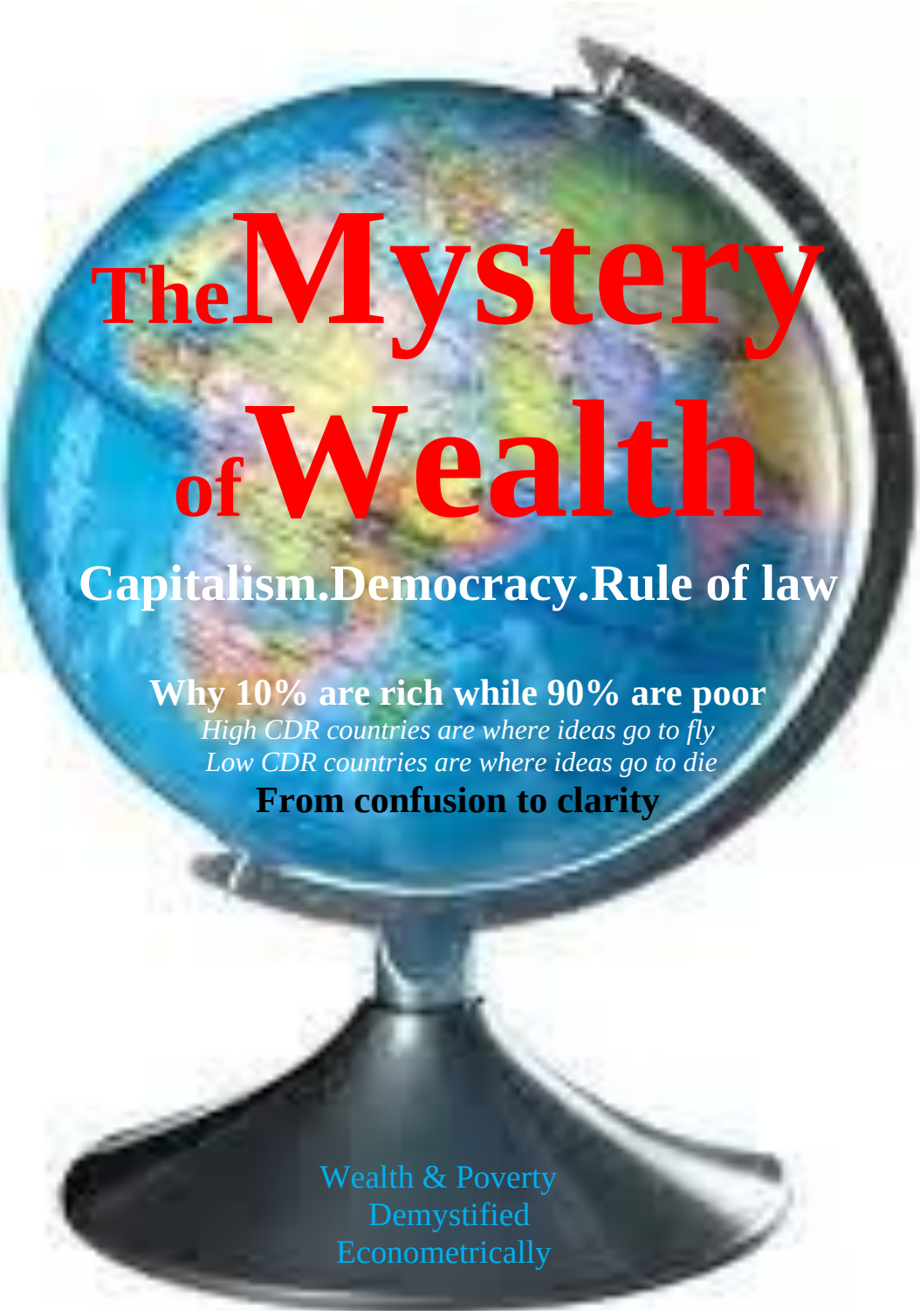


The Mystery of Wealth

Capitalism.Democracy.Rule of law

Why 10% are rich while 90% are poor

High CDR countries are where ideas go to fly

Low CDR countries are where ideas go to die

From confusion to clarity

Wealth & Poverty
Demystified
Econometrically

ENTREPRENEURSHIP

Dr. Dennis Ridley

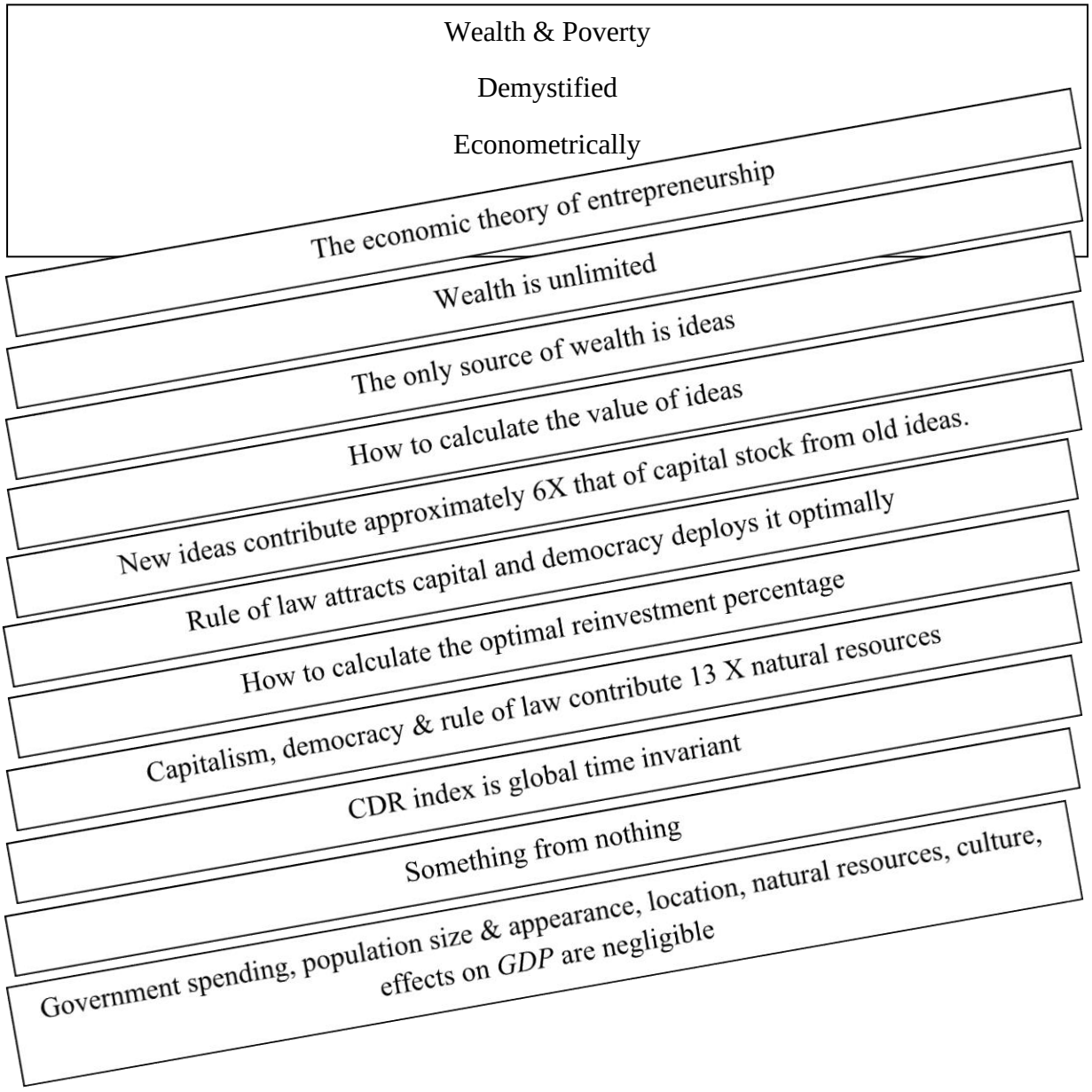
Wealth

explained by

Capitalism Democracy Rule of law

General theory of economics

CDR supply side scientific growth law unveiled
from confusion to clarity



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Dennis Ridley, Ph.D. (Clemson)

Florida A & M University and Florida State University, Tallahassee, Florida

About the Author

Dr. Dennis Ridley studied Electrical Engineering at Middlesex University in England and the University of the West Indies, where he received the Master of Science degree in Computer Methods in Electrical Power Systems Analysis. He received his PhD degree in Engineering Management from Clemson University, USA. He has the distinction of a US patent, publication in the Journal of the Royal Statistical Society, US State Department Fulbright Senior Specialist at Kharkov University in Ukraine and Harvard Business School certificate in The Art & Craft of Discussion leadership.

Currently, he is a Professor in the School of Business &Industry at Florida A&M University, and a Faculty Associate in the Department of Scientific Computing at Florida State University. Previous appointments include Howard, George Mason, and Clemson Universities, Nekoosa Packaging Corporation, Radio Corporation of America, Jamaica Public Service Co., and the International Atomic Energy Agency in Vienna, Austria.

He is widely published in the fields of electrical, industrial & biomedical engineering, economics, finance, management science, operations research, time series analysis, statistics, supply chain management and entrepreneurship. His professional societies have included the Institute for Operations Research and Management Science, the International Institute of Forecasters, the Institute of Business Forecasting, the American Statistical Association, and the Production & Operations Management Society.

He is the father of the computer-powered wire(less) ultra-intelligent real-time monitor, antithetic time series analysis, the moving window-spectral method, the CDR economic growth index, the professorial evaluation metric, live case study pedagogy, Andrew Ridley and Jon Ridley.

Dr. Ridley has served as an accreditation visitation team member in service to the University of the District of Columbia, Seton Hall University, State University of New York and Rutgers University.

PREFACE

The purpose of this book is to demystify the causes of wealth and poverty like never before done. It is the seminal comprehensive presentation of the CDR index. The CDR index is a mathematical model that shows how capitalism (C), democracy (D) and rule of law (R) jointly with natural resources and geography explain almost all economic growth. As it turns out, capitalism, democracy, and rule of law are intangible policy variables that are at the disposal of all countries and explain almost all gross domestic production of tangible products and services. There is also a minor contribution from non-policy variables such as natural resources and geography. These are all that countries require at their disposal and choice in order to enjoy their desired standard of living. The CDR economic growth model is a new paradigm.

The book will serve the needs of individuals who wish to gain a basic understanding of national wealth and the macro-economic growth and decision making that is responsible for wealth. The reader may start with a preliminary review of the information at CDRindex.blogspot.com and here in Chapter 1. The blog is intended for anybody, especially persons with a high school education and beyond. The introduction proceeds to explain wealth in general terms. It contains a summary of conclusions that flow from the basic CDR fact that the source of all wealth is human ideas of imagination and creativity. It contains many conclusions that are counterintuitive and different from commonly held beliefs. Chapters 2 and beyond are intended for college and university students, and professionals. It is anticipated that through the study of entrepreneurship, students might gain a sense of ownership and purpose that places higher value in their own education. They might also become more supportive of the minority of students who choose entrepreneurship for a career and will likely pioneer future wealth building for society as a whole. Chapters 2 explains the relationship of CDR and wealth to entrepreneurship. Chapter 2 focuses on entrepreneurship in the United States of America (USA). Chapters 3 and 4 explain the mind as source of wealth and its ramifications for welfare transfer payments. Chapters 5-12 drill down to develop the economic theory of entrepreneurship. The final (on economic theory) Chapter 13 addresses the implementation of the CDR model to improve the economies of all countries including wealthy countries. But low income countries can benefit the most. A seminal model is presented for political and economic transition from low CDR, low wealth countries to high CDR, high wealth countries. The transition involves game theoretic strategies for the replacement of pernicious corrupt dictatorship with nation building CDR. Chapter 14 considers what can be done with CDR to increase the wealth of formerly communist countries. Chapters 15a-15c contain pedagogical proposals for revising introductory economics, engineering and mathematics courses to better develop science, technology, engineering and mathematics (STEM), and entrepreneurial concepts and creative thinking in higher education.

Chapter appendices that include supporting information for a chapter are placed at the end of the chapter. Global appendices that support multiple chapters are placed at the end of the book and are named with double letters. Appendix AA contains a nomenclature of economic terminology that is developed specifically to explain the CDR growth model and how it works. Appendix BB contains the regression results and chart that depicts the source and mechanism of wealth. Appendix CC contains a question and answer review that compares traditional economic growth models with the new CDR economic growth model.

Contents

CHAPTER 1

Introduction: Context, Perspective and History of Economic Growth

Capitalism-Democracy-Rule of Law (CDR) theory of economic growth

The true source of wealth is entrepreneurial capital. Capital comprises intangible exogenous human entrepreneurial capital ideas of imagination and creativity, and capital stock of knowledge (skills and memory), and tangible endogenous machinery, recordings, computers, etc. Capitalism is a method of organizing capital for the purpose of profitable investment. Rule of law is an intangible exogenous catalyst that creates stability for attracting capital. Democracy is an intangible exogenous catalyst that creates new pathways for the optimal deployment of capital. Total capital is converted into production of capital stock, goods and services, which after consumption, depreciation and obsolescence, contributes to wealth. Since capital stock is subject to continuing depreciation and obsolescence, entrepreneurship must be the true source of new wealth creation. The CDR index is a weighted average of capitalism (C), democracy (D) and rule of law (R) that jointly with natural resources and geography explain almost all economic growth. High CDR countries are where ideas go to fly. Low CDR countries are where ideas go to die.

