

# A New Foundation for Portfolio Management

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# PREFACE

This paper was authored by Leslie Christian of Portfolio 21 Investments with the support of Don Shaffer of RSF Social Finance and Niels Zellers of Confluence LLC. Through a process of inquiry into the assumptions used to guide the investment strategies of their respective organizations, the team worked together to rethink portfolio management. This paper, a step in an ongoing research process, is a result of that inquiry.

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This paper is not a recommendation or an offer of any securities. As described in this paper, investments in securities involve risks, including potential loss of the invested principal. In preparation of this paper, the authors used sources that they believe to be reliable but cannot guaranty their accuracy. Outside of Ms. Christian's involvement with the Investment Advisory Committee of RSF Social Finance, the two entities (RSF Social Finance and Portfolio 21 Investments) are independently owned and operated.

## INTRODUCTION

In this paper we will question many of the assumptions that govern investment management policies and practices today, and propose new principles that bring portfolio theory into the 21st century.

We envision three primary audiences for this work:

- Investors who have a deep desire to radically rethink their investment portfolios based on prudent foundational principles
- Investment professionals who have been schooled in Modern Portfolio Theory (MPT), who see the inadequacies in that theory, particularly in the context of current market realities, and who are willing to propose practical changes to the portfolios they manage or advise based on these foundational principles
- Academicians who can use and expand these foundational principles to build forward-thinking portfolio management theses

Today's investment management practices are based on Modern Portfolio Theory, a framework first conceived during the post-World War II era and based on many assumptions and conditions that no longer hold true.

As world population expands and standards of living rise, the pressures on our natural and social systems are materializing in ways that we have not experienced in the past. These pressures are rarely incorporated into investment regimes. Current investment approaches ignore or underestimate the significant financial risk of ecological limits, for example.

Confidence in the financial system has been shaken by recent events such as the 2008 meltdown, the European debt crisis, and the ideological crosscurrents in the United States. These circumstances make for an audience that is awake, frightened, and open to shifts in their investment policies and practices.

A sense of urgency is intensified by a high level of social interaction, information exchange, and exposure to the connections between obscure financial transactions and personal economic circumstances.

We are reaching a tipping point in portfolio management—a moment in which investors are expressing unique sets of goals and priorities that require a nuanced definition and understanding of economic utility.

## TODAY'S IMPRUDENT FOUNDATION: KEY ELEMENTS

Current investment policies and practices rest on three problematic elements:

### 1. Inadequate Treatment of Risk

#### Risk and Uncertainty

One of the benefits of computer technology is the ability to manipulate vast quantities of data for use in correlation analysis, scenario modeling, historical pattern identification, and other statistical applications. This emphasis on quantitative analysis is well matched with probability estimates and expected distributions of outcomes. However, to the extent that a potential outcome cannot be quantified with respect to scope or timing, there is a tendency to exclude it from analysis. Modern Portfolio Theory addresses a limited scope of risk, which can be managed because it can be quantified. Uncertainty, on the other hand, involves that which is unknown and therefore not manageable in the same way. Statistical models and quantitative analysis work well with MPT's definition of risk but not with uncertainty. However, simply because uncertainty cannot be modeled precisely within the framework that MPT or other theories set forth, these powerful dynamics cannot be ignored. Qualitative analysis can contribute to a deeper, more nuanced understanding of uncertainty, differentiating between aspects of uncertainty that are truly unknown and those that are uncertain because their scope and/or timing are unknown.

#### Limited Definition of Risk

Modern Portfolio Theory defines risk as a single number—volatility, measured by the variance (or standard deviation) of returns around a mean. Beta measures the “systematic” part of risk, that is, the volatility of a portfolio or security that is a function of the overall market. A relatively newer measure, Value at Risk (VaR), uses probability distributions to measure the magnitude of expected losses over a particular period of time, typically using historical data to develop statistical probabilities.

These attempts to distill risk to a statistic are problematic. Financial analyst James Montier of Grantham, Mayo, Van Otterloo & Co. (GMO) writes: “In essence, and regrettably, the obsession with the quantification of risk (beta, standard deviation, VaR) has replaced a more fundamental, intuitive, and important approach to the subject. Risk clearly isn't a number. It is a multidimensional concept, and it is foolhardy to try to reduce it to a single figure.”<sup>1</sup>

Knut N. Kjaer, former CEO of Norges Bank Investment Management, notes that “...the global financial markets are complex adaptive networks, with behaviors similar to those found in biological networks.” Further, he states: “An investor must understand that risk not only is made up of known

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<sup>1</sup> James Montier. “The Seven Immutable Laws of Investing” *GMO Insights*. March 2011.

probability distributions but also is immeasurable because there is a complete lack of knowledge about what the future may bring.”<sup>2</sup>

