETF development. Specifically, the market environment that emerged from the active-to-passive shift will be addressed as an environment that made landmark ETF developments such as the SuperTrust possible.

Active and passive portfolio construction

While there are innumerable investment strategies one can employ to construct a portfolio, all may be categorized within the general boundaries of active or passive management. Active management, generally speaking, refers to the act of individual stock picking with the goal of beating the market return. If, for example, the market returns 1% on any given month, an active investor would attempt to construct a portfolio that will beat those returns by selecting stocks using either technical analysis, fundamental research, or a variety of other methods. If the market falls by 3%, an active investor may rebalance the mix of assets in their portfolio in aims of losing less than the market. In short, active investors argue that it is possible to achieve consistent above-market returns by utilising a variety of stock picking methods. This often involves

repeated buying and selling within the portfolio to achieve above market returns, behaviour often referred to as a ‘high friction’ strategy due to the constant repositioning of assets within the portfolio. As Roche defines it, active management is “...an asset allocation strategy with high relative frictions that attempts to ‘beat the market’ return on a risk adjusted basis” (2016, 10).

The early mutual fund industry in the US is an excellent example of how active investment strategies are used in portfolio construction. Mutual funds, like ETFs, are basket instruments: purchasing one share of a mutual fund gives an investor representative access to all the assets the mutual fund invests in. A mutual fund is headed by a portfolio manager who employs a team to assist them in determining the best assets to add to the fund’s portfolio based on the fund’s goals. Most early mutual funds in the United States were based on ‘value’, ‘growth’, or a mix of value and growth strategies to achieve above market returns for their investors. For example, a fund that focuses on value investing will attempt to buy stocks ‘on sale’. In other words, managers will purchase stocks whose intrinsic worth (in their estimation) is more than their prevailing market price and sell them once they reach or surpass their intrinsic valuation. By buying and selling stocks based on their intrinsic values, value-based mutual fund managers attempt to beat the overall market returns. Alternatively, growth mutual funds have portfolio managers who invest in companies with above-average growth potential. The analysis of growth stocks does not rely as heavily on a company’s intrinsic valuation, opting instead to focus on future growth prospects.

Prior to the rise in passive investment strategies, money managers in the United States attracted investment by advertising their returns in comparison to the general market.¹⁹⁵ By

¹⁹⁵ The majority of asset managers compared their performance to a benchmark index such as the S&P 500 or the Dow. These indices are still used as representative indicators for the overall economic health and financial performance in the United States.

advertising their experience and skill, asset managers developed a prestige in the markets. As a former pension fund manager recalls:

Traditional active managers...would talk about their instinct and insight and knowledge of the markets. They'd have great stories to tell at cocktail parties about this stock or that stock. Indexing wasn't glamorous...it required an education sell. (Interview 5).

As discussed in Chapter Two, traditional approaches to financial study advocated that active investing was most always preferable. In fact, it was not until the 1960s and the development of the theories discussed below that passive investment strategies were offered as an alternative. In general, passive investment managers do not believe that it is possible to consistently beat the market or achieve sustainable market beating returns. The reasons behind this outlook are related to the efficient market hypothesis, which will be discussed later in this section. Put simply, passive managers believe that any opportunity to profit from a stock based on deviations from its intrinsic value is slim as most price fluctuations in the market are random. It is important to note that passive investors do not deny that active investing may be able to beat the market in the short term; the passive thesis claims that achieving above market returns is unsustainable over the long term. Thus, passive investment strategists construct portfolios that mirror the overall market so that individual stock picking is not required: passive investing is “an asset allocation strategy with low relative frictions that attempts to take the market return on a risk-adjusted basis” (Roche 2016, 10). Passive portfolio construction is most popularly achieved through indexing: that is, replicating an index within an investment portfolio.

Passive strategies, then, are synonymous with index strategies, as passive strategies aim to mirror the market's performance. Early index investing, as discussed in Chapter Four, was most often achieved by individually purchasing the constituents of either the S&P 500 or Dow Jones

indices, for these were thought to be best representatives of the overall US market. By recreating a major market index in one's portfolio, an investor was able to participate in the movement of the market without taking on the issue-specific risk¹⁹⁶ that active stock picking often entailed. As a result, indexing (passive investing) also became known as a 'buy and hold' strategy as it provided investors with a portfolio that mirrored the market so no short-term changes are needed.¹⁹⁷

It is important to note the theoretical critique of the active-passive conceptualization of investment strategies. Notably, critics argue that any deviation away from investing in every single asset in the global market would constitute an active investment strategy, as decisions would have to be made about which stocks to include and exclude.¹⁹⁸ Thus, a portfolio that is comprised of the S&P 500 constituents would be considered active investing as it excludes many other available assets around the world. However, due to the practical limitations of achieving the 'market portfolio' in its totality, this chapter refers to any portfolio that seeks to mimic market returns as a passive strategy. In addition, rhetoric amongst interview participants chosen for this project supports the active-passive strategies as described above: portfolios that replicate indices were always referred to as passive strategies, while active strategies were referred to as stock-picking strategies. The practical rhetoric amongst market participants has also been used by theoreticians: Sharpe (1966) and Jensen (1968), who published comparative studies on the returns of active and passive portfolio strategies, both use a popular index as a substitute for 'the market' in its entirety, further emphasising the 'index as passive' understanding. Thus, in what

¹⁹⁶ As discussed in Chapter Four, issue-specific risk is the risk that applies to individual companies. If a portfolio is weighted heavily in one stock, or only holds a few stocks, the issue-specific risk is high.

¹⁹⁷ Passive portfolios mirror the market return minus any trading fees and expenses.

¹⁹⁸ For theoretical critiques of passive management strategies, refer to Walden (2015). At the aggregate (global) level, the Global Financial Asset Portfolio (GFAP) is a benchmark used for a theoretically optimal diversified portfolio, weighted by each asset's market capitalization. Refer to Roche (2016) for a theoretical discussion of the GFAP and Doeswijk et al (2014) for empirical work on the GFAP.

follows, the practical - not theoretical - representation of active and passive strategies will be discussed.

Portfolio Selection Theory

A portfolio refers to a group of financial assets that are owned by an individual or institution. Any type of financial asset may be in an investor's portfolio: individual stocks and bonds, cash equivalents, mutual funds, ETFs, or derivative instruments such as options or futures. Portfolio selection, then, refers to the methods used to select the most suitable assets to construct a particular client's portfolio. Portfolio selection, generally, encompasses both theoretical and empirical strategies and often involves concepts such as investor behaviour, attitudes towards risk, expected utility, risk and reward, and diversification.

Harry Markowitz developed his original portfolio selection theory in 1952.¹⁹⁹ Markowitz's theory focused primarily on concepts of risk, reward, diversification, and the relationship between various securities within a portfolio. Whereas the majority of 'pre-Markowitz' research on portfolio selection argued that diversification could completely eliminate risk within an investor's portfolio,²⁰⁰ Markowitz was able to statistically demonstrate that while risk could certainly be reduced through proper diversification without changing expected returns, it could never be eliminated entirely. As he states, "The returns from securities are too inter-correlated.

¹⁹⁹ Refer to Markowitz (1959) for an expansion to his 1952 paper and Markowitz (1999) for a history of theoretical and empirical developments relating to his original portfolio selection model. As this project is largely historical, recent critiques and developments relating to portfolio selection models will not be discussed. Instead, discussion will centre around Markowitz's early work.

²⁰⁰ A prominent theorist of this time was John B. Williams: "...there is no risk in buying a bond if its price is right. Given adequate diversification, gains on such purchases will offset losses, and a return at the pure interest rate will be obtained. Thus the net risk turns out to be nil" (Williams 1938, 67-69). Theorists working on portfolio selection models prior to the 1950s often used theories of expected value and dividend discount models to derive theoretical stock values. For an example of these theories in use, refer to Williams (1938, 55-75).

Diversification cannot eliminate all variance” (Markowitz 1952, 79). In the following years, William Sharpe was able to echo Markowitz’s findings: “...diversification enables the investor to escape all but the risk resulting from swings in economic activity - this type of risk remains even in efficient combinations” (Sharpe 1964, 441). For example, even if excellent diversification is achieved within a portfolio - large and small stocks from various industries, corporate and government bonds, et cetera - these assets all remain susceptible to systematic risk that pervades the entirety of financial markets (also known as ‘market risk’, as opposed to unsystematic risk²⁰¹): “...since all other types [of risk] can be avoided by diversification, only the responsiveness of an asset’s rate of return to the level of economic activity is relevant in assessing its risk” (Sharpe 1964, 441-442). Markowitz argued that as risk cannot be completely eliminated, the task then becomes a question of how to most efficiently allocate assets within a portfolio to manage risk exposure.

Markowitz began his theory of portfolio selection by demonstrating how the mean, standard deviation, and correlation of various assets determines the way they ought to be allocated within a portfolio.²⁰² Perhaps most notably, Markowitz’s portfolio selection theory was able to quantify how assets ought to be allocated within a portfolio by measuring the amount of risk²⁰³ an investor was willing to accept to achieve a particular return.²⁰⁴ In other words, Markowitz’s theory was able to formalize the trade-off that exists between risk and reward: “There is a rate at which the investor can gain expected return by taking on variance, or reduce variance by giving

²⁰¹ Unsystematic risk - also known as diversifiable risk - is decreased through diversification of portfolio assets (McClure 2010).

²⁰² The mean and standard deviation of assets were used to plot the relative return and risk of various portfolios.

²⁰³ Risk is synonymous with volatility in Markowitz (1952). The higher the risk, the greater the fluctuations in value of an asset. Correlation measures the degree of co-movement of asset returns. If the correlation of assets is zero, they have identical risk.

²⁰⁴ Markowitz (1952) developed a method called mean-variance optimization to quantify the trade-off between risk and reward as it relates to portfolio selection.

up expected return” (Markowitz 1952, 79). Simply stated, investors will only increase their risk if there is an expected increase in reward.²⁰⁵ For example, investing in an emerging corporate stock carries a higher risk than investing in an established Fortune 500 company for a multitude of factors. The reason one may invest in the asset that carries a risk premium is because there is a higher expectation of reward: the investor may reasonably expect to have their profits grow with the emerging company, whereas the less-risky Fortune 500 corporation offers stability but little opportunity for explosive growth. Similarly, other low risk assets - such as government bonds - are held with the understanding that rewards will be low: their relative safety is paid for with substantially lower expectations for profit.

This understanding about the trade-off between risk and reward was modeled into the concept of the efficient frontier (Markowitz 1952; 1959), also known as Markowitz optimization. That is, if optimal diversification is achieved, there will exist a portfolio that provides the lowest possible level of risk for every level of desired return: “for any level of risk, the efficient frontier identifies a point that is the highest returning portfolio in its risk class. By the same token, for any level of return, the frontier identifies the lower risk portfolio in that return class” (Goetzmann 1996, Chapter Two). As there are infinite points along the frontier, there is an optimal portfolio for every investor depending on their risk preference. These optimal portfolios, Markowitz noted, were always diversified portfolios. This result led him to the claim that seeking maximum returns for investment is unstable and unsuitable for investors: “Diversification is both observed and sensible; a rule of behavior which does not imply the superiority of diversification must be rejected” (Markowitz 1952, 77).

²⁰⁵ It is important to stress that there is only the *expectation* of reward, as profit from investment is never guaranteed.

The realization that focusing on the expected values of stocks only, as traditional theorists advocated, would lead to the conclusion that an investor ought to place all of their money in a stock with the highest expected return (Williams 1938). Clearly, this strategy was not occurring in financial markets, as the vast majority of investors preferred diversification. Even traditional theorists such as Williams (1938) who advocated the use of expected value constructed diversified portfolios. More so, the concept of diversification was also relied upon as a remedy for poor investment performance. For example, in a letter to investors during the great depression, investment managers of the Alexander Fund explained that diversification was the only solution to the poor performance of the market:

Your manager has often told you that human judgment in the selection is not worth much, and after forty years in the market we still believe that, aside from government bonds and a few others of low yield, the great safety in investment lies in diversified securities...Default in the earning power of gilt-edged investments proves pretty conclusively that the average financial advisor is a myth (Public Examination of The Alexander Fund, 1 February 1933, quoted in Report of the SEC on Investment Trusts and Investment Companies Part III 1939, 2488).

Thus, Markowitz was able to conclude that “The hypothesis (or maxim) that the investor does (or should) maximize discounted return must be rejected” (1952, 77) in favour of diversification.

What is noteworthy about Markowitz’s work on portfolio selection was that it was able to capture the intuitive preferences of investors and translate them into explicit, consistent language about portfolio selection. Intuitively, the idea that high risk investments had the potential to reward investors with large rewards and low risk investments were safe but not lucrative was not new. Prior to the 1950s, the studies on the financial markets often indirectly described

Markowitz's risk-reward trade-off by describing the risk-aversion characteristics of investors.²⁰⁶ For example, given two similar assets with different risk profiles, an investor will likely select the asset with the lower level of risk. The same holds true when combining multiple assets with varying levels of risk: "Prices will adjust so that assets which are more responsive to changes...will have higher expected returns than those which are less responsive. This accords with common sense" (Sharpe 1964, 440). By creating the efficient frontier, Markowitz was able to formalize this relationship between risk and reward and provide the foundations for investors to statistically determine the portfolio that will grant them their preferred expected return with the lowest risk possible. Markowitz's original work in 1952, and expansion on that work in 1959, represented the first time in financial theory where investor preferences for risk and reward could be formalized, quantified, and translated into ideal portfolios.

The concept of diversification is another intuitive preference that Markowitz was able to formalize through his portfolio selection theory. Common adages such as 'don't put all your eggs in one basket' have alluded to the importance of diversification as a risk-reduction strategy long before theoreticians applied it to the problem of portfolio selection. Just like the risk to eggs in a basket, an investor's assets, if isolated to one investment, risk catastrophic loss. Thus, the best way to protect an investor's investment is by using various carriers such as stocks, bonds, or cash-like instruments. However, as Markowitz described, not all diversification is created equal: those constructing portfolios must use the "'right kind' of diversification for the 'right reason'" (Markowitz 1952, 89).

The 'right kind' of diversification, for Markowitz, does not refer to the number of assets within a portfolio: "It is not enough to invest in many securities. It is necessary to avoid investing

²⁰⁶ Carl Menger (1871) discussed how investor preferences are ordered; Dewing (1953) discussed the psychological, not economic, motives of behaviour in the financial markets.

in securities with high covariances²⁰⁷ among themselves” (Markowitz 1952, 89). Consider a portfolio composed of 100 assets: if all of the assets were telecommunication companies, there would be a high covariance as firms within the same or similar industries exhibit similar reactions to economic and non-economic events. However, if the 100 assets were allocated across various industries, a lower covariance would result. To provide a simplistic example, if an investor had a heavy weighting of U.S. dollars in their portfolio, the ‘right kind’ of diversification would be to add an investment with a low covariance to the USD, such as gold. As the price of gold typically climbs when the value of the USD falls,²⁰⁸ an investor holding both of these assets will likely have one asset that gains value while the other falls, efficiently lowering their total risk profile.

To reiterate, Markowitz’s concept of diversification is not based solely on the number of assets held, but how the assets are allocated: “We should diversify across industries because firms in different industries, especially industries with different economic characteristics, have lower covariances than firms within an industry” (Markowitz 1952, 89). To provide another example: in periods of recession, the stock prices of luxury retailers often falls while the stock prices of entertainment companies - specifically, movie theatres - increases. Examples such as this are innumerable and, as the efficient frontier demonstrates, endlessly customizable depending on an investor’s preferred expected return. If a high return is sought, higher-risk securities will be properly diversified to eliminate the systematic risk. If a lower return is acceptable, lower-risk securities will be chosen so that their systematic risk is reduced as well.

²⁰⁷ Covariance measures the tendency of two or more variables to move in the same direction. Statistically, covariance is the product of the assets’ standard deviations and correlation coefficient.

²⁰⁸ Investors typically sell dollars and buy gold as the value of the dollar drops. This demand for gold pushes its price upwards as the dollar falls.

Again, Markowitz's portfolio selection theory was able to take the intuitive concept of diversification and apply it to the problem of asset allocation to explain *why* diversification was almost always preferred. That result was that diversification - if done properly - is able to increase portfolio returns without increasing risk. This concept of 'proper diversification' was quantified through the efficient frontier and formalized as a definitional term: financial researchers were, for the first time, able to empirically test the concept of diversification and systematically present its impact on various portfolios. The empirical research that focused on assessing Markowitz's optimization of diversification²⁰⁹ assisted in normalizing the concept of diversification within the marketplace so that when asset allocators began to speak about constructing 'well diversified' portfolios, they were referring to a standardized, measurable approach. The model of efficient portfolio selection could be used by traders to determine correlations of securities to an index, maximizing expected returns for set variances of return instead of focusing on orthodox methods which emphasized expected value alone. The standardization of the meaning of diversification was expanded on by Sharpe (1964) and Fama (1960), which will be discussed next.

Capital Asset Pricing Model

William Sharpe was greatly influenced by Markowitz's work on portfolio theory and received Markowitz's advice throughout the development of his PhD dissertation (Sharpe 1961), which involved elements of the now-infamous Capital Asset Pricing Model. In 1990, Markowitz

²⁰⁹ Refer to Cohen and Pogue (1967), Mao (197), and Grubel (1968) for examples of empirical work on portfolio theory.

and Sharpe were awarded The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel (the Nobel Prize) alongside Merton Miller for their pioneering work on portfolio theory and financial economics.²¹⁰ While this section will focus solely on Sharpe's work, it is necessary to mention that asset pricing theory (and, specifically, the CAPM), was a result of many independently working theorists such as Jack Treynor (1962; 1965), Jan Mossin (1966), John Lintner (1965a; 1965b), and Fischer Black, Michael Jensen, and Myron Scholes (1972). However, as Sharpe's CAPM has arguably achieved the broadest public reach and has been most widely credited as a direct inspiration for index developments,²¹¹ it is his work that will be the subject of focus in this project.

Sharpe's development of the CAPM was the first time that mathematical models were used to determine asset prices under conditions of risk. Mathematical formalization of the theory created an empirically testable approach²¹² that departed from the dominant theory of the time:²¹³ "Although many useful insights can be obtained from the traditional models of investment under conditions of certainty, the pervasive influence of risk in financial transactions has forced those working in this area to adopt models of price behavior which are little more than assertions" (Sharpe 1964, 425).

The CAPM is an extension of Markowitz's original portfolio selection theory (1952; 1959) and uses many of its original concepts in its derivations. For example, Sharpe identifies the

²¹⁰ Refer to MacKenzie (2006) for a sociological perspective on the historical emergence of financial economics.

²¹¹ Sharpe's theory has been credited by several of this project's interviewees as a source of inspiration for ETF development. This will be discussed later in this chapter.

²¹² The empirical validity of the CAPM was not without problem. As Sharpe himself noted, his model's assumptions are "...highly restrictive and undoubtedly unrealistic" (1964, 434). Despite the unrealistic assumptions regarding investor behaviour and rational expectations, Sharpe's work was able to formalize the theoretically optimal rate of return of assets.

²¹³ Prior to the CAPM, research from Gordon and Gangolli (1962), Hicks (1962), and Tobin (1958) assessed attitudes towards risk, but not decision making under risk conditions. Refer to Sharpe (1964, 427-428) for discussion.

correlation between assets and their expected rate of return as one of the primary elements of portfolio selection: "...the effect of an asset on an investor's over-all investment opportunity curve depends not only on its expected rate of return and risk, but also on its correlations with the other available opportunities" (Sharpe 1964, 431). Using the concept of correlation, Sharpe was able to construct what he called the capital market line. This line represents how an investor using proper diversification can only achieve higher expected returns by raising their risk profile (1964, 425).

Sharpe mathematically validated the intuitive understanding that individuals who purchase low risk assets are willing to accept low returns, and those who acquire aggressive assets will only do so if there is a reasonable expectation of high rewards. Thus, echoing Markowitz's theory of portfolio optimisation, the ideal portfolio for any risk level will fall along the capital market line. Formalizing the complexities involved in Markowitz's analysis of the trade-off between risk and reward, Sharpe was able to develop a simple mathematical model called beta (β). Beta measures an asset's volatility – that is, its sensitivity of returns to market fluctuations. The higher an asset's beta, the higher the expected returns. For example, a beta of 1.0 represents all of the assets in the market - the 'market portfolio'. If an asset scores less than 1.0, it is less volatile than the market and does not react to market movements in a highly correlated manner. Any asset scoring over 1.0 is more volatile than the market, and has a higher degree of correlation between its movements and the market. If an asset has a beta of 1.5, the asset will experience approximately 50% more volatility than the market and will tend to move in the same direction: for every 1% gain in the market, stocks with a 1.5β will gain 1.50%; for every 1% fall in the market, these same stocks will lose 50% more than the market. Conversely, if a stock is measured at 0.5β , it is theoretically 50% less volatile than the market: For every 1% rise in the

market, 0.5β stocks will rise 0.5%. For every 1% fall in the market, 0.5β stocks will lose 50% less than the market.

Beta provided, for the first time, a simple way to speak about the trade-off that exists between risk and return: $>1.0\beta$ is more volatile than the market, and $<1.0\beta$ is less volatile than the market. While this tradeoff was intuitively understood by market participants, beta was the first time the relationship became formalized so that investors could use a common measurement and frame of analysis when talking about risk and reward.²¹⁴ As Sharpe himself stated, “the familiarity of the implications need not be considered a drawback. The provision of a logical framework for producing some of the major elements of traditional financial theory should be a useful contribution” (1964, 442).²¹⁵

Perhaps most importantly, however, Sharpe’s work determined that of all the possible investment combinations, the most efficient was always the market in its entirety: “Of all possibilities...one will dominate: that investment plan lying at the point of the original investment opportunity curve” (Sharpe 1964, 432). This investment plan, referred to as the market portfolio, is comprised of all of the assets in the market, weighted by their market capitalization. Consider a hypothetical market that is comprised of three assets: asset A, accounting for 20% of the total market; asset B, with 10%, and C, with 70%. The market portfolio in this scenario is a three asset portfolio with A accounting for 20% of the total portfolio weight, B with 10%, and C, the remaining 70%. This concept of the market portfolio

²¹⁴ Beta is often equated as a measure of risk due to its measure of a stock’s price fluctuations in relation to the market. This, however has been critiqued because risk must also take into account a stock’s quality (e.g. the danger of a stock dropping in quality or future earning potential due to economic events). Refer to Graham (2006) for a discussion on this issue as it relates to portfolio selection.

²¹⁵ Beta and CAPM have been widely contested. It is not within the scope of this project to address the theoretical and empirical oppositions to these concepts as this project focuses on their integration in market parlance. As Fama and French have commented, “The attraction of CAPM is that it offers powerful and intuitively pleasing predictions to measure and the relation between expected return and risk. Unfortunately, the record of the model is poor” (2004, 25).

has significant implications for both Eugene Fama's efficient market hypothesis (EMH) and the development of index strategies, both of which will be discussed in the subsequent sections.

Efficient Market Hypothesis

Eugene Fama extended the work previously done on random walk theory²¹⁶ and the CAPM by developing something called the Efficient Market Hypothesis (EMH). The EMH states that investors may choose among securities "...under the assumption that security prices at any time 'fully reflect' all available information" (Fama 1970, 383). Fama used the CAPM to determine whether or not an investment was able to yield excess risk-adjusted returns in relation to the market. The random walk model (Samuelson 1965) was also incorporated into Fama's EMH to formalize the assumption that "successive price changes are independent...and identically distributed" (Fama 1970, 387). Fama assumed the validity of the assumptions built in to the CAPM and used the CAPM within his model to theoretically demonstrate that, because markets are efficient, any investor's claim to be able to knowledgeably forecast stock movements based on historical patterns²¹⁷ was "...nothing more than a pseudoscience" (MacKenzie 2006, 76) that could be "...generated artificially by a suitable roulette wheel" (Roberts 1959, 4). As a former economist and mentor to individuals such as Warren Buffet and Irvine Kahn reflects:

I could not comprehend how the management of money by institutions had degenerated from the standpoint of sound investment to this rate race of trying

²¹⁶ Random walk theory, prior to 1965, argued that changes in stock prices were random and unpredictable events. Refer to: Regnault (1863), Bachelier (1900), Working (1934), Kendall (1953), MacKenzie (2006, 37-69), and Fama (1970, 389-399). Paul Samuelson (1965) used statistical approaches to derive that it was the logarithms of stock prices that were random, not the stock prices themselves. This result meant that prices were log-normal in their random variances (representing the traditional bell curve shape).

²¹⁷ Forecasting stock prices based on historical movements is commonly referred to as chartism or technical analysis.

to get the highest possible return in the short period of time... They are promising performance on the upside and the downside that is not practical to achieve (Graham interview in Montier 2007, 434).

The EMH implies that traditional stock picking based on either financial charts or company fundamentals is misguided because stock prices already reflect all available information, meaning future stock movements are not predictable. Fundamental analysis typically involves deriving the intrinsic value of a firm by studying balance sheets, cash flows, and credit ratings (amongst other factors). As the EMH demonstrates, stock picking using fundamental analysis was not required because the factors involved in corporate fundamentals were already incorporated into the stock price as the information became available. In other words, the EMH implies that a company's intrinsic value can not differ from its market price because any change to intrinsic value would be immediately absorbed by the market and reflect a new market price for the stock. Thus, an investor who is constructing a portfolio by using research on individual company fundamentals has no better chance of achieving higher returns than an investor who chose random stocks of the same risk level.

Statistically, the concept of efficient markets makes the selection of 'winning' stocks extremely difficult and unsustainable over time, no matter the investor's skill. As a Congressional testifier on the US ETF industry states:

Fundamental research doesn't matter right now...nobody's doing it because nobody is getting paid to do it. On one of the big down days about three weeks ago [February 2016], I happened to look up in the middle of the day and the Russell 2000, the S&P, and the Dow were all down exactly 3.33%. What that tells me is that...traders, because they don't do the fundamental research, are using ETFs (Interview 8).

ETFs may be used as a replacement for fundamental research as they avoid the stock picking problem: by using indices to gain exposure to a broad market, investors are able to mimic a

realistic market portfolio and participate in large market movements without having to identify ‘winners’ or predict the future movement of individual stocks, concepts both theoretically challenged by Markowitz, Sharpe, and Fama. As concluded by Fama, the most efficient portfolio is one that is optimally diversified - the market portfolio. Thus, the best way to achieve the most efficient portfolio was to mimic the market and seek the market return.²¹⁸

Theoretical integration in the marketplace

The theories of Markowitz, Sharpe, and Fama were instrumental in reorienting the cognitive framework of market participants away from stock picking towards index-based investments. Markowitz was able to formalize concepts such as diversification, covariance, and risk as they relate to portfolio construction. Sharpe was able to take Markowitz’s methods and develop the concept of beta, further formalizing the trade-off between risk and reward. His early development of the CAPM indicated that the optimal portfolio was the market portfolio with a beta of 1.0. By capturing the complex relationships between stocks within a portfolio in a simple framework of beta, Sharpe’s work became widely dispersed throughout the market and products advertising beta began emerging.²¹⁹ Fama was able to build on Sharpe’s CAPM assumptions to theoretically demonstrate how active management strategies are unable to achieve market beating returns over the long term. Indeed, the empirical research that followed these theories

²¹⁸ Matching the market return is a theoretical concept only. In reality, an investor who attempts to mirror the market return will always achieve slightly less, as transaction fees and taxes will reduce their return. For example: if the market returns 8.5% per year, an investor in the highest tax bracket, paying a 1% fee, will reduce their compound annual growth rate to 4.69%. Refer to Roche (2016, 8-12) for a discussion of how fees and taxes in the US result in a discrepancy between the market return and a market portfolio’s return. The impact of fees will be discussed in Chapter Eight.