Organization

This book is a compilation of papers written by a collection of authors, collectively referred to in the text as "we" or "our" when stating in pertinent part, partial research findings and conclusions. The contributing authors and the related published paper are identified at the beginning of each chapter. The primary author is solely responsible for the creation of the book and any errors and omissions. The book discusses capitalism (*C*), democracy (*D*), and rule of law (*R*) - (CDR) and their role as the main drivers of global economic success. Chapters 1-6 are concerned with the fundaments of CDR. Chapters 2, 14 and 15 are guides to CDR education and how to teach it. These 8 chapters are kept qualitative for the reader who is not fond of mathematics and is satisfied with verbal arguments in support of the CDR theory. In the study of physical sciences like physics and engineering, experiments can be controlled and repeated at will. In growth economics considered here, the study is of data that are recorded from experiments that cannot be repeated. It is never obvious what and when changes in which variables occurred, and how they are related. The task of chapters 7-13 is to sort these out, and that requires some specialized quantitative analysis. Think of them as a bonus. They provide mathematical proof, and demonstrations based on econometric modeling and statistical analysis. While statistical analysis by simple regression is accessible to undergraduate sophomores, CDR is a multivariate model and therefore requires multiple regression analysis. Furthermore, *C* is a mixture of *exogenous* and *endogenous* components and therefore requires econometric analysis; two stage least squares and instrumental variables. But, Hakuna Matata (no worries), as all presentations are accompanied by copious verbal qualitative explanations. Of particular interest are the seminal presentations of how to calculate the value of ideas (chapter 9), how to calculate the value of endogenous growth, and proof that it is a fallacy of composition to think that we can simply jump from microeconomic production function conceptions to an understanding of aggregate production by society as a whole (chapter 11). Chapter 13 discusses how countries can increase

their CDR. The analysis there is based on game theory in general and Nash Equilibrium in particular.

Each chapter is self-contained, completely covering its designated learning milestone. But collectively they can be the reference book for a university course in entrepreneurship. They can also be used as a textbook dedicated to modern economic growth theory in general and the new CDR paradigm in particular. Like all good methodologies in economics that improve the wealth of nations, CDR can be applied to improve the personal wealth of individuals.

There may be instances where the reader is surprised by a finding that is inconsonant with their own personal beliefs and observations. The reason for this could be that the reader's information is anecdotal. Bear in mind that the data analyzed in this book are aggregate country macro-economic averages and the conclusions reached are about macro-economic averages. Actual outcomes are distributed around their average and may not *by themselves* provide reliable information about the whole population from which the data are summarized. One must take into account their distributional properties and statistics such as mean (location), variance (spread), asymmetry (skewness) and kurtosis (peakedness or flatness). Also, when certain concluding statements are made about the partial (or marginal) impact of a particular variable of interest, they are always based on the assumption of *ceteris paribus* where all other variables are held constant.

The Mission

Several researchers (Friedman and Friedman, 1980, Friedman, 2002, Gwartney, Holcombe and Lawson, 1999, Gwartney and Lawson 2003, Heritage Foundation, 1995-2016, Sowell, 2015, Rand, 1961, Homburg, 2015) have identified *C*, *D* and *R* as impacting gross domestic product (GDP). But they do not identify these variables as exclusive and unique policy variables. They have not eliminated what are assumed to be numerous other possible factors. This book presents a new macro-economic model that accounts for standard of living as a function of *C*, *D* and *R*. The model is a weighted average of *C*, *D* and *R*. When natural resources and geography are included, the model explains approximately 90% of standard of living. We assume that the remaining 10% is attributable to intrinsic error in the data. The data are based on all countries in the world and for all years for which there are data. This extraordinary ability to explain standard of living far exceeds that of any extant model. *C*, *D* and *R* are policy variables that can be implemented by a country. Natural resources (*N*) and geography as measured by the absolute value of latitude (*L*) are not policy variables under the control of a country. *N* and *L* cannot be chosen. Therefore, the model is referred to simply as the CDR model. By raising their CDR, countries can raise their standard of living. Even if certain limiting human characteristics, or *N* or *L* were obstacles in some nations, CDR is salutary to economic development in terms of making the best of what is possible.

C, *D* and *R* are complex variables with many elements. For the moment suffice it to say that *C* is the degree to which capital is organized, measured by total market capitalization. *D* is the degree to which democracy is implemented. *R* is the degree to which corruption is reduced. The way in which these variables are constituted, combine and interact, are explained later in this introductory chapter and in great detail in chapter 7. Numerous implications of CDR are expanded on throughout the book.

The CDR model is estimated by the regression of GDP adjusted for purchasing power parity (G) on *C*, *D*, *R*. All variables are standardized to range from 0 to 1 for easy interpretation.

The model obtained for the computation of standard of living is $\hat{g}$= 1.53C + 0.14D + 0.23R - 1.21$C{\cdot}D{\cdot}R$ + 0.38N. The high coefficient of multiple determination (R^2_{adj}) and the results obtained being the same for all the years for which data are available, demonstrate that the model is global and time invariant. This and the constant mean and variance randomness of the residuals from the regression indicate that there are no other systematic policy variables that are responsible for explaining GDP. Computations that demonstrate and prove the validity of the CDR model are given in chapter 7. All the data required to permit replication of all CDR results presented, are provided in Appendix BB. Collectively, these stake a dispositive claim for finally placing growth economics on a sound scientific footing. A CDR scientific growth law. The mission of this work is to assist in the fight against poverty, raise standard of living and wealth, and promote middle class societies everywhere in the world.

Wealth and poverty

About ten percent of the people in the world are rich and getting richer (Pew Research Center, 2015). Even when they do not know why they continue to do what appears to work. In 2014 when the research for this book commenced, ninety percent of the people in the world were impecunious, living on two to three U.S. dollars per day. The only thing standing between them and wealth is a corrupt dictator. It is high time for entrepreneurial education - capitalism, democracy and rule of law - to raise the human condition so that all people can enjoy a desirable standard of living. This book is a call to action, not to opine poverty. “The arc of the moral universe is long, but it bends toward justice.”

Capitalism is often associated with rapacious intentions of the one percent capitalists and their willful exploitation of the ninety nine percent common men. This rent seeker ad hominem trope places successful entrepreneurs in its crosshairs, but it has done nothing to raise the lot of the poor. If entrepreneurship is to be beneficial it is important to eradicate this wrongheaded way of thinking. Recall Adam Smith “Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society that he has in view. But, the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to society… He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. By pursuing his own interest, he frequently promotes that of the society more effectually than when he really intends to promote it.” A capitalist is one who attempts to maximize one’s earnings in return for one’s efforts. Therefore, every rational person is a capitalist. Capitalism is a method of organizing capital for the purpose of profitable investment. All countries possess capital, if only its people, but capital contribution to wealth is minimal unless it is organized by capitalism. An example of capitalism is the capital market, the ultimate such market being Wall Street, in the United States of America (USA). This is no time to fool. In today’s internet of communications and worldwide travel networks, capital can and will flee as quickly as it arrived at the slightest hint of corrupt dictatorship. At the time of this writing, the foot traffic of human capital fleeing South America, particularly Venezuela, has not gone unnoticed.

Investment by the one percent creates new products and services that benefit the ninety nine percent on a massive scale. That is why the poor in the USA experience a living standard that is far better than that of the preindustrial revolution members of any royal family none of whom had indoor plumbing. The one percent entrepreneurs who pursue wealth soon discover the

toil from experimentation, design and development, disappointment, joy of discovery, and the meaning of risk taking. Then, assuming positive proof of concept, they devote their leisure time to searching for ways to manufacture their product at a cost that makes it affordable to the ninety nine percent. The benefits of labor-saving devices, leisure time, health, and better standard of living in general accrue to common men. In reality, entrepreneurs are a gift to humanity. Anything done to impede their activities can only destroy capital and threaten a return to poverty.

Now that we have some insight into the cause of wealth, let us pause to consider the cause of poverty. For millennia, prior to the industrial revolution, with few exceptions, the normal state of existence of historic mankind was poverty. This was the case even though man was surrounded by natural resources. The way to maximize poverty was then and still is now, to do nothing. The next best way is not to innovate, but to live from day to day, hunting and gathering, barely eking out an existence, not knowing where the next meal is coming from. If the lifting up of the human condition was not due to capitalism, then what was it due to? Was it socialism? Socialism is a method of state owned and controlled production and redistribution of wealth. But, just as commonly held property (no property rights) cannot serve as fungible collateral-based capital for wealth generation, commonly held ideas (no patent rights) cannot be extracted from human capital for wealth generation (there are no incentives). When the source of government revenue is taxes, government spending cannot increase gross domestic product (GDP) without reducing the GDP contribution from the taxpayer (see also Ricardo, 1817,1821). The net change may be zero. And, when there is no wealth, what is obtained from the redistribution of poverty? Is it not poverty?

Entrepreneurship stops the poverty cycle

Entrepreneurship is the process of starting a business, typically a startup company offering an innovative product, process or service. At a time when the American government has promised to renew the fight against poverty, high technology productivity not only accelerated, it went global. This has led to a loss of high paying manufacturing US jobs, and massive profits for large corporations. One solution is for Americans to purchase stocks in the corporations and receive dividends. Since small businesses collectively create more jobs than the large corporations, another solution is entrepreneurship.

This book discusses factors that affect entrepreneurial mindset, economic success and poverty reduction. In particular, the case of extreme paucity of entrepreneurship in family background, that has led to confusion about the factors governing economic success and perpetual avoidance of entrepreneurship. One cannot deny the very low frequency of minority owned businesses. Formerly oppressed American communities typically have almost no examples of family entrepreneurs. They cannot imagine the inner workings of business. They are not part of any meaningful conversation on business planning or day to day business operations. They see a restaurant as a place to eat, not a place where business is being conducted. It may seem strange that a person can work and earn at one place of business, make purchases at another, and yet, not be able to decode the inner workings of either business. But it is no stranger than illiterate persons living amongst those who read newspapers every day, seeing signs all around them, yet themselves never having learned to read. After the oppressive forces are lifted, there is little ability to compete in business.

Wealth derives from ownership of the means of production. Technology as a means of production is an intellectual outcome. Factories may produce goods, but ideas produce factories.

Therefore, wealth creation is an indirect product of the imagination of the mind and study by the mind. This is distinctly different from the mere transfer of wealth through invasion, colonization, enslavement and theft. When the members of a deprived community own no means of production, they are almost void of wealth. Furthermore, their poor economic condition is persistent. Any transfer of wealth through welfare systems is soon returned to its owner via consumption, plus labor value added, minus unproductive government agency employee payments. And, the wealth gap increases. The days are long, but the decades are short, and no progress has been made. More time will not cure this.

Progress is possible through extensive introspection, and academic and experiential entrepreneurship education. Teaching entrepreneurship is about encouraging students to dream big, then showing them how to act on those dreams. A realistic program will benefit from incubators, angel investors, and future venture capital. It must produce entrepreneurially minded graduates, consultants, and entrepreneurs. Encouragement and economic development amongst the formerly oppressed that are now underrepresented in business is a good investment that the mainstream should welcome. Because, if anywhere, somebody makes a product at a lower price with the same quality or better quality at the same price, the total economic pie must increase, and poverty must decline for all to benefit.

Entrepreneurship creates jobs

Changes in US business and economic structure have led to high productivity by machinery and underemployment of people. One way to overcome this is through an increase in entrepreneurship. The purpose of CDR theory is to counter a debilitating mindset of self-doubt, an insurmountable obstacle that can stymie all other efforts to raise the level of entrepreneurship (see also Dweck, 2019).

First, recognize that the limited liability company is the greatest invention so far in economic history because it has impacted the lives of more people than any other. A tour de force. It is the instrument of capitalism. Before this invention (about the turn of the 19th century and the industrial revolution), apart from feudal lords, beneficiaries of the 17th century Amsterdam stock exchange, the Dutch and English East India Companies, and certain skilled artisans, all people were poor. Capitalism is the mechanism for capital formation. It needs democracy and the rule of law to grow and flourish. Capitalism has created vast wealth. To illustrate this, consider a measure, CDR, that combines the degrees of *C*, *D* and *R* practiced in a country. Health and wealth increase with CDR. This relationship should be a critical component of entrepreneurial education which if not understood, can impede all other efforts to increase entrepreneurship. Despite evidence to the contrary, it is easy to mistakenly think that economic development is attributable to natural resources, not CDR. It turns out that CDR is about thirteen times more important than natural resources. If anything, the true natural resource is human ideas of what to do with what would otherwise be mere natural deposits.

For the most part, USA, Western Europe and oil free Japan are prominent world economic leaders. However, Botswana, Poland, Chile and Equatorial Guinea were able to break quickly away from their geographic neighbors by adopting CDR policies. Bermuda and Cayman Islands are greater long-standing beneficiaries of CDR than their Caribbean neighbors. China's low CDR has kept its GDP low. Its recent growth rate though impressive, started from a very low base. Russia is awash in oil. But a mere accusation that they entered Ukraine illegally has caused their post-communist economic growth to collapse. While USA shares the top position with

some European countries, were it not for a liberal immigration policy, US GDP would be even greater, earlier. This is due purely to the need for time to assimilate. Furthermore, immigrants accomplish phenomenal economic gains for themselves and for the USA as they travel from low CDR territories to high CDR countries like the USA. They might have possessed great human capital while they were in the old country, but their capital was not realized until they were able to function in the USA.

Micro intrapreneurship

As economic growth succeeds there is one vexing problem that invariably occurs. It is what to do about workers who have been made indigent due to displacement by technology. The great contradiction is that many of these workers who helped to build efficient production systems, in which they were previously employed, become redundant. At a very minimum, as is inevitable in any dynamic economy, temporary structural unemployment looms large. Should they have listened to the luddites? Retraining will alleviate some structural unemployment and develop new sources of human capital. Not wanting to be defined by its poor, rich nations have adopted minimum wage laws and welfare systems. The economic law of demand stipulates that when the price of labor rises the quantity demanded falls, ceteris paribus. For that reason, minimum wage laws create unemployment amongst the least qualified persons. Welfare must then take care of the unemployed. To quote Milton Friedman, a former famous economist, "Welfare programs involve some people spending other people's money for objectives that are determined by still a third group of people. Nobody spends somebody else's money as carefully as he spends his own. Nobody has the same dedication to achieving somebody else's objectives that he displays when he pursues his own." From the point of view of CDR theory, self-efficacy is destroyed. James Murray Spangler (1848-1915) was an American inventor, salesman and janitor who invented the first commercially successful portable electric vacuum cleaner that revolutionized household carpet cleaning. Were he not a janitor, he might never have noticed the possibilities. Had he been rendered an unemployed janitor due to minimum wage laws, he might never have made his discovery. The unemployed cannot contribute to human capital stock and are therefore reduced to dead capital.