### Risk Associated with Ecological Limits

The term “ecological limits” refers to the physical reality that natural capital—the stock of clean water, fuels, fish, timber, minerals, ores, land, etc.—and ecosystems are not infinite but bounded by the earth and its atmosphere. Although it was not recognized at the time, humanity reached a significant milestone in the 1970s. In financial terms, the global community started expending natural capital rather than living on the “income” provided by our ecosystems. We reached a tipping point at which we were extracting material from the earth faster than it could replace it and emitting waste into the atmosphere and landfills faster than our natural systems could process it. We were officially in overshoot and still are. As of 2010, the world’s ecological footprint was 1.5, meaning that humans use 50% more ecological resources and services each year than can be renewed. The ramifications of overshoot are drastic climate disruptions, deforestation, desertification, food and water shortages, and more.<sup>3</sup>

With rare exception, financial professionals have failed to seriously address ecological limits and are thus unnecessarily surprised by disruptions and shortages. One exception is Jeremy Grantham of GMO, who recently published a piece in which he tracked inflation-adjusted commodity prices over past business cycles. He maintains that we have seen a “paradigm shift” as evidenced by the fact that, for the first time during a recession (2008–2010), inflation-adjusted commodity prices did not decline, but in fact increased. He suggests that investors focus on owning commodity-related assets as well as shares of companies that are actively engaged in resource efficiency.<sup>4</sup>

Forecasted returns used for financial modeling focus on the direct financial risk to the investing entity and do not consider the potential negative societal (universal) impacts of certain behaviors. These elements of risk are sometimes categorized as externalities because they are not measured as direct financial costs to enterprises and are, therefore, not reflected in financial statements and valuation models. As long as externalities were relatively small, they could be ignored or assumed away. But, in an interconnected global economy with rising population and consumption, it is increasingly imprudent to minimize their importance. Ultimately, businesses, governments, and societies are faced with the costs of externalities, which impact financial performance.

### Other Elements of Risk

While this paper focuses on ecological limits as the most comprehensive and non-negotiable

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<sup>2</sup> Knut N. Kjaer “Asset and Risk Management in a Post-Crisis Market”, *CFA Institute Conference Proceedings Quarterly*, March 2011, p. 63.

<sup>3</sup> “Living Planet Report 2010”, *Global Footprint Network*. [http://www.footprintnetwork.org/en/index.php/GFN/page/2010\\_living\\_planet\\_report/](http://www.footprintnetwork.org/en/index.php/GFN/page/2010_living_planet_report/) (accessed 3/4/11).

<sup>4</sup> Jeremy Grantham, GMO Quarterly Letter, Q2 2011.

source of risk and uncertainty facing humans in the 21st century, this does not preclude the existence and importance of other phenomena that will undoubtedly affect investment risk going forward. These include social upheaval, geopolitical instability, and limits to the intellectual capacity of human beings to deal with complexity. These are topics worthy of further exploration in the context of risk.

## 2. Presumption of Economic Growth

It is likely that most reasonable people will concur that ecological limits must ultimately affect business, but it is unlikely that there would be consensus with respect to threats to growth. Yet, ecological limits have very serious implications for the continuation of economic growth as we have traditionally defined and measured it and as we associate it with success and prosperity.

The world's current model for economic growth depends on increasing consumption, which in turn drives raw materials extraction and a cycle of manufacturing, distribution, and retailing that leaves behind a tremendous amount of waste. This is defined as throughput. Despite both a perceived shift to a "knowledge economy" and some reductions in per capita throughput (efficiency), economic growth still relies upon rising throughput due to population growth and increases in per capita consumption. Standards of living in emerging economies continue to rise without offsetting decreases in developed economies. In fact, in the United States, material consumption increased 57% (23% per capita) between 1975 and 2000, a period of time often associated with a shift from the material economy to the knowledge or information economy.<sup>5</sup>

Throughput is ultimately constrained by ecological limits. At the resource level, the earth contains finite amounts of water, fossil fuels, land, minerals, ores, and other natural resources. Traditionally, economists have assumed resource limitations away using the principle of substitution; and thoughtful people trust that human ingenuity will drive innovation without compromising growth. For example, in *Learnings from the Long View*, Peter Schwartz emphasizes knowledge rather than resources as the driver for economic value and cites synthetic biology as a promising solution for replacing fossil fuels as sources of energy.<sup>6</sup> However, ultimately there is no substitution for clean water or arable land despite innovative scientific efforts under way to develop alternatives and technological solutions. As Richard Heinberg explains in *The End of Growth*, there is no evidence that they will result in large enough changes soon enough to accomplish a smooth transition away from carbon-based energy and materials sources without jeopardizing economic growth.<sup>7</sup> As long as economic growth continues to depend upon "an increase in the physical scale of the matter/energy throughput that sustains the economic activities of production and consumption of

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5 William Rees, "Toward a Sustainable World Economy", Institute for New Economic Thinking Annual Conference, April 8-11, 2011.