²¹⁹ ETF providers now compete aggressively for the market share for ‘smart beta’ ETFs. For an excellent overview of the current field of competition for beta products, refer to Wigglesworth’s article for the Financial Times (2016), retrievable online: <https://www.ft.com/content/f1d345ae-c913-11e5-be0b-b7ece4e953a0>

verified how active managers will almost always underperform when compared against the aggregate market return. For example, Jensen demonstrated how, between 1945 and 1964, 89 of 115 active mutual fund managers underperformed their benchmarks by an average of -14.6% (Jensen 1968; Fama 1970, 412).²²⁰

As a result of theoretical developments, questions of how to invest in ‘the market’ came to the forefront of discussions amongst product innovators. These discussions became particularly prominent in the 1980s when technology was able to assist managers in trading hundreds and thousands of stocks with the push of a button. As a former pension fund manager states:

There are many reasons why ETFs gained favour worldwide...the fact that indices had outperformed active managers over different time frames; you had financial theory - William Sharpe, with his iconic article that active managers, collectively, just cannot beat the index. I think a lot of people were attracted to that theory (Interview 5).

Further illustrated by an executive of an index and data firm:

Over time, the vast majority of active managers underperform their benchmark. The research bears that out. And it’s for a whole host of reasons. There’s the Sharpe theory there, there’s risk diversification...At the end of the day, all that really says is, ‘Why would I own an active manager when I buy the benchmark for a lot cheaper and in most cases, outperform the active manager?’. That thesis has really taken hold a great deal more in the marketplace (Interview 18).

The pervasiveness of theory within the marketplace was clear: the majority of participants in the marketplace throughout the 1980s and into the 1990s were aware of Sharpe and Markowitz’s work on the benefits of proper diversification and Fama’s work that laid the theoretical groundwork for researchers to prove how active portfolios are much less likely to outperform

²²⁰ Current financial scholarship continues to assess the performance of active versus passive investment strategies. For recent studies, refer to Hung and Banerjee (2013), Banerjee and Hung (2011), Walden (2015), Fama and French (2010), Fortin and Michelson (2002), and Ewing and Malik (2000).

indices. The standardization and simplification of concepts about portfolio construction made it easy for the theoretical concepts to be integrated throughout the market, resulting in real world changes in portfolio construction. For example, the following portfolio manager inherited one of the largest pension funds in North America in the late 1980s. When asked to reflect on his investment philosophy, he stated:

[The pension fund] was primarily invested in active strategies which, frankly, had not done well... I had become heavily involved in indexing directly at that time (Interview 5).

The sentiment that passive indexing was superior to active portfolio management became widely adopted throughout the markets in the late 1980s and early 1990s as institutional basket strategies and index derivatives continued to grow in volume:

The gospel of active versus passive has taken root more...the flows into passive have completely outpaced the flows into active. That's why you see the active managers kind of on the ropes (Interview 18);

The days of individual stock picking were kind of over (Interview 15).

The Investment Company Act of 1940

The development of theories on portfolio construction began to change the epistemic orientation of market participants to favour passive investing strategies.²²¹ The popularity of

²²¹ As will be discussed in Chapter Seven, the transition in popularity from active to passive strategies was not without conflict. Active managers of mutual funds still oversaw the majority of investments in the United States and had much deeper pockets to entice investors with. The conflict between active and passive portfolio managers will be discussed in Chapter Seven in the context of marketing strategies and how they related to the proliferation of ETF products.

these strategies, in turn, led to the creation of a product called the SuperTrust, which was granted one of the most important regulatory precedents in ETF history: The Investment Company of 1940 Act exemptions. The purpose of the following section is to explain the founding principles and definitions of the Investment Company Act of 1940 and the environment in which the first exemptions under the act for ETFs were negotiated. To accomplish this, a brief overview of the 1940 Act and applicable definitions will be discussed. Next, the process to apply for exemptions from the Act will be described. This overview will set the foundation for the final section that analyses the negotiations that occurred between the SEC and the SuperTrust developers. These negotiations were crucial to the establishment of the ETF industry for the exemptions that were granted created a precedent that continues to act as the backbone of ETF legitimacy and regulation in the United States today.

Are ETFs investment companies, or made by investment companies?

After the market crash of 1929, the United States Congress tasked itself with repairing the public's faith in the financial markets. Widespread fraud conducted by both investment advisors and investment companies was uncovered in the wake of 1929, prompting Congress to commission the SEC to study the then-unregulated investment company industry. After five years of research, the SEC study was published in 1938.²²² In response to this report, Congress

²²² This report was presented to Congress between 1938 and 1939 in four volumes under the title *U.S. Securities and Exchange Commission Report on the Study of Investment Trusts and Investment Companies*. Volume One concerns the origins and scope of the study and was submitted to Congress on June 10, 1938; Volume Two is comprised of eight chapters of statistical data analysis submitted on March 10, 1939; Volume Three discusses the economic significance of investment companies, submitted in August 7, 1939; Volume Four analyses the abuses of investment

passed the Investment Company Act of 1940²²³ that, for the first time, defined what an investment company is. The 1940 Act also provided a framework that outlined minimum levels of regulation that investment companies ought to be subject to in order to “mitigate and, so far as is feasible, to eliminate the conditions...which adversely affect the national public interest and the interest of investors” (1940 Act §1).

Under the Act, an investment company is defined as “...an issuer which is or holds itself out as being engaged primarily, or proposes to engage primarily, in the business of investing, reinvesting or trading in ‘securities’” (1940 Act §3(a)(1)(A); SEC Investment Company Registration and Regulation Package). Any company operating within this definition is required to register with the SEC and is obligated, under the 1940 Act, to disclose investment objectives, expenses, and risks, in addition to meeting minimum capital requirements and other company-specific provisions.²²⁴

The Act defines three categories of investment companies: management companies, unit investment trusts, and face-amount certificate companies²²⁵. Of these, management companies and unit investment trusts are pertinent to the ETF. Management companies are structured similarly to corporations in that they have a board of directors that is responsible for overseeing the management of the corporation. These investment companies hire an investment advisor (also called a portfolio manager) to make decisions about the construction of the portfolio the

companies, submitted in June 26, 1939 (75th Congress House Documents No. 707; 76th Congress House Documents No. 70, 279, and 380; SEC Letter of Transmittal from Chairman Robert Healy, 17 August 1939).

²²³ 1940 Act legislation was first introduced to the US Senate on March 14, 1940 by Senator Robert F. Wagner of New York (S. 3580), and introduced to the House of Representatives on March 14, 1940 by Congressman Clarence F. Lea of California (H.R. 8935). The Act was eventually passed into law on August 22, 1940, to effective November 1, 1940 (Public Law No. 768, 76th Congress).

²²⁴ Refer to the SEC Office of Investor Education and Advocacy for more information on specific requirements (SEC Investor Bulletin on ETFs, August 2012). These specifics are not immediately pertinent to this project.

²²⁵ Refer to 1940 Act §2(a)(15), §3(a)(1)(B), and §4(1) for a definition and rules concerning face-amount certificate companies. These investment companies are not pertinent to the ETF.

investment company manages. The portfolios of investment companies are often constructed to beat a benchmark, so the investment advisor is permitted to make active trading decisions about the assets held within the portfolio. For example, a mutual fund that uses the S&P 500 index as a benchmark will attempt to profit more - and lose less - than the S&P 500.

Investment management companies may be organized as either open or closed end funds. An open-end investment company is defined as "...a management company which is offering for sale or has outstanding any redeemable security of which it is the issuer" (1940 Act §5(a)(1), 25). Open-end funds are best represented by looking at a mutual fund: the mutual fund company hires an investment advisor to construct an investment portfolio, then issues shares and sells these shares of their portfolio to the public. Investors may redeem their shares at any time by selling them back to the mutual fund at net asset value.²²⁶ These companies do not place a limit on the number of securities they may issue - if there is demand, the company will continue to issue, sell, and redeem their shares in perpetuity.

Alternatively, closed-end funds are defined as "...any management company other than an open-end company" (1940 Act §5(a)(2), 25). Closed-end funds are similar to open-end funds in every way except that their shares are only offered in a fixed amount and are not redeemable. Once a closed-end fund issues their pre-determined number of shares (typically through an initial public offering), investors can only buy and sell the shares on a stock exchange at market value.²²⁷

²²⁶ Net asset value (most commonly referred to as NAV) represents the price per share. It is calculated by taking the value of all of the securities in a fund's portfolio and dividing them by the number of shares of the fund outstanding.

²²⁷ Closed-end funds may be further subdivided into interval funds and business development companies under the 1940 Act, but this distinction is not necessary for this project. Refer to 1940 Act §2(a)(46) and Rule 23c-3 or SEC Release No. IC-25258 (2001) for details.

A unit investment trust is the second kind of investment company relevant to ETF regulation. Defined by three qualities, a unit investment trust: “...(A) is organized under a trust indenture, contract of custodianship or agency, or similar instrument, (B) does not have a board of directors, and (C) issues only redeemable securities, each of which represents an undivided interest in a unit of specified securities...” (1940 Act §4(2), 24). Unit investment trusts offer a fixed portfolio, so these companies do not need an investment advisor to make decisions about what assets to trade within the fund. In other words, a unit investment trust portfolio is constructed at the trust’s inception and will hold the same assets in the same weightings throughout its life. While these trusts do not have a board of directors like open- and closed- end funds, they do appoint a trustee who is responsible for adjusting the portfolio to maintain its original composition.²²⁸ Akin to open-ended funds, unit investment trusts may issue an indefinite number of securities for sale which are traded over a stock exchange at market value.²²⁹

The exemption process

Currently, ETFs are considered investment companies and must register such as with the SEC under the Investment Company Act of 1940.²³⁰ While ETFs are subject to many of the provisions under the 1940 Act, the ETF structure itself is only permitted by having several exemptions granted under the 1940 Act.

²²⁸ As dividends or capital gains accrue or if stocks split, the UIT portfolio may diverge from its initial weightings. Thus, a trustee is needed to provide oversight and maintain the original weightings of assets within the trust.

²²⁹ Investors may also sell back their UIT units directly to the trust at NAV in blocks of 50,000 units at a time (this basket size is legislated by the 1940 Act). These blocks, if being sold back to the trust, are called redemption baskets. This is cost prohibitive for most investors as a redemption basket typically costs several millions of dollars or more. Thus, the most common trades for average investors in UITs occur on a stock exchange. See 1940 Act §4 and §26 for UIT rules.

²³⁰ As ETFs trade on stock exchanges, they are also required to register under the Securities Exchange Act of 1934 (commonly referred to as the Exchange Act).

Exemptions have always been permitted under the 1940 Act and requests for relief were not - and are not - rare. Under Section 6(c) of the Act, the SEC has the authority to grant exemptions that are “necessary or appropriate in the public interest and consistent with the protection of investors and the purposes fairly intended by the policy and provisions”.

Between 1982 and 1985, the SEC Division of Investment Management²³¹ received over 600 exemption requests under the 1940 Act (SEC Release No. IC-14492 30 April 1985), leading a former SEC Director to describe the process as a “conga line” that “tied up lots of personnel” (Smythe Interview 2011). As she recalls, “If it was in the Investment Company Act, there was a line out the door of people seeking exemptive orders” (Smythe interview 2011). Reiterated by a former SEC Division Director:

[The Division of Investment Management] was the graveyard where all repetitive issues that no one had quite figured out how to make into rules, or hadn't quite gotten around to making a rule, went to die. You would have order after same order after same order and it could be incredibly boring...More or less you were just a processor, is a good way of putting it, but at the same time it was also the relief valve for innovation (Interview 22).

A securities lawyer working in the 1980s confirms:

The exemption for us at the SEC was big business. *Big business*. It seemed like you needed loads of exemptions to do a lot of the newer products (Interview 3).

However, exemptions were not always smoothly passed down the administrative conga line despite the number of exemptions that were processed every year. If there were no precedents to refer to, receiving an exemption could be an arduous process. As the SEC reported in 1985:

²³¹ The Division of Investment Management is the body that administers applications for exemptions under the 1940 Act.

While the Commission has codified routinely granted exemptions into rules of general applicability wherever possible, the time saved thereby has been more than offset by the time spent processing the increased number of novel applications involving new and sophisticated financial products (Federal Register 8 May 1985, 19339).

In fact, the first ETF product to be granted exemptions under the Act - the SuperTrust - took over three years of negotiations and six applications to the SEC. It was these negotiations that took place between the SEC and the SuperTrust developers that created one of the most important precedents in establishing the ETF industry, paving the way for the first modern ETF structure. In what follows, two themes of the SuperTrust will be discussed: first, the integration of theoretical attributes into the development of the SuperTrust, and second, the regulator-innovator relationship and process of negotiations will be analysed as an example of regulatory agencement.

SuperTrust: The mediation of innovation

Inspiration for development

The SuperTrust was created by the three individuals who founded the firm Leland O'Brien Rubinstein, Associates Incorporated (LOR). Hayne Leland and Mark Rubinstein were colleagues at the University of California, Berkeley and were noted for their work in financial engineering, particularly in the field of options theory. John O'Brien, who was already well known in the financial industry as a "genius financial product marketer" (Interview 3), began working with Leland and Rubinstein in the early 1980s to found LOR and market their first product. The first

product launched by LOR was portfolio insurance,²³² whose primary inspiration arose from the rapid rise of institutional investors in the stock market and their need for a hedging vehicle that would protect them from downside loss.

As discussed in Chapter Five, portfolio insurance was suspected of having exacerbated the 1987 crisis and rapidly fell out of favour with public opinion and institutional traders, leaving LOR without a viable product. An individual familiar with LOR explains:

The problem when the market break happened was that [portfolio insurance] didn't work because you still had to sell something and there were no buyers. So that then put them on to feeling like they had a lot of egg on their face from having \$60 billion dollars worth of portfolios covered by their portfolio insurance that didn't work (Interview 3).

An excellent analogy to LOR's strategy was later published by *Investment Dealers' Digest*: "Dynamic portfolio insurance said if the fire takes place at your house you could buy the insurance fast enough to cover the damage. But in 1987, every house was on fire" (Lux and Pressman 1992). LOR recognized that there needed to be a way to purchase insurance up front, or, in other words, before the fire started:

They were really committed to trying to come up with a product that wouldn't count on having to sell something or buy something at the moment of a market crash (Interview 3).

A member of LOR recalls:

²³² LOR's portfolio insurance used dynamic replication, a concept that underlies option pricing theory, to manufacture puts in response to changing conditions in the stock market. Portfolio insurance was a marketed strategy that used computer models, not a financial product that could itself be traded. For a discussion on portfolio insurance, including its impact in the 1987 crash, refer to Chapters Four and Five.

...it appeared that LOR was again innovating and leading the way with the development of the SuperTrust...I believed that the new technologies would be beneficial to investors and the markets (Interview 7).

By 1988, passive index strategies were being used with increasing frequency by both institutions and investment advisors on behalf of their clients. However, each index strategy in the market had its shortcomings. In the stock markets, participants could use two index strategies: physical stock baskets and index mutual funds. Index baskets could be actively traded on a stock-by-stock basis, but were extremely costly to construct as the institution would have to purchase every single stock constituting their desired index and individually monitor their price fluctuations.²³³ Index mutual funds solved the cost-inefficiency of index baskets but were tax-inefficient and could not be traded throughout the day.²³⁴

In the derivative markets, investors had two choices to implement index strategies: index options and index futures. Most index options were short-term contracts that made long-term positions difficult to implement and expensive if volatility occurred around the time of the contract rollover. For example, most index options in the late 1980s were short-term contracts of two years or less. While long-term index option contracts were launched on the CBOE in 1987, the market for them was fairly illiquid. Index futures had expiration dates to keep their prices in line with the index, but as discussed in Chapter Four, institutions did not like the extra costs associated with maintaining the separate trading and compliance accounts needed for participating in the futures market.

²³³ Refer to Chapter Four for a discussion about basket trading.

²³⁴ For an explanation of how mutual funds are structured and taxed, refer to Chapter Eight. To discourage active trading, mutual fund companies implement high fees for early redemptions and charge penalties for excessive trading. 'Excessive trading' and the administered penalty is determined on a case-by-case basis. In addition, selling and then repurchasing the same mutual fund within 30 days is referred to as 'washing' or a 'wash sale', and has been outlawed by the Internal Revenue Service (IRS Publication 550, 2015).

Clearly, one of the most beneficial attributes of index strategies in the stock market was their perpetual existence, and one of the most beneficial attributes of index derivatives was their low trading costs and ability to be frequently traded. The first attempt to blend the attributes of these two markets was the PHLX CIPs, which allowed the holder to control the maturity of the product or hold it in perpetuity (as discussed in Chapter Five). Mark Rubinstein acknowledged that while index participations “go part way” in hybridising the equity and derivative index markets, they were not able to provide a way for market participants to custom-tailor the blend of relatively low risk and relatively high risk portfolios (Rubinstein 1990, 19). Thus, development began on a new product that could combine the beneficial attributes of each market.

Resulting from this realization was LOR’s SuperTrust. Designed to “...offer both individual and institutional investors the ability to participate broadly in the market and to manage risk and returns” (SuperTrust Concept Brochure 1988), the SuperTrust offered a group of securities that could be separated and recombined at the investor’s discretion.

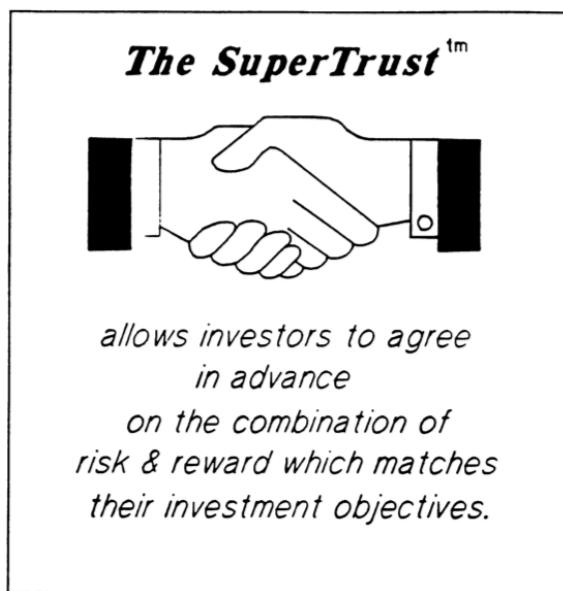


Figure 1. SuperTrust draft concept brochure I (1988).
Source: Interviewee

The SuperTrust was a group of securities structured as both open-end mutual funds and unit investment trusts (UIT). The Capital Market Fund was an open-ended mutual fund²³⁵ that could be redeemed directly back to the mutual fund company. This mutual fund had a portfolio of stocks that mirrored the S&P 500 index and a portfolio of money market and cash investments. Investors of the Capital Market mutual fund had the option, for a ‘separation fee’, to divide the mutual fund into two UITs called the Index Trust SuperUnit, which was the mutual fund’s stock portfolio, and a Money Market Trust SuperUnit, which was the mutual fund’s interest bearing money market portfolio. Because SuperUnits were UITs, they could be traded independently on the AMEX²³⁶ or recombined and converted back into the Capital Market mutual fund.

The purpose of the SuperUnits were to divide the mutual fund into two risk levels: the Index SuperUnit had more risk but more potential for profit because it held the S&P 500 stocks, while the Money Market SuperUnit was extremely stable but had little upside potential as interest payments on money market assets are very small. An investor could trade their SuperUnits on the AMEX to achieve their desired risk exposure: hypothetically, an investor could sell all of their Money Market SuperUnits and hold only the Index SuperUnits, vice versa, or any other combination of their choosing. In addition, an investor could elect to pay another fee and further divide their SuperUnits into four different types of baskets called SuperShares, which were tradable UITs that allowed further customization of risk and return levels. SuperShares could be

²³⁵ The Capital Market Fund was one mutual fund comprised of two series. These series were referred to as the Index Series (the S&P 500 index portfolio) and the Money Market Series (the cash equivalent portfolio) in concept brochures. Refer to Figure 2.

²³⁶ Early SuperTrust documents stated that the NYSE would be the listing exchange for SuperUnits. However, LOR ultimately decided to list SuperUnits on the AMEX. Thus, the AMEX will be referenced throughout the SuperTrust discussions even though this may diverge from what is in early (pre-1990) LOR and SEC documents. The reason why the AMEX was most always chosen as the listing exchange for innovative basket products will be discussed in Chapter Eight.

recombined back into SuperUnits, just as SuperUnits could be recombined into the Capital Market Fund:²³⁷

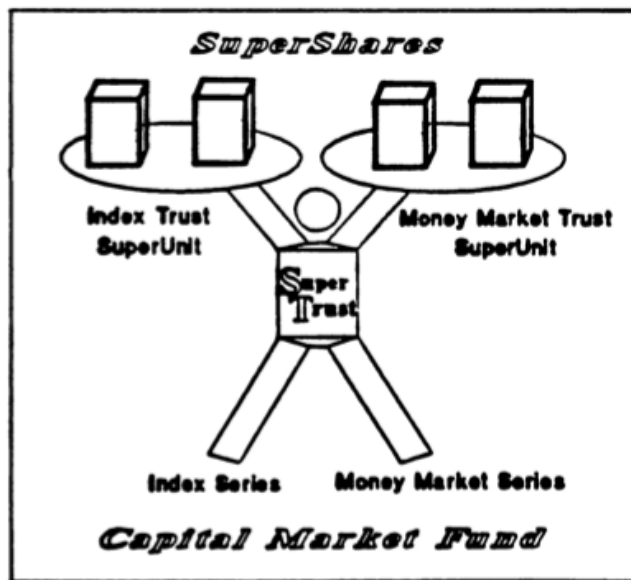


Figure 2. SuperTrust draft concept brochure II 1988)
Source: Interviewee

The Index SuperUnits could be divided into Appreciation SuperShares and Index Income SuperShares. Appreciation SuperShares received any capital appreciation from the Index SuperUnits. Appreciation SuperShares were the higher risk option as they only provided a payoff if the S&P 500 equities increased in value; if the value of equities fell, holders of Appreciation SuperShares would not receive anything. Appreciation SuperShares are the most similar to a call option. The Index Income SuperShares, alternatively, received all dividend payments and capital gains distributions from the Index SuperUnits. These were the lower risk option as investors in the Index Income SuperShares were guaranteed to receive dividend payments on the S&P 500 stocks irrespective of whether the stocks increased or decreased in value. However, as the Index

²³⁷ The names of the four SuperShares changed throughout the development process. In what follows, the SuperShares will be referred to by the same names that are displayed in the marketing images.

Income SuperShares were only eligible for dividend payments, investors did not get rewarded if stocks increased in value. To summarize, Appreciation SuperShares were more volatile but offered more potential reward, while Index Income SuperShares were less volatile but offered less reward.

The Money Market SuperUnits could be divided into Protection SuperShares and Money Market Income SuperShares. Protection SuperShares would appreciate, dollar for dollar, as the value of the S&P 500 index fell. Protection SuperShares were the higher risk option as holders would receive a payout if the S&P 500 index decreased in value, but would receive nothing if the value of the index increased. These SuperShares were most similar to collateralized puts - index options - in that they allowed investors to make a calculated bet on the value of the stock market falling.²³⁸ Recalling the Investment Dealers' Digest article that described portfolio insurance as an insurance policy that could only be purchased once a house was on fire, the Protection SuperShares offered investors the ability "to purchase the insurance up front" (1992). As reiterated by LOR: "If...portfolio insurance strategies were implemented with Protection SuperShares, investors would not need to trade during periods of market turmoil" (Leland and Rubinstein 1989), correcting a major shortcoming of LOR's portfolio insurance.

The Money Market SuperUnits were also divisible into Money Market Income SuperShares, which received all of the interest payments from the Money Market SuperUnit. These SuperShares were the lower risk option as the interest payments came from the cash equivalents in the SuperUnit: Irrespective of the rise and fall in the value of the SuperUnit, the investor in the Money Market SuperShares would receive their interest payment. As the interest rates were tied to cash equivalents which represented extremely low risk, the interest payments were very low.

²³⁸ For detailed information on the construction of the collateralized option basket of the SuperTrust, refer to Harvard Business School case study 9-294-050 (Kyrillos, 1995, 7-8).

To summarize, Protection SuperShares were higher risk but offered protection from losses in the S&P 500 index equities, while Money Market SuperShares were extremely low risk but offered little reward.

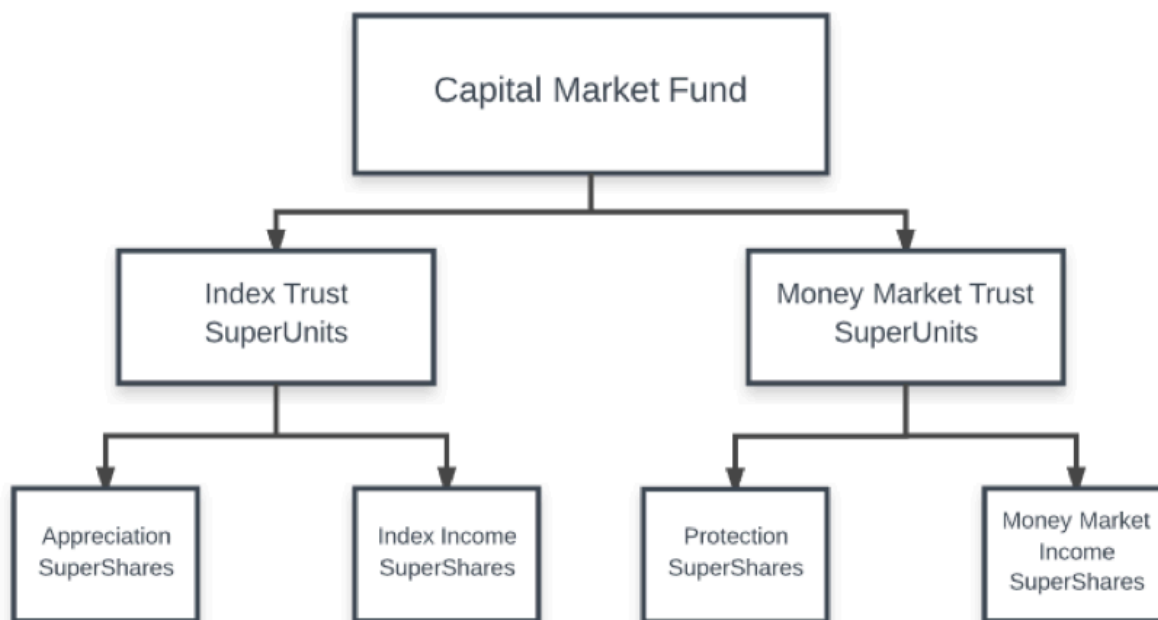


Figure 3. Simplified structure of the SuperTrust. Depiction is the author's own.