Chapter 4 contains a seminal presentation referred to there as micro intrapreneurship. It is the CDR based alternative that preserves human capital and promotes further economic growth. In this proposal, government stipulates what it considers to be a living wage. It supplements all wages in the amount of the difference between the living wage and the wage that an employer is willing to pay. Unemployment for anybody wishing to work will end instantly. The part of the wage the employer pays saves the government money that it would have incurred in welfare transfer payments. And, it is temporary until the worker is retrained or acquires relevant experience. There is also the contribution of the workers' human capital to the national pool in their neck of the woods. The net result is a higher average standard of living for society.

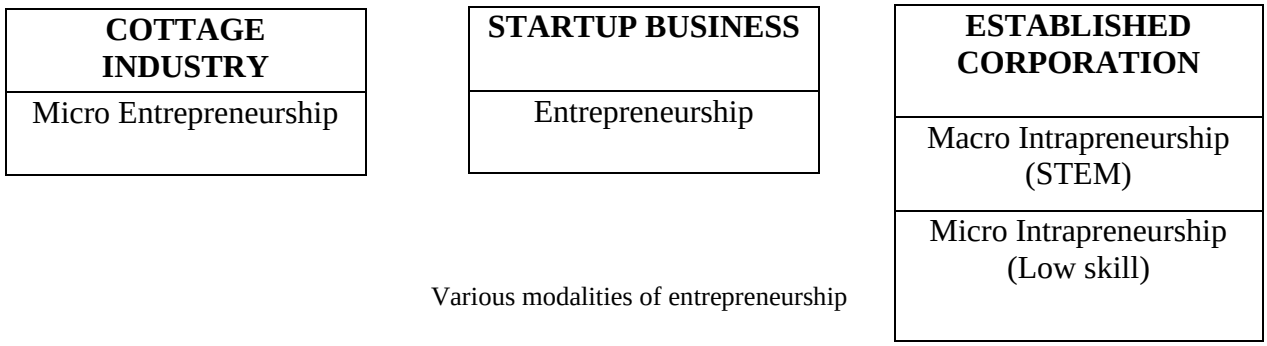
Macro intrapreneurship

In passing we also mention those professional STEM employees who contribute ideas of creativity and imagination. They are entrepreneurs in heart and spirit. But these intraprenuers prefer to utilize the resources (people, equipment, money, etc.) of the large corporation in which

they are employed. They are also attracted to the many opportunities there such as finding likeminded camaraderie and existing viable projects in need of their expertise.

Micro entrepreneurship

In passing we also mention microloans because of their relationship to human capital. Microloans to individual businesspersons are examples of support for cottage industry micro entrepreneurship. Microloans attract people with business ideas of their own, and pride in those ideas. In underdeveloped countries, these loans have a stellar rate of repayment with interest. This observation is consistent with the CDR model in which wealth comes from ideas and the bearers of the ideas need a suitable environment to bring them to fruition. Many great ideas have humble origins.



Various modalities of entrepreneurship

Entrepreneurship curricula

It seems clear from the preceding that entrepreneurship must play a significant role in wealth building. Chapter 2 explains the relationship between wealth and entrepreneurship. It also explains how to plan a general management American university entrepreneurship curriculum that is necessary to create an entrepreneurial community that in turn is necessary to improve the functioning of entrepreneurs and entrepreneurship in society. Chapter 14 is an English translation of our Russian paper that explains how to plan an entrepreneurship curriculum in a country that is formerly communist and where entrepreneurship is an altogether new concept. The country example used is Russia. Russia was selected because it is emblematic of communism. And, while it has the greatest abundance of natural resources, it is relatively poor, a direct result of a long history absent of entrepreneurship. Chapters 15a-15c contain a pedagogical suite of proposals for revising introductory economics, engineering and mathematics courses. They

include sample syllabi designed to better develop science, technology, engineering and mathematics (STEM), and entrepreneurial concepts and creative thinking in higher education. In passing we mention that one must learn the difference between entrepreneurship and business management, and how to transition from entrepreneurial creative innovation and entrepreneurial implementation to startup business management activities such as selling, phone answering, order acquisition, order processing, order fulfilment, payroll, services, and income tax returns, etc.

Capitalism democracy and rule of law

This book studies the impact of CDR on the standard of living of nations represented by per capita real gross domestic product, GDP, adjusted for purchasing power parity (*G*). This is indeed a very important relationship that needs to be studied from different perspectives. We argue that one of the major channels of the impact of the CDR factors on *G* is through entrepreneurship. The data on *G*, policy variables *C, D, R,* and non-policy variable natural resources (*N*) are collected from open sources such as the IMF, the World Bank and Transparency International. Capitalism is based on total capitalization of the financial markets of publicly traded stocks. It represents the present value of all future income from investments in the production of goods and services that comprise GDP. Democracy and rule of law are based on country ranking. These data are then transformed into indices that take on values from 0 to 1 for ease of interpretation. These data are then used to construct cross sectional regressions for all 79 countries in the world for which data are available for the year 2014. The remaining countries are small, have small populations less than one million, and are therefore insignificant. The regressions are repeated for all other years for which data are available with remarkably very similar results. From the regressions, we discover that all three policy variables (C, D, R) have a positive and significant impact on *G*. There is a C•D•R interaction effect that has a negative and significant impact. And, *N* has a positive and significant impact. Afterwards, a CDR index is formed by using the estimated coefficients from the regression as weights.

The CDR model is parsimonious. It is this parsimony that demonstrates the power of only three policy variables as regressors to determine economic growth. It is true that democracy and rule of law are complicated concepts. And, there are numerous component factors that make up these variables. But such subcomponents are highly correlated with the actual regressors used in the model. Therefore, for the purpose of statistical analysis, it does not matter that these subcomponents are excluded. There is no need to include them in a regression model for explaining *G*. Furthermore, to include such sub components would only serve to reduce the degrees of freedom and reduce the statistical significance of democracy and rule of law. In any case, most, if not all the components are not available for all countries.

Chapter 7 contains all calculations and results, informative graphs of *G* versus *C, D, R,* and *N*. There, we discuss the importance of capitalism, democracy and rule of law compared to the presence or absence of natural resources. One surprising result is that the interaction effect is negative. At the beginning of the research it was considered that the three policy variables would contribute positively to *G* and that their interaction might result in a positive bonus. What we learned is that democracy is necessary for the deployment of capital. And, without democracy people tend to lose their enthusiasm for contributing their best. But, unless all parties are in perfect agreement, democracy can also slow down the decision-making process resulting in a less than optimal process thereby subtracting from maximum *G*. Another surprising result is that

the impact of natural resources is only six percent. We knew from casual observation that countries flush in oil are typically poor and many rich countries have no natural resources. But six percent is a jaw dropping discovery. It turns out that contrary to commonly held beliefs, there is no scarce resource impediment to economic growth. Human ideas of imagination and creativity will create all that are needed. And, the only real shortage in poor countries is capitalism, democracy and rule of law. Another surprising result is that latitude (*L*), the variable used to measure the effect of geography has an even smaller impact equal to four percent. One demonstration of this is the disparate economies of North and South Korea. These two countries were formerly one, of common geography and culture. Now, they are separated only by CDR, GDP and the 38th parallel. It is obvious that a population that is located in a geographic region where a wide variety of foods cannot be grown will suffer through no fault of their own. But, now that we know what Adam Smith had to say, it is equally obvious that trading will solve the problem associated with geography. In today's worldwide travel and communications, trading could not be easier. In any case, we also suggest that countries can raise their CDR index and standard of living to the degree of economic development that is salutary to that country, given their geographic disposition. That is, they can make the best of their circumstances while enjoying the climate of their choice.

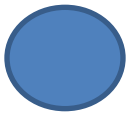
Last but not least, the greatest and most welcome surprise is that wealth can be explained for the most part by capitalism, democracy and rule of law, and almost entirely (approximately ninety percent) when natural resources and latitude are included. The implication of such a high coefficient of multiple determination is that the conversion of *C* to *G* is the same in all countries in the world. It is determined by the laws of natural science. What is commonly thought to be differences in productivity is actually the differences in the amount of *C* that countries can attract for conversion to *G*. It is now clear that the true and only source of wealth is human capital ideas of imagination and creativity. Money is a method of accounting for wealth, but it is not the source. Since ideas are in unlimited abundance, then potential wealth is unlimited.


Human capital ideas of imagination and creativity are the only source of wealth.

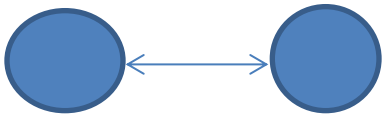
Adults possess human capital, but the more successful they are the less likely they are to contribute more capital if it means taking risks. They are more settled in their ways and less entrepreneurial. They tend to sit on their laurels so to speak. Each child brings its own wealth into the world, and some, due to their very uniqueness. What they appear to do most is take risks. Uniqueness means that they add to diversity. It is now well known that diversity makes for better decision making in problem solving. The wisdom of crowds exceeds that of the smartest individual amongst them. Any pregnancy that ends without a birth reduces what would have

been greater diversity and its accompanying wealth. It behooves us to make proper arrangements to welcome the child, teach it the current state of knowledge capital, and help it to contribute its own capital. No child is a liability and every child is an asset. Any suggestion that a child is a liability is counterfactual. New ideas are the natural born enemies of the way things are. Only change can usher in new wealth. "Sometimes it is the people who no one imagines anything of who do the things that no one can imagine." There is trace entrepreneurship in everybody. If wealth were fixed, children would contribute to the impoverishment of everybody else. The massive wealth creation by high CDR countries where population has grown dispels any suggestion of impoverishment. The inescapable conclusion is that countries must raise their CDR index if they are to raise their standard of living.

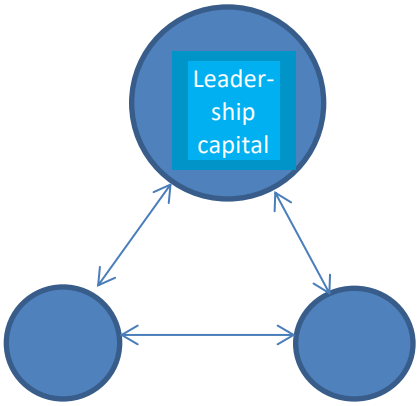
Democracy creates additional pathways for the optimal deployment of capital but genius is not impressed by democracy, for democracy can only dilute it. Genius is impressed by rule of law that protects its property rights in the form of patents. Still, lest we underestimate the potential for democratic pathways, and the attendant power of idea generation for finding an optimal solution to any problem, consider the following examples of one through six person teams acting democratically. We see that the number of pathways increases exponentially. For n persons the number of pathways increases according to the square of n, calculated from $n(n\text{-}1) = n^2\text{-}n$. For a mere 10 persons there are as many as $10^2\text{-}10 = 90$ pathways. Note also the hierarchical potential to deploy leadership capital from the top while paying full attention to all persons. This is a big deal.



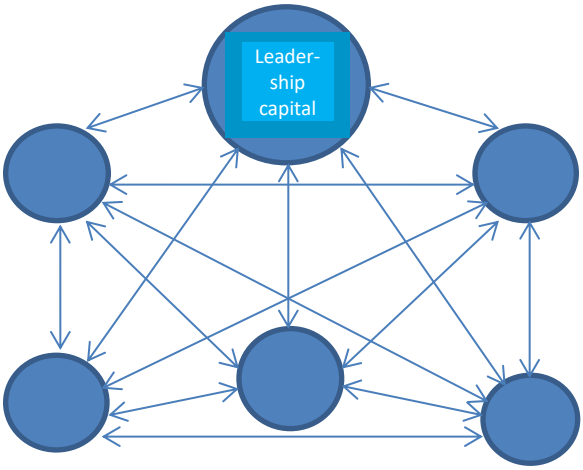
One person yields zero pathways



Two person team yields two pathways



Three person team yields six pathways



Six person team yields 30 pathways

Democracy is a catalyst that creates additional pathways for the optimal deployment of capital

Stahl (2019) reported recent developments in functional magnetic resonance imaging (fMRI) that reveal thought patterns by detection, analysis and color diagrams displayed on a computer screen. This type of mind reading gives the same answer irrespective of the native language or cultural background of the subject. The implication for entrepreneurship is possibly enhanced communications by international team members. Also, corrupt dictators (see chapter 13) can be identified in a medical checkup of those running for political office. The electorate can make better informed choices.