6 Peter Schwartz, *Learnings from the Long View*, The Global Business Network, 2011. [http://www.gbn.com/articles/pdfs/GBN\\_Learnings%20from%20the%20Long%20View\\_PS\\_2011.pdf](http://www.gbn.com/articles/pdfs/GBN_Learnings%20from%20the%20Long%20View_PS_2011.pdf).

7 Richard Heinberg, *The End of Growth*. New Society Publishers, BC, 2011.

commodities”,<sup>8</sup> the rate at which the global economy is expanding is unsustainable. And, as succinctly stated recently by Paul Gilding, “When something is unsustainable, it will stop.”<sup>9</sup>

### 3. Limited Understanding of Utility

The term “utility” is used to describe the relative satisfaction attributed to a set of options. In economics, higher expected financial returns are assumed to provide higher utility than lower returns. This is a core assumption of Modern Portfolio Theory—that investors are rational and will always choose the highest available risk-adjusted return with little or no utility placed on the nature and quality of the returns (short-term versus long-term, price appreciation versus income, for example). MPT has focused on quantity, which is easy to count, rather than quality, which is difficult or impossible to measure. However, every day people make financial decisions that economists generally deem “irrational”. People give money to strangers, pay more for locally-made products, and avoid certain vendors or companies despite their attractive products or prices. This behavior is explained in many ways, including altruism, conscience, guilt, personal values, ethics, enlightened self-interest, perceived value and concern for the common good. These and other forces can drive investors to make decisions that do not seek to maximize short-term financial returns to the investors but, rather, recognize the value of balancing returns over the long term for all (or some) affected parties, including employees, customers, suppliers, local communities, and the environment, as well as investors.

Importantly, the efficient frontier of portfolios that are optimized to provide the highest return for a given level of risk (variance) is the true efficient frontier only if actual future returns, variances, and covariances are identical to those that were forecasted at the time the portfolio was created. It is this point, identified more than half a century ago, that is increasingly problematic in the 21st century as complexity and uncertainty rise. As Harry Markowitz<sup>10</sup> states: “It is precisely at the point where the assumptions break down that financial models, pushed to their limits, lead to disastrous consequences...”<sup>11</sup>

Despite this clear warning from Markowitz, financial practitioners have not replaced or meaningfully modified the problematic embedded assumptions upon which asset allocation and security selection processes are based and which we have identified as inadequate at best. There is a set of growing unpriced risks that need to be addressed, assumptions about perpetual growth that are problematic, and limited understanding of investors’ utility functions that need to be expanded. The principles of diversification and risk-adjusted returns are prudent only if they are built upon a solid foundation that is representative of current economic and ecological conditions.

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8 Herman E. Daly, *Beyond Growth: The Economics of Sustainable Development*. Beacon Press, Boston. p. 31.

9 Richard Heinberg. *The Great Disruption*. Mercy Corp. Portland, Oregon. May 5, 2011.

10 Harry Markowitz published “Portfolio Selection” in 1952. Widely recognized as the seminal work that underlies Modern Portfolio Theory, this paper spawned a new era in financial analysis, although it would be more than twenty years before MPT gained traction among financial professionals.

11 Harry Markowitz, “Portfolio Selection”. *The Journal of Finance* 7. March, 1952.

## NEW FOUNDATIONAL PRINCIPLES

The three principles described below are founded on observed facts and market behavior in contrast to simplified assumptions and generalizations. These New Foundational Principles should form the basis for investment decision-making in place of a theory that can only be substantiated by making unwarranted and unrealistic assumptions about risk, growth and utility.

### 1. Integrated Risk

Integrated Risk includes the externalities that are not priced in the market but which threaten to inhibit or shift returns. Integrated Risk considers the potential impact of ecological limits as they manifest in business disruptions, shortages, and social/political upheaval.

Integrated Risk is science-based while acknowledging that uncertainty, although not quantifiable, must not be ignored. It moves beyond the historical financial payoff characteristics of a particular asset (debt, equity, etc.) to deal with the specific nature of the asset. It takes a multidimensional approach to asset analysis, so that observable risks and uncertainty are dealt with in a much more granular way.

In his discussion of risk as the permanent impairment of capital, James Montier cites three sources of impairment: 1) valuation risk, or the risk that the investor pays too much for an asset; 2) fundamental risk, or the risk that the asset is inherently flawed; and 3) financing risk, or the risks that arise from leverage. The first two—valuation and fundamental risks—are particularly relevant with respect to ecological limits. Because valuation of assets can be adversely affected by factors external or internal to the asset, pricing considerations must include both exogenous and endogenous elements of risk and uncertainty. As the economy encounters ecological limits, the boundaries between internal and external elements will become increasingly blurred. The internalization process will not be limited to formal and more easily forecasted financial charges to businesses—taxes, fees, tariffs, etc., expressed as rising expenses and liabilities. It will also include indirect impacts such as reduced consumer demand for products when food and energy prices rise due to shortages, disruptions in production due to extreme weather events, and geopolitical instability driven by resource constraints. To the extent that externalities can be quantified, they will be priced as internal variables, but it will be exceedingly challenging to deal with the uncertainty that is driven by complexity in the face of ecological limits. Conditions that may have once been considered temporary, exceptionally unusual, or irrelevant (exogenous), will be critical to the success or failure of particular businesses and even whole economic sectors.