Theoretical applications in ETF structuring

At the heart of the SuperTrust was the UIT structure, which was a passive product structure whose internal assets were not actively traded. The UIT structure allowed LOR to divide the mutual fund portfolio into its money market assets and the S&P 500 assets, and then trade these passive portfolios independently over a stock exchange. In addition, by allowing investors to further subdivide their SuperUnits into SuperShares, and then trade the SuperShares on the stock

exchange, investors were able to custom-tailor their risk levels based on expected return, a concept first formalized by Markowitz.

As discussed, Markowitz was the first to demonstrate that while diversification could reduce risk, risk could never be completely eliminated. Thus, the only manner in which to manage risk is to make decisions regarding expected portfolio returns: the higher the risk tolerance, the higher the potential for returns. As Markowitz noted, intelligent investors will often maximize expected return while minimizing risk. By allowing investors to make active decisions and trade their risk exposure within a passive portfolio, the SuperTrust carried on in the Markowitz tradition:

All of the recent basket trading proposals [CIPs and SuperTrust]...tend to make trading intentions and motivations more visible to all market participants by physically separating passive from active trading (Rubinstein 1990, 19).

The point of separation active from passive trading was best represented in the SuperTrust marketing brochure. In the brochure, LOR created an image which represented the two passive SuperUnit portfolios as large blocks that were each comprised by two smaller SuperShare baskets that controlled risk exposure:



Figure 4. SuperTrust for Capital Market Fund Inc. Summary Graphics (1992)

Source: Interviewee

The depiction is similar to a jigsaw puzzle, with the four risk-controlling SuperShares being able to be separated, traded, and re-combined to form the larger SuperUnits. A former executive of index services at a major North American exchange commented on the growing importance of using passive portfolios to make investing decisions in the 1990s:

[In 1989/1990] You had people looking at SECTORS, CIPs, and international indices, right? Following a passive management strategy, but enabling people to make more targeted bets (Interview 20).

The SuperTrust was also the first ETF-style product to use financial theory and academic research in its justification for exemptions under the 1940 Act. Specifically, Leland and Rubinstein used the importance of the CAPM and the empirical testing of the EMH to justify to the SEC that the SuperTrust was in the best interest of investors. Specifically, LOR mentioned how the CAPM concludes that investors ought to divide their investments between a single standardized market portfolio and a riskless interest bearing asset. The SuperTrust provides both of these portfolios through their SuperUnits - the Index SuperUnit provides the standardized market portfolio that contains all of the S&P 500 securities in proportion to their market value, and the Money Market SuperUnit provides an interest bearing, cash equivalent portfolio.

In addition, LOR referenced empirical academic studies relating to the EMH. Specifically, LOR argued that it was “fruitless” for investors to use stock picking in attempts to beat the market (Leland and Rubinstein 10 August 1989). As markets were relatively efficient, the application argued that the safest strategy for investors was to allocate their assets across the market. As the SEC recognized, the SuperTrust did this by offering “minimal management discretion” through their index-mimicking S&P portfolio and the “nature of the Money Market”

portfolio (SEC Comment Letter 30 May 1989, 7). The most investor-friendly way to achieve this broad market exposure, given the shortcomings of both index equities and index derivatives, was LOR's low cost, fully collateralized, passively managed SuperTrust.

LOR's justification for the SuperTrust continued for 25 pages, mentioning how the growing popularity of using equity market indices as performance benchmarks made their product a useful contribution to the market. Because the SuperTrust provided a diversified portfolio, an "efficient means to trade baskets", and the ability for large and small investors to custom tailor their risk exposure, the SuperTrust would facilitate the "trading needs of large classes of investors" (Leland and Rubinstein 10 August 1989, 2). Thus, LOR argued, as their product was backed by empirically substantiated financial theory, the SuperTrust was in the best interest of investors, consistent with the protection of investors, and would not set an undesirable precedent for future products applying under the 1940 Act.

Despite the initial interest from investors, the SuperTrust failed due to its complexities, high initial investment requirement, and potential for high fees. Its SuperShares - the baskets that allowed investors to customize their risk exposure within a SuperUnit - were the source of much confusion:

The basis of the SuperTrust...is so unusual that Parallax employees spend much of their time simply explaining what's going on (Marshall interview 1993).²³⁹

The SuperTrust's SuperUnits, however, created an important milestone in the burgeoning ETF industry. The SuperUnits were the first time that a product could trade the physical assets that composed an index identically to a stock.²⁴⁰ As Mark Rubinstein of LOR stated:

²³⁹ The five-person Connecticut derivatives firm, Parallax Group Inc., was one of the SuperTrust soliciting dealers.

²⁴⁰ To reiterate from Chapter Five, the CIPs was backed by futures and not physical stocks.

SuperUnits look and feel like a common stock even down to their newspaper listing along side other stocks on the AMEX (Rubinstein 1993, 3).

As the founder of an investment management firm stated in an interview about the SuperTrust:

More people are more interested in the market than in a particular stock...I'm a great, great believer that Baskin Robbins works because it has 31 flavors. People want that (Marshall interview 1993).

While the PHLX CIPs were also tradable like a stock, they were backed by futures and had no inventory carrying costs. This meant that investors who traded the CIPs were not invested in the physical stocks of the S&P 500 and thus the CIPs did not have to register as an investment company.²⁴¹ In addition, as the CIPs were backed by futures contracts, CIPs were ultimately declared a derivative instrument. The SuperShares offered investors the physical underlying for the first time, fully collateralizing their positions and creating the immediate precedent to what is now recognized as an ETF. Because the SuperTrust's units were physically invested in the constituents of the S&P 500 index, it was necessary for the SuperTrust to be registered as an investment company (specifically, a UIT) under the Investment Company Act of 1940. As the SuperTrust was the first of its kind and notably complex, LOR and its legal team underwent almost four years of negotiations with the SEC. It is this process to which this chapter now turns.

Exemption requests

²⁴¹ The Investment Company Institute threatened legal action over the CIPs because they argued that the product ought to be registered as a mutual fund. This issue was eclipsed by the CFTC-SEC lawsuit and never went to court.

The regulatory negotiations that the SuperTrust underwent with the SEC has been the subject of two detailed Harvard Business School case studies and will not be covered in as much depth here.²⁴² In what follows, the key events that shaped the negotiation process between the SuperTrust developers and the SEC will be outlined. These events will set the stage for the final discussion concerning the regulatory agencement evident in the SuperTrust negotiations.

In 1988, LOR hired a legal team called Donovan Leisure Newton & Irvine to bring the SuperTrust to market. Initially, their counsel estimated the process to bring the product to market would take six months and \$600,000 (Kyrillos 1995). As discussed in Chapter Four, due to the lack of organization and substantial processing delays at the SEC, most companies attempted to bring their products to market through a SEC no action letter. To file motion for no action, the innovator needed to supply a relevant precedent. If there was a clear and relevant precedent, requesting a no action letter was often the least expensive and labour intensive approach to launch a product. In the case of the SuperTrust, LOR applied for no action using the Americus Trust as a precedent on December 15, 1988.²⁴³ However, no stranger to controversy, the developer of the Americus Trust had been in and out of SEC and Congressional hearings and ended up having his Americus Trust exemptions withdrawn. As a former SEC staff attorney recalls:

[LOR] had at one point done what everybody does, which was to see how much they could ask for and have us bite. That is the regulatory application process, to a certain extent... We said, 'Hey guys, that's bullshit! At this point you're going to have to come back to us'. And some of that had to do with the history that had produced no-action letters (Interview 22).

²⁴² Refer to Tufano and Kyrillos (1994) and the revised case study by Kyrillos (1995).

²⁴³ The Americus Trust was a UIT that held only one stock in its portfolio. The Trust could be broken down into two UITs called PRIMEs and SCOREs. The PRIME gave the holder the right to any capital appreciation of the stock, while the SCORE gave the holder the right to any dividend and capital gains distributions from the stock. The Americus Trust never succeeded.

LOR's request for no action on the SuperTrust was denied in early 1989 because the SEC Division of Investment Management had rejected the similarities between the SuperTrust and its named precedent, the Americus Trust. Because the Americus Trust was not deemed a suitable precedent, the SuperTrust could not be exempted under Americus' provisions. After their request was denied, LOR had two options: first, they could submit an appeal to the denied no action request, or second, they could prepare a formal application to the Division of Investment Management for exemptive relief from the 1940 Act without a named precedent.

Attitudes at the SEC towards the SuperTrust were mixed, ranging from scepticism to nonchalance (Interview 3, 7, 22, 15, 32), which gave LOR the sense that the Division of Investment Management would be "sympathetic" to an exemptive application (Kyrillos 1995):

You know, [The Division of Investment Management] was easy to work with. There was no antagonism from the regulators; just their usual scepticism. The 'you have to convince me' kind of attitude (Interview 3).

A member of the Division of Investment Management describes their doubts over the viability of the product, but confirms that LOR met the most important provision for exemption - the SuperTrust did not appear to violate the fundamental provisions of the 1940 Act:

We frankly didn't think [SuperTrust] was going to go far...It was a pretty complicated and highly expensive method of hedging. I never really understood the attraction. But the reasons I didn't think it was going to work was not related to investor protection. I looked at it more as, 'These guys have a business and now that's blown up and now they're trying to find their next line of business and, god bless them, but I don't think it's going to work!' (Interview 22).

The many informal meetings between LOR and SEC officials made LOR confident that their application for exemptive relief would be well received. On April 3, 1989, LOR filed their first applications for exemptions from Section 4(2) and 22(d).

Section 4(2) of the 1940 Act describes the characteristics of UITs. One characteristic in particular states that UITs, under the 1940 Act, “issue only redeemable securities, each of which represents an undivided interest” in securities. The SuperShares component of the SuperTrust were not redeemable, as they could only be traded over an exchange or recombined into SuperUnits. More so, SuperShares were a clear division of interest in the representative securities in the SuperUnits.

Section 22(d) relates to the shares of investment companies and dealers in the shares of investment companies. Specifically, it states that dealers are not permitted to purchase or sell shares of an investment company at anything other than NAV. As the SuperUnits would be traded over an exchange, dealers would be transacting at prevailing market prices of the units, not their NAV.

LOR’s first application for exemption under the above sections of the 1940 Act was rejected. Between April 3, 1989 and July 6, 1990, LOR would submit six successive applications²⁴⁴ as the SEC required detailed justification about how the SuperTrust was within the best interest of investors, contributed to market stability, and did not violate the fundamental provisions of the 1940 Act. Increasingly, LOR relied on arguments from financial theory such as the CAPM and EMH to justify the benefits their product would bring to market (Rubinstein 1998; 1990). By

²⁴⁴ The amended and/or restated applications for exemptive relief were filed with the SEC on the following dates: 3 April 1989, 7 September 1989, 6 February 1990, 2 April 1990, 3 July 1990, and 6 July 1990. Other relevant dates include: Notice of Application (SEC Release No. IC-17612, 25 July 1990), and the filing of the SuperTrust prospectus and Forms N1-A and S-6 (SuperTrust and Capital Market Fund Registration Statements) on 6 March 1992.

1990, LOR's legal costs were nearing four million dollars when, on October 19, 1990 - three years to the date after the market crash - the SuperTrust received provisional exemptions to launch their SuperUnits on the AMEX²⁴⁵ (SEC Release No. IC-17809).

During the period of negotiations between the SEC and LOR, the SEC was threatened yet again with litigation from a derivatives exchange over the jurisdiction of a hybrid financial product. The CBOE argued that the SuperShares component of the SuperTrust represented an options-like product that used the S&P 500 index license. However, the S&P had previously granted the CBOE exclusive use of its S&P 500 index for options products, causing the CBOE to argue that SuperShares ought to be under their jurisdiction. Wanting to avoid the same fate as the CIPs, the SEC and LOR agreed that the SuperShares component of the SuperTrust would be traded on the CBOE. This, however, further complicated the product as the mutual fund shares would be redeemable to the mutual fund, the SuperUnits would trade over the AMEX, and the SuperShares would trade on the CBOE. Because the SuperUnits had the potential to be broken down into SuperShares, all investors invested in the SuperTrust needed the appropriate licenses to trade options on the CBOE, even if they had no intentions to divide their SuperUnits into SuperShares.

After almost four years of negotiations between the SEC, LOR, and the AMEX, and negotiations between the CBOE, LOR, and SEC, the SuperTrust launched in 1992. The launch of SuperTrust was significant for it was the first product to be granted exemptions to allow the physically-backed ETF structure to trade on a stock exchange. More so, its entrance to the

²⁴⁵ The SuperShares component of the SuperTrust were listed on the CBOE.

market was the first time that an index-based product was officially declared by regulators to be in the public interest.²⁴⁶

The SEC as Leviathan? Internal conflict and control

You have to remember that there's fiefdoms. It's very easy to think of the SEC as a place. And it's not. It's more like a man of war. It's a collection of different living things all together in one shell (Interview 22).

Undoubtedly, LOR's SuperTrust application was an exercise in patience. A Harvard Business School study on the regulatory proceedings of the SuperTrust concluded that it was unclear whether or not "...the SuperTrust approval process was so complicated because the product was radically different or because LOR was involved" (Kyrillos 1995).²⁴⁷ However, oral histories discussing the SuperTrust exemptive process tell a story of intra-SEC disorganization and conflict, not one centred around the credibility of the innovators.

The SEC, as an institution, was tasked with the protection of investors and ensuring that legislation was not violated to the detriment of the market and its participants. However, the various divisions within the SEC "each had their own victim" (Interview 3) in the wake of the 1987 market break and struggled to reconcile their divergent attitudes towards the SuperTrust. As a member of the LOR team states:

At the LOR and the AMEX, there was enormous frustration that, while some SEC and other regulators had been calling for basket and indexed securities,

²⁴⁶ "The Commission...may conditionally or unconditionally exempt any person, security, or transaction...from any provision or provisions of this title or of any rule or regulation thereunder, if and to the extent that such exemption is necessary or appropriate in the public interest and consistent with the protect of investors..." (1940 Act §6(c)). Though the CIPs predated the SuperTrust, they did not need exemptions under the 1940 Act and did not have to formally address their benefit to the public interest.

²⁴⁷ As mentioned earlier in this chapter, LOR was known to be the developer of portfolio insurance, a product initially thought to be the cause of the 1987 market crisis. Though this claim was not substantiated in any of the official post-crash reports, the LOR team had become rather infamous to regulators and traders alike.

the regulators seemed to squabble amongst themselves and were delaying clearance of the ST [SuperTrust] (Interview 7);

Interviewer: Was the SEC receptive [to the SuperTrust]?

Interviewee 3: I think so - particularly the SEC Trading and Markets people.

The Division of Trading and Markets was receptive to the SuperTrust application as the SuperTrust offered a fully collateralized hedging mechanism that would not require active trading in periods of market volatility. As the Division of Trading and Markets was tasked with maintaining the efficient and orderly functioning of markets, its directors “wanted something that might prevent another market break” (Interview 3) and worked closely with the SuperTrust’s sponsoring exchange - the AMEX - to ensure appropriate standards would be upheld. The Division of Corporation Finance, alternatively, was preoccupied with ensuring that the correct information about investment products was being circulated in the market so that investors could make informed decisions. The members of the Division of Market Regulation were considered “real guardians of their rules and regulations...And always sceptical of creating new precedents” (Interview 3) that might have unintended consequences for investors. As summarized by a former attorney within the Division of Market Regulation, “Our main thinking was, ‘does [SuperTrust] fundamentally violate the provisions of the [1940] Act?’” (Interview 22).

In short, attorneys operating within the SEC in the 1980s and 1990s agreed that the 1987 market break was a much bigger factor to the Divisions of Corporation Finance and Trading and Markets than it was to Market Regulation, which was preoccupied with upholding the statutes of the 1940 Act and related legislation. The different attitudes within the SEC itself and the complexities of the SuperTrust product were the source of the long delays in granting an exemptive order:

My feeling at the time was that the SEC especially, with its divergent divisions, struggled to understand the ST (Interview 7).

A practicing securities lawyer who specializes in 1940 Act legislation explains:

I would say that the level of comfort that the SEC needs varies depending on what type of action we need to take. If it's just a question of standing by and not formally disapproving it, that's one thing. If they need to take various types of formal action, then the bar is higher in terms of getting the divisions comfortable with it (Interview 29).

Despite the struggles to satisfy the various Divisions, SEC attorneys were hesitant to bring the SuperTrust application to the SEC Commissioners for a formal hearing because they did not think the product would be popular or achieve long-lived success. Thus, after much internal conflict, the Division of Investment Management was chosen to lead the negotiations with LOR with the understanding that the rest of the Divisions would remain informed throughout the process and follow the lead of Investment Management's attorneys.

The first ETF products - of which CIPs was the first and the SuperTrust a close second - were introduced at the crux of a turn in the United States markets. This turn occurred as index-based strategies were heralded as a modern solution to the difficulties of diversification and hedging experienced in the 1980s, and regulators such as the SEC began removing barriers to entry for formally defined products into the marketplace. However, despite the apparent willingness of the SEC to embrace basket innovation, conflict abounded. First conflict with the CFTC over the CIPs product, and second with the intra-organizational conflict within the SEC that caused prolonged negotiations with LOR over the SuperTrust.

Negotiating the ETF precedent

As discussed in Chapter Two, regulatory agencement focuses on three related processes. First, how regulators participate with their devices, such as the interpretive process of rules like those within the 1940 Act. Second, regulatory agencement analyses how regulators attribute qualities to financial products in guiding the innovation from a product-concept to tradeable instrument. Third, regulatory agencement focuses on the points of intersection between regulators and innovators during the development phase of a new financial product. Bringing attention to the commonalities between regulators and innovators works to illuminate why these parties may be considered co-constituents of the innovative process and not simply dichotomized entities.

The SuperTrust is a useful study to examine regulatory agencement and the assemblages that enable this process. First, the documented history of negotiations between the SEC and LOR provide evidence that the SEC participated in attributing particular characteristics to the product itself. This process represents an instance of how innovators and regulators were able to move beyond dichotomized relations to co-constitute the product development process, transitioning the SuperTrust from a concept to tradeable product. Second, the relationship between the innovators and regulators held no evidence of ‘cat and mouse’ dynamics. As demonstrated throughout the negotiations, both parties had intersecting goals regarding investor protections and benefits, and structured their negotiations around concepts of diversification and risk control first addressed in financial theory. Using a common standard to assess the benefits and

shortcoming of the SuperTrust demonstrates how the SEC and LOR were able to use points of intersection, not rivalry, to bring the product to market.

In the case of the SuperTrust, the SEC was able to resolve its internal issues relatively early but continued to delay the LOR application for years. Many of the delays were caused by the Division of Investment Management rejecting particular attributes of the product itself or asking for particular provisions to be included in the SuperTrust structure. In providing suggestions to the LOR team, the SEC was able to participate in shaping what particular characteristics were and were not to be brought to market, representing how regulators and innovators both participate in attributing characteristics to financial products. For example, as stated earlier, the name of the SuperShares units changed several times throughout the application process at the request of the SEC. Originally, the SuperShares were to be named Upside Appreciation, Index Income, Downside Protection and Money Market Income Supershares. However, after the exemptions to the product structure were granted, the SEC argued that the names may be misleading to investors and delayed the approval for listing until the SuperShares were renamed in a manner the SEC deemed appropriate.

In addition, The SEC requested that LOR restructure particular elements within the Money Market component of the SuperTrust because the Divisions were concerned that the hedging vehicle may be interpreted as having a futures component. As the failure of the CIPs project was still making headlines, the Commission wanted to ensure that the SuperTrust structure would uphold inspection from the CFTC.²⁴⁸

²⁴⁸ As explained by a member of LOR's legal counsel, the CFTC provided guidance in shaping the early SuperTrust application. However, the CFTC was ultimately comfortable with the SEC taking the lead in bringing the product to market as long as certain restructurings took place.

Last, throughout the numerous applications, the SEC drafted statements that were to be included in both the SuperTrust’s prospectus and marketing material. Consider the following comments from the Division of Market Regulation: “The SuperTrust prospectus must clearly disclose that...”; “The Division believes that Applicants should add the following as a condition...”; “The Division will support the requested relief...by the inclusion of the following new condition...”; and “Please amend the application...or include the following new condition [and] make corresponding changes to the Fund’s prospectus and governing documents” (SEC Comment Letter 30 May 1989, 3-15). Comments such as these demonstrate that the SEC was indeed a participant in the design and marketing of the SuperTrust product, interpreting their 40 Act rules to make subtle changes that would, it was hoped, maintain investor protections.

The delays caused by the above regulatory shaping of the SuperTrust are a material example of how regulators came to participate directly in the qualification of early ETFs. By making alterations to the product structure and marketing material, regulators subtly impressed their interpretations of the 1940 Act on the product structure. These impressions represented a material change between the SuperTrust’s original concept and the form it took when it launched on the AMEX four years later. In other words, in examining the documented history of the SuperTrust, regulatory mediation assisted in attributing qualities that converted the Supertrust from a concept to a formally defined and tradeable financial artefact.

A second aspect of regulatory agencement evident in the SuperTrust case is found in examining the innovator and regulator relationship and its points of intersection. First, there was clear demand for a basket product after 1987 (see Chapter Five), meaning that both LOR and the SEC were willing to bring an innovation to market. While LOR did indeed attempt to see “what they could get away with”, the SEC was “not hostile” towards their innovation, even going as far

as being described as “sympathetic” towards LOR’s application (Interview 29). As for LOR, it was in their best interest to maintain positive and productive relationships with the SEC. As an attorney specializing in ETF legislation explains:

In every case I’ve ever dealt with, I’ve never dealt with a client that was willing to try to disobey SEC requests...it would poison the client’s relationship with the SEC. And a client needs a relationship with the SEC in order to thrive. In order to launch anything...By virtue of necessity, the relationship has to be much more collaborative as no innovation can launch without getting the SEC divisions comfortable with it (Interview 29).

Evidently, LOR did maintain a positive relationship by providing any further justifications the SEC asked for instead of filing for appeal and “calling the SEC’s bluff”, which was certainly within their right to do.²⁴⁹

However, the justification for the SuperTrust primarily came down to academic theory. The consensus that occurred over the theoretical foundations of the innovation was the beginning of a conceptual alignment between innovator and regulator purpose. It was the prominent role of academic theory such as the CAPM and EMH that enabled the regulator and innovator to uncover their common orientation and understanding of what constituted investor benefit. That is, the embedding of theory into the SuperTrust’s structure, written justifications, and amendments requested by regulators exposed how the SEC and LOR purposes were aligned. For example, the SEC Division of Investment Management was preoccupied with ensuring investor protection. After 1987, the SEC was encouraging innovations that would allow investors to take advantage of the benefits of new trading technologies that made low cost, transparent, and

²⁴⁹ Attorneys have explained that it is almost always within an innovator’s legal rights to challenge the SEC requests for changes to a product concept in court. As one attorney explains, “while it is not formally impossible to sue the SEC and possibly get a judgment in court against them, [laughing], no one would *ever* do that! You have to work with the SEC to run your business!” (Interview 29).

efficient trading possible. The rise of index strategies, in response to the popularity of portfolio theories, provided the aforementioned benefits to investors. More so, after the 1987 market crash, the increased positive attention paid by the SEC to basket products indicated that they believed passive index-based investing to protect investors from volatility and instability. As a result, the SEC never reproached LOR's invocation of financial theory to justify the benefits of passive investing in all six of the LOR applications. The Division of Investment Management, while sceptical of its potential success, believed that the SuperTrust embodied the best characteristics of portfolio theory and offered a way for investors to safely insure themselves against risk: the only contentions from the SEC were in regards to achieving clarity over the product structure itself.

While the primary goal of the SEC was the protection of investors, LOR was preoccupied with providing investor benefit. As discussed previously, the SuperTrust was developed to correct the major failing of portfolio insurance and provide investors with the most beneficial attributes of each the stock and derivative markets. The SuperTrust was LOR's attempt to give average investors the same access to risk control that large institutional investors had been using for decades (SuperTrust Concept Brochure 1988; SuperTrust for Capital Market Fund Inc. summary graphics 1992). Due to the pervasiveness of portfolio theory in the marketplace, LOR's justification of the benefits of SuperTrust were similar to the SEC arguments relating to investor protection: both LOR and the SEC advocated for products that increased trading efficiency, increased the availability of passive portfolios, and allowed for enhanced risk management to protect investors from volatility such as was experienced in the 1987 crash.

The regulatory agencement that occurred in the case of the SuperTrust demonstrates that the process of financial innovation is co-constituted by both innovators and regulators with each

party actively participating in the qualification of the product. In the case of the SuperTrust, a common environment was constructed from the widely adopted devices of financial economics that caused innovators and regulators to negotiate using the same conceptual outlook: both prioritized the concepts of diversification and risk management to make their case for investor protections and benefits, concepts first pioneered by Markowitz, Sharpe, and Fama. Thus, regulating innovation was not just a matter of dichotomized power relations, as new political economy may suggest. Using a framework of regulatory agencement to examine the SuperTrust illustrates how innovators and regulators both actively participate in transitioning an innovative concept into a formally defined, bounded artefact.

Chapter Seven

The refinement of innovation

The purpose of this chapter is twofold: first, this chapter will trace how the ETF concept was refined from its first instantiation to the modern ETF structure traded today. The refinement and redefinition process is particularly interesting for it involves innovations from both the United States and Canada. As both countries were involved in the refinement and redefinition of the product concept, important questions surface involving how transnational innovation flows occur and the conditions under which they contribute successfully to the innovative process. Second, this chapter will provide a detailed case study on the transition of a Canadian ETF product to the United States. In 2000, Canadian iUnits ETFs were successfully transitioned to the American markets and rebranded as iShares. This process is significant for it was the first time that ETF developers directly adopted Canadian marketing and educational strategies for retail investors in the United States. In conclusion, this chapter will address questions that transnational innovation flows elicit for understanding socio-technical processes, financial engineering, and bricolage.

Innovation flows: ETFs across borders, across investors

The socio-technical origins of Toronto Index Participation Units (TIPs)

Often credited as the first ETF in the world, the Toronto Index Participation Units (TIPs) were developed by the Toronto Stock Exchange (TSE) and approved by regulators (the Ontario Securities Commission) incredibly quickly compared to its American predecessors, the CIPs and

SuperTrust. Launched on March 9, 1990, the TIPs was the first ETF to be developed and marketed specifically to retail investors²⁵⁰ in North America.