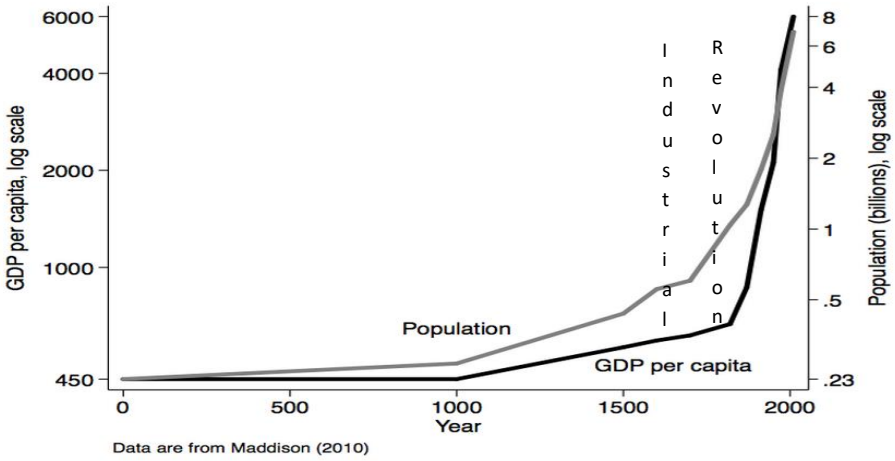
In passing, we mention the problem of legitimate logical and binary thinking, and group thinking that can be obstacles to communications along potential pathways. We note the ability of music to connect that which people have in common. Music and sports cut through polarization and binary logic to facilitate political and other problem solving. They can bring together people who might otherwise not think to associate. Consider also, the possibility that genetics can make people predisposed to liberalism and conservatism (Hibbing, Smith and Alford, 2014). It is quite astonishing that in the advanced democracy of the USA, these characteristics appear to be split nearly evenly in the population. Assume that both liberalism and conservatism make important contributions to economic decision making. Democracy can deploy these traits in a meaningful way. On the other hand, the absence of democracy could permit one of these two traits to dominate the economy. The outcome may be a reduction in diversity and a weaker economy.

One of the essential elements of rule of law that needs to be understood is property rights. Property is a legal expression of an economically meaningful consensus by people about assets, how they should be held, used and exchanged. Property rights are essential to wealth creation. However, land has not always been owned as private property. It turns out that the vast majority of people in the world do not have property rights. This is obvious with respect to communist and former communist countries. But it is also true for most other countries as well. Unlike the USA most countries employ some form of communal ownership of land. From the point of view of the entrepreneur, communal land cannot be used as collateral for a bank loan. For this reason, communal land is dead capital (de Soto, 2000). Privatizing and titling these lands would create collateral and release massive amounts of investment capital and wealth, far in excess of foreign aid. Western European countries employ various types of lease hold systems where land reverts back to the government or to the crown as the case may be upon expiration of the lease. In order to avoid such limited property rights, the USA implemented the system of fee simple land ownership where automatically unless otherwise stated, ownership can be traded, transferred or bequeathed to family members, etc. We now know that USA property rights and rule of law is a great attractor of capital in the form of human ideas of imagination and creativity.


Rule of law is a catalyst that creates the stability that attracts capital.

As was the case in Medieval Britain, much of African land today is still owned communally, rather than individually. By virtue of the parliamentary statute law, the enclosure of land began in England in the 1500's. Beginning around 1550 the enclosure movement resulted in the privatization and division of land among cultivators. There were the Tudor enclosures between 1550 and 1700 and the parliamentary enclosures in the century following 1750. There were numerous objections in the 1600's. The Katt's rebellion in 1549, the Oxfordshire rebellion in 1596, the Midland revolt of 1607 and others up to the Swing riots of 1830-1831 were all defeated by the state (Charlesworth, 1983). Practically all of Britain was private property by 1850. This led to property rights, increase in the value of property and economic development. Had the lands remained in common, the residents might have done nothing with it. The exclusive owners of private property developed the land and land use for economic growth and the beneficiaries who included the un-landed classes.

The confluence of democracy extending from Magna Carta in 1215, rule of law through property rights in the 1500's, the cognitive revolution through the royal charter of 1662 for the study of science, and capitalism through the limited liability business law of 1811, is our best explanation of the perfect storm: possible random convergence of methodologies that led to the industrial revolution on or between 1760 and 1840. They are inextricably linked. The critical role of Adam Smith, the father of modern economics and his theory of division of labor and the invisible hand for creating surplus capital cannot be overestimated. This led to massive economic growth hitherto unknown. There is no intention here to whitewash the catastrophes of English hegemony and dastard colonialism. It appears that bad actors will invariably weave their way into the best company. The industrial revolution could have happened anywhere in the world but it happened in England. It spread to Western Europe and the USA. Japan may have had its own industrial revolution. Their economies have grown exponentially while, with few exceptions, poverty persists everywhere else. Before the industrial revolution, with few exceptions, everybody was poor. Since the revolution, standard of living has risen everywhere that what we are calling CDR policies has intentionally or otherwise been adopted to permit the revolution to succeed.



Before and after the industrial revolution

Chapter 12 contains the seminal presentation of a CDR econometric model for the a priori computation of world average endogenous growth. The estimate reported there is 1.8%. We mention in passing an interesting observation that this equates to $\frac{1}{4}e^2$, where e is Napier's constant (Euler's number) and the base for the natural logarithm. A small number of countries have been growing at a much higher rate while most have experienced no growth or negative growth. Independently of the CDR model, the widely reported ex post estimate for developed countries is approximately 1.8%. When CDR is unbridled, job creation can outstrip population as is typical in the case of the developed countries that resort to immigration for acquiring desired personnel.

The economic growth in Western Europe, USA, Japan and elsewhere, has demonstrated that economic growth does not cause price inflation. For example, USA growth in years 2017, 2018, and 2019 is substantial, unemployment is low, people are working and succeeding and there is no inflation to speak of. A Goldilocks economy. Japanese inflation rate is a trifling 0.2 percent per annum. In passing, we mention that this is a contradiction of the implication of the Phillips curve (inflation implies falling unemployment), another one of the paradigms that must give way to the CDR growth model. The explanation of this counter intuitive reality, counter to commonly held beliefs, is worth documenting. Ever since the industrial revolution, while it is true that sticker prices of products have on average risen, the number of their features (quality, complexity, power, and ability) has exploded. The price per feature of products produced has fallen. For example, today's smart cell phone has the power of a supercomputer of the past, occupies a tiny fraction of the space, and has hundreds of times more consumer-oriented features to boot. So, standard of living has been rising due to all the new features and functions that people can employ to improve their lives. The principle applies similarly to all products and services.

Once one accepts CDR global time invariance one must accept several contradictions to prevailing economics and accept a new counter intuitive paradigm. This paradigm is contrary to commonly held beliefs. All wealth has its source in the human capital ideas of imagination and creativity. Ideas are converted to capital stock of knowledge, machines, computers, etc., that only depreciate. Chapter 8 contains the seminal presentation of a unitary capital elasticity of *G* that

provides an optimal policy guide for the CDR reinvestment strategy that maximizes *G*. The estimated optimal reinvestment reported there is 21%. It turns out that year 2014 world average gross fixed capital formation (GFCF) was independently reported at 21%. This correspondence between the theoretical CDR prediction and the empirical GFCF lends evidence to validate the CDR growth model.

Uncommon sense

Before science, mankind relied on what we think of as common sense to make decisions. Common sense by itself dictates that things must be done the only way we know they can be done. Beyond that, human DNA had to change to permit certain new operations. For example, longer arms to pick out of reach high hanging fruit. Cognition and science on the other hand, permitted man to design and construct a ladder and climb that ladder to reach the fruit. There would have been a time when the idea of acquiring that fruit would have lacked common sense. So might be the idea of a ladder. The owner of the idea too might be the subject for similar derision and scathing criticism. Common sense was replaced by uncommon sense….an entirely different strategy. Science and the cognitive revolution reintroduced human capital which we now know is the genesis of wealth. It would make perfect common sense for people to suggest to Henry Ford that what were needed were faster horses.

We would like to point out how rapidly entrepreneurship and CDR can raise standard of living. Consider the story of a coastal community subject to annual tsunamis, and where the primary food supply is common sense chicken meat. The tsunamis drown the chickens, killing them and creating a devastating shortage for the residents. For whatever reason, the chicken farmer learns that while chickens drown, ducks float. He and the residents democratically made a rule of law business decision to switch from chickens to ducks, uncommon sense by way of tradition, and the entire community is lifted out of poverty. The increased standard of living occurs not in generations, but in the short time it takes for incubation, gestation, and maturity.

The garbage bag was invented in the home by a homeowner before it climbed the corporate ladder. Janitor James Spangler's vacuum cleaner invention cleaned up the world. His lowly job as a janitor may have played a key role in this contribution that also climbed the corporate ladder. Lest we become embroiled in the legitimacy of supply side trickle down economic theory, notice that none of the above is particularly top down in source or structure. Like many, they represent supply side that trickled bottom up.

Up to five years ago common sense told us that USA oil reserves were declining, placing economic growth in jeopardy. Now, new uncommon sense horizontal drilling, hydraulic fracturing, retorting, pyrolysis and shale make USA self-sufficient in oil and an exporter of natural gas. Shale is a natural resource, but it was always there and what made the difference was scientific knowhow.

Chapter 7 presents a unique application of the heterodox CDR model to the information theory of economics for explaining entrepreneurship and wealth. Common sense ideas are guaranteed to have no entrepreneurial value. The reason is that everything is already known about them. They contain no surprise. Knowledge is about the past and entrepreneurship is about the future. While uncommon sense ideas are not guaranteed to be good ideas, the mere characteristic of being surprising is what gives them any chance of being valuable. Still, in a low CDR (high noise) cacophonous environment (channel), a new idea (signal) does not make it

through the decision-making process and is ignored. In a high CDR (low noise) environment, the signal to noise ratio is high and the new idea is duly noted. It is given full consideration.

Management theory and CDR

The current consensus of management study is that the top three functions for twenty first century success are creativity, communications and collaboration. Creativity translates to human capital ideas of imagination and creativity. Communications and creativity translate to democracy. That is, management theory has recognized the true source of wealth and it is high time that economics acknowledge this. But, both of these fields of study must understand that rule of law is what attracts capital and democracy is what deploys capital optimally. This in summary is the CDR theory and the CDR index that measures and predicts GDP. Furthermore, while this is a new discovery via econometric and statistical data analysis and extrapolation, it has always been true. It is a general theory of economics.

The ultimate discovery from this research is that monetary and machine aids to poor countries have by themselves been mere ephemeral analgesics. The machinery is subject to depreciation and obsolescence, and the money invariably creates more debt than anything else. What poor countries need is help to raise their GDP by raising their CDR index. How to raise the CDR index in a timely way is an unanswered question. How to raise the level of democracy? How to reduce corruption and raise rule of law? Perhaps, instead of thinking of tackling these two problems directly, maybe it is possible to create incentives that will raise them automatically. All this is outside the scope of this book. But one cannot help noticing the remarkable and phenomenal rise in the GDP of Singapore. As it turns out the government leaders and workers in Singapore are remunerated by a bonus system that is tied to economic performance. Fundamental management theory states that rewards are best related to objectives if high performance outcomes are desired. So, is this the reason for Singapore's GDP success? Whether it is or not, the system seems reasonable and appears to be harmless.

The presence of pernicious corrupt dictators is a particularly vexing problem in the theory and practice of political economy. We know from this CDR and other research that the root cause of poverty is corrupt dictatorship. But there is no clear theory or well-defined methodology for modifying or removing inimical corrupt dictators from office. The only thing we know with any certainty is that "power tends to corrupt and absolute power corrupts absolutely." Chapter 13 contains a seminal presentation of a game theoretic model enlightened and informed by the CDR model epistemology. The corrupt dictator and a team of nation builders (such as a proposed parliament or congress) are presented decision options and corresponding economic CDR growth outcomes. The assumption is that there exists a Nash equilibrium where the two parties can agree to permit CDR and economic growth to prevail without the need for riots, wars and bloodshed. However much it amounts to a distasteful bribe, both parties might have a preference for a settlement emolument over physical altercations that can continue ad infinitum. A Hobson's choice. History has revealed two types of dictators. One is the monarchical corrupt dictator where there is some tradition, lineage and claim to bloodlines. These characteristics make them in some ways predictable. The other is the sole proprietor corrupt dictator where there is no tradition, no lineage and no claim to bloodline. Their only characteristics appear to be highly erratic behavior, and total self-interest with little or no regard for anyone else. Even worse, they surround themselves with a malevolent kakistocracy, chorus of thespians pretending to be a benevolent cabinet of governors. Still, hope abounds that this is only an interregnum since in

either case, the computation of the Nash equilibrium only requires that the dictator be rational in the sense of having a utility for money that is monotone increasing.

There are numerous theoretical arguments for why corrupt dictatorships cannot be overcome and how modern communications, banking networks and rapid travel threaten the possibility of an international corrupt dictator nexus. The proponents are typically the victimized residents of victimized countries. They are compelled by common sense reasoning and personal experiences. Even Adam Smith identified the wealth of nations as a special status that needs to be accounted for by some good new uncommon sense reasoning. Achievement of poverty is easy. Just do nothing! In the counter narrative, residents of rich countries now know better, not to stand for corrupt dictatorship, because they have experienced the benefits of freedom and the application of the theories of Adam Smith. Pre Magna Carta, the people of England suffered under corrupt dictatorship. Post Magna Carta England is a solid demonstration that corrupt dictatorship can be overcome. A tyrannical monarchy was transformed into a constitutional monarchy. The USA chose a constitutional republic. Every nation must choose how they do it but economic freedom and CDR are the only demonstrable methods for increasing wealth and standard of living: the ascent of the nation state over tribalism. We are prisoners of hope.