For example, if, as Grantham suggests, commodity prices have begun a secular upward trend due to the combined pressures of increasing demand and declining supply, consumers will have to spend more of their disposable income on necessities such as food. Of course, there will be direct impacts on all commodity-related businesses, but there will also be ripple effects throughout the economy. Any business that relies upon discretionary spending will be affected, not just over

short periods of time as in the past, but permanently. Consumers will most likely buy discretionary items less frequently, will seek attractive prices, will reuse and recycle, and may participate in community-based sharing and bartering.

We are living in a period of increasing awareness of ecological limits, and we are witnessing a wide variety of responses to this reality. Because these responses are by no means uniform or consistent from one company to another, it is essential that analysis be conducted at a granular level rather than using generalizations. Granular analysis requires that considerable effort be devoted to deep understanding of the threats and opportunities arising from ecological limits. This granular analysis can then be used to analyze an asset from a whole systems perspective, helping analysts uncover risks and uncertainty. The same methodology needs to be used with regard to Montier's last point, leverage. With granular analysis, an investor will recognize that positive performance of leveraged assets in good times will correspond to equally negative performance in bad times. In periods of high and rising uncertainty, leverage should be judicious—the exact opposite of what has occurred during the past decade.

Until very recently, there was little or no acknowledgement by investment professionals that ecological considerations were material to financial analysis, and, even now, this is by no means a generally accepted or fully understood element of Integrated Risk. A possible explanation for this situation is that knowledge and understanding of ecological limits cannot be attained by studying financial markets, nor is it a straightforward process to model the possible outcomes and distill them to a single variable. The development of scenarios and projections is vital, but it requires different skills, education, and levels of awareness and openness than are normally present among financial professionals.

## 2. Selective Growth

Economic prosperity is dependent on a successful transition from an extractive economic system to one that is based on energy and materials efficiency, renewal of natural systems, and resilience. Resilience refers to the ability of a system to adapt to rapidly changing conditions. Because of uncertainty, resilience requires high levels of diversity and redundancy. This fundamental necessity to shift to a different economic model is not embedded in Modern Portfolio Theory. MPT and associated asset allocation strategies fail to recognize this reality because they fail to explicitly integrate ecological limits into long-term analysis and projections of risk and return. Asset allocation and security selection models traditionally assume positive economic growth by using positive expected mean returns on investments as input. Volatility inputs allow for the possibility of negative short-term returns, but the long-term expectation is consistently positive. In a typical asset allocation model, provisions for temporary economic declines include hedging strategies such as elevated cash reserves, option-like investments, and defensive holdings. But these are short-term measures taken as part of a cyclical strategy. The possibility of long-term, continuous zero or negative economic growth precipitated by ecological limits warrants deeper consideration for long-term investment portfolios. It has been politically, socially and financially unpopular to ques-

tion the wisdom and/or probability of infinite growth, but that does not mean that infinite growth is, therefore, the only possibility.

The end of growth does not mean the end of the economy, but, because the economy must curtail throughput, there will be clear winners and losers. Rather than a “rising tide lifting all boats”, the new economy will resemble a zero sum game with respect to throughput-driven growth. The term Selective Growth refers to the fact that growth can occur even if average economic growth is zero or negative, but it will be unique to particular sectors and companies rather than a function of rising per capita material consumption. Economist Herman Daly envisions a “steady state” economy, and University of British Columbia professor William Rees notes:

“The economy needn’t cease developing, it must merely stop growing. With luck and sound management it could hover indefinitely in the vicinity of its ‘optimal scale’ while human well-being steadily improves. There are no limits on the capacity of human ingenuity to better our quality of life, only on the quantity of throughput available to do it. And even within that constraint, new firms and even whole industrial sectors could both develop and grow even as their thermodynamic equivalents in obsolete or ‘sunset’ industries are phased out.”<sup>12</sup>

Daly, Rees, and others do not foresee an economy of deprivation, and they are realistic in their perspective that increasing throughput to support rising material consumption cannot continue unimpeded in a finite physical system.

Investors need language and processes for allocating financial assets in ways that consider the reality of ecological limits and the end of throughput-driven growth through Integrated Risk analysis. The evaluation of financial statements and projections, economic indicators and projections, market conditions, and management qualifications must be overlaid with questions of resource and energy dependency, contingency and opportunistic planning and implementation of programs, and competitive landscape in the face of ecological limits—all with a view to Selective Growth opportunities.