The TIPs was officially called the Toronto-35 Index Participation Unit, or TIPs-35. The ‘35’ component of the title refers to the Toronto Stock Exchange 35 Composite Index (TSE-35) that the fund tracked. The TIPs were designed near-identically to the CIPs product launched by the PHLX: like CIPs, the stocks in the TIPs basket were held in the same proportion as they were in the index²⁵¹ and were priced at one-tenth of the underlying index level.²⁵² The major difference was in how the TIPs and CIPs constructed their underlying baskets. Unlike CIPs that were backed by futures to replicate the index, TIPs were backed by physical shares of the stocks in the index. As explained by the TSE:

The Exchange decided not to structure the TIPs as IPs [Index Participation Units], principally because of...the desirability of having a derivative product with real securities rather than cash values as the underlying interest...TIPs will allow investors convenient access to a diversified portfolio of senior Canadian equities (TIPs-35 Application 27 September 1989, 7).²⁵³

The TIPs product is popularly referred to as the world’s first ETF because it was the first product to use physical stocks in its basket, as opposed to the CIPs that used derivatives. While the SuperTrust’s SuperUnits were broken down into one UIT that tracked the S&P 500 stocks and one UIT that tracked the mutual fund’s cash investments, it’s complicated structure was only

²⁵⁰ ‘Retail investor’ is the industry term for ‘small investors’ or ‘individual investors’. Retail investors invest their own capital and will often hire an investment advisor to oversee their accounts and make decisions about their portfolio. The vast majority of retail clients do not have access to the same amount of capital as institutional clients.

²⁵¹ “IPs are designed to place the holder in an economic position similar to that of a purchaser of a portfolio of stocks consisting of those that make up the underlying index, with each stock represented in the portfolio in the same proportion as in the index” (TIPs-35 Application 1989, 6).

²⁵² “It is anticipated that TIPs will be priced by the market based on 1/10th of the Index level (or a lesser or greater fraction depending on the trust’s success at tracking the Index levels)” (TSE-35 Application 1989, 9). 1/10th pricing means that if an index was valued at 500, an ETF share would be priced at \$50.

²⁵³ TIPs were also structured with a physical underlying rather than derivatives due to the preferential treatment of dividend distributions within a trust under Canadian tax laws (Interviews 5, 10, 11, 20; TIPs-35 1989).

partially an ETF product. The TIPs product isolated the SuperUnit that tracked the S&P 500 and added the physical stocks instead of mutual fund shares. So, while the CIPs and SuperTrust ought to each be considered ETF products, the first modern-era, physically-backed ETF product was indeed the TIPs-35.

The creation of the Canadian TIPs, while strikingly similar to the PHLX CIPs, underwent a very different development process. While the CIPs were largely developed in secret in hopes of avoiding copycat products, the Toronto Stock Exchange created an advisory committee that consisted of indexers, active managers, futures and options industry representatives, and individuals that used cash baskets, such as those that ran equities trading desks at investment banks such as Royal Bank of Canada. In the year the advisory committee was created, 1989, the TSE offered two indices: the TSE-100 and TSE-300.²⁵⁴ These indices were not ideal for basket trading, the TIPs advisory committee found, as interested groups complained that both indices were too broad for Canadian markets and had poor liquidity. As one of the TIPs developers explains:

As for the 100 index, there probably weren't 100 large cap companies in Canada...and the 300 was kind of awkward because it was just too damn hard to buy the bottom 50 names at times - actually, often (Interview 5).

A TSE-60 index was discussed within the committee but was ultimately rejected by the derivatives representatives in attendance on the grounds that “a fixed number of names would suit their trading better, their baskets better” (Interview 5). In the Canadian marketplace at the time, finding 60 large-cap companies that would remain relatively stable enough to remain on the 60 index was difficult. Derivatives traders were concerned that if the smaller companies on

²⁵⁴ The Toronto Stock Exchange created and maintained its own indices until it sold this portion of their business to Standard & Poor's in later years. Specifically, the TSE-60 became the S&P/TSX 60 on December 31, 1998.

the TSE-60 index routinely changed position within the marketplace, the index constituents would be changing constantly. To address the concerns of the derivatives community, the advisory committee settled on a TSE-35 index, comprised of the 35 largest Canadian companies traded on the TSE. Settling on 35 names was thought to be the most efficient grouping in the Canadian marketplace for basket trading and basket products:

Interviewer: Would it be fair to say that the Toronto-35 index was developed for the sole purpose of an ETF product?

Interview 20: Yup, that's right...the Toronto-35 index was intended to be investable and also designed as a basket-weighted index, not a traditional market-cap weighted index. And it was designed to be highly liquid, very investable, with the opportunity for people to do cash-to-index arbitrage in order to keep the index in line with the broader market.

It appears that equities traders also had a large influence in the negotiations for the TSE-35 index. At the time of negotiations, Canadian equities trading desks were using spreadsheet trading, which allowed trading desks to launch all of their orders from a single spreadsheet instead of submitting trades one-by-one. A former executive of the TSE recalls:

[A prominent equities trader involved in negotiations] swears up and down that the reason there were 35 stocks in the index was because the then-version of Lotus 1-2-3 that they were using could comfortably fit 35 cells on one screen (Interview 20).²⁵⁵

As a result of negotiations within the advisory committee, the TSE-35 index was created for the purpose of underlying the TIPs ETF basket. While the index also benefitted institutional traders and the derivatives community, the TSE-35 was designed specifically to give Canadian

²⁵⁵ Lotus 1-2-3 was the fastest computer application used for spreadsheet trading. Lotus developers pioneered new coding that allowed for instantaneous calculations and updates. It was launched by IBM on January 26, 1983. Microsoft overtook the Lotus application in the 1990s and Lotus was discontinued in 2014.

retail investors convenient access to a diversified and highly liquid basket that they could enter and exit out of at any time.

Unlike the hostile environment encountered by the CIPs development team, the Canadian markets offered an ideal environment for ETFs to emerge. First, there was a lack of industry interests in the Canadian futures industry, and second, there was a clear priority placed on innovations benefitting the interests of Canadian retail investors by exchanges and regulators alike.

During this time in Canada, futures were traded on the Montreal Exchange. While the Montreal Exchange was a prolific innovator - it was the first in North America to trade currency options, the first to trade gold options through international linkages,²⁵⁶ the first exchange to become fully automated,²⁵⁷ and the first foreign exchange to oversee the everyday operations of an American exchange²⁵⁸ - it was often thought of as “the little Canadian exchange” (Freeman 1985, 1) as its volumes were miniscule in comparison to its American counterparts. As explained by a former TSE executive:

[In the U.S.] there was significantly entrenched interests around futures. In Canada, obviously, we didn't have that. There really was very little liquidity at all around the index or index futures in particular. You didn't have that entrenched self-interest of the futures exchanges. The Montreal Exchange wasn't going to go to the mattresses to protect their futures, unlike the United States (Interview 20).

²⁵⁶ MX established linkages for cash-settled (instead of bullion-settled) gold options trading with Amsterdam and Australia in the late 1980s.

²⁵⁷ Of the exchanges in North America that used the specialist system, the MX was the first to completely remove the specialist system. MX transitioned to full automation in 2001.

²⁵⁸ The MX was responsible for the day-to-day operations of the Boston Options Exchange (BOX) as the MX was the sole provider of BOX's electronic trading systems. The system provided was the Sola Trading platform. The Sola Trading Platform was engineered by the MX specifically for derivatives trading and is still used today.

The status of futures in Canada was significant to the emergence of the TIPs ETFs because ETFs are commonly seen as alternatives to index futures. Thus, as was seen in the CIPs case (Chapter Five), futures exchanges viewed ETFs as a threat that would cut into their market share if ETFs gained traction. In the United States, early ETF innovators were keenly aware of the competitive dynamic with the futures industry:

The entrenched businesses, whether it's the Merc²⁵⁹ or Board of Trade, you knew...you were up against them too (Interview 20).

As there was not a robust or liquid futures market in Canada in the late 1980s, the TSE did not have to negotiate with the Montreal Exchange for the TIPs' entrance into the market. As there existed no influential industry lobby to support index futures in Canada, the TIPs product was introduced to the financial market with no opposition. Interestingly, the TIPs product also received no objections from the Canadian mutual fund industry:

It was really two worlds. We had very little engagement with the mutual fund guys at all. Again, [like the Montreal Exchange], they didn't feel like their retail core was being disintermediated (Interview 20).

The second environmental condition that enabled TIPs to launch quickly with immediate success was the priority that exchanges placed on the Canadian retail investor. Product developers (Interview 10) and exchange executives (Interview 5) alike expressed similar sentiments:

There was that real belief...that we were doing something that was helping individual investors in improving their investing experiences and outcomes. We wanted to feel good about the work we did...to feel like we've made people better off (Interview 5);

²⁵⁹ 'Merc' is industry slang for the Chicago Mercantile Exchange.

‘What would be in the best interest of the investor?’ That really guided our product strategy (Interview 10).

The priority given to the needs of small investors resulted in an ETF structure that was easy to understand and more accessible than both the CIPs and SuperTrust. As the TIPs were deliberately designed for retail clients and their investment advisors, they did not require the special accounts or derivatives-trading qualifications that the CIPs and SuperTrust did. Any advisor could easily understand the TIPs, purchase it for any client account, and explain it in an uncomplicated manner no matter their clients’ financial literacy. The simplified structure of the TIPs also made negotiations with Canadian regulators much easier than in the United States.

The relationship between the TSE CIPs innovators and their regulator, the Ontario Securities Commission, was a collaborative and productive one:

A lot of jurisdictions, including Canada, tell you what you *can* do. But in the US, they tell you what you *can’t* do (Interview 5).²⁶⁰

Canadian innovators found that the proactive approach the Ontario Securities Commission took towards the product made the approval process much quicker than in the US. Whereas the CIPs were in development between 1985 and 1989, and the SuperTrust between 1987 and 1992, the TIPs were developed and brought to market in just two months:²⁶¹

I don’t recall that there was a lot of pushback or significant issues related to the product or prospectus...As far as the acceptance of the product, it was fantastic (Interview 20);

²⁶⁰ It is important to note that there is no national securities regulator in Canada. Each province has their own regulator. As the TIPs were a product of the TSE, the Ontario Securities Commission was the primary regulator.

²⁶¹ Oral histories suggest that the CIPs concept was incubating for years before the first documents were produced. A SuperTrust developer suggested that they first began to think about the product concept on October 20, 1987 - the day after the market break (Interview 23), though documents were not produced until the following year. The TIPs application was submitted by the TSE in September 1989 and was approved by the OSC in November, 1989 (OSC Ruling Order dated 7 November 1989).

In Toronto, it was much more of an enthusiastic adoption by the regulators - that helped” (Interview 10).

ETF innovation flows: From the U.S. to Canada and back again

Despite the very different environments the Canadian and American ETF developers were operating in, innovation flowed easily across borders and concepts were shared and improved upon with each reinterpretation of the ETF concept. To reiterate, the first ETF concept was the CIPs in Philadelphia, followed by the SuperTrust in California, the TIPs in Toronto, and the SPY in New York. The CIPs and SuperTrust made their applications with no named precedents, whereas the TIPs and SPDR developers, to varying extents, credit CIPs and SuperTrust as relevant precedents:

TIPs are designed to fill a role in the marketplace in Canada similar to that of index participations (“IPs”) in the United States (TIPs-35 Application 27 September 1989, 6);

The first attempt, as far as I’m aware, to do a unit trust product representing a basket of shares was actually at the NYSE, and it was something called SuperShares (Interview 20).

Once it was clear that the CIPs were to be delisted, individuals from the TSE contacted the PHLX developers and met them for an informal meeting in Philadelphia. As oral histories suggest,²⁶² the TSE asked for permission to adopt the CIPs concept for Canadian retail investors. As the SEC lost the CIPs’ legal appeal and the PHLX refused to have their product traded as a

²⁶² To the author’s knowledge, there is no documented evidence of this meeting. No participants from Toronto could be found to verify the details from their point of view. However, the meeting was confirmed by two former PHLX members and one former TSE member (though the TSE member was not in attendance at the actual meeting).

futures contract, the PHLX agreed and Canadian developers went to work to simplify the design of the CIPs and restructure it for Canadian investors.

Unlike previous ETF attempts in the U.S., the TIPs succeeded by capitalizing on the strengths of the CIPs and SuperTrust and adapting them for Canadian retail clients. For example, the SuperTrust was struggling to attract assets because of its complicated splitting function - the function that allowed, for example, one SuperUnit to be divided into two SuperShares. TIPs developers realized that the SuperTrust was not only excessively complicated even for the financially literate, but its high fees and inappropriate pricing structure made the product largely inaccessible:

The issue [the TSE had with SuperTrust] was that it was a very, very large sized basket. I think the underlying value was two-point-something million which took it completely out of the realm of the retail space (Interview 20).

The SuperTrust was just not financially or conceptually accessible to the retail investor despite its claims to the contrary.²⁶³ However, TIPs innovators saw an opportunity in the SuperTrust's structure. In isolating the Index SuperUnit, the TIPs innovators were able to develop the component they felt would best serve their retail community and substitute its underlying - the mutual fund shares - with the physical stocks in the TSE-35 index:

²⁶³ Refer to Chapter Six for examples of the SuperTrust marketing strategy.

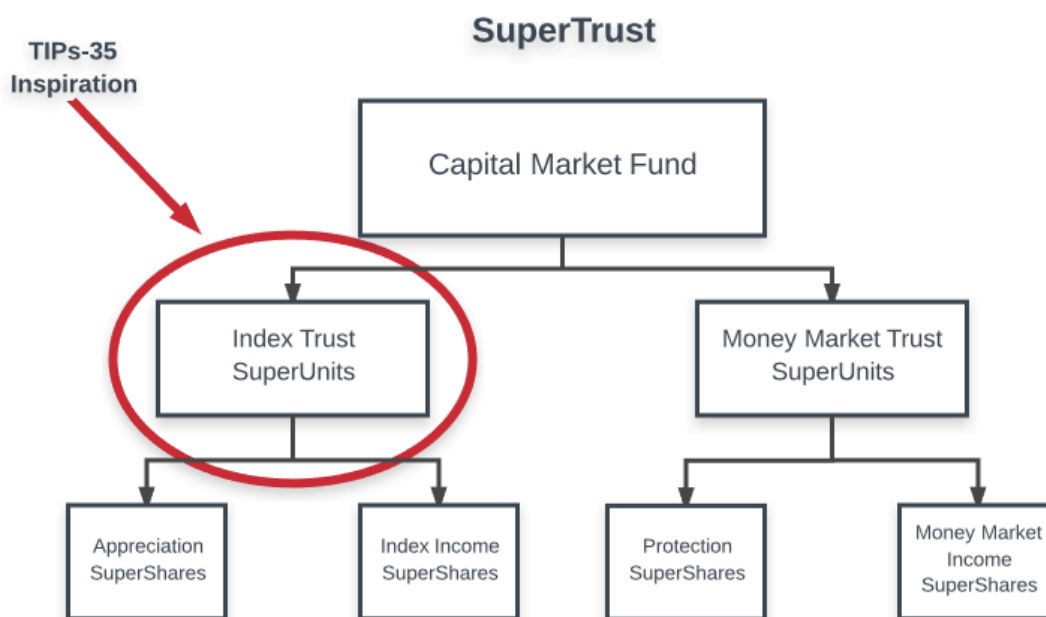


Figure 5. Isolating the TIPs-35 from the SuperTrust. Depiction is the author's own.

In addition, because the TIPs-35 was a product made by the Toronto Stock Exchange, there were no management fees charged to investors. This made the TIPs substantially less expensive and more tax efficient for retail clients than mutual funds.²⁶⁴

After its launch, the TIPs grew exponentially in its assets under management and began to attract the attention of the American exchanges. As a former TSE executive recalls, “there were conversations back and forth with the guys at the AMEX” (Interview 20) over the TIPs development process and the potential of a physical ETF for American markets. In fact, when the first physical ETF product filed for SEC approval in the United States, developers included the TIPs-35 prospectus in the application's appendix:

Well of course there were a lot of things preceding it back in the day. But we always told Nate Most and his team at the AMEX when they tried to explain

²⁶⁴ The TIPs-35 had approximately 5 basis points of operating expenses (0.05%). These expenses were charged back to the fund and subsidized by the TSE so the product could be completely free for investors. The tax benefits of ETFs as compared to mutual funds are discussed in Chapter Eight.

that they were the real innovators, that, you know, ‘Nate, whose prospectus was stapled to whose prospectus as an example of another product?’ (Interview 20).

The first physical ETF in the United States was called the Standard & Poor’s Depository Receipt 500 - most commonly referred to as the ‘SPY, ‘spider’, or ‘SPDR’ - and submitted its first request for exemption from the 1940 Act on June 25, 1990, just three months after the TIPs launch in Canada.²⁶⁵ Similarly to the TIPs, the SPY was a physical ETF, meaning it was backed by physical stocks in the same proportions as the index it tracked, which was the S&P 500. Just as the TIPs was able to refine the CIPs product by removing the derivative component and replacing it with physical stocks, the SPDR was able to refine the TIPs physical basket by creating something called a creation/redemption mechanism.²⁶⁶

The creation/redemption mechanism has become the integral component of modern ETFs. When an ETF company wants to create ETF shares, it enlists the help of an authorized participant, which is typically an investment bank or institution with substantial capital. To create SPDR ETF shares, for example, the authorized participant will physically purchase all of the stocks in the S&P 500 index in the same weight as they exist in the index. The authorized participant will then transfer the stocks to the ETF issuer in exchange for ETF shares. After this transaction, the ETF issuer has the physical stocks that enable it to track the index, and the authorized participant has ETF shares which it can trade over an exchange. This is the ‘creation’ part of the mechanism.²⁶⁷

²⁶⁵ Since its launch on the AMEX, the SPDR ETF has grown to be the most popular and heavily traded ETF in the world. As such, it has been the subject of innumerable research publications, books, and articles so its structure and history will not be covered in detail here. For an excellent overview of this product, refer to Gastineau (2000), Groves (2011), State Street Global Advisors (2013), and Sullivan (2013).

²⁶⁶ As discussed previously, the structure of physical ETFs such as the SPDR are also adapted from the SuperTrust’s S&P 500 Index SuperUnit. The SuperUnit was identified as a precedent in SPDR negotiations as it was with TIPs.

²⁶⁷ In the United States, creation/redemption transactions may only be executed in blocks of 50,000 units as per SEC rulings (specifically, the 1940 Act).

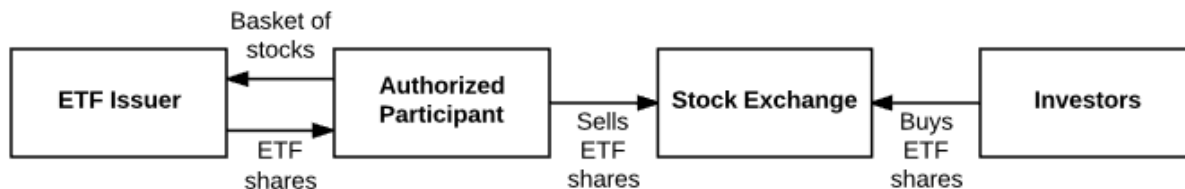


Figure 6. ETF creation process. Depiction is the author's own.

The redemption mechanism also works in reverse: The AP may purchase ETF shares over the exchange and exchange their ETF shares for the physical stocks being held by the ETF issuer. This will remove ETF shares from the market.

The creation/redemption mechanism created by the SPDR developers was important because it provided a simple mechanism to keep the ETF share price in line with the value of its index. Because ETFs trade over an exchange at market value, their price may, on occasion, deviate from the value of their constituent securities. This is typically referred to as a tracking error. If short-term price deviations occur, the authorized participant will intervene by conducting arbitrage. For example, if the SPDR ETF shares rise above the value of their underlying S&P 500 securities, the authorized participant will purchase the discounted S&P 500 stocks and sell the SPDR ETF shares. This arbitrage will reduce the tracking error between the ETF price and the price of its underlying stocks. Because this process allows the authorized participant to profit from exploiting the discrepancy in price between the ETF and underlying stocks, it is in their best interest to immediately capitalize on deviations, efficiently keeping the ETF in line with the index it tracks.²⁶⁸

²⁶⁸ The creation/redemption system is also efficient for retail investors in ETFs as the authorized participant pays the trading expenses involved with acquiring or disposing of ETF shares. If mutual funds need to create shares, the

The creation/redemption mechanism refined the structure of the TIPs ETF. The TIPs took longer to clear and settle than the SPDR because a variety of TSE members, not an authorized participant, had to agree to assemble the stock baskets and deliver the TIPs to purchasers during a set-distribution period.²⁶⁹ While similar to TIPs, the SPY's creation/redemption mechanism was proven to be more effective and now underlies all physical ETF structures, enabling trades to clear and settle within three trading days - the standard for any stock trade.

While there exist thousands of ETFs in North America that represent incredibly varied structures, the first product structure to be approved, traded, and marketed using the terminology of 'exchange-traded fund' in the United States was the physical, index-tracking SPDR ETF. However, the historical trajectory of innovation demonstrates that this product did not emerge *ex nihilo*; it was instead a product that emerged from the deliberate adoption of previous innovations combined with its unique socio-technical environment.

As discussed in Chapter Four, the technological revolution in American financial markets throughout the 1970s and 1980s created the infrastructure necessary for baskets of stocks to be traded with the push of a button which, in turn, made index options and futures possible for the first time. The Philadelphia Stock Exchange, looking for an opportunity to capitalize on the exploding popularity of index derivatives, created the first formally defined ETF called CIPs (Chapter Five). Concurrently, the developers of portfolio insurance were working on the

trading costs are passed on to investors. Refer to Chapter One or Chapter Eight for a discussion comparing ETFs and mutual funds.

²⁶⁹ Distributions of TIPs initially took 15 trading days to settle, then later dropped to 5 days. The following process typically took place: on the day prior to issuance, TIPs were listed for trading. All purchases of TIPs within the distribution period would be settled by the issuance of TIPs shares against the delivery of stock baskets by Exchange members. This process would continue on an as-needed basis. The Exchange would invite members to act as underwriters for the TIPs: "...the Exchange will announce the issue day and the proposed size of the issue and invite underwriters to commit for an allotment of TIPs...This allotment will bind underwriters to purchase the allotted number of TIPs...the underwriters will deposit baskets of shares and any accrued distribution amounts with the trust and will be issued certificates for TIPs" (TIPs-35 Application 1989, 8).

SuperTrust. As previously discussed, the SuperTrust used portfolio theory and new trading technologies to construct a product that could control risk through diversification, protecting investors from another market crisis (Chapter Six). Despite receiving landmark exemptions to the 1940 Act, the SuperTrust launched to modest interest and was eventually delisted, meeting the same fate as its predecessor, the PHLX CIPs.

At this point in ETF history - 1989 - ETF innovation transitioned from experimental development inspired by institutional trading strategies to building upon the concepts of the SuperTrust and CIPs products which provided clear documented histories and regulatory precedents. A deliberate effort from the TSE to bring the CIPs product to market with modifications for Canadian investors resulted in the first physically-backed index ETF. This product was then deliberately adopted by the AMEX and modified into a physical ETF fit for American investors and regulation.

However, the SPDR was not initially popular in the United States, unlike the CIPs was in Canada. From the SPDR's launch in 1993 and continuing for several years after, the influx of assets was modest, trading volumes were disappointing, and no substantial marketing effort was made to attract investment.²⁷⁰ In what follows, Barclays Global Investors (BGI) and their suite of iUnits ETFs in Canada will be introduced. iUnits developed in Canada and later transitioned to the United States and were rebranded as iShares. The subsequent launch of iShares in the United States (discussed later in this chapter) represented the first time that a concerted effort was put behind educating American retail investment advisors and their clients about the benefits of

²⁷⁰ Companies were hired on behalf of the SuperTrust to market the product through distribution channels. However, individuals from these marketing companies have admitted that the product was difficult to sell because their clients - and their own sales staff - had difficulties understanding the product structure. These difficulties resulted in lower than expected sales. Refer to Chapter Six for discussion.

index ETFs. The deliberate effort behind marketing ETFs catalyzed their exponential growth and proliferation across the US marketplace.

iUnits to iShares: A case study in transnational innovation

Proxy contests and the establishment of iUnits in Canada

By 1999, the TSE offered two sister ETFs - the original TIPs-35 ETF and the TIPs-100 ETF that tracked the TSE-100 index. While the two TIPs products were largely influenced by CIPs and SuperTrust, their ultimate purpose was different. Notably, the TIPs were designed to be marketed and sold as a retail product from their inception, making them the first ETF products in North America to be both constructed for and marketed to the retail community. However, as the TIPs were a product of the Toronto Stock Exchange and charged investors no fees, the TSE was not able to afford as significant a marketing push as they felt the product deserved and decided to exit the index fund business. In 1999, the TSE issued a proxy vote to combine the TIPs-35 and TIPs-100 and transfer the new product's management to an independent firm.

In October 1999, Barclays Global Investors Canada Ltd. (BGI) had launched their first ETF called the iUnits S&P/TSE 60 Index Participation Fund that tracked the 60 largest stocks in Canada. As their iUnits were achieving early success, BGI solicited to have the TIPs ETFs rolled into the iUnit ETF. However, State Street entered a surprise bid for the TIPs ETFs in hopes of establishing their own presence in Canada's promising ETF market. What resulted was one of

the first proxy fights in Canadian financial history.²⁷¹ A proxy fight or proxy contest is, as the name implies, a competitive bid by two or more institutions for the control over a financial organization. As the TIPs ETF was the subject of the proxy contest, the TIPs shareholders were the legal owners of the TIPs and were thus required to submit their preference of future TIPs administration through a proxy vote. As a former executive of BGI Canada recalls:

Oh my god, we were elated at our whole strategy and we could see a bright future ahead of us and, all of a sudden, this challenge from State Street [for the TIPs]. They formed a very aggressive attack about why theirs was a better product. It was a fascinating process! We effectively had a war room where everyday we tried to figure out what State Street was doing (Interview 5).

To counter State Street's bid, BGI launched an aggressive marketing bid for the TIPs rollover that involved purchasing primetime television ads, creating a dedicated and investor-friendly website for their iUnits, and hiring academics from the University of Toronto to write both academic and print media articles about the merits of BGI and their ETFs.²⁷² The following passages are representative examples of the print media marketing published by BGI:

A greater critical mass and higher fees will permit the manager, Barclays Global Investors Canada Ltd., to put a bigger spotlight on the advantages of buying an index fund than the TSE could ever afford (Toronto Star 2000, C4);

I really like the new i60s...But readers shouldn't sell their TIPs to buy them. That would be a horrible thing, which would trigger a capital gain and commissions. [Wait until] the conversion takes place, there will be no additional costs (Kirzner 2000, 1).

²⁷¹ While proxy fights were relatively rare in Canada until 2003 (when 5 proxy fights were initiated), they grew steadily from the financial crisis in 2008 until 2012 when 30 proxy fights were recorded. For an excellent legal summary of proxy fights in Canada, refer to *Proxy Contests: Issues and Trends* published by the Hedge Fund General Counsel Summit (2013).

²⁷² The (now defunct) website was www.iUnits.com, and BGI worked with individuals within the Rotman School of Management to produce promotional literature. At least one of these individuals, Eric Kirzner, held a position of interest in the TIPs-35 management. Kirzner, in particular, was instrumental in pioneering the concept of "armchair investing" and participated in many Toronto Star articles about passive, index based investments such as the i60s. Refer to Luukko (Toronto Star 20 November 1999, U1), Cruise and Griffiths (Toronto Star 15 November 1999, D2), and Toronto Star (21 February 2000, Business 1) for examples of Kirzner's efforts.