Wealth and forced labor

One of the contentious issues often discussed in society is that of wealth and forced labor. There is a perception that forced labor represents stolen labor or wealth. And, we can all agree that wheresoever the practice is discovered, it should be stopped, the perpetrator prosecuted, and reparations paid by the beneficiaries to victims. The reason is forced labor is immoral and as we will explain below (and in chapter 13), it is economically inefficient. Understanding the inefficiency provides an incentive to avoid the practice altogether in the first place. Before we can evaluate that proposition, we must distinguish between wealth creation and wealth transfer. Forced labor does not create wealth. That sounds odd, cold and insensitive when one considers stolen and uncompensated labor. That is, it sounds thoughtless when one considers the cruelty associated with it. But that conclusion was reached after a great deal of cogitation and thought about wealth and poverty in general and about CDR in particular. What we discover from CDR research is that the only source of wealth is the human capital ideas of imagination and creativity. Human capital is converted to capital stock of knowledge, machines, computers, devices, etc. Human capital is subject to appreciation. Capital stock is subject to depreciation and obsolescence. Rule of Law creates the stability that attracts capital and democracy creates additional pathways for the optimal deployment of capital for the production of goods and services. The activity of forced labor deprives society of the human capital part of the human being. This also includes the immoral strategies of redlining and incarceration of innocent impecunious members of society and political dissidents. It may be possible for forced labor of one man by another to transfer wealth from the former to the latter, but there is no net creation of wealth, and net wealth is reduced. Adam Smith thought that it was not economically viable. By his accounting, the net product of free labor is twelve times that of forced labor (Weingast, 2015). That is, free market tenancy is a Pareto improvement over forced labor. We show that CDR contributes thirteen times more to G than do natural resources (Appendix BB). Is this ($12 \simeq 13$) correspondence between natural resources and forced labor an uncanny coincidence? Is this further evidence that human capital ideas of imagination and creativity are as different from natural resources as they are from forced labor? Is the objectified human being the economic

equivalent of the natural resources object after the distillation of each? Only triskaidekaphobia would automatically rule out this mathematical possibility. Should China reconsider the policy of currency devaluation to lessen the value of manufacturing employee personnel? The upshot is that forced labor is a bad idea.

Any institution or activity that practices the denigration of mankind of any class or creed diminishes them and must destroy human capital, the only source of wealth. Both the forced laborer and society lose. In a linear system that calls for force to perform work, a man that is twice as strong as another man can convert twice as much capital into wealth contribution. But, neither one of them creates wealth as the source of wealth is human capital (not human labor). So, any stolen wealth is not associated with labor. The stolen wealth is the devaluation of the human capital of the human being. Chapter 2 identifies this as potential harm to the psyche and self-efficacy of future descendants for generations. This epigenetic transgenerational sequela is worse and is especially harmful if left untreated (Weber-Stadlbauer, 2017). People who are hurt, hurt people. A permanent underclass and relatively low wealth community could persist. Whatever the wealth is that exists in America today, it would have been even greater if there were no forced labor in the past.

Consider also the following facts that imply that the US economy has benefited from the abolishment of forced labor. Forced labor was first abolished in the territory of Vermont in 1777. Vermont subsequently became a US state. The second to abolish forced labor was England in 1833. The third was Brazil in 1888. Of these three western states the US has the best economy and Brazil has the worst. In the east, forced labor was abolished in Russia in 1861. Forced labor is still legal in China, Pakistan, Bangladesh, Uzbekistan, Cambodia, India and Qatar. Legal or not, up to 70 million people worldwide depending on how they are counted, are in forced labor. Today, forced labor continues throughout much of the world that is impoverished where people are living on not much more than $2-$3/day. During the past 50 years most of the wealth created in the USA came from digital innovation (empires of mind, not forced labor and not natural resources). The city of San Francisco, home of Silicon Valley has the world's greatest number of billionaires per capita. Globally, natural resources contribute only 6%. Geography contributes only 4%. The US states in which forced labor was legal at the time of the civil war now have on average the least wealth. Although not offered as proof, this observation is consistent with our observation that forced labor is destructive of capital and wealth. We argue that if there never was US forced labor, the US average wealth would be even higher than it is today. Throughout time, the perpetrators and victims of forced labor have been of all skin colors.

In addition to the destruction of wealth by forced labor, there are also the lost economic opportunities for intergenerational wealth transfers via inheritances. But inheritances have an average longevity of only three generations. The heirs of successful entrepreneurs may simply not be interested in continuing the business operations that they inherit. In any case, as heirs themselves produce offspring, inheritances get divided into smaller amounts. There is also the 21% reinvestment to satisfy GFCF. Therefore, intergenerational transfer by itself is not a vehicle to be relied on. Instead, it is better to invest inheritances as a means for generating new wealth. As best we can tell, the safest bet is STEM and entrepreneurship education, and the political economic systems of capitalism, democracy and rule of law.

Wealth and RQ.

One of the contentious questions in education is how to measure intelligence quotient (IQ). And, assuming that a measure of IQ is available, how much does it tell us about creativity. Still, we believe that wealth is correlated with creativity. So, it may be better to consider measures of research quotient (RQ), where RQ is a propensity for inquiry, research and development that can lead to new discoveries. This in turn leads to new products and services. Here too, it may not be possible to design a dispositive test for people who will contribute to a company's RQ, but we know expression of this potential when we see it. It is fair to assume that a high CDR environment will promote RQ, expression of human capital and therefore wealth.

Summary of findings from the CDR growth model and theory

An understanding of the following summary may benefit from a review of the definitions (see Appendix AA) and a review of comparisons of the new CDR growth economics to its predecessor in the extant literature (see Appendix CC). Once one recognizes that the true and only source of wealth is capital from human ideas of imagination and creativity, and that labor is corporeal only, the following findings flow directly:

Intangible *C*, *D* and *R* contribute thirteen times more to *G* than do tangible natural resources.
New ideas contribute approximately six times that of capital stock from old ideas.
The theoretical optimal reinvestment fraction estimated from CDR is equal to empirical GFCF.
Capital to *G* conversion is global time invariant.
Natural resources effect on *G* is negligible.
Government spending net effect on *G* is negligible.
Country population size effect on *G* is negligible.
Location effect on *G* is negligible.
Culture effect on *G* is negligible.
Population physical characteristics effect on *G* is negligible.
Wealth is unlimited.

CHAPTER 2

Entrepreneurial Mindset and the University Curriculum

Reference: Ridley, Davis and Korovyakovskaya (2017).

Until recently, most American university management programs focused on the development of students for work in corporate settings with little focus on entrepreneurial skills. The need for graduates with an entrepreneurial mindset has grown. A framework for developing students campus-wide with an entrepreneurial mindset across the management education curriculum is proposed. First, foundational theories and concepts are introduced to students. Next, they learn, practice and reflect on skills necessary for entrepreneurship. Student entrepreneurial mindset is further developed through business plan and case competitions. Finally, students apply the concepts and theories via student-run companies housed within business, science, engineering and technology incubators.

INTRODUCTION

Mindset

Countries such as those of the former Soviet Union, Sub Sahara Africa, South America and formerly oppressed minorities in the Unites States of America appear to be frozen in time with regards to entrepreneurship. Each of these communities has received American aid with little to show for it. The reason is that little attention has been paid to the debilitating mindset that remained after their segregation from a modernizing world. This is despite the fact that many universities have introduced entrepreneurship education to raise the capabilities of practicing managers. This paper presents a management education design for engineers and managers who have only a paucity of entrepreneurial family background and experience. To reconstruct confidence, evidence is shown that capitalism, democracy and rule of law constitute a joint indicator for economic success and pathway to understanding the rationale and benefits of entrepreneurship. Then, support is provided through the integration of curricula, faculty research and invention mining, munificent incubators, community, and angel investment of financial and human capital. The objective is to raise the rate of entrepreneurship and business formation, gross domestic product, and the size of the world's economy for the benefit of all.

Pedagogy

Entrepreneurship is the process of starting a business, typically a startup company offering an innovative product, process or service. This pedagogical paper is designed to have a positive impact on any community that lacks a tradition of formal business activity. Ridley and Davis (2009) and Ridley, McKinley-Floyd and Davis (2008) proposed concepts that laid out strategies for entrepreneurship education and community transformation. Some of their strategies have already been implemented. Elements of entrepreneurship were added to a course while converting the method of teaching to live case study. Unlike traditional static paper case study, live case study involves multiple student visits to existing companies to gather data and information. Under the guidance of the professor, students construct a company supply chain,

including random numbers, and create computer color graphics animated simulations of the supply chain. Not only do the students gain hands on experiential research and learning, they consider all elements of the data, including randomness and distribution. They are forced to review all of their quantitative prerequisite courses on statistics, operations research, calculus, accounting and finance, and learn to apply the principles of queuing theory, goodness of fit and other hypothesis testing. The end products are simulated pro-forma cash flow and income statements, and a balance sheet. There is no assuming away randomness by way of simple averaging. This is critical to arriving at correct answers when queues and asymmetric distributions are involved. The evidence of achievement is the several student intellectual contributions in conference presentations and proceedings publications (see Ridley, et., al. 2011, Brown, et., al. 2011, Abrams, et., al. 2011, Crafton, et., al. 2011, Ridley, Corner, et., al. 2012, Ridley, Foree, et., al. 2012, Ridley, Bryan, et., al. 2012).

There exist opportunities for more institutions to link entrepreneurship education to the creation of business enterprises that transform communities and bring wealth accumulation and economic viability to the individuals and communities in which these businesses operate (Mugge 2005). The basis of university and college entrepreneurship programs is that entrepreneurship is the single most important factor in determining whether a region or community achieves its full potential (Mugge 2005). Practicing entrepreneurs support entrepreneurial education and research (Zeitham and Rice 1987). Successful economic and technological models of regional development such as the Silicon Valley in Northern California, the Route 128 Corridor in Massachusetts, and the Research Triangle in North Carolina are clustered around universities. The establishment of an entrepreneurial culture and rapid development of technology-based clusters are two very important accomplishments that will serve as defining measures of a community's competitive advantage in a contemporary economy (National Governors Association 2004). U.S. News (2015) uses entrepreneurship to rate schools of business. Still, many universities lag behind in entrepreneurship course offerings. This is especially true of those that serve students from communities that lack a tradition of formal private business activity. Examples include formally oppressed minorities in the United States of America (USA) and former communist soviet countries like Russia and those constituting the Commonwealth of Independent States (CIS). While it is true that minority businesses in the USA grew 45.4 percent between 1997 and 2002, ninety percent had no employees (Harris, Edmunds and Chen, 2011).

Organization

The remainder of the paper is organized as follows. We begin with a review of the related literature. Prior research on mindset focused on factors that impact entrepreneurial intentions and self-efficacy, which if understood might enhance entrepreneurial activity and success. This paper focuses on the implication of extreme paucity of entrepreneurship in family background, leading to confusion about the factors governing economic success and perpetual avoidance of entrepreneurship. Next, we introduce an index that reflects the degree of capitalism, democracy, and rule of law (CDR index) that we assert is the main driver of global economic success. We offer CDR as prolegomena to thinking about entrepreneurship. The purpose is to counter a debilitating mindset and insurmountable obstacle that can stymie all other efforts to raise entrepreneurial intentions, self-efficacy and competence via entrepreneurship education and environmental munificence. This index is offered as a pathway to motivation and foundation for the pursuit of entrepreneurship activities at the university. The references to ancient scientists and inventors, their year of birth and death, and their need to overcome difficulties despite their

genius, are intended to inspire students. Next, we introduce the concept of an Interdisciplinary Entrepreneurship Center (IEC). The paper proposes one framework scenario in which it might impact the institutional mindset. In that framework the IEC executes specific tactics via all relevant college and institutional activities as well as community sources of support and benefits. Concluding remarks include suggestions for further research.

RELATED LITERATURE

The interest in entrepreneurship seems constantly to be escalating. Berglund and Holmgren (2006) suggested that entrepreneurship has disseminated from an industrial sphere to other spheres such as the public, academic, private and the educational. In the academic sphere, a growing number of colleges and universities throughout the world now offer courses and programs in entrepreneurship (Gartner and Vesper 1994) within their business or engineering programs both at the undergraduate and graduate levels. Entrepreneurship programs are among the fastest growing initiatives in modern colleges and universities (Laud, Betts and Basu, 2015; Mattare, 2010). Harrington and Maysami (2015) articulate the role that entrepreneurially engaged regional universities may have in improving their communities. While considerable research and writing has been done with regard to the number of colleges and universities that now teach courses or that have such programs, little has been done with regard to what specific courses are taught and what a model curriculum might include in creating an entrepreneurial mindset.

Ede, Panigrahi, and Calcich (1998) indicated that the surging interest of many business schools in entrepreneurship education has been to the delight of the pro-entrepreneurship public, government, and the media, and there does not seem to be any documented research on attitudes and feelings of business students toward the entrepreneurship emphasis in the curriculum. The authors further suggested that business educators need to go beyond introducing entrepreneurship into the curriculum to fitting this curriculum to the needs of their present and prospective students. Hatten and Ruhland (1995) suggested that identifying and nurturing potential entrepreneurs throughout the education process could produce more successful entrepreneurs. Ede, et. al. (1998) indicated that their research pointed to the need for entrepreneurial interaction and mentoring in all aspects of the entrepreneurship curriculum. It cannot be left to experiences outside of course work.

Kussmaul, et. al. (2006) and several other researchers indicated that many institutions offer curricula that utilize interdisciplinary courses, where business and engineering students work together to gain an understanding of each other's disciplines. The authors further suggested that this approach enables students to enhance their understanding of entrepreneurial ventures and their ability to work with peers from other disciplines to see a project through to fruition. In recent years, there has been a strong interest in entrepreneurship from students outside of business and engineering (Farris, Levenburg, and Lane 2004) and future entrepreneurs will include significant numbers of students from non-business disciplines (D'Intino, et. al. 2010).

Bilen, et. al. (2005) suggested that their institution has been successful in creating an institutional entrepreneurial mindset that build students' life skills so they can succeed within innovative, product-focused, and cross-disciplinary teams. The authors further suggested that the broad goals of their school's program are to provide students with multiple exposures to what it means to have an entrepreneurial mindset and to facilitate the development of both the passion and the ambiguity-management skills needed for new product or venture creation.