### **3. Multidimensional Utility Functions**

The existence of Multidimensional Utility Functions means that clarity with respect to the unique purpose and goals of each asset owner should be central to the investment process. But, unless this is specifically called out, there is a tendency for investors, advisors, and consultants to default to the language and practices of Modern Portfolio Theory, despite the shortcomings identified here and elsewhere.

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<sup>12</sup> William Rees, “Toward a Sustainable World Economy”.

Leverage and speculation increasingly dominate financial markets, changing the investment landscape, invalidating current methodology and forcing long-term investors to resort to short-term strategies. In the face of securities markets in which prices fluctuate based on changes in short-term outlook, it is challenging to take a long-term view. If there is no qualitative difference between gains (or losses) derived from short-term price spikes and long-term dividend streams with slow appreciation, and if investment performance is evaluated over quarterly intervals relative to a market index, then there is little motivation for investors to consider the long-term ramifications of their decisions.

Yet there is a deep desire and often a stated commitment on the part of many asset owners to make constructive long-term investments. They find high utility in knowing that their financial activities are contributing to the creation of long-term economic value and their returns are derived from “real” economic activity. It is not unusual for individual investors to express concern about their investment decisions and the world they are creating for their children and grandchildren. This expanded view of investing ties the concept of value to the efficacy of the whole economic system rather than limiting it to the specific outcomes for the investor alone. For these investors, we suggest a deceptively simple question as a tool for differentiating speculation from investment and thus providing clarity with respect to the underlying activity. The question is: “Does my financial return depend upon appreciation in the underlying value of the asset, or does my return depend merely on appreciation of the price of the asset?”<sup>13</sup> Obviously, it is not a simple task to answer this question, but the process encourages asset owners to carefully consider their motivations, intentions and expectations as well as the quality and source of returns.

For example, investing in timberland has a heavy weighting toward value appreciation as the investment return relies upon trees growing in both size and value. But, there are also elements of speculation if the expectation is that the price of logs and lumber will increase. High frequency algorithmic trading exhibits no investment characteristics, but what about buying a publicly traded stock that pays a good dividend derived from providing renewable energy or smart grids? Perhaps public stock markets are all speculative by definition because they are not providing opportunities for direct investment in companies. In that case, an investor would opt for direct private equity investments. Perhaps a private equity investment is made as a way to grow a business and increase its value, but maybe it is made as a short-term speculation that the company can soon be divided and sold in pieces at a higher total price than was paid. There are no right or wrong definitions, but investors who aspire to invest in accordance with Multidimensional Utility need to be fully conscious and informed as to the nature of financial transactions, vehicles, and strategies.

The utility of various structures and types of relationships differs from one investor to another. As mentioned above, some investors may derive high levels of satisfaction from investing directly in an enterprise rather than owning secondary shares or bonds. Others may prefer the liquidity of publicly traded secondary securities and may place high utility on short-term speculative strate-

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<sup>13</sup> Personal conversation with Ellie Winninghoff, investigative journalist and financial analyst, July 8, 2011.

gies. Some financial vehicles are designed to facilitate transparent relationships between investor and borrower, for example, while others insist upon anonymity and opacity. Investors need to be clear as to their requirements for connectedness and transparency. They also need to define the aspects of their utility functions that relate to their desire for impact. Consideration of all of these factors should result in a set of guidelines that can be expressed in the Statement of Utility and used to evaluate new investment opportunities as well as the success or failure of portfolio holdings.

It is generally assumed that investors seek to maximize financial returns to themselves and/or their beneficiaries within certain risk parameters and timeframes. Returns may be derived from dividends, interest, earned income, or capital appreciation, or a combination of these. There is no stated utility, positive or negative, assigned to the societal (universal) effects of the form or characteristics of return generation. This single-minded focus on returns to the investing entity is problematic when it fails to consider the end beneficiaries. For example, a pension fund may derive financial returns from an investment in a real estate project that has uprooted and destabilized the retired employees who receive financial benefits from the fund. Does the financial return to the fund offset not only the financial, but also the personal costs to the beneficiaries? A critical element of Multidimensional Utility is to acknowledge potential contradictions like this and to confront the tendency to compartmentalize in the face of complexity.

Investment policy statements currently focus on percentage allocations to various asset classes based on their financial payoff characteristics (cash, debt, equity, real property, for example) and the strategies that are used within or among these asset classes (indexing, hedging, leverage, absolute return, etc.). These policy items should be addressed only after the investor has, through a thoughtful process, clearly articulated a Statement of Utility that addresses both qualitative and quantitative goals and objectives.

## **SUMMARY AND NEXT STEPS**

The purpose of this paper has been to propose three new investment decision-making principles related to risk, growth, and utility. Our goal is to empower investors, investment professionals, and academicians with these principles.

We have provided information about the experiences of two entities that have built Integrated Risk, Selective Growth, and Multidimensional Utility Functions into their investment practices. The Portfolio 21 Investments story focuses on risk and growth, while the RSF Social Finance story highlights the organization's utility function and its applications. These two stories are attached as appendices to the paper.