The lower management expense and the higher returns of IPU's [Index Participation Units] are, of course, very attractive. But the thing I like most about IPU's is that they avoid gambler's ruin... IPU's go up when the market goes up and down when the market goes down (Kirzner interview in Cruise and Griffiths 1999, D2).

BGI Canada won the proxy contest against State Street due in large part to their already established presence in the Canadian ETF market, something State Street did not yet have. In early 2000, the TIPs-35 and TIPs-100 were rolled into BGI's ETF, the iUnits S&P/TSE 60 Index Participation Fund (popularly referred to as the 'i60s'). While many institutional investors immediately sold their iUnits because of the fee increase,²⁷³ the vast majority of retail investors stayed invested and new investors quickly began to accumulate:

We knew then we had remade the indexing game for retail. Within a few months, we knew. They were very popular... I think we definitely felt like we were fighting above our weight and contributing to what, collectively, had been a lot of innovation (Interview 5).²⁷⁴

Newspaper articles making the iUnits accessible began appearing with more frequency.

Analogies were often used to make the product relatable to those without advanced investment knowledge. Consider the following examples from newspapers discussing iUnits:

If you think your chances of making a good investment are about as random as throwing a dart at the stock tables, there's an increasingly popular alternative. It's called indexing. In effect, the manager of an index fund flings a whole basketful of darts, hitting everything in sight (Luukko 1999, U1);

²⁷³ The iUnits product had a fee of 0.17 percent of assets, whereas the TIPs were subsidized by the TSE and thus free to hold. iUnits promoters justified the fee increase by comparing their 0.17 percent fee to popular Canadian index mutual fund management fees, which averaged between 0.5 percent (Altamira Precision Canadian Index Mutual Fund) and 0.9 percent (CIBC Canadian Index Mutual Fund).

²⁷⁴ In addition to creating the world's first physical ETF (TIPs-35), Canadian developers also created the world's first bond ETFs, currency hedged ETFs, and synthetic ETFs. Most of these innovations are attributed to iShares, a division of BGI (now known as BlackRock). The iShares were first launched as iUnits in Canada. However, once iShares launched in the US, iUnits were rebranded to iShares in Canada (Interviews 5, 10).



Figure 7. Toronto Star cartoon, 1999.

BGI's marketing of index ETFs was focused on providing accessible education to those without advanced financial literacy. Specifically, various media outlets were used to compare the cost-benefits of ETFs versus mutual funds, the relatively safety of ETFs, and separating the product from the concept of gambling.

Transitioning iUnits to iShares in the United States

The success of the TIPs and iUnits in Canada inspired BGI to translate their Canadian strategy south in order to access to the American retail market. In 1997, Barclays U.S. had reached a valuation ceiling and executives believed the only way to catalyze growth was to enter

the retail investment market.²⁷⁵ As Barclays U.S. did not have any retail products in the U.S. at this time, the executive committee began evaluating their options, which were thought to be either purchasing a mutual fund operation or attempting to construct one from scratch (Interviews 5, 10, 20). Each of these options would be extraordinarily expensive with no guarantee of success as the American mutual fund industry was filled with legacy institutions had been firmly entrenched in the marketplace since the 1920s. As a former BGI executive recalls:

I have never been a fan of strategies were you go and try to copy what someone else is doing and then you try to convince investors that they should do it with us because we're doing it better, right? And that's exactly what we would have been facing with the mutual fund industry (Interview 10).

BGI U.S. began looking for alternate pathways to increase their valuation through the retail market. BGI U.S. had followed the success of the TIPs-35 in Canada and began recruiting individuals involved with either the TIPs product, the Toronto Stock Exchange, or with BGI's Canadian operations: for example, four interview participants for this project had begun working in the Canadian ETF industry in the late 1980s and early 1990s. By the late 1990s, all had either been recruited by BGI U.S. or had been transferred to the BGI U.S. offices in senior executive positions. As one transferred executive recalls, the prominence of Canadians throughout BGI's American offices contributed to the enthusiasm for ETFs at BGI U.S.:

[A BGI colleague] said, 'You know, I've been hearing about these exchange traded funds, TIPs, and I thought we maybe could use those to try and get into the retail market instead of using mutual funds'. I said, 'That is a brilliant idea! Why didn't I think of it?!'. It seemed obvious in retrospect... We went to see the Chairman, who was also a Canadian, so he knew a lot about the Canadian markets and had TIPs too (Interview 10).

²⁷⁵ In 1997-1998, BGI was the largest institutional trader in the United States but had yet to enter the retail business.

The concept of iShares (known in Canada as iUnits) was pitched to the board of Barclays Bank in 1998 and BGI U.S., now with many Canadian ETF developers amongst its ranks, received an enthusiastic response. In 1998, the executives at Barclays Bank had decided to reorganize and invest heavily in various strategic initiatives that would expand their business and create new products for clients.²⁷⁶ The initiatives included an organizational restructuring of the firm, developing the quantitative side of BGI's business, and, after BGI's pitch, developing the iShares suite of ETFs in the United States. A former BGI executive reflects on the meeting they had with Barclays Bank about the potential for ETFs in the United States:

Canadian connections allowed [Barclays] to grasp very quickly that this was a great idea... What really mattered was the fact that we had several Canadians at the top of the firm who knew all about TIPs. Had we not been investing in TIPs personally at the time, it's not even clear to me that the idea would have gotten traction at Barclay's (Interview 10).

Once the funding was allocated, BGI began work on developing the iShares brand. The iShares operation was to work completely independently from BGI, with management going so far as to house the iShares development team in a building entirely separate from the rest of BGI. This was in order to develop a distinct innovative culture centered around retail clients instead of BGI's established specialty, which was institutional clientele.

The iShares were able to be brought to market rather quickly as compared to the SuperTrust and SPY, which each took upwards of three years. The iShares applications (for the first 17 ETFs) were submitted on April 30, 1999 and received SEC approval for launch on the AMEX on

²⁷⁶ There were five initiatives developed for BGI. These initiatives, in large part due to the iShares business, would take BGI from an approximate \$500 million USD valuation in 1998 to \$13.5 billion USD when BGI was sold by Barclays to BlackRock Global Investors in December of 2009.

April 17, 2000. As previously mentioned, the iShares developers had a template to work with courtesy of the SPDR and TIPs,²⁷⁷ so the majority of production time was spent negotiating exclusive contracts with index providers instead of justifying the 1940 Act exemption requests to the SEC:

Interviewer: It must have taken quite a while to have all of your flagship ETFs approved with the SEC?

Interviewee 10: Well it was negotiated not just through the SEC, but it was negotiations with all the index providers because we had to get Standard & Poor's, and Russell, and everyone on board and contract it... So what I remember is the negotiations with the index providers (Interview 10).

At the time, index providers such as Standard & Poor's would license the use of their indices on an exclusive basis for qualifying products. For example, if Vanguard mutual funds had wanted to construct a mutual fund that tracked the S&P 500, they would need to negotiate and pay for an exclusive contract to use the S&P 500 brand name. However, these contractual agreements had only begun in the 1980s, when Merrill Lynch requested use of the S&P 500 index for its Unit Investment Trust. As a former executive at S&P recalls:

In those day at S&P, S&P evolved out of a financial publishing firm... We realized that folks out there were willing to pay to license the index and create products around it. Folks would come in and bring us all these prospectuses and want to license the index, and it started to become a steady flow to the point where by 1987 we had roughly 40 license contracts outstanding. And they were literally thrown in a file cabinet! Nobody knew what the terms were, everything was haphazard... There was no standardization whatsoever (Interview 15).

²⁷⁷ iShares took the same open-end fund structure as the SPDR, but drew their main inspiration from the TIPs: "We were very familiar with TIPs. [We] knew everything about them, or almost everything about them. So we really didn't need to go back to get more input" (Interview 10).

The S&P index division's profitability increased dramatically throughout the 1980s with the explosion in popularity of index futures and index options:

After the crash in 1987, the volume took off in futures and options because you had development of a lot more structured products and risk management which didn't really exist before that... We were getting really, really profitable money on each product because we were getting paid per transaction (Interview 15).

By the time iShares began contacting index providers such as S&P, it was necessary to build relationships with each provider as competition for index products was continuing to increase. By 1998, BGI was meeting with S&P at least once every six months to discuss how the index was being used by their traders in the market and was providing insights for the S&P index developers about new index possibilities (Interviews 15, 18).

The relationship built between index providers and innovators was crucial to the profitability of business ventures, the importance of which exchanges such as the PHLX learned the hard way: because the S&P had "extremely close" and "friendly" ties with the Chicago Mercantile Exchange and the PHLX was often left out in the cold, requiring them to pursue their own index business as they could not get licensing from S&P (Interviews 15, 1). When the Philadelphia Exchange first began circulating information on their CIPs product, S&P executives noticed that the CIPs index was identical to the S&P 500, minus six or seven stocks (Interview 1). The S&P threatened litigation over the CIPs product unless the Philadelphia developers could prove that the CIPs was indeed different from the S&P 500 index futures and options offered at the Chicago exchanges, which had exclusive contracts to use the S&P 500 brand. Philadelphia successfully proved their product's uniqueness, and they were granted an exclusive license to launch the CIPs using the S&P 500 brand after paying a fee.

To avoid a similar fate to the PHLX, the iShares team spent over one year negotiating contracts with various index providers and ensuring their relationships were mutually beneficial.²⁷⁸ Standard & Poor's quickly granted BGI iShares use of their indices because of the quality associated with BGI's name:²⁷⁹ when asked to list the criteria that would determine whether or not a firm received a S&P license, a former S&P executive replied, "Basically, the brand name of the firm. Anyone we perceived who wasn't a fly-by-night operation, we would license. Obviously the bigger firms had an easier time" (Interview 15).

After the index contracts were formalized, the iShares brought their suite of ETFs to the SEC. Unlike their predecessors in the US ETF market, iShares developers were building upon previous ETF precedents and did not have to develop a close working relationship with the SEC regarding a permissible product structure. To BGI's advantage, BGI Canada's successful experiences with ETFs in Toronto had been observed closely by the SEC, with one executive commenting that "the Securities Commission was more familiar with ETFs in Canada than the U.S." (Interview 5).

By the year 2000, the SEC was becoming increasingly familiar with the structure of ETFs, how they were traded, and the protection and benefits ETFs offered for the investing public. As a result, the SEC began granting exemptions without requesting increased justifications for how the product was to benefit the public. What resulted was a streamlined approach to the ETF application process (Interviews 3, 29). In addition, particular SEC staff attorneys were known to

²⁷⁸ Interview participants from the S&P, AMEX, NYSE, and BGI referred to these index provider-innovator relationships as "gentleman's agreements" where firms would give index providers insight into the trading practices in the markets and S&P would grant licenses subject to suitability. These agreements were always bespoke and the cost of an exclusive index contract varied from firm-to-firm.

²⁷⁹ The brand name of the index is just as important to the firm: An industry-wide survey in 2000 indicated that 45% of investment advisors believed the brand name of an ETF's index was "very important", while 36% rated it as "moderately important". 100% of ETF experts surveyed in the same year agreed that brand-name indices were needed for an ETF's success because brand names would attract interest from specialists and market makers (Data provided by Interviewee 26 on behalf of the Financial Research Corporation).

be more proficient in the 1940 Act structure and ETF exemption process than others. Due to close ties between BGI and the SEC from previous projects, BGI attorneys and product developers knew who the “right people” were to speak with if there were any questions regarding their exemptive order (Interview 10). In addition, because of the respect associated with BGI’s name and its size in the marketplace, when developers did bring a question about iShares to the SEC, “...the SEC would give us an audience and they would listen carefully”, which helped to expedite the approval process (Interview 10). Thus, BGI was able to keep their iShares launch secret until they were ready - and certain - that their paperwork was correct and would be approved by the SEC without delay.²⁸⁰ On April 17, 2000, 17 iShares ETFs were approved by the SEC for launch on the AMEX with little to no competition from other firms.²⁸¹

ETF education and marketing efforts

By the time the iShares project received clearance from Barclays Bank in 1998, BGI executives noticed that other ETFs besides the SPDR were entering the market.²⁸² However, none of these products were being marketed to retail clients and their investment advisors. The lack of ETF promotion throughout the United States led BGI executives to consider ETFs a “sleeping giant” (Interview 5) that held enormous potential to benefit both retail investors and BGI’s valuation. For example, the SPY was being “under-marketed and under-utilized” (Interview 20) and had no strategy to attract assets. As a former AMEX ETF consultant recalls,

²⁸⁰ The original iShares application required one small amendment at the request of the SEC. Upon correction, the entire product suite of the 17 ETFs was passed.

²⁸¹ For a complete list of the initial iShares suite that was launched in May 2000, refer to Appendix B. The initial SEC application date of the iShares suite was April 30, 1999.

²⁸² In 1998, there were 29 ETFs listed on American exchanges. 28 were listed on the AMEX and 1 was listed on the NYSE. The popularity of the AMEX as an ETF listing exchange will be discussed in Chapter Eight.

as late as 1997, the AMEX only required three part-time staff members to answer inquiries and distribute information about the SPY:²⁸³

Frankly, State Street had already shown up in the U.S. with the SPDR but they were doing nothing with it. There was no marketing other than that it was there. So it was kind of a nascent area, it was interesting, some people were using [ETFs] but they weren't promoted... We [iShares] had walked into a vacuum (Interview 5).

In addition to the SPDR, other ETFs called World Equity Benchmark Series (WEBS) and CountryBaskets were launched on the AMEX.²⁸⁴ Both WEBS and CountryBaskets allowed investors to gain targeted exposure to 17 foreign indices of countries around the world. However, like the SPDR, these ETFs had not yet attracted substantial interest. BGI recognized an opportunity:

A lot of the focus for both the WEBS basket and the CountryBasket that they were sponsoring was focused on institutions. So what we did was get at the retail market... we set up a marketing effort to teach investors about the benefits and get them to use them... And we had a fairly big budget from Barclays Bank to do that. Nobody had kind of thrown that concerted effort and the necessary financing behind it before... though the [TIPs and iUnits] provided us a template to work with" (Interview 10).

During the early years of ETF marketing, index providers such as the S&P would travel to conferences around the United States to promote their S&P sponsored products.²⁸⁵ The iShares developers at BGI would do the same, often in participation with representative of their listing

²⁸³ The AMEX was the original distributor and sponsor of the SPDR, so it was the point of contact for inquiries about the ETF. "In all fairness, when they started there weren't any calls. They started getting phone calls when they started getting out there to small and mid-sized investment managers. Then calls would rotate amongst three people" (Interview 15).

²⁸⁴ WEBS and CountryBaskets are discussed in Chapter Eight.

²⁸⁵ An Index Committee was tasked with marketing S&P licensed products at industry conferences around the United States. In the late 1980s, this committee was founded with approximately eight individuals and was considered a part-time job for those in S&P's Index and Data Division (Interview 15).

exchange, the AMEX. Specifically, a large marketing effort was made by BGI directly to retail clients about the lower fees and the preferential tax treatment that ETFs offer in comparison to mutual funds.²⁸⁶ Less tax penalties and lower fees were concepts that were immediately grasped by retail investors, though more persuasion was needed to educate retail advisors as to why ETFs were better options than their well-established mutual funds. As will be discussed in Chapter Eight, these efforts to promote ETFs to retail advisors was often referred to as “missionary work”, “preaching”, and “spreading the gospel” as ETFs were not yet popular, did not have a significantly entrenched history, and did not offer the same lavish rewards to investment advisors as the mutual fund industry did.

Despite initial skepticism from their distribution channels, the early efforts of iShares paid off. In the first two trading days after the iShares launch, four of the iShares ETFs attracted \$1.2 billion USD.²⁸⁷ While initial volumes largely came from institutional trades, the retail industry quickly caught on and volumes continued to grow.²⁸⁸ The explosion of ETF volume and depth of the ETF marketplace will be the subject of focus for the following chapter, Chapter Eight. In what follows, an analysis of the ETF innovation flows between the United States and Canada will be provided.

Refining the ETF: A job for bricoleurs?

Documented evidence demonstrates that the first formal ETF-style products were the CIPs and SuperTrust in the United States, which established the early definitional and regulatory

²⁸⁶ The taxation of ETFs and mutual funds is discussed in Chapter Eight.

²⁸⁷ Data provided by Interviewee 26 on behalf of Financial Research Corporation.

²⁸⁸ The relationship between retail investors and ETFs will be discussed in Chapter Eight.

precedents for ETF-style products. Through the regulatory mediations that brought them to market, the CIPs and SuperTrust became concretely defined artefacts that produced rules and definitions about what ETF-style products were. Because of the formalization process, the early concepts of ETFs were easier to transfer across borders than the undefined and bespoke trading strategies of the decade prior. As strategies transitioned into formally bound products through socio-technical processes, the concept of what an ETF ought to be became increasingly refined as each product built on the precedent set by those that came before.

What are the implications of an international innovative process such as the one discussed above? A product with origins in the United States, transferring and altering its structure to suit Canadian legislation, and transitioning back to the United States seems to clearly invoke Miller's opportunistic cat-and-mouse dynamic²⁸⁹ where innovators seek to exploit any regulatory loopholes: the ETF's entrance in to the Canadian marketplace was undoubtedly easier for innovators due to the regulatory and market environment. However, the cat-and-mouse dynamic falls short of offering a substantial theoretical structure to analyse the multi-faceted social and technical refinement and redefinition of the ETF product.

To successfully apply Miller's cat and mouse dynamic to the refinement of the ETF innovation, developers would have to be motivated by profit potential and exploit the loopholes or shortcomings of the regulatory apparatus. However, these motivating elements were not evident in many of the development cases. For example, while the PHLX attempted to create the CIPs to profit from developing a niche market, they worked closely with the SEC in order to ensure the product was within the boundaries of the existing securities legislation. The failure of the CIPs came not from the maneuvering of innovators versus regulators, but from inter-

²⁸⁹ Refer to Chapter Two for a discussion of Miller's theory of financial innovation.

regulatory conflict. The Canadian case of ETF development is also difficult to categorize as an innovation motivated by cat-and-mouse dynamics. Because the TIPs was a product of the Toronto Stock Exchange, its operating expenses were subsidized and thus was completely free to purchase, leaving no profit potential for the exchange.²⁹⁰ More so, the Ontario Securities Commission was in full support of the project for they believed it would benefit the small investor. There were no lengthy negotiations in Canada and no counterproductive or competitive dynamics between the Ontario Securities Commission and the Toronto Stock Exchange. As described earlier in this chapter, both regulators and innovators were working towards the same goal: providing retail investors an easy to understand, fully transparent product that would, they hoped, make investing experiences less intimidating and expensive than before.

Perhaps more specifically, the translation of innovation across borders also presents an interesting study on how we are to understand the refinement of innovation. As discussed in Chapter Two, the framework of bricolage provides a useful contrast to processes of financial engineering that imply a defined goal and a set of purpose-driven tools to accomplish it. Bricolage, alternatively, is a process constituted by the gathering and recombination of resources, translating their original purposes to serve new ones. In the words of Levi-Strauss, the bricoleur's universe "...is the contingent result of all the occasions there have been to renew or enrich the stock or to maintain it with the remains of previous constructions or destructions. The set of the 'bricoleur's' means cannot therefore be defined in terms of a project. It is to be defined only by its potential use" (1966, 17).

To understand the ETF's transnational innovation process as bricolage is to understand the process's fluidity, never having defined a beginning or end. This is in opposition to financial

²⁹⁰ The product itself had no fees that were passed on to investors. However, investment advisors would typically charge a fee for buying and selling products over the exchange on a client's behalf.

engineering, which implies a clearly defined, final structure as a goal of innovative effort. As each reinterpretation of the ETF built on the developments of its predecessors, with developers using the devices at hand in order to translate the structure into something other than its original representation, the bricoleur's accumulation and repurposing of resources is evident. However, the relationship drawn between human beings and their objects in bricolage remains problematic when applied to highly technical fields such as financial markets.

As a meta-framework, bricolage subscribes to the human-centric conception of agency which, as described in Chapters Two and Four, provides an incomplete account of how agency forms and is expressed in the financial markets. Bricolage describes actors manipulating and shaping their environments. While this is not problematic in itself, it does deny the unique socio-technical agency that is illuminated when one considers how human beings simultaneously shape and are shaped by their devices. With socio-technical agency, human beings are more than bricoleurs: humans are products of their social and technical environments and are thus able to express unique forms of agency that are irreducible to either themselves or their technical devices. For example, the cognitions of human beings are built in to their devices (such as computing programs) which are then used to equip human beings who participate in the financial markets. The human being and the devices they use to interact with the financial market create the financial actor through enabling a socio-technical expression of agency: it is this fusion between human beings and their devices that brings about the particular form of agency expressed in the financial markets and creates a 'financial actor'. Bricolage denies this expression of agency because it describes the human being as an independent actor who reaches into their environment to collect and recombine devices without being affected by them. In reality, each interaction with devices equips the human being and projects their socio-technical

agency in a new way, either through the formation of desire or the formation of action (Refer to Chapter Four for a discussion on socio-technical agency and the financial markets).

Innovation, for the bricoleur, is inherently unstable as devices - rules, technical objects, and cognitive interpretations - are constantly being disassembled, recombined, and translated into new artefacts: Engelen et al's (2011) latticework of innovation is particularly adept at explaining the impermanence of financial innovations. However, in describing innovation in this way, financial artefacts are no longer seen as deliberate constructs or achievements of social and technical assemblages. Instead, innovations are seen as a side effect of one's interpretation and manipulation of an external environment.

The concept of bricolage does present an *a priori* problem: if innovation is to be understood as vast lattice works of ever-changing interconnections, combinations, and repurposing, anything 'new' is to be understood as a reinterpretation of 'old'. While this would (non-problematically) indicate that an innovation is a product of its environment, it does not address how the artefacts that comprise the environment are first created by (and simultaneously give shape to) those who are in participation with them. As was demonstrated in Chapter Four, emerging trading technologies allowed human beings to participate in the financial markets in new ways. Soon after, market participants began constructing strategies and products that were reliant on the technological infrastructure so much so that participating in the financial markets is now possible only through participation with socio-technical devices. This socio-technical form of agency, as analysed in Chapter Two, provides a deeper understanding of the innovation process as it focuses on human beings and their devices, which is particularly beneficial to technologically advanced fields such as finance.

More specifically, the refinement of ETF was not solely a recombining and repurposing of available infrastructure. To make the ETF structure possible, new regulations were drafted, new entities such as authorized participants were constructed, and new technological systems were developed. While product designs of later ETFs were unquestionably adapted from their predecessors, the differing interpretations of the ETF concept in Canada and the U.S. were a result of the different social and technical environments the innovators were working within. These environments - shaped by available technology, regulatory relationships, systems of investor education, and corporate governance - each produced a unique ETF structure that was defined in ways distinct from its predecessors. For example, while both Canadian and American ETF developers named the CIPs ETF as a precedent to their products, the differing social and technical relationships in the two countries produced very different results for very different investors, such as the SuperTrust and the TIPS. While this example does not disqualify bricolage from providing a useful framework of analysis, the large variance in style of ETFs that resulted in each the U.S. and Canada suggests that there were deeper social and environment assemblages that influenced the ETF design.

To reiterate, the purpose of this chapter was to analyse the international flow of early ETF innovation between the U.S. and Canada. In doing so, questions were raised concerning how the refinement of innovation challenges what we know about financial engineering and bricolage, and how socio-technical analysis may contribute to this discussion. The specific case study presented was the transition of BGI's iUnits in Canada to BGI's iShares in the United States, though this case study was set within a broader historical analysis that included innovations that came both before and after BGI's ETFs. Concluding analysis suggests that the refinement of the ETF concept from the U.S. to Canada and back again was not simply recombining already

existing artefacts for new uses, nor was it a simple case of financial engineering: with each translation of the ETF concept, new rules and systems of education had to be defined, concretized, and then legitimated by financial actors. The refinement of the ETF product concept - from early experimentation with the CIPs to a more streamlined design of the SPY - demonstrates that bricolage only goes part way in providing a complete explanation for transnational flows of innovation: to provide a more thorough analysis, the impact of the socio-technical environment each refinement emerged from is of the utmost importance.

Chapter Eight

The Retail Channel: The ETF's Final Frontier

ETFs are now one of the fastest-growing and most popular investment vehicles in the United States with total assets under management soon expected to eclipse mutual funds. The purpose of this chapter is to examine the factors that enabled the ETF industry to proliferate at an unprecedented rate after its lacklustre start with the failed CIPs and SuperTrust projects. Specifically, three developments will be analysed for their role in contributing to the growth and depth of the ETF marketplace. First, the historical shift from commission to fee-based advisory structures will be analysed as an event that created demand for discount advisory operations - 'mom and pop' investment shops - and packaged, cost-efficient retail products such as ETFs. Second, the amendments to the Unlisted Trading Privileges legislation will be discussed because the amendments allowed exchanges to immediately list one another's ETFs and compete for order flow. This greatly enhanced the competitive relationship between the AMEX and NYSE and resulted in a multitude of new ETFs being brought to market and the ultimate downfall of the AMEX, who once held a monopoly over ETF listings. Third, these events will be analysed for their role in constructing something known as the registered investment advisory (RIA) channel, a channel that created a strong demand for ETFs and catalysed the explosive growth of the ETF marketplace for small, retail investors.

“If there’s one thing banks love, it’s charging fees”²⁹¹

*May Day: The deregulation of trading commissions*²⁹²

Since the inception of formalized financial exchanges, member firms would charge a commission fee for their brokers to place trades on behalf of their clients. The SEC oversaw the commission structures, which were fixed at high rates and made trading unaffordable for average individuals. Most often, commission rates were charged as a percentage of the trade value or price per share. Prior to the deregulation of commissions on May 1, 1975, the vast network of informal agreements led to exchanges such as the NYSE being called ‘clubs’ that were only accessible to institutions or individuals with substantial personal wealth. These agreements were as old as the exchanges themselves and the gentlemanly accord of the time offered no incentive for participants to negotiate for lesser rates. In fact, brokers that attempted to give discounts to their clients risked being banned from trading on the NYSE. In order to remain competitive under the fixed commission structure, many firms offered free services like customized research reports in order to add value to their clients. This system of fixed, high commissions meant that it often cost the same per share to trade \$100 or \$100,000 worth of stock, leaving smaller retail investors with no affordable way to access the market. As a former executive of an electronic trading platform recalls, brokerages “...didn’t do anything illegal, they just didn’t have the incentive to change the system” in order to benefit smaller investors (Interview 16). As another

²⁹¹ Interview 15.

²⁹² For an exceptional overview of the political events and NYSE-led opposition in the decade leading up to May Day - which, for purposes of brevity, cannot be included in this project - refer to Welles (1975). Welles’ book, supplemented by document analysis and interviews conducted by Nocera (1994), have provided much of the context to this section as the majority of interviewees for this project were not yet working in the 1960s.

executive reiterates, “no one wanted to deal with a smaller customer” (Interview 8) for there was perceived to be no profit potential in making small, infrequent trades.

Fixed commissions were integral to the profitability of member firms at the NYSE and the SEC was complicit in the regulation of such agreements. For example, when trading volumes would decline, it was common practice for national exchanges such as the NYSE to request that the SEC allow a commission increase to make up for lost revenues. Prior to 1975, the NYSE had standard commission rates set at 10%, which the SEC increased to 15% at the request of the NYSE in 1973 (Market 2000 Report 1994; Wells 2000).