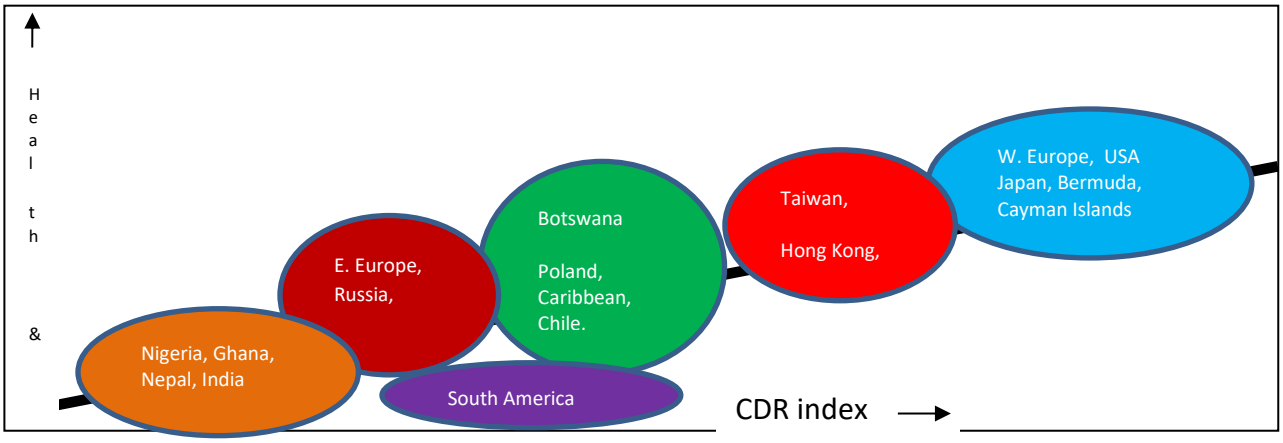
Fayolle and Gaily (2015) discussed the relationship between entrepreneurship education and a mindset of entrepreneurial intensions. We will revisit this below as we construct a course design for students with no entrepreneurship family background. Whereas research like Jang (2013) focuses on the role of individual student education on long term future entrepreneurship success (and are not conclusive), we focus on student and community transformation to correct an historical absence that might impact negatively on entrepreneurial intentions and outcomes for a whole class of students. Ilouga and Mouloungni (2014) argue that personal dynamics and psychological mechanisms are what matter, far more than economic and environmental constraints. Haus et. al. (2013) and Schlaegel and Keonig (2014) discussed the indirect effects of distal variables such as entrepreneurial traits, personality traits, entrepreneurial exposure and education.

CDR INDEX

The purpose of a business incubator is to provide a home where a new company gets its start. But, it can also be a bonafide institution where capital can find investment opportunities. Therefore, it may be wise to recall the purpose of the company itself. We recall from Ridley and Davis (2009) that this great invention that impacted the lives of more people than any other is the instrument of capitalism (Smith 1776, 2007). Before that (circa: the turn of 19th century and the industrial revolution), with the exception of feudal lords and beneficiaries of the 17th century Amsterdam stock exchange, the Dutch East India Company, and certain skilled artisans, all people were poor. Capitalism is the mechanism for capital formation. In addition, shareholders demand democracy and the rule of law. Nothing can be more motivational than recognizing the vast wealth that this mechanism has created (Micklethwait and Wooldridge 2003). To illustrate this, consider a CDR index = $f(C,D,R)$, that combines the degrees of capitalism (C), democracy (D) and rule of law (R) practiced in a country. Figure 1 illustrates the approximate relationship between wealth and health, and the CDR index. Health and wealth are shown to increase with CDR. Although no formal measure exists for the CDR index proposed here, the broad relationship depicted in Figure 1 is indisputable today. Therefore, we present it here as sufficient evidence of its existence. It is a critical component of entrepreneurial education which if not understood, can stymie all other efforts. Despite evidence to the contrary, it is easy to mistakenly conclude that economic development is attributable to natural resources, not CDR.

Concerns are often expressed regarding the rapaciousness of capitalism, and its unsuitability for civilized conduct when compared to its socialist counterpart. Of course, we are not proposing capitalism in the absence of democracy and the rule of law. For, in isolation, capitalism is as subject to abuse as any other tool or instrument. A surgeon's knife can save life, but in the wrong hands it is an efficient killer. The upshot of all this is that the relationship in Figure 1 is independent of the visible characteristics of the people in a country. As counterintuitive as it may seem to a certain mindset, the primary factors are not natural resources. Whereas natural resources can exacerbate the social ill effects of little or no democracy and injustice due to little or no rule of law (Norman, 2009; Frankel, 2012), economic success is dependent on the institution of policy to adopt and engineer a high CDR index.

FIGURE 1
HEALTH & WEALTH VS CDR INDEX



Aside from a few tiny oil rich principalities and micro nations, USA, Western Europe and oil free Japan are prominent economic world leaders. However, notice how Botswana, Poland, Chile and Equatorial Guinea were able to break quickly away from their geographic neighbors once they adopted CDR policies. Bermuda and Cayman Islands, themselves small, are greater long-standing beneficiaries of CDR than otherwise similar Caribbean islands. China has not made the switch to CDR and they are where they are. A mere accusation that Russia entered Ukraine counter to rule of law, and despite being awash in oil and gas, their post-communist economic growth collapsed once again.

While the USA shares the top position with some European countries, were it not for the American policy "Give me your tired, your poor, your huddled masses yearning to breathe free, the wretched refuse of your teeming shore. Send these, the homeless, tempest-tost to me, I lift my lamp beside the golden door! (Lazarus 1883)," US GDP per capita would be even greater, earlier. Furthermore, it is simply amazing what immigrants have been able to accomplish as they travel from low CDR territories to the high CDR of the USA.

INTERDISCIPLINARY ENTREPRENEURSHIP CENTER

In this paper we examine the potential impact on mindset of entrepreneurship through a campus wide IEC. One of the theories of the company is that it can outlive its creators. However, for this to occur, it demands maximal transparency provided by the rule of law. Like the company, if the IEC is to outlive its creators, full transparency is an operational imperative.

The Mission

We explain below why the IEC must be an independent institution on the university campus. In like manner, it must also have a unique mission. A suitable mission for the IEC might be stated as follows: To promote interdisciplinary entrepreneurship education across all colleges and schools of the university, with special attention given to the expansion of the pool of entrepreneurs by changing the mindsets of underrepresented communities and governments to enable their cooperative participation and to employ the principles of capitalism, democracy and

the rule of law to expand and lift their minds to see over the obstacles that might otherwise defeat them.

Impact on institutional mindset

Some members of society have no examples of entrepreneurs within their families and community. They cannot imagine the inner workings of business. They are not part of any meaningful conversation on business planning or day to day business operations. There is a poor dad but no rich dad (Kiyosaki 2011). They see a restaurant as a place to eat, not a place where business is being conducted. It may seem strange that a person can work and earn at one place of business, make purchases at another, and yet, not be able to decode the inner workings of either business. But, it is no stranger than illiterate persons living amongst people who read newspapers every day, and seeing signs that are all around them, yet themselves never learning to read. *Cogito ergo sum* in reverse.

Fayolle and Gailly (2015) showed that the positive effects of an entrepreneurship education program are all the more marked when previous entrepreneurial exposure has been weak or inexistent. Close relatives have been found to be positive role models (Mathews and Moser 1995, 1996; Scott and Twomey 1988; Shapero and Sokol 1982). This is consistent with the proposed framework that an entrepreneurship course should give special attention to the thought process of students who have no business ownership in their family background.

If the members of a community are historically oppressed, then the further back they look into their family history, the less likely they are to find an entrepreneur. Real life examples of this occurred in the communist countries of Eastern Europe, Russia and oppressed minorities in the USA. Both sets of people were forcibly segregated from the modernizing world. Even after the oppressive forces are lifted, there is almost a total inability to compete with existing business owners. The likely outcome is the noble practice of getting an education and finding a job. Not entrepreneurship.

Further to the above discussion of the CDR index, we recognize that wealth derives from ownership of the means of production. Technology as a means of production is an intellectual outcome. Therefore, wealth creation is an indirect product of the imagination of the mind and study by the mind. “Since new developments are the products of a creative mind, we must therefore stimulate and encourage that type of mind in every way possible (Carver 1864-1943).” This is distinctly different from the mere transfer of wealth through invasion, colonization, enslavement and theft. When the members of a deprived community own no means of production, they are almost absent of wealth. Furthermore, their poor economic condition is persistent. The least among them may even experience what is often referred to as a cycle of poverty. Any transfer of wealth through welfare systems is soon returned to its owner via consumption, plus labor value added, minus unproductive government agency employee payments. And, the wealth gap increases. The days are long but the decades are short and no progress has been made. More time will not cure this.

The only way for formerly oppressed communities to compete in business and acquire means of production is through extensive introspection, and academic and experiential entrepreneurship education via an institution such as the IEC. The IEC might take its guidance from scientist George Washington Carver: “Education is the key to unlock the golden door of freedom.” “Where there is no vision, there is no hope.” “There is no short cut to achievement.” “Life requires thorough preparation - veneer isn't worth anything.” “How far you go in life

depends on your being tender with the young, compassionate with the aged, sympathetic with the striving and tolerant of the weak and strong. Because someday in your life you will have been all of these." (Carver 1864-1943). Teaching entrepreneurship is about encouraging students to dream big, then showing them how to act on those dreams.

Encouragement and development amongst the formerly oppressed that are underrepresented in business, is a good investment that the mainstream should welcome. For, if anywhere, somebody produces products at a lower price with the same quality or produces better quality at the same price, the total economic pie must increase for all to benefit.

Fayolle and Gailly (2015) also showed significant counter effects of the entrepreneurship education program on those participants who had been exposed to entrepreneurship. A realistic entrepreneurship course must point out the fact of high failure rate by business startups (Gerber, 2001). Initially, those facts, being alarming, might very well temper enthusiasm on the part of students who by virtue of prior exposure to entrepreneurship, can appreciate what is being presented. This suggests that an entrepreneurship course should provide a good understanding of the CDR effect, explain the common misconceptions and mistakes that may easily be avoided, as well as provide for interdisciplinary collegiality and experiential learning opportunities, and analytical and computer simulation methodology that raises risk management skills and builds confidence. Even then, students may need access to incubators, angel investors, and future venture capital. These are consistent with the proposed framework that follows. Indeed, they are the motivation.

Student clubs

Alexander Bell's (1847-1922) telephone invention was acknowledged as fascinating. However, many people thought it was a shame that nobody would have any use for it. After all, the telegraph was already in use (Morse 1791-1872, Edison 1847-1931). Telegrams were typed and delivered. Why would anybody want to hear a message and have to remember what was said? Even Bell considered his invention an intrusion on his real work as a scientist and refused to have a telephone in his study. Well, as they say, the rest is history. J. P. Morgan invested in Edison's electricity. In response, his father said "I'm disappointed in you…. This is the stuff of carnivals and fairs,…., you have been taken." It was fascinating to watch Motorola's Marty Cooper make the first wireless brick cell phone call on 6th Avenue in New York City, on April 3, 1973 (Shiels 2007). However, initially, the crowd gathered there could not understand why they should leave the land phone already installed in their apartment and enter the streets of New York City to make a phone call. Why not just call from the apartment with the phone already owned? The quiet and comfort of the apartment confused and trumped the notion of mobility. Today, young people get their first apartment without a land line. Mobility is all that they know. This led Marty Cooper to formulate the Law of Spectral Efficiency, otherwise known as Cooper's Law. The Law states that the maximum number of voice conversations or equivalent data transactions that can be conducted in all of the useful radio spectrum over a given area doubles every 30 months. "Marty is the most influential person no one has ever heard of," says Robert McDowell, a commissioner with the Federal Communications Commission, America's telecoms regulator.

The point is that inventions are often considered irrelevant by the many persons who do not see their applications. Indeed, many of the applications will not have been invented as yet. For that reason, entrepreneurship can be very lonely. Entrepreneurial type students need solace.

Where better for them to find that than in an entrepreneur's club. They need to be among likeminded students. A genius is the one most like himself (Monk 1917-1982). Student clubs can contribute constructively to a sense of family away from home. Similarly, the student entrepreneurs club can help organize and run summer entrepreneurship camps for high school seniors. The exposure to entrepreneurship is invaluable. Moreover, exposure to the university campus will pay large dividends in future freshman recruiting.

Like the IEC, student clubs are independent. They function under the rules of the host university. But, they are of necessity developmental, albeit under the advice of faculty. Students must be allowed to make decisions. They must learn and practice intra and inter networking, learn and practice the conduct of meetings, Robert's rules of order (Zimmerman 2005), how to take minutes that record agreed on assignments of responsibility, and measure and monitor task completions. Students must make the election to pursue the scientific method and approach: Measure what is measurable and make measureable what is not so (Galilei 1564-1642). Faculties come and go, but widespread student and alumni involvement is the only way to build tradition and achieve longevity for the IEC. Student IEC academic curricula, research and management activities are discussed below.

Interdisciplinary Entrepreneurship course

The ultimate objective of the IEC is the creation of new business start-up based on the commercialization of technology, and lifestyle and social entrepreneurship. It is always possible to obtain these objectives on a one-off basis or on a short term basis. Great early American inventors did it entirely on inspired vision (Bell 1847-1922; Carver 1864-1943; Edison 1847-1931; Morse 1791-1872). However, to create a sustainable long term effort and raise the rate of entrepreneurial success, a targeted curriculum in entrepreneurship education must be developed.