There are multiple opportunities to expand these elements and develop applications for investors, practitioners, and academicians. Following is a brief sampling of ideas for further thought:

### Indexing

If uncertainty cannot be priced, then it could make sense to avoid “market basket” strategies in favor of actively managed portfolios with long-term orientations. What factors would support this? Does indexing still make sense if there is an expectation of negative growth?

### Asset Classes and Asset Allocation

In a similar vein, what is the most effective set of differentiators for asset classes? Is it enough to allocate among traditional asset classes, or should asset classes be subdivided based on Integrated Risk and Selective Growth exposure? What is the role of Multidimensional Utility in defining asset classes and determining appropriate allocation?

### Diversification

Consider parsing diversification based on exposure to various ecological limits-related phenomena (both risks and opportunities). Evaluate the role of diversification in a Selective Growth economy.

### Statements of Utility

Develop a set of guidelines for use by investors and their advisors to develop utility statements. Go beyond checklists and attempts to quantify. Take the challenge of reconciling conflicting utility aspects by pushing personal and institutional boundaries (for example, combine the investment committees and program offices of foundations).

### Fiduciary Duty

Question definitions of “prudent” and develop proposed revisions of fiduciary standards to take into consideration these new principles.

### Investing Cost Structures

Analyze the cost implications of fundamental granular analysis. Are there collaborative models that could result in shared costs without compromising confidentiality and proprietary strategies?

## **CONCLUSION**

Our hope is to ignite a lively conversation among thoughtful individuals and institutions who share a commitment to investing based on these foundational principles.

## APPENDIX A

### PORTFOLIO 21 INVESTMENTS: AN APPLICATION OF INTEGRATED RISK AND SELECTIVE GROWTH

What does it mean to incorporate Integrated Risk and Selective Growth into every investment decision? For us at Portfolio 21 Investments, it began with an epiphany. The concepts of Integrated Risk and Selective Growth came alive and we were ready to transform our approach to investment practices. In this story, we share some of our experiences with the hope that they will be helpful to others who are exploring Integrated Risk and Selective Growth and considering adopting similar practices.

#### Our Epiphany

In 1997, we attended an educational seminar that introduced us to The Natural Step, a set of four system conditions developed by Karl Henrik-Robert, a Swedish physician and cancer researcher. He concluded that, to be sustainable, society cannot systematically increase the concentrations of substances extracted from the earth's crust (such as oil, natural gas, coal, and ores and minerals), nor can it systematically increase the concentrations of substances that are produced by society (such as pollution, carbon dioxide, landfill waste, and toxic waste). A sustainable society cannot physically degrade its means of support (such as agricultural land, fresh water, and forests), and it must ensure there is fair distribution of resources so that people can meet their long-term needs.<sup>14</sup> Dr. Robert's conclusions were so simple and profound that we felt compelled to act. We knew that, in light of this stark reality and the implications for the global economy, we needed to radically change our investment philosophy and decision processes.

#### Implementation

We set out to develop a framework for investing in companies that understood and were functioning in ways that reflected the principles of The Natural Step. We started by working with Susan Burns, currently with the Global Footprint Network, to develop a set of selection criteria and a methodology for evaluating which companies would be included in our investment portfolios.

The biggest challenge in 1997 and continuing in 2011 is obtaining relevant data in a format that is truly useful. In 1997, there were no third party providers addressing the issues we had identified as critical factors for businesses facing the environmental challenges of the 21st century. The focus of most available data was environmental responsibility and "doing the right thing" rather than environmental sustainability as an imperative for survival and competitive advantage.

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<sup>14</sup> The Four System Conditions. *The Natural Step*. <http://thenaturalstep.org/the-system-conditions> (accessed 8/19/11).

We needed to understand the greatest risks and opportunities to companies and sectors in the face of ecological limits as they manifest in climate change, natural resource depletion, and related phenomena. This meant a focus on products and services, business models, and leadership as well as how companies were allocating funds for research and development, and whether their mergers and acquisition activities were consistent with awareness of ecological limits. This depth and quality of information was not available from any of the third party analysts.

Our solution was to build it ourselves. We developed a proprietary evaluation and scoring/weighting system and built an internal database using information we obtained from company publications, direct communications, and third parties. Today, the use of ESG (environmental, social and governance) factors in the investment process has gained some traction, and there is much more data available in compiled formats from sources such as MSCI, Bloomberg, Sustainalytics, and RepRisk. We subscribe to several of these and use them for an initial overview of a sector or company. While they are helpful in presenting data points, they do not offer the in-depth qualitative analysis that we require. Thus, we continue to rely upon our internal process.<sup>15</sup>

By developing, expanding, and improving our internal systems, we have established a solid base for our thinking and a robust collection of material for company and sector reviews and evaluations. But, this is a labor-intensive and time-consuming endeavor. For most investors and fiduciaries, it is not practical to try to replicate our system, just as it is not practical to try to replicate the financial analysis systems of asset managers. It is critical, however, that investors and fiduciaries require their managers to evaluate Integrated Risk and Selective Growth factors, and that these managers are held accountable with respect to their methodologies and processes.