In the late 1960s, the U.S. Department of Justice began inquiries into trading and fee structures of the NYSE and recommended that regulations on commissions be enacted in order to promote “efficiency, innovation and healthy, progressive change” (Department of Justice inquiry 1970). As a result of initial inquiries by the Department of Justice, the SEC began studying the commission structure of national stock exchanges and concluded that fixed commission rates were considered an “anticompetitive practice...[that] continues to work against the development of a fair and efficient market system” (Market 2000 Report, I-2). As a result of prompting from the Department of Justice, the SEC mandated that volume discounts be applied within the system of fixed rate commissions (Securities Exchange Act Release No. 8324 and 8399, 1968) and began what would be almost four years of oral hearings²⁹³ about the commission structure on national exchanges such as the NYSE. The SEC hearings resulted in a report entitled the Statement of the SEC on the Future Structure of the Securities Markets, and was used to inform Congress on various issues of the securities markets. One of the conclusions of the Future Structure Statement was that the public was entitled to “competition focused on providing the

²⁹³ The majority of hearings on fixed commissions were held by Congressman John Moss (D.-California).

best combination of price, service, and transaction cost” (Future Structure Statement 37 FR 5286, 1972).

While the vast majority of brokerages and national exchanges were vehemently opposed to the idea of deregulating commissions, the then-president of the NYSE, Robert Haack, risked his career to voice his support for deregulation. In an address before the Economic Club of New York in 1970, Haack criticized fixed commissions and concluded that:

Unless the New York Stock Exchange is willing to compete effectively with markets where commission fees are presently negotiated it faces a continued reduction in its share of overall trading, and at an accelerated pace. Whatever vestiges of a private club atmosphere which remain at the New York Stock Exchange must be discarded (Haack 1970).

Members working alongside Haack at the NYSE mentioned that Haack had kept his speech private until he delivered it, knowing that his statement would not be supported by the NYSE leadership and its member firms (interviews in Nocera 1994). Haack seems to have accepted that his statement would not be popular within the NYSE, admitting “I have spoken with great candor which will alternately be applauded and deplored” (Haack 1970). Within the year, Haack had been forced to step down as president of the NYSE²⁹⁴ and was replaced by NYSE Chairman James Needham, an individual strongly opposed to commission deregulation. In the years that followed, Needham threatened to sue the SEC if it deregulated commissions: “If we don’t get what we want, I’ll see them on the steps of the courthouse at Foley Square” (Needham quoted in Nocera 1994, 116). Needham’s threats, amongst others from NYSE member firms, were

²⁹⁴ Instead of firing Haack for his comments, a move that would likely cause a public relations ordeal, the NYSE Board of Governors reorganized the executive positions within the Exchange to eliminate the President’s position until 1980. In the interim, Needham, the NYSE Chairman, was chosen to absorb Haack’s responsibilities.

addressed in a speech by the SEC Chairman, Ray Garrett Jr., at the Securities Industry Association National Convention:

In the interest of all of us and the country, I hope you will join me in striving for composure. I know that it makes great copy if Jim Needham and I, or others in the industry, start calling each other dirty names, or...if we start threatening to meet each other on steps belonging to some square named Foley. If we start playing "chicken" with one another, proving just how stubborn we all can be, unfortunate things will happen (Garret 1974, 2-3).

Exchange lobbyists and brokerage firms tirelessly petitioned the SEC, leading the SEC Chairman to call the meetings "a parade of horrors to scare the members of the Rules Committee" from drafting deregulation legislation (Garrett 1974, 4). Of all of the national stock exchanges in the U.S., only one advised the SEC that it was willing to voluntarily comply with deregulation - the other stock exchanges indicated that they would not comply unless the changes were mandated by law (SEC Annual Statement 1975, 6). However, despite industry efforts to pressure the SEC and Congress to retain fixed commissions, former NYSE President Haack's speech turned out to be prophetic in the years to come.

In 1971, the SEC expanded the volume-discount legislation and required national exchanges abolish fixed commission rates for trades in excess of \$500,000 USD. This meant that large institutions and wealthy individuals could now choose amongst brokerage firms that competed to offer the best service and price (Securities Exchange Act Release No. 9105 and 9132, 1971). One year later, the \$500,000 USD trade minimum was reduced to \$300,000 USD in hopes of offering more investors competitively priced commission structures (Future Structure Statement 37 FR 5286, 1972). The NYSE and its member firms, strongly against the concept of unfixed commissions, raised their commission rates to 15% in response to the SEC Future Structure Statement. While the SEC acquiesced to the NYSE's commission rate increase, the approval was

tyed to the condition that the NYSE would begin deregulating commissions for high value trades and move towards complete deregulation by May 1, 1975. Due to the dollar threshold the NYSE set for negotiated rates, discounted trading was only available to institutions or individuals with substantial personal wealth prior to May 1, 1975.

In 1974, the SEC proposed Rules 19b-3 and 10b-22 under the Securities Exchange Act (Securities Exchange Act Release No. 11703, 1974) that would prohibit national exchanges from allowing their members to set fixed commission rates for any trade irrespective of its value:

Under present circumstances, the free play of competition can provide a level and structure of commission rates which would better serve the interests of the investing public (SEC Annual Statement 1975, 7).²⁹⁵

The proposed rules were made effective on May 1, 1975, leading to the moniker ‘May Day’ (Securities Exchange Act Release No. 11203).²⁹⁶ Effective on May Day, brokerage firms would be forced to compete for business and offer the best service at the lowest price for their clients. This legislation transitioned the clubby and gentlemanly atmosphere of national exchanges to a transaction-based environment where brokerages were forced to develop new programs to attract investors of all sizes.

On May Day and beyond, opposition from industry continued as brokerages attempted to maintain profits in the wake of deregulation. While brokerages were advertising their new investment plans for small investors, oftentimes these plans had such substantial hidden fees built in that they were cost prohibitive to clients. For example, Merrill Lynch created a

²⁹⁵ The SEC held multiple hearings to receive input on the proposed deregulation rules. Despite heated opposition, the rule change was passed (SEC Annual Statement 1975, 7).

²⁹⁶ The abolishment of fixed commissions was codified into the Securities Exchange Act Section 6(e)(1), 15 U.S.C. §78f(e)(1), by the 1975 Securities Exchange Act Amendments in order to “eliminate all unnecessary or inappropriate burdens on competition”. Effective May 2, 1975, the SEC began a program to monitor the effects of deregulation on the brokerage industry under Rules 17a-20 and Form X-17A-20 (Securities Exchange Act Release No. 11395, 1975).

‘Sharebuilding Plan’ specifically to attract small, ‘everyday’ investors, but introduced many hidden fees for account opening and maintenance. Small trades within the Sharebuilding Plan were also subject to a 5% commission increase in the first year so that retail investors often did not make much, if any, profit. There were also accounts of Merrill Lynch brokers discouraging individual investors from opening accounts if they were not planning on active trading.²⁹⁷

Despite opposition from some members, reports show that at the market open on May Day, large institutional commission rates dropped by 50%, with brokerages trading in their “gentlemanly affairs” for “two-fisted, bareknuckled brawls over...vicious price cutting” (Elia interview in *The New York Times* 1975). As the market environment adapted into July 1975, institutional commission rates had stabilized an average of 19.5% lower than their regulated levels (SEC Annual Report 1975, 8) and large individual block trades had stabilized at approximately 50% of their regulated levels (SEC Commission Rate Trends 1982).

However, small investors were still struggling to afford market access. At market open on May Day, the price of trading small individual orders actually increased (SEC Commission Rate Trends 1982). By July 1975, where institutional and large block trades were substantially less expensive, commission rates for small investors had only dropped by <2% (SEC Annual Report 1975, 8). Despite the brokerage community’s lack of interest in competing for small retail accounts, May Day deregulation eventually went on to influence retail commission structures: by 1982, the commission rates charged for small retail trades had dropped by an average of 20% from their regulated levels (SEC Commission Rate Trends 1982, Appendix 2 and 3).

²⁹⁷ The accounts regarding Merrill Lynch activities in the early 1960s/1970s were provided to Nocera (1994) for his interview research. As stated previously, no interviewees for this project could be found that were operating at brokerages in the 1960s/1970s.

Gradually, smaller investors began to enter the market as commission rates became more affordable. Lower rates, in turn, attracted more investors, which increased brokerage competition over the burgeoning retail industry. For example, between 1975 and 1990, individual shareholder accounts with NYSE member firms grew from 25 million to 51 million and trading fees for small accounts had dropped by over 50% (Market 2000 Report 1994, 6). The growing affordability of trading for average individuals and the entrance of competition into pricing structures has led May Day to be described as “the most momentous day on Wall Street since the predecessor of the New York Stock Exchange was formed in 1792” (Zweig 2015) and a day that “broke one of the oldest cartels” in the United States (Ofer and Melnick 1978, 641). Perhaps most importantly to the ETF industry, May Day created the opportunity for small retail investors to access the market through a new medium called discount brokerages.

From suits to Schwab: The allure of discount operations

Before May Day, individual investors paid high commissions to have their investment advisors provide advice about investment strategies and to buy and sell financial products on their behalf. Fixed commissions meant that brokerages firms often competed against one another by providing ‘value-added’ (free) research, reports, and advice to their clients about the financial markets. After May Day, brokerage firms were forced to compete for business from individual investors based on the rates they charged for trading.²⁹⁸ As a result, discount brokerages began to emerge - the first of which was named after its founder, Charles Schwab. Discount brokerages

²⁹⁸ The quality of trade execution (e.g. speed of execution, accuracy of execution, market selection and ancillary services) was also an important field of competition for brokerage firms post-May Day, though this was of greater importance to institutional investors than small investors that only placed the occasional trade. For an empirical study about how the varied quality of execution affected commissions after 1975, refer to Ofer and Melnick (1978).

are called such because they provide the traditional trading services to clients but do not provide any ancillary services or give financial advice. The new ‘bare-bones’ approach to trading and investment allowed discount brokers to charge commissions that were much lower than the traditional and elitist full-service brokerage firms.

Buying and selling stocks without a stockbroker enabled average investors to access the financial markets affordably for the first time. Whereas the clubby atmosphere of full service brokerages prioritized institutions at the expense of individuals before May Day, after May Day, discount brokerages began competing to attract an untapped market: the price-conscious retail investor. As a current ETF developer and former Merrill Lynch executive recalls:

May 1 was a seminal moment because that’s where this road turns. We laughed at them [Charles Schwab]. We said, ‘There’s no way anybody’s going to operate a discount operation. That would be ridiculous when you have guys like us who wear three-piece suits at Merrill Lynch! Come on!’ And that began a whole new world (Interview 9).

The exponential rise in discount brokerages was, in part, attributable to the entrance of commercial banks into the financial market. As banks began buying failing brokerage firms in the 1970s, they began structuring investment services similarly to commercial bank services by charging fees instead of commissions. As a result, many early ETF developers that were funded by banks began attending investment advisor conferences to market their products:

There wasn’t really anybody who knew anything about retail marketing, so it really was a ‘hit or miss and learn as you go’ type of effort. We went to the Charles Schwab RA [registered advisor] conference in 1995...It was then we realized that there was the market for these products (Interview 15).

The market for the ETFs, developers soon realized, was the small clients managed by investment advisors who were, until the 1980s and 1990s, largely ignored or prohibited (by price barriers) from accessing the financial marketplace.

The conflation of big banking and small investment

An influential development in the shift to fee-based investment was the entrance of banks into the brokerage industry, a trend escalated in part by the failure of many brokerage firms. In the 1960s, as the SEC and Congress began investigating the effects of commission fixing, unprecedented trading volumes were being experienced at the NYSE. Between 1965 and 1968, for example, average daily volumes on the NYSE grew from 5 million to over 12 million shares. The rapid increase in volume led to a crisis in many brokerage firms as their pen-and-paper recordkeeping could not keep up with the volume of trades. Haack, the former NYSE President, estimated that 90% of the funds used to liquidate 10 member firms were used to correct their record-keeping mistakes (Haack 1971). The number of mistakes and unsettled trades led to this period of the late 1960s being called ‘the paperwork crisis’.²⁹⁹

Computers were the only way to keep pace with the amount of trades being conducted over the NYSE, though computing infrastructure in the late 1960s was extraordinarily expensive. The cost to implement such infrastructure was prohibitive for small brokerage firms, forcing them out of business. For those firms that could afford the electronic infrastructure, steep learning curves for employees often meant that execution failures and recordkeeping mistakes remained as

²⁹⁹ For an excellent account of the development of the paperwork crisis, refer to Wells’ Harvard Business School review (Wells 2000).

prominent as with pen-and-paper organization. The trade corrections and cost of employee education and training led many of these more prominent firms to fail.³⁰⁰ As a result of the increase in trading and lack of affordable infrastructure to manage it, many brokerage firms suffered insurmountable failures of trade execution that forced them to close their doors permanently. To make matters worse, a substantial decrease in trading volume between 1969 and 1970 meant that those firms who had survived by investing in expensive automation equipment were not making enough revenue and went into forced liquidation. By 1971, 100 member firms of the NYSE - representing approximately one-sixth of the brokerage firms in the U.S. - had been liquidated or taken over by larger firms (Wells 2000).

The vast majority of buyers of the fledgling brokerage firms were commercial banks, which had recently been granted more flexibility from the Federal government to enter the investment industry.³⁰¹ For example, the largest member firm on the NYSE in the 1960s - Merrill Lynch, Pierce, Fenner & Smith - was sold to a bank, Merrill Lynch & Company, alongside other traditional brokerage firms such as Smith Barney:

There were a lot of very interested parties - certainly investment banks, and banks in general - they had a hunger to get products as they needed products to sell (Interview 3).

The significance of banks purchasing brokerage firms is that traditional commercial banks typically use fee structures to generate revenue from their clients. When commercial banks began

³⁰⁰ For example, the collapse of a large firm, Hayden, Stone, Goodbody, and Dupont Brokerage, was attributed directly to back-office (recordkeeping) failures (Elias 1971).

³⁰¹ The Glass-Steagall Act was passed as part of the U.S. Banking Act of 1933 and restricted any relationship between commercial banking and investment banking. Under Glass-Steagall, for example, commercial banks could not be involved in the activities of investment firms. In the 1960s, federal regulators re-interpreted two provisions of the Act and allowed banks to become involved in particular investment activities. One result of the 1960s reinterpretation of Glass-Steagall was that commercial banks could derive a portion of their revenue from investment activity. Glass-Steagall provisions were incrementally relaxed until the Act's full repeal in 1999.

purchasing brokerage firms, they began restructuring the firms to charge investors fees instead of commissions. As a former Merrill Lynch executive recalls:

[Banks] changed the brokerage industry significantly because brokers worked on commission - when you did something you got paid. Now the whole idea was that banks wanted fees for the broker to work. Brokers are now on the same side of the table as their customer (Interview 9).

Due to the popularity of discount brokerages and the growing ownership of brokerages by commercial banks, the landscape of the retail investment environment began gradually to change:

Banks only know how to charge fees. Fee for this and fee for that. For whatever. Now that they're in possession of these brokerage firms...they've given us an idea of what we can expect for the future (Interview 9).

The future, in this case, was a movement to replace commission rates based on assets with a flat fee that could be charged for investment services such as buying and selling, account maintenance, advice, and access to ancillary services. Gradually, into the 1990s, a flat fee would be charged by an investment advisor to work for their clients. As brokerage firms began moving towards fee-based businesses and the amount of retail client accounts began growing rapidly, many brokers began to open their own small businesses as registered investment advisors (referred to in the industry as RIAs). With the assistance of affordable computer programs that would construct optimal portfolios based on a client's risk levels, financial advisors no longer had to construct portfolios stock-by-stock for each client. As one of the largest model developers in the U.S. recalls:

As I began to see them move more towards the fee based business, I had to do the same. So I started creating products and models that an advisor could put into his portfolio. We were, in essence, managing for him so that when a change took place we'd send an email to the advisor, the advisor would simply go into the customer's portfolio and execute. This allowed them to take on more clients and lower fees into the 1990s and 2000s... In one year, our model garnered \$4.5 billion. So then we created an ETF, which garnered another \$5 billion (Interview 9).

Commercial banks were also interested in developing new products to sell to clients through their newly acquired retail investment services. Many early efforts by commercial banks to develop investment products failed from the outset, with firms such as Chase Bank abandoning the ETF due to issues about product valuation and structure.³⁰² As an early ETF developer describes:

It's almost like automobiles in the 1920s. There were almost 3,500 automobile companies. But there were only three that actually made cars that were worthwhile, like General Motors. The ETF? Same thing. The ETFs that really flourished have been for the professional advisor (Interview 8).

Deutsche Bank's ETF experiment

Deutsche Bank was one of the first commercial banks to experiment with ETF development, creating a suite of products called CountryBaskets. CountryBaskets were the first foreign index ETFs in the U.S. markets and launched in March 1996 after several years of development and four SEC applications.³⁰³ The reasoning behind Deutsche Bank entering the ETF business was to

³⁰² These issues have been confirmed verbally by an individual who had been working with Chase Bank during the ETF concept development. No document records could be found to verify as the early products did not make it beyond the concept phase.

³⁰³ The original SEC application for the WEBS (World Equity Benchmark Series) was filed on September 14, 1994, and took four resubmissions before the product suite was approved for listing. CountryBaskets and WEBS were launched within 48 hours of one another. WEBS also tracked foreign indices, but was launched by Morgan Stanley. WEBS launched on the AMEX and CountryBaskets launched on the NYSE.

expand their retail sales after acquiring investment firms in both the U.S. and U.K.³⁰⁴ With interest growing in the SPDR ETF that was launched in 1993, U.S. Deutsche Bank executives believed that ETFs could be the retail product needed to boost their sales. However, the American executives were faced with skepticism from Deutsche Bank headquarters in Frankfurt, Germany which controlled U.S. investment funding. As Germany did not launch ETFs until 2000, German executives were unsure about the potential of funding an American ETF product in a relatively unestablished market with little trading volume. In attempts to pique the interest of its headquarters abroad, Deutsche Bank's U.S. ETF team devised a cunning plan:

We started getting phone calls when ETFs like the SPDR started getting out there to something like small and mid-sized investment managers... So in order to get the attention of Deutsche Bank [in Frankfurt], we had friends of ours orchestrate a huge trade in SPDR to go across the trading desk at Deutsche. Just so they would look at the ticker and not recognize this non-corporate entity so they would have to go check out what the product was (Interview 15).

In order to further satisfy the Frankfurt executives that ETFs were legitimate products, the CountryBaskets ETF team at Deutsche Bank U.S. decided to break with tradition and list their ETFs the NYSE instead of the more popular ETF exchange, the AMEX:

Politically, within Deutsche Bank, it was a lot easier to sell the product idea internally with the New York Stock Exchange than the American Stock Exchange behind it because you had to go over to Frankfurt and they didn't know the AMEX over in Frankfurt (Interview 15).

While funding for the ETF project was ultimately granted, uncertainties regarding the ETF's viability continued:

³⁰⁴ Deutsche Bank had purchased C.J. Lawrence in the U.S. and Morgan Grenfell in the UK. These research and investment banks ended up running Deutsche Bank's investment services in the U.S.

The only thing people really knew was that the SPDR was fairly successful because it was the S&P 500. It was unclear whether or not these country indexes would ever really be successful... There was a lot of skepticism - it wouldn't work, wouldn't be traded, wasn't a mutual fund, wasn't a popular type of product. So we got put into our own stand alone group because Deutsche Asset Management, which was based out of Frankfurt, they didn't know what to do with us (Interview 15).

Once CountryBaskets were launched on the NYSE, the Deutsche Bank ETF team, which was comprised of only a few individuals, was tasked with raising enough interest from the investment community to make their product profitable. One area of potential was the burgeoning retail channel for small investors:

I got assigned what was perceived to be the leftovers from the marketing channel at Deutsche Bank, which were family offices that were just getting started then and the RA [registered advisor] business... And we found the RA business really by accident, because an RA called one day... the guy explained to me that he was managing money for a fee, but most of these were mutual funds. He came to New York and educated us to the whole RA market. We then made a big push into the RA channel by offering [ETFs] as an alternative to mutual funds (Interview 15).

By 1996, the CountryBaskets ETFs were able to attract approximately \$400 million USD in assets, though trading volume was low and there were not enough retail advisors willing to transfer client assets from mutual funds to a relatively new product with an unproven performance record. Despite Deutsche Bank's launch of the first foreign index ETFs, CountryBaskets were delisted in 1996 at the directive of Deutsche Bank's Frankfurt headquarters.

ETF demand as a function of the fee-based transition

As fee-based firms attracted many small retail investors previously unable to access the markets, advisors became increasingly attuned to the price sensitivities of their clients. Advisors realized that purchasing even a few stocks and trading those intermittently throughout the year could become quite expensive for their clients as fees were charged per trade. To bring value to their small clients, fee-based advisors were constantly seeking ways to optimize portfolios through cost-effective diversification.

As previously discussed, mutual funds were the preferred choice for decades as they provided diverse market access and their shares were priced with a management fee built-in. However, any trading done within the mutual fund portfolio passed its trading expenses and trading profits onto clients every year through capital gains distributions. This meant that in a volatile year where a mutual fund share price lost value, its investors would still be responsible for paying the fund's capital gains taxes from selling profitable stocks throughout the year. In other words, mutual fund investors were "buying someone else's tax history...if I bought an interest in a fund and that fund starts actively trading, at the end of the year, I'll get their tax bill" (Interview 22). As a Congressional testifier on the mutual fund industry explains, the tax burden placed on mutual fund investors³⁰⁵ is often unacceptable:

If the portfolio manager sold a security out of my mutual fund for a profit, the mutual fund company, under our arcane tax law, has to do a dividend. So they dividend out those profit-taking trades even though the overall position is down in value...The tax is harmful to long term mutual fund investors (Interview 8).

³⁰⁵ It is important to note that the tax structure of mutual funds is governed by the Internal Revenue Service (IRS). ETFs in the United States, beginning with the SPDR ETF, were exempt from the tax laws that mutual funds were subject to. Both the IRS and the SEC exempted ETFs through private letter rulings.

ETFs were exempt from mutual fund tax laws because the early ETFs were considered *packages* that replicated the market, not custom-designed *products*. As a former law-maker for early ETF products explains:

As long as you had simple broad-based indices and you had very limited ability to manipulate the portfolio, it wasn't like buying a mutual fund that invested in Korean securities or whatever the hell it wanted" (Interview 22).

Ultimately, this reasoning from both the Internal Revenue Service and the SEC meant that ETF investors were not subject to the same taxation as mutual fund investors:

I could have, in a really bad year like the crash of '08, a mutual fund portfolio be down 25% or 30% and still owe the government money for capital gains on securities that were in that mutual fund package. If an ETF goes down 35% and I don't sell it, there's no similar tax. So there's a fundamental, un-level playing field which is encouraging more and more people to move into tradable ETFs (Interview 8).

Into the early 2000s, the majority of mutual funds were considered active management strategies, meaning that portfolio managers actively traded the stocks within the mutual fund's portfolio to beat the fund's benchmark market.³⁰⁶ As academic and industry research routinely demonstrated, the chance that any portfolio manager had of beating the market was slim, no matter their education or skill (Chapter Six). As both theory and research showed, mirroring the market was the ideal strategy as above-market returns could not be guaranteed or expected over the long term. In addition, mutual fund management fees were higher than the management fees of ETFs as the portfolio management team had to be compensated. As index ETFs had no portfolio management team, they were able to offer substantially lower fees than mutual funds.

³⁰⁶ The active management approach was instrumental in the IRS determination that mutual funds were designed products. Again, due to the early structure of ETFs that simply replicated an index, ETFs were considered a 'package' or 'wrapper'.

While index tracking mutual funds had been developed and were incredibly popular, their tax structure and portfolio management team still made them more expensive to hold than ETFs. Thus, the most investor-friendly, cost and tax effective product for fee-based advisors to sell their retail clients was ETFs. ETFs required little internal trading (though, unlike mutual funds, offered the ability to do so), meaning that investment advisors could buy and hold the product for their clients without worrying about (1) trading it frequently, or (2) the trading occurring within the fund itself.³⁰⁷ As an ETF developer explains:

When an advisor has to buy five products and make changes throughout the year, it becomes relatively expensive for his customer and he would prefer to have it all wrapped up into an ETF (Interview 8).

The transition from fixed commissions to fee-based investment services made investing affordable for individual investors. With commercial banks increasingly becoming involved in investment services, retail investors emerged as the untapped market to sell investment products to. As retail clients are cost-sensitive, fee-based advisors were looking for products that would not require constant trading and would not trigger unnecessary tax burdens. ETFs, due in part to their diverse baskets, gave retail clients access to entire markets for little cost, making them the natural choice for fee-based investment. However, while ETFs were less expensive and more tax-efficient than mutual funds, the mutual fund industry offered many perks for advisors who bought their products. The trappings of the mutual fund industry influenced many advisors to continue purchasing mutual funds in client accounts instead of ETFs (the resistance to ETFs will be discussed later in this chapter). As a developer explains:

³⁰⁷ It is important to note that fee-based remuneration also reduces the incentives for advisors to churn their client accounts. Churning refers to the practice of excessive trading to generate commissions. Churning is prohibited under securities laws though must be assessed on a case-by-case basis.

Mutual funds saw [ETFs] as a defensive strategy that if there was a bear market, people could use these ETFs instead of selling their mutual funds, which created all kinds of capital gains. ETFs were a more efficient way to do it. But the point was that ETFs had become a vehicle to capture lots of assets in a much more efficient way from a pricing and tax point of view than mutual funds (Interview 6).

As a result of their many advantages for retail investors and the fall in price of computing power, the selection of ETFs in the market increased substantially. A securities lawyer specializing in exchange traded products emphasizes the ease of which even small, independent investment advisors can develop and access their own ETFs:

There are companies now that will do all the work for you, help you market [ETFs]. It's like ETF in a box. Anyone can do it. And that is the natural phenomenon of technology (Interview 8).

While over 100 ETFs were available in the United States by 2001, their future remained questionable as ETF providers were struggling to attract trading volume and assets. However, with the rise of the dot-com bubble, ETF volumes dramatically increased and the two major American exchanges - the NYSE and AMEX - began to compete over ETF listings by invoking a little-used rule that had been recently rewritten by SEC legislators.

UTP Amendments: Waging war between giants

The AMEX and NYSE relationship

The AMEX received its name in 1953 and grew out of decades-long trading arrangements that took place on the streets of New York.³⁰⁸ Since the 1950s, the AMEX's substantial growth relative to the NYSE was a result of three strategies. As a former AMEX president explains:

Making sure that you got in early on the IPO stocks was one [strategy]. Product innovation would have been another. People were constantly trying to find the next big thing. Out of that group, ultimately, came the ETF business. And a third was trying to improve the trading experience for people - expanding the size of the orders that could get automatically executed, trying to reduce turnaround times, trying to make for better investor experiences (Interview 25).