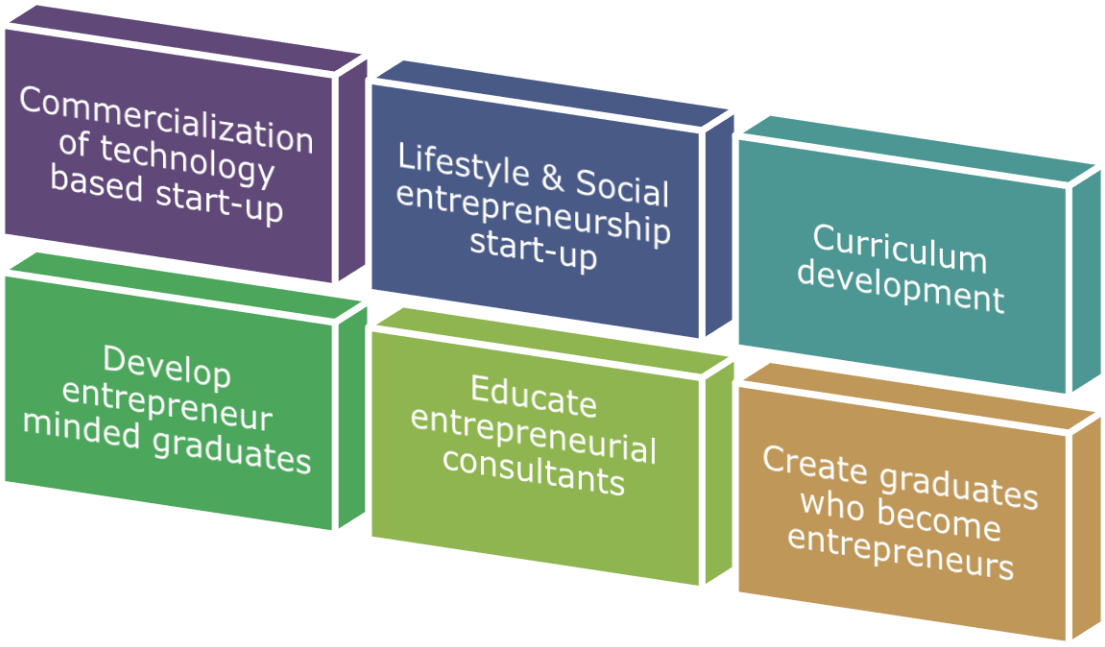
Sometimes it is the people who no one imagines anything of, who do the things that no one can imagine! See screen playwright (Moore 2014) "the imitation game" on Alan Turing's crypt-analytical disambiguation of the Nazi German enigma cyphers. Only a few sui generis people invent, most people are required to implement. To be helpful they need to have the requisite mindset. Intrapreneurship is the practice of entrepreneurship within large organizations. It may include corporate ventures in which subsidiary organizations are spun off. Intrapreneurial leaders must take risks and exercise initiative, taking advantage of market opportunities by planning, organizing, and employing resources, to innovate new or improve existing products.

Hemmasi and Hoelscher (2005) found that unlike other students, only those with high nascent entrepreneurial inclinations are comparable to actual practitioners. Holmgren, et. al. (2005) found that entrepreneurship is located within the entrepreneur (see also, Sherman, 2005). Still, we propose that all business students need to become supportive of entrepreneurship as they assimilate into the wider community. For these reasons, an entrepreneurship curriculum must, inter-alia, educate three types of graduates, as shown in Figure 2. It must develop entrepreneurially minded graduates. These are the majority of graduates who go to work in various fields of endeavor, various professions, and various employments. For example, bank employees and officers need to be entrepreneur friendly and adaptable to change. An entrepreneurship program must educate entrepreneurial consultants. These are typically "A" students who remember all the theories, methodologies, strategies, rules, and regulations. Of course, an entrepreneurship program must create graduates who become entrepreneurs. These are the small minority that generate path breaking ideas and are willing to take the risks that are

required to create new enterprise. Often, these are solid "C" students. Shrader and Finkle (2015) found that students who had been entrepreneurs scored significantly lower on college entrance exams and grade point average.

FIGURE 2

ENTREPRENEURSHIP EDUCATIONAL OBJECTIVES



Course Description

Consider a course constructed from the topics in Table 1. This course provides a framework for developing students campus-wide, including freshmen through senior level, with an entrepreneurial mindset across the management education curriculum. Special attention is paid to the thought process of those who have no business ownership in their family background. Indeed, it is the reason for early freshman introduction. First, students are introduced to the foundational theories and concepts of entrepreneurship in the core topics. They are given the opportunity to learn, practice and reflect on skills necessary for entrepreneurship. The student entrepreneurial mindset can be assessed and further developed through internal mock business plans and external business case competitions. Next, students are provided with opportunities to apply the concepts and theories via co-curricular activities such as student-run companies that

are housed within business, science, engineering and technology incubators. Finally, this course will enhance student preparation for a senior level entrepreneurship course where they will prepare a full business plan based on real data. The wide breadth of academic disciplines represented suggests that the course be team taught. Unlike many university courses that use textbooks, this course utilizes published research papers and professional books.

TABLE 1

INTERDISCIPLINARY ENTREPRENEURSHIP COURSE

Topic	Academic Discipline	Objective Impact on Mindset (development of skills, abilities, and experiences)
Developing an entrepreneurial mindset	Business: macro economics, entrepreneurship, management	Students learn the role of CDR; the role of the entrepreneur in the U. S. economy and countries around the world; to analyze forces behind entrepreneurship; the role of globalization (Kao and Mao 2011); to evaluate their potential as an entrepreneur; to push the envelope and profit from the lessons of failure.
Parliamentary procedures Types of business Taxation Intellectual property rights Business financing Personal financial management Estate planning	Business: law, finance	Students learn the legal requirements for shareholder meetings, voting and recording; types of business and how they are taxed; the principles of copyrights, trademarks and patents; about credit financing & rating; about wills & trusts.
Designing a competitive business model	Business: entrepreneurship, management	Students learn to differentiate between competing business models; to analyze how strategic management affects small business; to compare the characteristics of basic strategies and when to use them; the concept of competitive advantage and ways to create a competitive advantage.
Business ethics	Business: law, entrepreneurship, management	Students learn the legal framework for small business; to research, study and understand laws that apply to entrepreneurship and small businesses.
Building a new venture team	Business: entrepreneurship, management	Students learn to identify the building blocks of a new-venture team; to construct a "skills profile" to identify skills needed for the successful operation of a new-venture team; to observe team dynamics and learn how to manage task, process, and relationship conflicts; to learn techniques for assessing new venture financial liability.
E-commerce and the entrepreneur	Engineering, computer science, entrepreneurship, marketing, advertising, mass communication, creative writing, art	Students learn factors that an entrepreneur should consider before entering e-commerce; business and marketing strategies for promoting an e-commerce business; to design and develop an e-commerce website for posting content, blogs, messages on Facebook, Twitter and other social networks to promote a business; how to track website results; how to protect customer privacy.

TABLE 1

INTERDISCIPLINARY ENTREPRENEURSHIP COURSE….continued

Design	Engineering, science and technology, art, marketing, mass communication	Students learn various design forms, elements, traits of elements and their relationships; the process of design, design analysis, and creative problem-solving; to think visually; optimal design principles; the difference between the commodity and the process of a business.
Franchising and the entrepreneur	Business: law, entrepreneurship, management	Students learn to contrast and compare types of franchising; to evaluate the advantages and disadvantages of buying a franchise; the legal framework and laws covering franchise purchases; how to franchise a successful business; the major trends in franchising.
Buying an existing business	Business: law, entrepreneurship, management	Students learn to evaluate the advantages and disadvantages of buying an existing business; steps of evaluation of an existing business; the negotiation process and how to structure the deal.
Pricing strategies	Business: Micro economics	Students learn to analyze relationships between pricing, image, competition, and value; effective pricing techniques for introducing new and existing products/services.
Managing cash flow	Business: finance, accounting	Students learn the importance of cash management in small operations; the fundamental principles of managing accounts receivable, accounts payable, and inventory; to differentiate between cash and profits; how to create a cash budget.
Sources of financing: equity and debt	Business: finance, accounting	Students learn to evaluate the differences between equity capital and debt capital; the advantages and disadvantages of equity and debt financing; to analyze sources of each type of capital available for an entrepreneur.
Global aspects of international entrepreneurship	Supply chain management	Students learn why entrepreneurs pursue opportunities around the world; the main strategies that a small business can use for going global; the major barriers to international trade and their impact on the global community; how to write a plan for a profitable export program.
Reading list	All disciplines	Students read research papers and professional books (not academic textbooks).
Vocabulary: List of common business terms	All disciplines	Students build a working vocabulary of business terms that enable them to understand documents and literature on business and entrepreneurship.

In addition to the topics in Table 1, students must spend some time in one of the incubators (described in the next section) to receive some part of 4 credit hours. See Liao (2008), Jaber, Marle and Jankovic (2015), Danilovic and Browning (2007), and Mick and Linder (2005) for some discussion on the planning and programming of interdisciplinary teams and activities. Students may work on company or entrepreneur sponsored ideas to assess opportunities and validate ideas, develop and demonstrate pretotypes and prototypes, identify target markets, and create business plans. Planned activities must take students out of their departmental silos frequently enough to have lunch with students from other colleges and departments. Students must learn the difference between entrepreneurship and business management, and how to transition from entrepreneurial innovation to startup business management activities such as selling, phone answering, order acquisition, order processing, order fulfilment, payroll, services, and income tax returns, etc.

Space does not permit a complete analysis of all the topics in Table 1. Also, many of the topics listed are established standards. Their impact on knowledge and skill is well known. They are only listed here to suggest their impact on mindset. To illustrate mindset impact analysis, consider for example the first row. The impact of CDR was discussed earlier in the paper and is unique to this framework. So, consider now the impact of failure. The very nature of entrepreneurship is embodied in pushing the envelope. This implies a raised level of risk of failure. A refusal to risk failure implies a guaranteed pass for competitors. A failure does not have to be due to lack of due diligence. It may simply be due to an element of uncontrollable randomness associated with any business environment. The best that the entrepreneur can do is to learn as much as possible from failures. The second row is concerned with issues that might easily be overlooked by an inexperienced student run company. Many of the subtopics are not standard in a business curriculum. Yet, they are critical to entrepreneurship. For example, personal financial management is not a standard topic. But, a prospective student entrepreneur will not be eligible for business loan financing if their personal credit is unworthy. Personal financial management is as concerned with mindset as it is with knowledge and skills. Regarding the last two rows, the focus on professional books instead of academic textbooks is not a standard. In the standard, not only is it possible, it is quite likely that a business student will graduate with no real factual knowledge of the origins, history, development, status and leadership of major American corporations (Ridley and Davis 2009). A vocabulary list will enable meaningful access to the assigned reading.

Not all elements of success can be reduced to a scientific method. As much as we would like entrepreneurship to be formulaic, no two incubators are the same. As a result, their related problems are by definition episodic. They are nuanced and ambiguous. Students should recognize that many bad practices are known to lead only to bad outcomes, while good practices, although not guaranteed, can lead to good outcomes. Therefore, it is critical that students learn to develop the best of practices, with no chance of classroom texting and browsing since multitasking while learning is humanly impossible (Beland and Murphy 2015, Rosen 2013). Delayed gratification (Mischel and Ebbesen 1970), time management and the development of good personal study habits is required.

The opportunity to obtain a minor in entrepreneurship can be considered.

Organizational structure

There are two possibilities of interest for establishing the organizational structure of the IEC. Each has its pros and cons for success. In one possible scenario (see Figure 3), an entrepreneurship grant is given to an academic unit, college, department or institute in the university. All activities are centered within that unit. This structure is relatively easy to manage. So is the assignment of responsibilities and monitoring of accountability. The physical facilities can belong to the academic unit. One such example of an academic unit is the business school. This appears to be reasonable since entrepreneurship has so much to do with business. Classes can be designed for business majors, and non-majors can be allowed to take them. However, while the results can be excellent, there might be little or no impact on the rest of the university.