For the majority of financial professionals, the consideration of ESG (environmental, social, and governance) factors has historically been considered a somewhat marginalized activity, more “feel good” than financially significant. In firms that offer socially responsible investments (SRI)—now often referred to as ESG—financial analysts and environmental or ESG analysts have traditionally worked separately from each other with little cross communication or cross training. Until very recently, the curriculum for the Chartered Financial Analyst certification, considered by many the most prestigious investment-related certification, contained no reference to ESG issues. On the environmental side, very few experts in ecological issues are also well-versed in financial markets and analysis. Since 1997, there has been an increase in the numbers of graduate students with double degrees in business and environmental science, environmental studies, or resource management, but there continues to be a dearth of CFAs with an understanding of ecological limits and the analytical expertise necessary to meaningfully consider these complex risk factors in financial analysis.

Our investment thesis at Portfolio 21 Investments is that the risks and opportunities arising from

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<sup>15</sup> Additional information about our services, investment philosophy and practices can be found on the SEC’s website [www.adviserinfo.sec.gov](http://www.adviserinfo.sec.gov)

ecological limits are the central issues of this century and cannot be ignored, even if financial markets are slow to integrate them. From the outset, we concentrated on making the business case for environmental sustainability, and we structured our research process to address the most relevant ecological limits, risk factors, and related opportunities for each of the sectors and companies we evaluated. Our investment management team is composed of portfolio managers and analysts who work together to assess and improve our research process. Our CFAs attend conferences such as Bioneers where they are exposed to the most current thinking on ecological limits and related social issues. We call upon outside experts such as Bill McKibben (350.org) and Nate Lewis (California Institute of Technology) and other individuals who can provide in-depth information and insight into contemporary ecological issues.

Therefore, at Portfolio 21 Investments, we advise our clients that 100% of their investments should follow the principles of Integrated Risk and Selective Growth as opposed to other firms that still see this as an option to be included only if clients insist. We believe that failure to pay attention to the implications of ecological limits when constructing an institutional or individual portfolio is, simply put, imprudent.

### **What Comes Next?**

Global financial markets are currently fixated on debt limits rather than ecological limits, but there is an inevitable collision on the horizon between ecological limits and economic growth as we know it. In financial terms, it will be increasingly costly to emit, pollute and produce, and some companies—even whole sectors—will face significant disruptive challenges.

Based on what we have learned and are practicing at Portfolio 21 Investments, we are suggesting a radical transformation in investment management, one that requires investors and fiduciaries to anticipate the impacts of ecological limits and the associated economic disruptions and limits to growth based on material and energy throughput. These are not always intuitive or even acceptable conclusions for financial professionals and investors who have been schooled to subscribe to the unrealistic but pervasive assumption of perpetual growth. Questioning these assumptions is often met with denial and fear, which prevent thoughtful consideration of the issues and positive action. Brilliant thinkers and strategists are spending time and energy on financial engineering and short-term trading strategies rather than on the critical analysis of Integrated Risk and Selective Growth that is necessary for the transition of the global economy in the face of ecological limits.

We, at Portfolio 21 Investments, believe we need a rebirth of fundamental analysis in which every assumption about growth, resource availability, price elasticity, consumer demand, and long-term trends is examined, questioned, and revised in light of Integrated Risk and Selective Growth. We are engaging in this analysis at Portfolio 21 Investments, knowing that we are obligated as stewards of our clients' money to do so both in the short and long term for the benefit of all.

## APPENDIX B

### RSF SOCIAL FINANCE: AN APPLICATION OF MULTIDIMENSIONAL UTILITY FUNCTION

#### Introduction

What does it mean to implement a Utility Function that challenges mainstream economics and investment practices? RSF Social Finance has identified a specific Utility Function and developed it consistently over 27 years. We share our story with the hope that others will also be inspired and empowered to design unique Statements of Utility to serve as the backbone of their investment decision-making.

#### Our Inspiration

In a series of lectures in 1922 in Austria, Rudolf Steiner took on the topic of economics. Steiner had already made significant contributions to the fields of education, architecture, medicine, spirituality, and agriculture. In the economics lectures, he asserted that “true price” must always be derived from a buyer and a seller being in direct relationship, and that “associations” of people and small businesses engaged in these direct exchanges of value were essential for healthy, vigorous economic life. In Steiner’s view, the more disconnected the economic relationship, the more distorted it became.

Steiner’s insights inspire everything we do at RSF Social Finance. The secret of RSF’s success has been bringing investors and borrowers together in community. Interconnectedness is the cornerstone of RSF’s utility function. We have found that if investors and borrowers can be more visible to each other—if they can understand each others’ needs and intentions, and sustain a personal connection whenever possible—then risk decreases and fulfillment increases.