Since its inception, the AMEX specialized in listing the stock of newly emerging and small corporations. The benefits to emerging corporations being listed on a national exchange was that they were able to issue stock to aid in their capital formation, a vital aspect of their business growth. As the emerging businesses eventually grew into large corporations, many would transfer to the prestigious NYSE - a 'legacy exchange' - that catered directly to large 'blue chip' corporations and institutional traders. As a former Chairman of the AMEX acknowledged in their annual address to the Exchange:

[The AMEX] has long been the prime market for newer, smaller risk-taking corporations. Many companies that now populate the Fortune 500 list had their start here. They were nurtured in the auction market, moving from narrow, or regionally-based, shareholder populations to national prominence (Levitt 1979).

³⁰⁸ In the late 1800s, brokers would trade stocks of emerging companies on the streets of New York, becoming known as 'curbstone brokers'. This community organized to establish rules in 1908 and named themselves the New York Curb Market Agency. The Agency was renamed to the New York Curb Exchange in 1929 until its renaming to the American Stock Exchange (AMEX) in 1953. In 2008, the AMEX was purchased by the NYSE Euronext and has since undergone several name changes. For purposes of this project, only AMEX history post-1953 will be discussed.

Specializing in emerging companies was beneficial to the AMEX because it allowed the exchange to establish a monopoly over the niche market, becoming known as a specialist in assisting the capital formation of small corporations.³⁰⁹ AMEX was able to assist in the development of small companies by offering numerous services to encourage them to list on the exchange. While the large corporations listed on the NYSE typically had lobbyists representing their interests through national and trade associations, small companies did not. For example, small and emerging companies often lacked a platform with which to lobby for tax reforms. As Miller noted, changes in tax law often provide a large impetus for financial innovation - either to evade new restrictions or take advantage of beneficial tax breaks.³¹⁰ As a service to its members, the AMEX often acted as a medium between its listed members and lawmakers. For example, in July 1980, the AMEX founded the American Business Conference whose purpose was to allow small and emerging companies to network with government officials and industry representatives. While the conference attracted modest attention in its inaugural year, by the mid-1980s prestigious speakers were recruited from throughout academia, industry, and government.³¹¹ Throughout the years, the Conference attracted speakers such as Secretary of Defense, Secretary of State, Lieutenant Generals, Senators, and executives from over 300 international firms, giving AMEX-listed companies a platform to meet and discuss their domestic and national interests.³¹²

In addition to providing networking services such as the American Business Conference, the AMEX also made a substantial effort to provide the most technologically advanced services for

³⁰⁹ The NASDAQ also assisted small company capital formation.

³¹⁰ Refer to Chapter Two for an overview of Miller's theory of financial innovation.

³¹¹ Agendas for the American Business Conference between 1986 and 1988 have name speakers such as the academics John Volker of Princeton, Paul Kennedy of Yale, and Martin Feldstein of Harvard, all of which have held prestigious roles in industry and government.

³¹² For a historical case study on the AMEX's American Business Conference, refer to Bruchey (1991, 141-167).

its members. As discussed in Chapter Four, the AMEX pioneered many industry-leading technologies that enabled it to increase the speed with which trades could be executed. In fact, the growing focus on technological infrastructure assisted the AMEX in performing better relative to larger exchanges like the NYSE during the market crisis in October 1987.³¹³ For example, a common measurement of performance is something called the DK or DK'd rate that measures uncompleted trades.³¹⁴ Uncompleted trades are trades where the buyer and seller information (e.g. number of shares) does not match. Exchanges such as the NASDAQ and NYSE were reporting DK rates of up to 10.5% on October 19, whereas the AMEX reported a rate of 5.5%. While the AMEX Performance Committee concluded that its specialists had “substandard performance” that “failed to maintain fair and orderly markets” (Leibler speech 1987), their comparative success against the larger exchanges and broker-dealers making markets in over-the-counter securities ensured continued business for the AMEX (Interview 28).

As the AMEX's status evolved and volumes surged into the 1990s, the AMEX broke a record for the second highest rate of new listings in history.³¹⁵ Alongside new listings, the primary constituency of the AMEX grew to mid-sized companies, most of which had been with the AMEX since their initial public offering. The AMEX also actively encouraged small investors to trade on their exchange which further differentiated itself from the NYSE whose fixed commissions often made trading unaffordable to individuals without substantial wealth. As the Chairman of the AMEX, Arthur Levitt, stated in a 1979 speech:

Most importantly, we have to convince the individual investor that the market system is fair and that the same kind of investment opportunities that are

³¹³ The events leading up to and the impact of the market crash on October 19, 1987 are discussed in Chapter Five.

³¹⁴ ‘DK’ or a ‘DK’d trade’ is industry slang for ‘don’t know’, and has become the term used to refer to uncompleted trades.

³¹⁵ Between 1987 and 1988, the AMEX secured the second highest number of new listings in U.S. exchange history with 111 listings. The new listings came primarily from the over-the-counter market.

available to institutions are also available to individuals...[we must] bring the individual investor back to the market to aid the capital formation efforts of small companies (Levitt 1979).

By the end of 1977, approximately 70% of the AMEX's business came from the trading activity of individual investors (Levitt 1978, quoted in Bruchey 1991, 87). The focus on small institutions and investors allowed the AMEX to substantially grow its market share relative to the NYSE, which focused primarily on large, established corporations and institutional investors.

Because the AMEX was one of the most technologically advanced exchanges and the most popular to list emerging companies, its reputation was gradually built as an exchange that encouraged investor friendly risk-taking and innovation. As a result, the AMEX was routinely chosen for the listing of new products and quickly built a monopoly over the listing of ETFs: by 2001, the AMEX was the sole listing exchange for 117 of the 119 domestic ETFs on the market, while the NYSE gained listing fees from only one ETF product.³¹⁶ As a former ETF consultant recalls:

New York was trying to win ETF listings but the AMEX really sewed up that business because they had all the expertise. AMEX would subsidize the company's legal filings to list there, and they just had so much more infrastructure that it was hard for the New York to compete (Interview 15).

As the AMEX and NYSE each specialized in the listing of different corporate demographics, the exchanges were able to maintain the gentleman's agreement - not to directly interfere with the business of another exchange - for decades.³¹⁷ However, the growing public interest in

³¹⁶ The only ETF to be listed on the NYSE was the iShares S&P Global 100 ETF. Deutsche Bank's CountryBaskets ETFs were also launched on the NYSE but were liquidated shortly after launch.

³¹⁷ This is not to say that the exchanges were not competitive with one another. As markets expanded throughout the 1980s and 1990s, both the AMEX and NYSE competed aggressively to attract new listings. However, many market participants acknowledge that AMEX was the first choice for small, emerging companies and the NYSE was the first choice for larger, more prestigious companies.

ETFs and new legislation regarding listing rules would soon challenge the AMEX and NYSE's gentlemanly relations.

UTP amendments and their lackluster response

In the original Securities Exchange Act of 1934, exchanges were free to list any security already trading on another exchange without applying for permission. In 1936, amendments were imposed so that any exchanges wishing to trade a listed security would have to apply for formal privileges to do so from the SEC, which took between 45 and 60 trading days to approve. This legislative ruling intended to provide a 'head start' to the primary exchange and extend their competitive advantage over any exchanges that choose to subsequently list the security in question. As discussed, it was legislated prior to 1994 that a security may not trade on any exchange other than its primary exchange, unless a secondary exchange formally applied for Unlisted Trading Privileges (UTP) to list the security (15 U.S.C. §78l(a)). If a secondary exchange wished to exercise UTP for a security, they must formally apply to the SEC. As stated in previous chapters, the exchange exercising UTP can compete for order flow with the primary exchange, but will not be able to charge fees to list the stock. Leading up to the 1994 amendments, it was argued by Congress that "the delays caused by the UTP application and approval process may have anticompetitive impacts" (1994 U.S.C.C.A.N. 3299, 3302).

In 1994, emphasis on inter-market competition was strong because competition was viewed as the best method to offer fair, transparent, and liquid markets for investors:

The NASD strongly believes that the best markets for investors result from vigorous, fair competition...[The UTP Act] promotes competition in the marketplace by allowing the regional stock exchanges to compete for order

flow with the listing exchange (Ketchum Congressional Testimony, *supra* note 26).

Pursuant with this view, the 1994 amendments to the UTP Act were passed by Congress with the support of the SEC in the belief that immediate intermarket competition for order flow would enhance the speed of trade executions, enhance liquidity, tighten spreads, and lower transaction fees between exchanges, ultimately benefitting the investor and protecting the market from events such as the October 1987 market break. Resulting from the Act, any regional exchange could begin listing a security as soon as the security's first trade on its primary exchange was reported to the consolidated tape, effectively removing barriers to competition and allowing exchanges to compete for order flow vis-à-vis other exchanges.

The 1994 UTP Act amendments were an important catalyst to the spectacular growth of the ETF market in the 1990s for they eliminated procedural formalities in order to facilitate intermarket competition. However, this change did not take place overnight. The NYSE did not immediately exercise their UTP rights for the AMEX's ETFs for two reasons. First, there was the "old, legacy Wall Street gentleman's agreement" which decreed "not to interfere with the business of another exchange" (Interview 15). Second, the volumes on ETFs were not promising until the later part of the 1990s. As any exchange that lists another's product is not privy to listing fees, the NYSE was hesitant to violate the gentleman's agreement for a product that may not generate substantial interest. However, as fees dropped and trading volumes began to grow into the early 2000s, ETFs that allowed investors to participate in the tech bubble exploded in popularity.

From boring to booming: An explosion in ETF volume

The most popular ETF used to access the tech industry during the tech bubble was called the QQQ,³¹⁸ which tracked the 100 largest domestic and international technological companies traded on the NASDAQ. As a former Senior Vice President of the AMEX explains:

If you think about that time in the market... the internet bubble that was going on. A lot of those stocks were part of the NASDAQ 100 so there was a huge amount of interest in that index... The notion that you didn't need to choose the right stock when buying a vehicle like QQQ made it hugely popular (Interview 25).

With the growing popularity of the QQQ ETF into the early 2000s (accounting for approximately one-third of the AMEX's average daily trading volume), the NYSE, for the first time in its 200 year history, exercised UTP to offer the QQQ product even though it would not receive listing fees in doing so. In 2002, after achieving success in gaining a market share in the QQQ, the NYSE extended its UTP and began offering 34³¹⁹ more of AMEX's ETFs on the NYSE, directly challenging the AMEX for trading volume of the popular new products.³²⁰ As a former consultant for the AMEX recalls:

What happened was the New York decided to instigate and change the model of relations (Interview 15).

Responding to this direct challenge from the NYSE, the AMEX exercised Unlisted Trading Privileges in August 2002 to list 120 of NASDAQ stocks,³²¹ allowing AMEX to trade the QQQ, the underlying securities in the QQQ, and many other stocks comprising the S&P 500 index.

³¹⁸ The QQQ was the ticker symbol for an ETF called the NASDAQ 100 Index Tracking Stock. This ETF was developed by Invesco PowerShares and was launched in 1999.

³¹⁹ This total includes 17 Merrill Lynch HOLDRs ETFs, 9 sector SPDR ETFs, the S&P 500 Mid-Cap 400 ETF, and 7 fixed-income ETFs.

³²⁰ See: "The NYSE and the AMEX are going to war over Exchange Traded Funds"; Bresiger, *supra* note 65; "Another ETF Blow by Big Board", Traders Magazine, 1 August 2002; Hall 2004.

³²¹ Clary, Isabelle. "AMEX Rolling Out NASDAQ Stocks Auction Style", SEC Industry News, 12 August 2002.

This move attracted arbitrageurs who could trade ETFs and the underlying ETF constituents on the same exchange. The AMEX also eliminated transaction fees on all NYSE-listed products (later extending the offer to all ETF products) “...in order to maintain a competitive, level playing field. We’re not going to allow [the NYSE] to gain any sort of competitive advantage” (Brent, *supra* note 15).³²² Quickly following suit with the suspension of trading fees was the NYSE, who then also successfully lobbied for regulatory changes to its Front End Capture System which allowed it to execute faster trades than the AMEX.³²³ The results were “...a damaging but not fatal blow to the AMEX, which has pioneered an array of ETFs but watched helplessly as volume was picked up by other traders” (Wall Street Journal, 5 August 2002). The flow of ETF volume away from AMEX only increased when electronic communications networks like Island began trading ETFs on much faster systems than both the NYSE and AMEX. In addition, some electronic platforms - such as Instinet - offered trading rebates to further incentivize the use of their platform:

Once the UTPing started, that was the opening for Island and Archipelago to come in. [Before ETFs] they weren’t getting a lot of trading volume because they weren’t a price discovery mechanism.³²⁴ There was no price discovery mechanism for an individual stock on the electronic exchanges but they didn’t need it on an ETF because it’s all index based. So the index was calculated by a third party and they were just competing on what the indicative net asset value was. And they were able to do that better (Interview 15).

The attraction to the newer, faster, electronic exchanges was almost immediate. As a former CEO of one of these electronic platforms explains:

³²² See also: “AMEX Puts ETF Transaction Charges On Hold”, Wall Street Letter, 5 August 2002.

³²³ The Front End Capture System required that orders be entered into an electronic database before they are sent to the auction market. NYSE successfully petitioned to first send orders to the auction market, and then enter orders into the electronic database within 90 seconds (67 Fed Reg. at 1528; Exchange Act Release No. 34-43, 689).

³²⁴ Price discovery relates to the process of determining a security’s spot price through active buying and selling in the marketplace. For example, if demand for a security is high and there is low supply, its price will increase.

We had started trading so much volume so that, in essence, it embarrassed the institutions into trading with us. If you were buying stocks in the public market, meaning the market makers were advertising to the public that they were buying at 15 and selling at 15 and a half, fund managers kept buying stock at 15 and a half, when there was an order out on [our platform] at 15 and a quarter, it became too embarrassing for them to pass away from us (Interview 16).

On 19 March 2002, Island set records by capturing 45% of the total market volume in the QQQ ETF, 24% of SPDRs ETFs, 24% of Diamonds ETFs, and 32% of HOLDRs ETFs in one day (Hall 2004, 1140). The faster speeds at which these electronic networks were able to trade came down to technological infrastructure and the fact that they did not need to maintain gentlemanly accord with the larger exchanges:

You could, first of all, trade baskets very quickly and very efficiently. The prices tended to be better [on the electronic networks] and the people who created ETFs don't need research from Wall Street and they don't need IPOs from Wall Street. So their incentive was to get the lowest transaction cost possible and get the best prices possible (Interview 16).

The escalation of the use of unlisted trading “proved to be the beginning of the end for AMEX” (Interview 15) for it reduced AMEX trading profits at a time when the exchange was already stretched thin for resources. As a former AMEX Vice President recalls:

In some ways, we were victims of our own success. For the longest time, equities paid all the bills and they were the real powerhouse, and eventually the options business really took off. Then ETFs came along and became their own department... When you went into technology planning and building budgets, we were constantly fighting for resources. At the time, we were competing against exchanges that were simply focused (Interview 25).³²⁵

³²⁵ Examples of ‘simply focused’ exchanges would be the electronic networks such as Island, or the Chicago Board of Options Exchange that only dealt with options.

Despite the setback to AMEX, the UTP legislation accomplished what regulators had hoped: the gentleman's agreements were slowly eroded and competition was increased in the market to the benefit of the public who were charged increasingly lower fees, could have trades confirmed almost instantaneously by their brokers, and were offered enhanced product choices. As a result of the entrance of electronic exchanges, spreads on ETFs became tighter, liquidity was added to the market, trading fees were lowered, and trading efficiency increased as exchanges sought competitive advantage over one another. In short, the only way to remain competitive in the market under the new UTP legislation was to increase the efficiency of trading technologies whilst offering new cost-effective ways for investors to access the marketplace.

ETFs v. mutual funds: A David and Goliath story?

The trappings of the mutual fund industry

As discussed in Chapter One, the mutual fund industry in the United States originated in 1924³²⁶ and, until 1976, consisted exclusively of active-management strategies where portfolio managers used their expertise to pick stocks expected to outperform the general market. On August 31, 1976, Vanguard created the first index tracking mutual fund.³²⁷ Like an ETF, index mutual funds replicated an entire index in their portfolio. Unlike an ETF, index mutual funds

³²⁶ The first mutual fund in the United States was called the Massachusetts Investors Trust and launched on March 21, 1924. This was a private fund that was not made public until 1928. It was structured as an open-end investment fund, meaning that the mutual fund could continuously issue and redeem shares. Refer to Chapter Six for an explanation of investment company structures.

³²⁷ Vanguard's index mutual fund is called the Vanguard 500 Index Fund and still trades today (ticker symbol: VFINX). This mutual fund tracks the S&P 500 Index, which consists of the 500 largest U.S. companies that trade in the U.S. equities markets.

were required to pass any trading expenses on to their shareholders in the form of capital gains distributions and charged substantially higher fees for their products.³²⁸

Product fees are set by the degree of investment oversight needed. For example, mutual funds typically have higher expenses than ETFs because they require portfolio managers to make frequent decisions about investment strategies. Within the mutual fund universe, active mutual funds typically have higher expenses than index-tracking mutual funds due to the frequency of trading and decision making required. In 2014, all active funds in the United States (including ETFs and mutual funds) had an average asset-weighted expense ratio of 0.79%, while passive (index) funds had average fees of 0.2%. These fees are of critical importance to both large and small investors for they impact the return on investment.

Consider the following example where an investor holds three investments with the following management expense ratios: mutual fund A charging 2.3%, mutual fund B charging 0.8%, and an ETF charging 0.2%. If the investor invests \$10,000 into each fund and receives a 10% annual return on each product over the course of 10 years, mutual fund A will be worth \$20,500, mutual fund B \$23,900, and the ETF \$25,500.³²⁹ Even if the ETF was to return 2% less per year than mutual fund A, the ETF would still achieve higher returns after 10 years due to the difference in expenses.

As retail-friendly innovation proliferated and investors had increased options of both mutual funds and ETFs, the management expense ratios of the products became a large deciding factor. The importance of fees in retail investment decisions is clear when examining capital flows

³²⁸ Mutual fund fees encompass three categories: first, a management fee that covers the cost of investment management and trailing commissions paid to advisors that sell the product; second, the operating expenses of the fund such as account openings and closings; and third, the taxes that are due on administration fees charged by the fund. Altogether, these expenses are referred to as a Management Expense Ratio (MER).

³²⁹ Final figures are rounded to the nearest hundredth dollar and are reduced by \$100 to approximate for brokerage fees. The majority of fund providers and regulatory websites across the U.S. and Canada offer programs where investors can calculate their own fee-adjusted potential returns.

between investment products: between 2004 and 2014, the least-expensive quintile of funds received 95% of capital inflows, amounting to approximately \$3.03 trillion USD. Because ETFs are most always less expensive than their comparable mutual funds, ETFs are likely to be in the lowest quintile of expense ratios.

Despite their higher expenses, the mutual fund industry has continued to compete aggressively for market share relative to ETFs by lowering fee structures. For example, between 2009 and 2014, 24% of mutual fund fees dropped by >10%, and 39% of mutual fund fees were dropped by <10% (Morningstar Fee Study 2015). The competition between mutual funds and ETFs benefit investors by ensuring that management expense ratios of most products continue to trend downwards, with the majority of ETFs remaining consistently lower than mutual funds.³³⁰

As mutual fund products still hold more assets than ETFs and continue to receive higher fees, fund companies can afford to incentivize financial advisors to purchase their funds for end-clients. One of the methods that mutual funds have always used is a commission payment to advisors who sell their products to customers called a ‘trailer’, ‘trail’, or ‘trailing commission’. This payment is made directly from the fund company to advisors who sell the company’s products and is typically calculated using a percentage of assets sold (though calculations may vary between fund companies). For example, a mutual fund will pay a financial advisor a trailing commission of approximately \$5 to \$10 per year for every \$1,000 of client funds they invest into the mutual fund. This commission is paid indirectly by the client because the trailing commission expenses are built into the management expense ratio of the mutual fund. Again, the

³³⁰ There are new ETF products that are actively managed and use complex derivative instruments to achieve inverse and multiplied returns of their benchmarks. These ETF products may be more expensive than the average mutual fund due to their complex structuring. However, the trend into the 2000s and beyond is for fees to continue to be reduced as competition for assets increases (refer to the Morningstar Fee Study 2015 for current analyst outlooks).

management expense ratio is built into the price per share of the mutual fund, so end-investors are not often aware of the trailing commissions they are paying.³³¹

In addition to trailing commissions, mutual fund companies use powerful sales techniques to influence investment advisors to purchase their products. These sales techniques often include educational retreats in exotic locations or all-expenses-paid conference tickets. As an early ETF developer explains:

Think about it. If you're a retail advisor and your choice is a S&P 500 mutual fund which, at the time, offered golfing in Palm Springs in January and seminars aboard yachts in the Caribbean and trailer fees and all of the other things that went along with it, are you going to sell the SPY ETF? Or the TIPS? Or are you going to sell the related Fidelity mutual fund? Well, you're going to sell the Fidelity fund of course (Interview 20).

The benefits that came from mutual fund companies meant that establishing a client base for the early ETFs was difficult because ETFs - due to their low cost - could not provide the same level of benefits:

At that time, mutual funds were paying the investment advisors and we didn't realize that was the way that that business worked. So we [ETF providers] were confined to the really small yet growing group within those RIAs who were just charging fees based on assets under management as opposed to getting paid by the mutual fund trails and what have you...It was missionary work (Interview 15).

In addition to offering lucrative benefits to retain the investment advisor community, many mutual fund companies expressed skepticism about the potential of ETFs and chose not to fund ETF development. For example, it was common for many of the early ETF developers to pitch

³³¹ Mandated by SEC rulings, the management expense ratio (MER) is made explicit to investors in any mutual fund and ETF in the product's prospectus. However, the portion of a mutual fund's MER that is used to pay trailing commissions is not made available to the public, though there have been recent efforts to try and change this.

their product concepts to mutual fund companies that had large budgets to fund innovation. An ETF consultant recalls their efforts to market ETFs in the 1990s and 2000s:

Any large company that had a large mutual fund presence, when we went in there with the [ETF] product, they'd say, 'This intermediates us from the product, fees are lower, we don't like this idea of trading, we don't want to get involved with it'. I remember one company said, 'This is just odd. A one-off deal. Outside of a few products this will never amount to anything'. Well, that's their problem now (Interview 15);

[Mutual fund companies] did not believe there was an intermediary to the retail investor who was going to take a chance selling this stuff (Interview 5).

Despite the skepticism from the mutual fund industry and its influential sales tactics, the ETF industry managed to proliferate at an astonishing pace. Was the success of the ETF due to savvy marketing and institution-to-institution competition, or were there deeper processes involved? Can *agencement* offer an alternative theory of the ETF's recent success as something other than marketing prowess?

ETF proliferation in the retail channel: Agencement or effective marketing?

As discussed in previous chapters, the first ETFs had no concerted marketing efforts behind them. Instead, sponsoring exchanges and firms relied on institutional relationships and word of mouth amongst their members to generate interest in the products. For example, Chapter Five describes how the Philadelphia Stock Exchange developed and launched the first ETF product - CIPs - in secrecy, relying only on its relationships with large institutional traders to promote and trade the product on its trading floors. The SPDR ETF also had no organized marketing strategy at the time of its launch on the AMEX in 1993. Like the Philadelphia Exchange, the AMEX

relied largely on its institutional traders to generate interest in the SPDR (Chapter Seven). Last, the quiet launch of the TIPS ETF at the Toronto Stock Exchange was not followed by a large marketing effort as the TIPS was launched as a free promotional product of the Exchange. Thus, no fees were being collected from its trading and the Exchange could not afford to not market it aggressively (Chapter Seven).

Into the late 1990s and 2000s, markets were expanding rapidly and the financial optimism encouraged companies to put a more concerted effort behind funding and marketing ETFs. BGI iShares,³³² for example, was the first ETF brand to develop an aggressive marketing campaign before their initial product launch. Perhaps most importantly, iShares were the first ETFs in the United States to be marketed directly to retail investors through popular media such as television, radio, and print media advertisement. These efforts undoubtedly contributed to the rapid proliferation of the iShares brand throughout the retail channel of financial advisors and investors, which itself was developing in the late 1990s and 2000s. Is it enough to call the success of ETFs a success of marketing, or must the analysis go further? While ETF sales to retail clients are certainly linked to marketing strategies with retail investment advisors and education efforts for retail clients, the early ETF campaigns are only one of many reasons for the proliferation of the product. To attribute ETF growth solely to marketing efforts does not go far enough to provide an explanation of the environment out of which the innovation emerged in such a highly technical industry.

Despite the opposition to ETFs from mutual fund companies, several environmental factors were able to proliferate the inflows of investment in ETFs at an unprecedented rate. The innovations in technological infrastructure made ETFs affordable to construct and trade. The

³³² As discussed in Chapter Seven, BGI sold its iShares business to BlackRock in 2009. The ETFs still trade under the iShares brand today.

technically-equipped environment that ETFs emerged from were a result of infrastructure such as electronic trading technologies and communications linkages established in the decades prior.³³³

As a former ETF developer confirms:

The fact that you had big drops in the price of computing power really - without that, we wouldn't have ETFs. The fact that the processing is so inexpensive, you could assemble the baskets to create or redeem the creation units fairly inexpensively. Otherwise the product wouldn't have worked. So you know, that's from the structuring point of view. And from the innovation point of view, which was going on at the trading desks, everything was getting faster, cheaper, commissions were dropping. That enabled the desk to trade these more often and throughout the day (Interview 15).

ETFs were also able to proliferate because the transition to fee-based structures made advisors more highly attuned to the price-sensitivities of their retail clients. The lower fee structure, preferential tax treatment, and transparency of ETFs made it easier for retail advisors to market ETFs than mutual funds to many of their clients:

We realized it was a two-part sell. It was an index sell and it was the tradeability sell: 'Trade these! They are more tax efficient and lower cost' (Interview 15).

Despite the benefits advisors were receiving from investing their clients in mutual funds, ETFs continued to grow in popularity as brands such as iShares put a concerted effort into marketing ETFs directly to clients. The AMEX too, as the premier listing exchange of the early ETFs, was instrumental in developing a strong retail marketing strategy for ETFs by promoting their benefits vis-à-vis mutual funds:

³³³ Refer to Chapters Four and Five for a discussion on the shift to technological solutions in the U.S. financial markets and how this shift impacted product development.

We ran ads when I was in charge [of AMEX ETFs and options]... Some of the early ads that we ran went along with the education of the concept of indexing and once you've done that, the mindset certainly took root (Interview 25).

As discussed previously, the ETF characteristics also influenced SEC attorneys that ETFs were a product well suited to retail investors. As former SEC attorneys explain:

[The ETF] was a readily understandable product with a very, very light fee structure, so from a policy point of view we didn't feel like there was a huge information requirement issue [for retail investors] (Interview 22);

The product itself had a lot of natural advantages simply based on the concept of indexing. [ETFs] were going to outperform four out of five index managers out there. It had low costs, it allowed you easy entry intraday as opposed to 4 o'clock pricing that was available with index mutual funds... We felt and I still believe that ETFs are a superior product [to mutual funds] (Interview 25).