Since 1984 when RSF made its first major loan to help rebuild a school building destroyed by fire, RSF has made over \$230 million in direct loans to both for-profit and non-profit social enterprises in the areas of Food & Agriculture, Education & the Arts, and Ecological Stewardship. Our track record has been outstanding, with less than 1.4% in cumulative losses over twenty-seven years.

#### Implementation

Our Utility Function informs all of our activities, beginning with our statement of purpose: to transform the way the world works with money.

The global financial system in 2011 can be characterized as complex, opaque, and anonymous, based on short-term outcomes. At RSF we believe, in contrast, that every financial transaction should be direct, transparent, and personal, based on long-term relationships. Participants in a

transaction become participants in a relationship. We believe this is nothing less than the antidote for modern finance, if applied on a substantial scale.

Since the first group of community members came together to start RSF, we have been working to enhance relationships with and among our stakeholders. We recently adopted a new approach to loan pricing for our \$75 million flagship senior-debt fund (RSF Social Investment Fund). Each quarter, we convene representatives of RSF, our loan fund investors, and our borrowers to indicate what annualized return rate investors should receive the following quarter, and what base interest rate borrowers should pay—a radical form of transparency. We call this community-based pricing. These pricing meetings foster direct relationships between our borrowers and investors, increasing participants' interest in the others' activities and provide an opportunity for shared learning.

In addition, the pricing meetings allow stakeholders to better understand where their returns are coming from. By having the opportunity to interact with the end borrower, investors can truly understand the organizations in which they are invested and also see how their returns are being created to ensure that it is from the appreciation of the underlying value of the organization rather than just an appreciation in its price. Borrowers are able to understand the source of their funding, and are therefore more compelled to pay back their borrowed funds. They are also more conscious of the value of borrowing from an aligned lender. As the intermediary and convener of these relationships, RSF receives a positive return on our utility function and, we generate a positive financial return to cover our expenses and satisfy investors.

RSF's utility function also governs our \$40 million asset management program. In 2007, we redefined our investment thesis to focus on investments that are as direct as possible, transparent, long-term, relationship-based and place-based where appropriate. In order to achieve this, we mapped the current holdings of our Impact Portfolio against our investment thesis and decided to divest of hedge funds due to the fact that they are most often not transparent, long-term or relationship-based.

This rigorous mapping exercise also led us to sell 100% of our holdings in public equities last year, due to the inability to create a genuine relationship between RSF and the companies in the portfolio. Our strategy has led us to create a portfolio which now consists of smaller funds where we can build strong relationships with the underlying organizations. Investments include private equity and real asset holdings that are consciously and effectively dealing with the risks and opportunities of ecological limits. This not only reflects our own utility profile, but also, through granular due diligence and a focus on selective growth, RSF has been able to achieve competitive returns that outperform our blended benchmark.<sup>16</sup>

One holding in the Impact Portfolio that demonstrates RSF's utility is Elevar Equity. Unlike most private equity funds supporting microfinance that only invest in microfinance institutions and then

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<sup>16</sup> Past performance is not guaranty of future results.

take all returns out of the local communities, Elevar invests in businesses that are adjacent to microfinance lenders, ensuring that more money is recycling within the local economy and that local entrepreneurs are getting more support. RSF expects a return commensurate with other private funds conducting international lending. We have decreased our risk exposure due to the direct and transparent nature of the investment vehicle, and we are receiving a return on our utility through the support of the local community.<sup>17</sup>

## What Comes Next?

RSF has continually innovated to ensure that its investments are consistent with the utility functions of interconnectedness. This focus prevails throughout all of our offerings related to investing, lending, and giving. The systemic application of our utility has allowed us to lower our risk across all of our products while also ensuring deep social and environmental impact. New products include the Transformation Portfolio, which brings donor-investors together to learn from each other and actively discuss how to align their personal values with their investments, and the Mezzanine Fund, which provides social entrepreneurs with alternative financing such as revenue participation agreements so they can receive growth capital without diluting their ownership and control.

Our Utility Function calls for de-coupling from Wall Street as much as possible. Based on phenomena like algorithmic trading, we feel that global capital markets today are vulnerable. We believe networks of place-based economies will be more resilient in the decades to come, and investment returns in small- and medium-sized privately held businesses will be superior, especially for those enterprises focused on ecological stewardship in some way.

RSF serves as an example for other investors who want to engage in “whole portfolio activation”, where 100% of a portfolio is aligned with mission. We encourage all investors, both individuals and organizations, to define their utility clearly and then invest to create an entire portfolio, including grants and gifts when applicable, around that utility.

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<sup>17</sup> This is not an offer of, or solicitation of orders for, in any securities. Investors should consider their individual financial objectives and investment risks, which include, without limitation, potential loss of the invested principal.