Third, the mutual fund industry had been plagued by a scandal and volatile markets in the 2000s which shook investor confidence and questioned the ability of portfolio managers to profit in volatile environments. One of these crises, the mutual fund timing scandal, was uncovered in 2003 and greatly increased the outflow of investment from mutual funds and into ETFs.

As discussed previously, mutual funds are priced at 4pm Eastern every day, so investors who place trades throughout the day will not receive their valuations until the market closes. In 2003, the SEC uncovered that many mutual fund companies were allowing their preferred clients to place mutual fund trades after 4pm for that same day's closing price. Not only was this practice of market timing illegal, it allowed particular investors (primarily large institutional investors) to benefit from knowing the price of the mutual fund they would be purchasing before others.³³⁴

After a full investigation, the SEC acknowledged that market timing existed in the mutual fund

³³⁴ This practice is commonly referred to as 'market timing' or 'late trading'. The SEC seems to have acknowledged that market timing has been an issue for mutual funds as early as 1981, where the potential for mutual fund timing was mentioned in a SEC no action letter.

industry as early as 1981 but continued to allow mutual fund portfolio valuations to be updated after 4pm if a significant event occurred or if orders came in from broker-dealers, banks, and 401(k) plan administrators (Investment Company Act Release No. 26288, 2003). In a 2004 Performance and Accountability Report, SEC staff acknowledged that their passivity towards the mutual fund timing scandal negatively impacted investor confidence in the mutual fund industry:

Indirect performance measures, including the [negative] rate of mutual fund ownership... indicate that investor concerns about the integrity of the securities market has waned (2004, 61).

In addition to the market timing scandal, the financial crisis in 2008 and sustained market volatility in the years following led to severe losses in assets under management from many actively managed funds. Between 2008 and 2009, hedge funds in the United States lost approximately 33% of their assets to ETFs as investor confidence in the ability of portfolio managers to achieve returns - or even keep pace with - market fluctuations diminished significantly.³³⁵ Taken together, the volatility and timing scandal lead to substantial outflows from mutual funds into ETFs. Between 2006 and 2014, domestic equity ETFs received net inflows of \$855bn USD while domestic equity mutual funds recorded outflows of \$595bn USD.³³⁶

Since the mutual fund scandal was uncovered in 2003 up until the end of 2014, the number of ETFs available in the US markets grew from 119 to 1,396³³⁷ and allow investors to access seven

³³⁵ Figures pulled from the Investment Company Institute (ICI) ETF Research and Statistics division (2014).

³³⁶ Market data recorded by the Investment Company Institute (ICI) ETF Research and Statistics division (2014).

³³⁷ These figures exclude 'funds of funds', which are ETFs whose portfolios contain other ETFs. Figures are pulled from the Investment Company Institute (ICI) Fact Books and Research Data Publications, 2003 - 2014.

different asset classes.³³⁸ To gain a rich understanding of the forces that caused the ETF to flourish so rapidly, two processes have been analysed. First, the social and technical environmental conditions present at the start of the ETF's proliferation were surveyed. These conditions include such processes as the development of technical infrastructure that enabled ETF creation and trading, and the development of the retail investment channel that was catalyzed by the deregulation of trading commissions and the entrance of commercial banks into the brokerage industry. Second, the effects these environmental characteristics had on the way in which human beings interacted with the financial market were analysed. These effects include the adoption of technical infrastructure into decision making so that financial agency is now a fusion of technical devices and human beings. In addition, the rise of discount brokerages and fee-based investment advisory services changed the way in which financial advisors gave their clients advice and what products they recommended. The structure of fee-based services, as discussed earlier in this chapter, was a natural fit for the ETF's low cost, low maintenance, and tax-friendly attributes. As discussed in this chapter, these environmental conditions were linked to a rise in ETFs being marketed direct to retail investors as mutual fund alternatives. Taken altogether, the proliferation of ETFs throughout the U.S., coinciding with the development of the retail channel, is an example of how socio-technical *agencement* is responsible for the successful proliferation of the ETF.

³³⁸ These asset classes include equity, fixed income, commodity, currency, real estate, hybrid (e.g. equity and fixed income) and volatility. For a breakdown of the number of U.S. ETFs available categorized by asset class, investment philosophy, and index composition as of 2015, refer to Appendix C.

Chapter Nine

Concluding Remarks

This project has sought to construct the first historical sociology of the ETF and introduce it as a subject of analysis to those in the social studies of finance. To accomplish this, research and analysis was centred around the early trading strategies and product concepts that precipitated the first formally defined ETFs. As these precursory developments occurred mostly in the United States, with substantial contributions from Canadian developers, this project was geographically isolated to the United States and Canada. Specific entities of focus included the exchanges involved in ETF-related innovation such as the Philadelphia Stock Exchange (PHLX), American Stock Exchange (AMEX), New York Stock Exchange (NYSE), and the Toronto Stock Exchange (TSE), and institutions such as Leland O'Brien Rubinstein Inc. (LOR), the Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), Barclays Global Investors (BGI), and Deutsche Bank.

Perhaps most importantly, this project aimed to present an alternative to the institutional-level analysis of financial innovation and regulation prevalent in new political economy, field theory, and much of economic sociology (Chapter Two). In order to provide a deeper level of analysis, the theoretical grounding for this research invoked concepts popular within the social studies of finance such as socio-technicality, assemblages, and *agencement*. This narrative illuminated in what ways human beings and their devices interacted and, in the process of interaction, became co-constitutive of institutional decision making around early ETF innovation.

To analyse the ETF within a subset of actor-network theory (*agencement*) is to think of its emergence as a product of relationships. Thus, this project addressed two separate, yet related, relationships integral to financial marketplaces. First, this project examined relationships that existed between regulators and financial innovators, and second, this project analysed the relationship that was developed between emerging trading technologies and market behaviour (market behaviour, in this sense, refers to both innovative and regulatory actors).

To reiterate from earlier chapters, *agencement* and assemblages were a central narrative theme of this project. The primary reason for invoking *agencement* was to introduce the ETF to sociological inquiry, specifically, the social studies of finance, and emphasize its emergence as a product of oft overlooked relationships. As discussed in Chapters One and Two, there has been a growing field of sociological inquiry relating to the emergence and effects of innovations within the financial domain. To date, however, there has been no sociological scholarship written about the ETF despite its global surge in popularity since its appearance 28 years ago.³³⁹

Framing the study of the ETF as an *agencement* focused attention on the subtle relationships that are often overlooked in the institutional-level analysis of financial organization. Both interview research and documentary evidence suggested that the two relationships most important to the ETF's emergence were the relationships formed between human beings and their devices (socio-technical relationships) and, more generally, the relationships formed between financial innovators and financial regulators.

³³⁹ Throughout this project, the launch of the PHLX CIPs in 1989 has been used as the origin date for ETFs. It is important to note, however, that most media sources refer to either the TIPs (Toronto Stock Exchange, 1990), or the SPDR (AMEX, 1993) as the first ETFs. Due to the CIPs' use as an ETF precedent in regulatory applications and the adoption of its purpose and structure into later products, this research maintains that the first ETF in the world was the CIPs in 1989.

Throughout this project, *agencement* was used as a framework to empirically trace the socio-technical production of agency and its effects on ETF-related innovation. For example, Chapter Four analysed how the introduction of computing technology gradually altered the ways in which individuals participated in and thought about the financial markets. For example, the introduction of electronic trading systems was demonstrated to have had specific effects on the types of trading strategies employed on major financial exchanges in the United States. Specifically, it was discovered that the development in technological capability (such as the NYSE's DOT system) between the late 1960s to the 1980s assisted traders in transitioning their strategies from block trading to basket trading to index replication strategies - out of which came the first ETF product concept. The technical reorientation of the markets during this period also shifted the way in which regulatory agencies such as the SEC perceived the role of technology and its use within the market for surveillance and process streamlining. As this chapter concluded, the rather crevice cognitive and material integration of technicality in financial markets ultimately brought about a new *agencements*: the socio-technical actor was an irreducible integration between both human and technological activities. As the assimilation of electronic technologies in the financial markets continued, an environment emerged where financial activity became inseparable from the human and technological networks that provided financial infrastructure. Again, it was out of this socio-technical environment that the first ETF concept - Cash Index Participation Units (CIPs) - emerged in Philadelphia (Chapter Five).

The empirical analysis of socio-technical relationships continued in later chapters to demonstrate how cognitive developments were materially integrated in ETF product design and regulation. For example, Chapter Six analysed how academic theories directly contributed to the shift that occurred from active investment strategies to passive, index-based strategies. In

particular, documentary evidence was produced that demonstrated how academic theories were used as precedents to approve ETF-style products such as Leland O'Brien and Rubinstein's SuperTrust. The SuperTrust case study showed how the integration of technical and semiotic developments facilitated the emergence of activities such as diversification and arbitrage, which later became foundational elements of the modern ETF structure. From this socio-technical frame of analysis came one of the primary findings of this project: the ETF innovation was largely attributable to the fusion of human beings and their technologies. As a product that emerged, in part, as a consequence of the market's turn from human-centric to socio-technical, the ETF may be construed as an *agencement*, or, a result of the unique form of agency produced from the recently transformed financial environment.

The second relationship analysed in this project was the one that formed between ETF innovators and regulators. By using *agencement* and, to a lesser extent, assemblage theory, this project discovered that the relationships forged between innovators and regulators were crucial, collaborative, and, perhaps most importantly, co-constitutive of early ETF design. For example, in Chapter Five, it was demonstrated how the jurisdictional disputes between the SEC and CFTC pushed the SEC to partner with product developers at the Philadelphia Stock Exchange to ensure that new products would fall under securities, not futures, legislation. In addition, Chapter Six examines how the SEC and developers at Leland O'Brien Rubinstein negotiated through five successive product applications to bring their product, the SuperTrust, to market. In the case of the SuperTrust, documentary evidence shows how the SEC attributed definitional and structural qualities to the product throughout the innovative process. In addition, Chapters Four and Eight discussed in what ways the SEC and innovators like BGI iShares emerged from similar socio-technical environments. It was argued that a shared socio-technical environment influenced the

way in which innovators and regulators developed their outlook on the viability of index-based trading and how regulatory processes were defined and streamlined. Specifically, innovator-regulator relationships were analysed to advance an alternative narrative from what currently exists in the literature on the regulation of innovation.

To reiterate, the innovator-regulator relationships were of particular interest because they were not explainable by prominent theories of financial regulation - particularly capture theory that emphasizes competitive 'cat and mouse' power dynamics. Capture theory could not offer a suitable explanation for the regulation of ETF innovation for it appeared that both innovators and regulators constructed elements of the product itself, either through encouraging particular characteristics or directly inserting definitions or qualities to the product itself. The material evidence of collaboration - notably, the direct attribution of qualities to the ETF by regulators and the perception of the regulator-innovator relationships by participants - meant that traditionally theorized 'cat and mouse' power dynamics were not applicable to ETF innovation.

As discussed in Chapter Two, collaboration in the regulation of innovation has been analysed through theories of joint regulation. However, the innovator-regulator relationships involved in ETF innovation routinely moved beyond the joint-regulation framework as well. For example, as discussed in Chapters Five and Six, regulators such as the SEC and innovators such as the PHLX and Leland O'Brien Rubinstein actually co-constructed a product's prospectus. In this instance, then, regulation was not just a matter of overseeing innovation by providing the necessary checks and balances; regulators such as the SEC became a constituting element of - and inseparable from - the innovation itself.

Removing the stark delineation between regulators and innovators becomes necessary when regulators are actively involved in attributing qualities through the concept-to-product process of

innovation. Thus, this project has sought to construct an alternative narrative of regulators as collaborative instead of confrontational with emerging innovation. This collaborative relationship-building was demonstrated empirically by reviewing documentary evidence of ETF product applications and examining the ways in which the regulators mediated the transition from concept to a formal listing. In addition, interview responses from both regulators and innovators were substantially similar when asked to describe innovator-regulator relations: in the case of individuals interviewed prior to 1990, all described innovator-regulator relations as either collaborative, mutually reinforcing, and helpful, with only two respondents classifying innovator-regulator relations as rooted in skepticism or competition. In the cases in which the perception of the relationship was negative, the interviewees were found to have been involved in modern ETF developments not surveyed by this project. In other words, both regulators and innovators entered into productive relationships that went deeper than just joint agreements; the relationships enabled regulators and innovators to concomitantly produce and attribute qualities to early ETF innovation through a process similar to, though not quite the same as, socio-technical *agencement*.

As a result of research findings, this project developed a concept called *regulatory agencement* (Chapter Two) that illuminated the extent to which the innovator-regulator relationship was able to mediate the ETF from concept to product. *Regulatory agencement* put forth an explanation of innovator-regulator relations alternate to those provided by capture theory and joint regulation in three ways. First, it brought attention to how the SEC participated with socio-technical devices to bring about a new environment that enabled process streamlining (Chapter Four). Second, *regulatory agencement* illuminated the points of intersection between the SEC and ETF innovators to determine how the decision making capabilities of each entity

may have been constructed by a shared environment that was conducive to collaboration (Chapter Six). Third, *regulatory agencement* was used to develop a narrative concerning the extent to which regulators participated in the qualification of early ETF innovation (Chapters Five, Six, and Seven).

In summary, the purpose of this project was to construct the first sociological history of the exchange traded fund. In doing so, this project demonstrated the empirical robustness of *agencement* as a theory and introduced the ETF as a sociological subject, particularly to scholars operating within the social studies of finance. There were two primary findings of this project: first, that invoking *agencement* was useful in empirically framing the ETF origin story as a product of the socio-technical turn of the U.S. financial markets in the 1970s and 1980s. Second, this project developed an alternative theory of the regulation of innovation called *regulatory agencement*.

As this project was the first time that the ETF was brought into sociological analysis, there exist substantial opportunities for future empirical, theoretical, and critical work on the subject. Empirically, this project traced a history that focused on major events that precipitated early ETFs such as the 1987 crisis and the 1989 SEC-CFTC lawsuits. Due to practical constraints of time and resources, this history would benefit from additional analysis of events including, but not limited to, the relationship between U.S. stock and futures markets and the impact relations had on index-based trading and development, the relationship between legacy mutual fund companies (e.g. Vanguard) and early ETF providers, the impact of the mutual fund scandal of 2003 on ETF inflows (Chapter Eight), and in what ways back office operations were affected by the meteoric rise of both trading volume and financial products between 1970 and 1990. These

themes emerged as peripheral events to those discussed in the body of this research, though are of no less importance to the sociological study of the ETF.

Theoretically, this project attempts to understand processes of financial innovation and the regulation of such innovation. While there exists no shortage of literature on these subjects, the diversity of explanations of innovation and regulation still leaves room for contribution. Thus, this project adapted *agencement* to *regulatory agencement* in order to fit the unique assemblage of regulators and innovators that formed to bring the first ETFs to fruition. As a concept developed for this project, *regulatory agencement* offers potential for future theoretical refinement and application in field research.

In addition, due to limitations in time and space, this project depicted the ETF as an entity whose definition remained static once formalized as an index-replicating innovation. In other words, this project only defines the ETF as an index-replicating instrument despite the multitude of recent changes that have occurred in its product structure. This decision was made in order to mark a clear end to the case study timeline. Clearly, the development of a financial product is not as black and white, nor does a financial product exist in an atemporal, static marketplace. The process of financial innovation is inherently fluid; as concepts emerge and are formalized, others disintegrate or shift. While this ebb and flow of constraint and possibility is shaped by complex socio-technical assemblages, the purpose of constructing the ETF as a case study was to examine the ETF's origin: notably, how the concept itself first emerged, was qualified, and finally, launched as a marketable product. While this project focuses on the advent of index-replicating ETFs, there have been many modern developments in the global ETF industry that provide promising fields of exploration.

Where do we go from here? Since the early 2000s, when this project's timeline ends, the ETF industry has continued to rapidly expand its offerings. In 2002, bond ETFs were introduced to the U.S. markets; 2003 saw the introduction of alternative-weighted ETF indices;³⁴⁰ in 2004, the first ETFs that tracked commodities and currencies were introduced;³⁴¹ 2007 broke records for the most ETFs launched in a single year;³⁴² the SEC approved actively-managed ETFs in 2008; and in 2010, ETFs had broken the \$1 trillion USD barrier in global assets under management (Investment Company Institute Fact Book 2010). This upward trend continued into 2014 when ETFs broke records for net share issuances worth \$214 billion USD (Investment Company Institute Fact Book 2014).

In 2015, the ETF industry has surpassed \$2 trillion USD in assets worldwide and has now begun prompting industry and academic researchers to question if market is saturated and the extent to which these new ETF offerings are beneficial to investors. For example, studies linking the rise of index trading to higher systemic market risk (meaning that stocks are becoming increasingly correlated) have begun to appear throughout industry and academia (Bradley et al 2011; Bradley and Litan 2010; Bradley and Litan 2011; J.P. Morgan Delta One Derivatives Team 2011; Sullivan and Xiong 2012).³⁴³ In addition, the U.S. Congress has invited experts to testify about growing public concerns over the complexity of new ETF structures and the extent

³⁴⁰ Prior to 2003, ETF indices were all weighted by the constituents' market capitalization. For example, if Stock A is worth \$20 million and the total market is worth \$100 million, Stock A would represent 20% of the index and thus 20% of the ETF's basket. In other words, the larger the corporation, the larger its representation in the index. Alternative index weightings may be calculated by using corporate fundamentals or stock price, amongst other custom-chosen statistics.

³⁴¹ ETFs that track commodities and/or currencies are also referred to as "non-1940 Act ETFs", for they are not regulated under the Investment Company Act of 1940. As discussed in Chapters One and Five, the CFTC oversees financial instruments backed by commodities or futures. Refer to Appendix E for further information.

³⁴² 269 new ETFs were approved for listing between January 1, 2007 and December 31, 2007 (Investment Company Institute Fact Book 2007).

³⁴³ Refer also to J.P. Morgan Delta One Derivative team data presented throughout Bradley and Litan (2010; 2011) and Bradley et al (2011).

to which they may or may not be of any economic benefit. When interviewees were questioned on their future outlook for the ETF industry, the vast majority agreed that the present market was fully saturated in its product offerings and presented a range of outlooks from apathy to scepticism and fear about future ETF developments - especially around derivative instruments that provide inverse or leveraged returns and active management strategies. One interviewee went as far as to claim these new ETFs ought to be considered “weapons of mass destruction” that “harm investors and businesses and destroy the capital formation process” of the financial markets (Interview 8).

While this dissertation does not offer critique or reflection the potential of the ETF marketplace, it does offer a foundation for what ought to be a fruitful area of sociological inquiry and critical analysis. By providing the first historical account of the emergence of the ETF innovation, this project has analysed how socio-technical relations impact the development of concepts and how, in turn, those concepts are transitioned into formally defined, marketable products.

References

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Appendices

Appendix A

The below chart indicates typical trading volumes in S&P 500 stocks (the 'Stock Market'), S&P 500 futures (referred to as the 'Futures Market') the week leading up to and including October 19, 1987. Note the sharp rise in the average basis error on October 19 and 20, which indicates the extent to which a derivative has deviated from the value of its underlying asset(s). In this case, the futures market was uncoupled from its underlying index, the stock market. Data provided by Furbush (1988, 71), on behalf of the U.S. Office of Economic Affairs:

Trading and Basis Error of the S&P 500 index, 1987

Date	Futures Market (\$ millions)	Stock Market (\$ millions)	Total (\$ millions)	Futures/Total	Average Basis Error
October 14	242.2	9.3	251.5	96.3	-0.76
October 15	509.2	24.5	533.7	95.4	-0.22
October 16	3588.8	201.8	3790.6	94.7	-0.41
October 19	3230.6	1856.6	5087.2	63.5	-11.79
October 20	3597.1	377.6	3974.7	90.5	-17.30

Source: Furbush (1988, 71).

Appendix B

Four iShares ETFs were launched on the AMEX on May 19, 2000, and an additional ten on May 26, 2000. Within this period, iShares also took over and re-launched the World Equity Benchmark Series (WEBS) ETFs. All phases of the original iShares launch are separated by date and broken down by the underlying index, AMEX ticker symbol, and expense ratio below.

May 19, 2000:

Index	Symbol	Expense Ratio
S&P 500	IVV	0.095%
Dow Jones U.S. Technology	IYW	0.60%
Dow Jones U.S. Internet	IYV	0.60%
Russell 1000	IWB	0.15%

May 26, 2000:

Index	Symbol	Expense Ratio
S&P MidCap 400	IJH	0.20%
S&P/Barra Growth	IVW	0.18%
S&P/Barra Value	IVE	0.18%
S&P SmallCap 600	IJR	0.20%
Russell 1000 Growth	IWF	0.20%
Russell 1000 Value	IWD	0.20%
Russell 2000	IWM	0.20%
Russell 3000	IWV	0.20%
Dow Jones U.S. Financial	IYF	0.60%
Dow Jones U.S. Telecommunications	IYZ	0.60%

iShares rebranded and re-launched the following World Equity Benchmark Series (WEBS) ETFs as part of their original ETF offerings. These ETFs provided access to major indices in the following countries: Australia, Austria, Belgium, Canada, France, Germany, Hong Kong, Italy, Japan, Malaysia, Mexico, Netherlands, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.

Source: Quill, G., Zurbrigg, K., and Ziik, E. (2000) on behalf of the Financial Research Corporation.

Appendix C

Number of Exchange Traded Funds by Type

Year	Total	Broad-Based Domestic Equity	Sector-Based Domestic Equity	Global/International Equity	Hybrid	Bond
1993	1	1	-	-	-	-
1994	1	1	-	-	-	-
1995	2	2	-	-	-	-
1996	19	2	-	17	-	-
1997	19	2	-	17	-	-
1998	29	3	9	17	-	-
1999	30	4	9	17	-	-
2000	80	29	26	25	-	-
2001	102	34	34	34	-	-
2002	113	34	32	39	-	8
2003	119	39	33	41	-	6
2004	152	60	34	43	-	6
2005	204	81	68	49	-	6
2006	359	113	133	85	6	6
2007	629	197	219	159	5	49
2008	728	X	231	X	X	X
2009	797	X	228	X	X	X
2010	923	248	248	X	X	105
2011	1,134	285	293	365	7	164
2012	1,194	X	301	X	X	X
2013	1,294	X	311	X	X	X
2014	1,396	314	317	490	19	256

Totals include registered and non-registered ETFs under the Investment Company Act of 1940 and exclude ‘fund of funds’, which are ETFs that invest in other ETFs. ‘X’ indicates no data available for the specific asset class.

Source: Investment Company Institute Fact Books (1994-2015), retrievable online at www.ici.org/pubs.

Breakdown of US-listed ETF market by investment objective

Investment Philosophy	Asset Class	Specialty	Index Composition
Passive Management (1,100)	Equity (1,058)	Non-leveraged (1,398)	Traditional (1,272)
Enhanced Strategy (e.g. contango/backwardation, dividend, forex, hedging) (428)	Fixed Income (282)	Leveraged (129)	Fundamental (123)
Active Management (122)	Commodity (149)	Inverse (44)	Alternative (e.g. option strategy, volume-weighted, custom-weighted, yield curve strategy, production-weighted) (261)
Socially Responsible (6)	Currency (39)	Inverse Leveraged (85)	-
-	Real Estate (36)	-	-
-	Hybrid/Multi-Asset (75)	-	-
-	Volatility (17)	-	-

As of 11/12/2014. Figures include US-listed ETFs and ETNs.

Source: XTF ETF Research Report (2014).

Appendix D

Distribution of consolidated tape trades in NYSE stocks, 1976-1992

Year	NYSE	AMEX	PSE	CHX	PHLX	BSE	CSE	REGIONAL	INSTINET	NASD	TOTAL
1976	85.99%	0.01%	4.86%	3.56%	1.50%	0.85%	0.77%	11.55%	0.01%	2.39%	100.00%
1977	85.16%	0.02%	5.65%	3.39%	1.55%	0.77%	1.61%	12.99%	0.02%	1.83%	100.00%
1978	87.02%	0.01%	5.64%	3.16%	2.20%	0.65%	0.47%	12.13%	0.02%	0.83%	100.00%
1979	86.58%	0.00%	5.51%	3.33%	2.77%	0.65%	0.53%	12.79%	0.03%	0.60%	100.00%
1980	85.37%	0.01%	5.34%	3.58%	3.47%	0.77%	0.71%	13.88%	0.02%	0.74%	100.00%
1981	82.42%	0.00%	6.41%	4.54%	3.85%	0.91%	0.87%	16.58%	0.02%	0.96%	100.00%
1982	78.61%	0.00%	8.27%	5.89%	3.92%	1.00%	0.84%	19.92%	0.04%	1.44%	100.00%
1983	77.68%	0.00%	8.58%	6.81%	3.88%	1.25%	0.49%	21.01%	0.04%	1.28%	100.00%
1984	75.40%	0.00%	8.93%	7.95%	4.10%	1.78%	0.34%	23.10%	0.09%	1.41%	100.00%
1985	74.24%	0.00%	9.51%	8.16%	3.82%	2.17%	0.32%	23.98%	0.10%	1.70%	100.00%
1986	72.68%	0.00%	10.57%	8.52%	3.65%	2.25%	0.29%	25.28%	0.03%	2.00%	100.00%
1987	73.60%	0.00%	9.31%	8.94%	3.50%	2.32%	0.26%	24.33%	0.02%	2.05%	100.00%
1988	72.99%	0.00%	8.44%	9.74%	3.22%	2.33%	0.35%	24.08%	0.03%	2.91%	100.00%
1989	69.23%	0.00%	8.35%	10.43%	3.39%	3.16%	0.44%	25.77%	0.03%	4.98%	100.00%
1990	66.17%	0.00%	8.14%	9.71%	3.02%	3.77%	0.63%	25.27%	0.03%	8.53%	100.00%
1991	67.33%	0.00%	8.13%	8.03%	2.84%	3.37%	0.74%	23.11%	0.03%	9.53%	100.00%
1992	65.17%	0.00%	7.55%	8.34%	3.31%	3.17%	1.85%	24.22%	0.03%	10.57%	100.00%

Source: Data provided by the Consolidated Tape Association and published in the Market 2000 Report (SEC 1994, Exhibit 18).

Appendix E

Summary of ETF legal structures and features

ETF-Type	Open-End Fund	Unit Investment Trust	Grantor Trust	Partnership	Exchange-Traded Note (ETN)
Principal Regulatory Framework	1933 Securities Act, 1934 Securities Exchange Act, 1940 Investment Company Act	1933 Securities Act, 1934 Securities Exchange Act, 1940 Investment Company Act	1933 Securities Act, 1934 Securities Exchange Act	1933 Securities Act, 1934 Securities Exchange Act, 1936 Commodity Exchange Act	1933 Securities Act, 1934 Securities Exchange Act
Principal Uses	ETFs tracking indexes of shares and bonds; Active ETFs	ETFs tracking indexes of shares	ETFs tracking individual commodities and currencies	ETFs tracking commodity, currency and futures pools	ETFs tracking niche and more complex indexes
ETF Investor's Exposure	Portfolio of securities	Portfolio of securities	Pro rata share in the interests of the trust	Pro rata share in the interests of the partnership	Senior, unsecured debt of ETN issuer

Source: Deutsche db X-trackers U.S. (Deutsche Bank 2017).