FIGURE 3

PERIPHERAL RELATIONSHIP: EXCELLENT RESULTS WITH A HOLLOW VICTORY AND NO STUDENT, FACULTY OR UNIVERSITY DEVELOPMENT

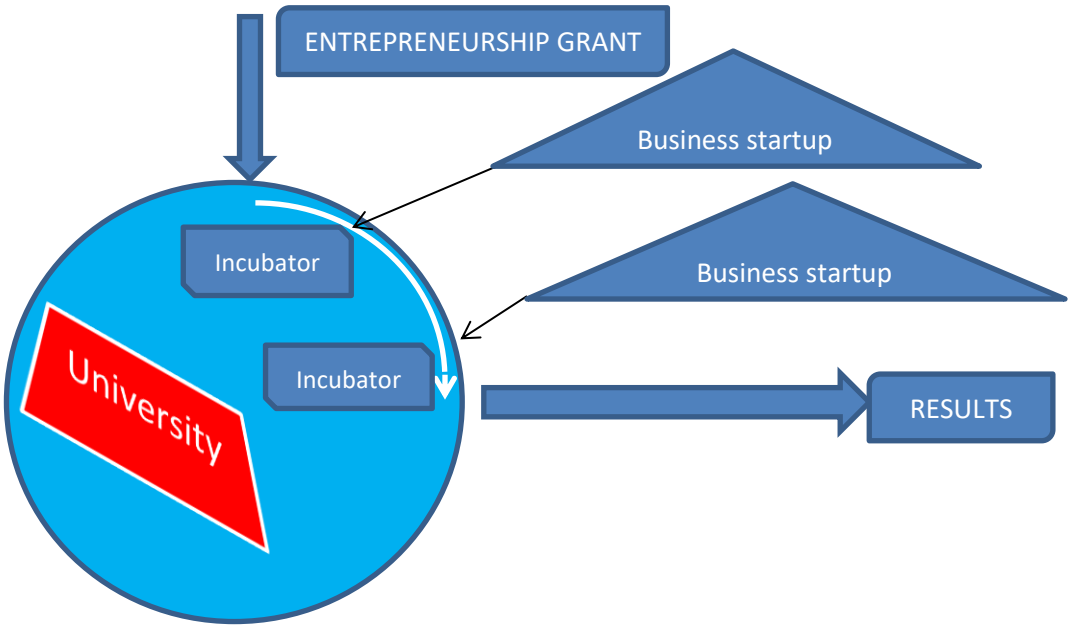
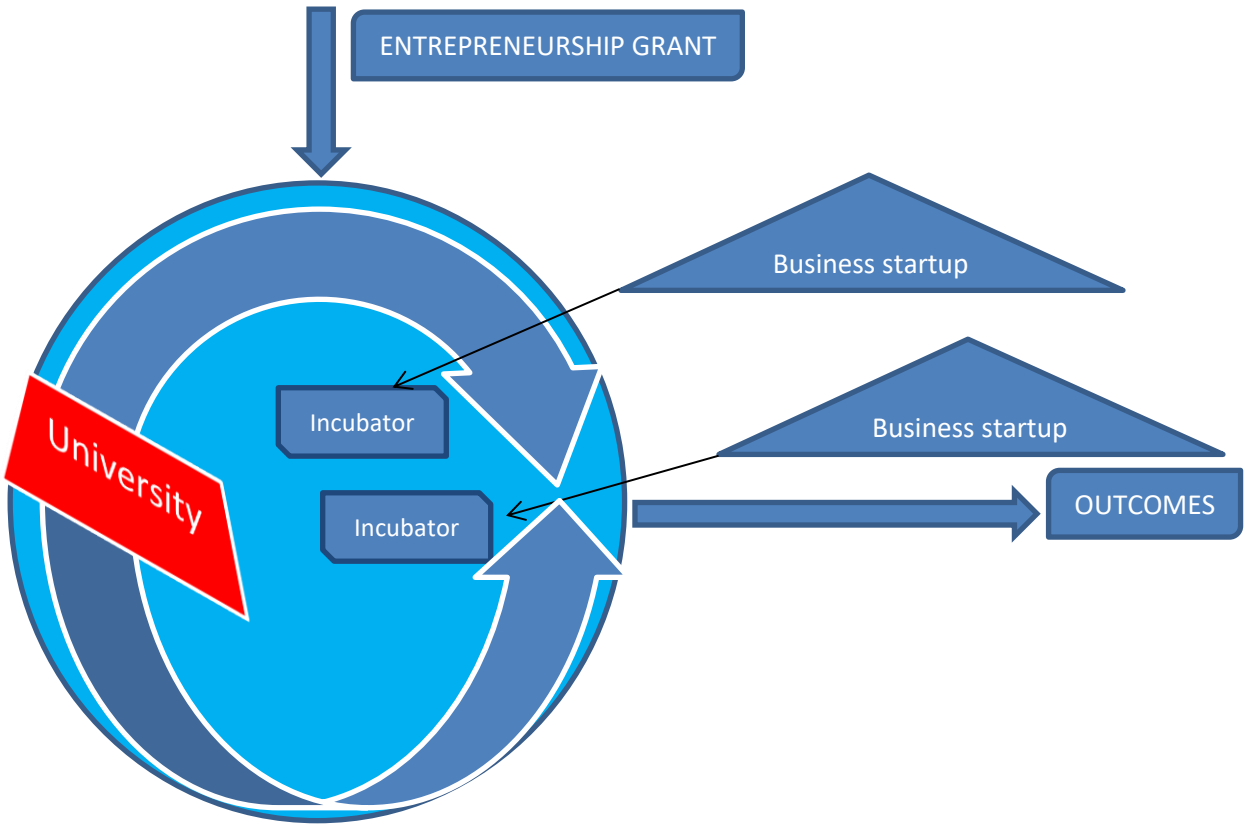


FIGURE 4

INTEGRATED RELATIONSHIP: EXCELLENT OUTCOMES. VICTORY FOR STUDENT, FACULTY OR UNIVERSITY DEVELOPMENT THROUGH CAMPUS WIDE INVOLVEMENT, EDUCATION, COURSE WORK, INSTITUTIONAL MEMORY



The preferred alternative is an integrated scenario (see Figure 4). An entrepreneurship grant is given to the university for integration campus wide, and community development. The managing unit is a separate IEC, independent of all colleges, schools, departments and institutes. The IEC is designed and directed to serve all university constituents equally. Nonbusiness entrepreneurs are identified in the professional schools such as law and medicine, engineering, science and technology. Technology, lifestyle and social entrepreneurship can grow out of various alliances on campus. The results are equally excellent outcomes, but greater in scope than the peripheral relationship, and with a lasting impact on the university and the community. In case there is resource limitation at the time of startup of the IEC, it may be necessary to locate it in a university college. At such time as it grows into a sustainable unit, direct college

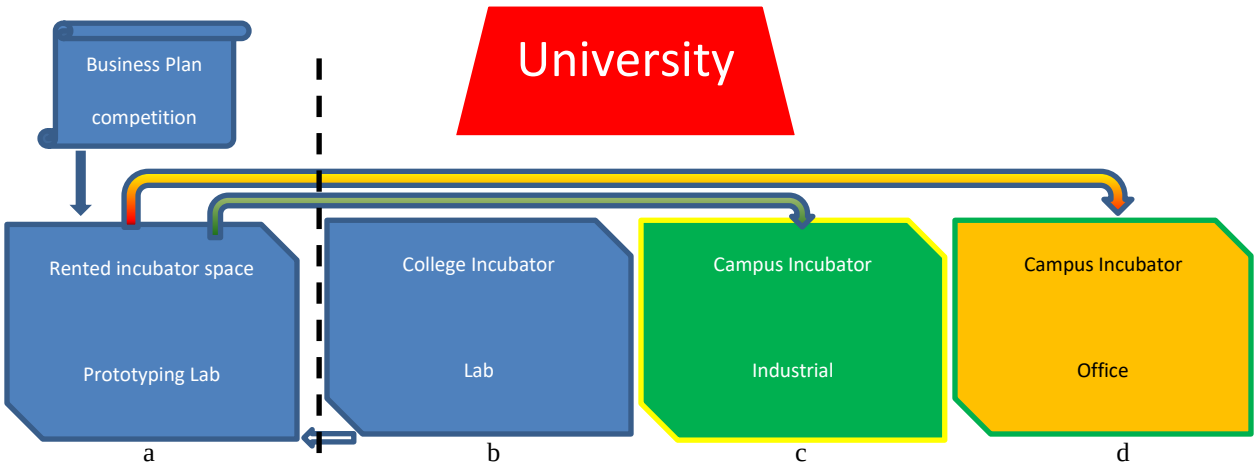
management can be adjourned *sine die*, and a new and independent center opened. If for any reason, due to reorganization, it turns out to be impractical, it can be return to the college.

Incubators

There are different types of incubator depending on the stage of development of the business idea. Some technology based ideas require prototyping, testing and proof of concept. Large inventions derive from small discoveries (Ashton 2015). An incubator of that type is shown in Figure 5a. Such an incubator may be special purpose in design, but unrelated to university education. For example, Domi Station and Making Awesome, adjacent neighbors in Tallahassee, Fl. provide business coaching and rapid prototyping CNC/CAD/3D machines for making electronic circuit boards and device containers, respectively. Those elements of the process are vocational in nature, not academic. Renting space there may be the best option. Some technology based ideas require development in a university science laboratory, such as those used to teach and conduct university physics, chemistry and pharmacology research. An incubator of that type is shown in Figure 5b. Although specialized, great expertise and a Doctor of Philosophy are required. An idea leaving this incubator may still be theoretical and benefit from time in incubator 5a. Ideas that leave incubators 5a and or 5b as working devices then go to the industrial (5c) or office (5d) commercial startup incubator.

FIGURE 5

INCUBATOR TYPES



Entrepreneur's Day

Prior to the preparation of business plans, the university is engaged in a number of entrepreneurship activities. Those are academic activities. But, the university must have an annual event related to the entrepreneurs themselves (Figure 6). It is a day for the application of entrepreneurship by the campus entrepreneurs. Consider for example, university entrepreneur's day. On that day there are a number of activities. One activity is a business plan competition. A business plan forces the students to think through and understand their business. It can also be used to seek financing. The competition creates a winning business that receives a first prize cash award, recognition, and an opportunity to enter a commercial startup operation incubator for one year (Figure 7). At the time of the business plan competition the participants must sell their ideas. An end of semester competition date will maximize the time for students to prepare their business plans. And, a published deadline has a wonderful way of concentrating the mind.

One year after exiting the incubator, or on an even multiple of years thereafter, the business can apply to enter the Shark Tank style venture capital forum, where on entrepreneur's day they must sell their income statement and balance sheet to venture capital investors (Figure 8). Their idea may have been impressive on the day when they won the business plan competition, but the venture capital investors will want to know how well their idea was implemented and how well it was received by customers.

Integration

In addition to being cash poor, we are concerned with technology based entrepreneurship where larger investment and knowhow is required than for lifestyle and social entrepreneurship. The IEC objective is to positively impact the university and the related community. An integrated approach starts with multidisciplinary student teams brainstorming and mining faculty research for commercial ideas (see schematic diagram in Figure 7). This activity can be greatly enhanced with help from student members of the entrepreneurs' club. There should also be physical and electronic notice boards for faculty to display ideas and inventions.

In addition to the interdisciplinary entrepreneurship course discussed earlier, extra-curricular student activity can increase student wisdom when enjoined by experienced business people from the external community. For example, the Economic Club of Florida (ECF) is a one stop shop for potential advisors and angel investors. Student members of the ECF can learn from the speakers who address the ECF monthly luncheons. This can be a live term paper source of information for courses that they are taking in business, economics, journalism, government, etc. Tallahassee Technology Alliance (TalTech) can be a source for students taking information technology courses. The Institute of Electrical and Electronic Engineers is a source for science and engineering students, and so on. Of these external organizations, the ECF is one of particularly great interest for networking because they comprise many bankers and investors. Members of ECF can speak at student club meetings, especially on the topic of business plan writing. They are a readily available source of angel investors. Other sources of investment are family, friends and alumni angel investors, venture capital, crowd funding and grantors.

FIGURE 6

BUSINESS PLAN COMPETITION AND SHARK TANK STYLE FORUM ACTIVITY TIME LINE LEADING TO ENTREPRENEUR'S DAY

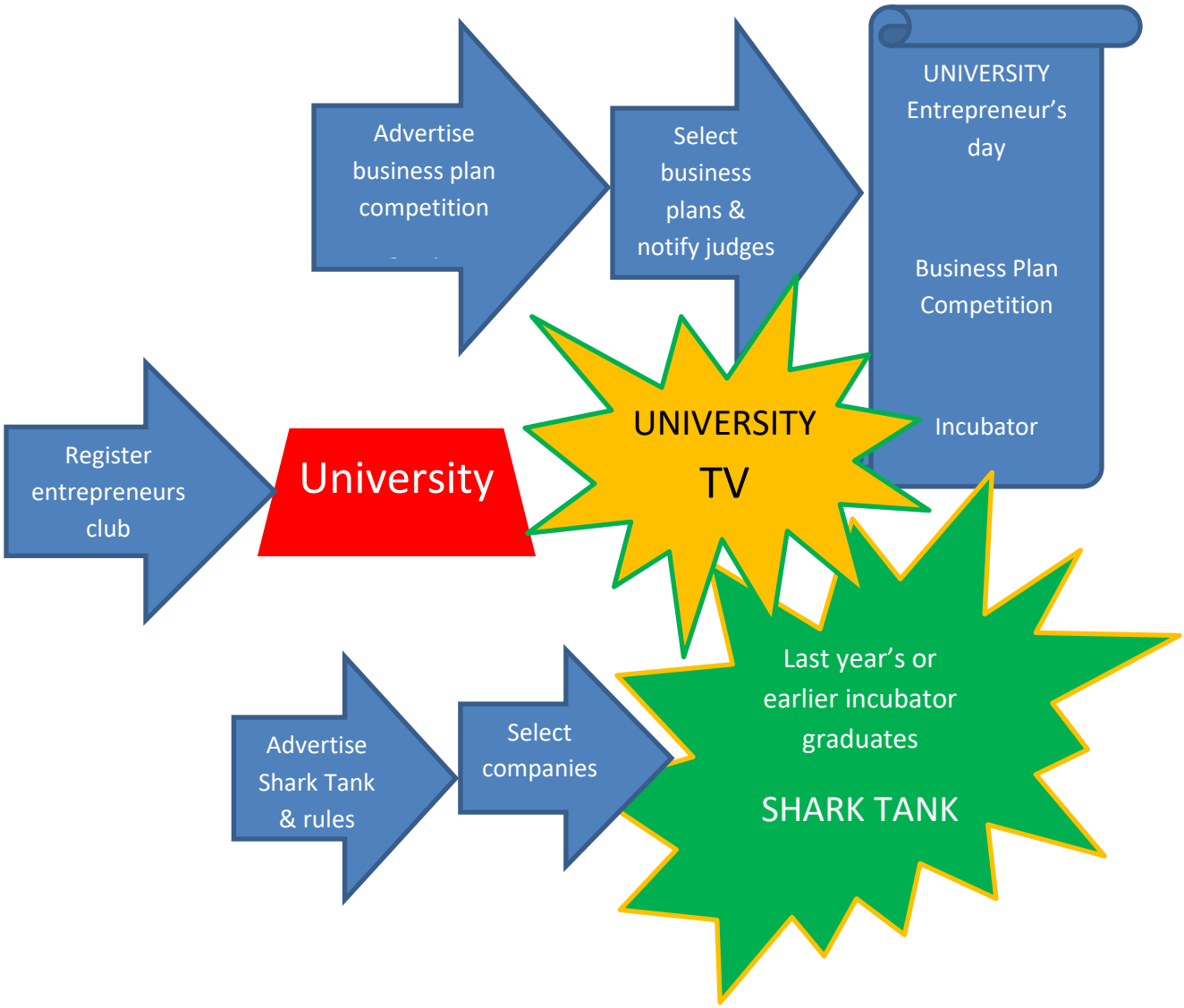
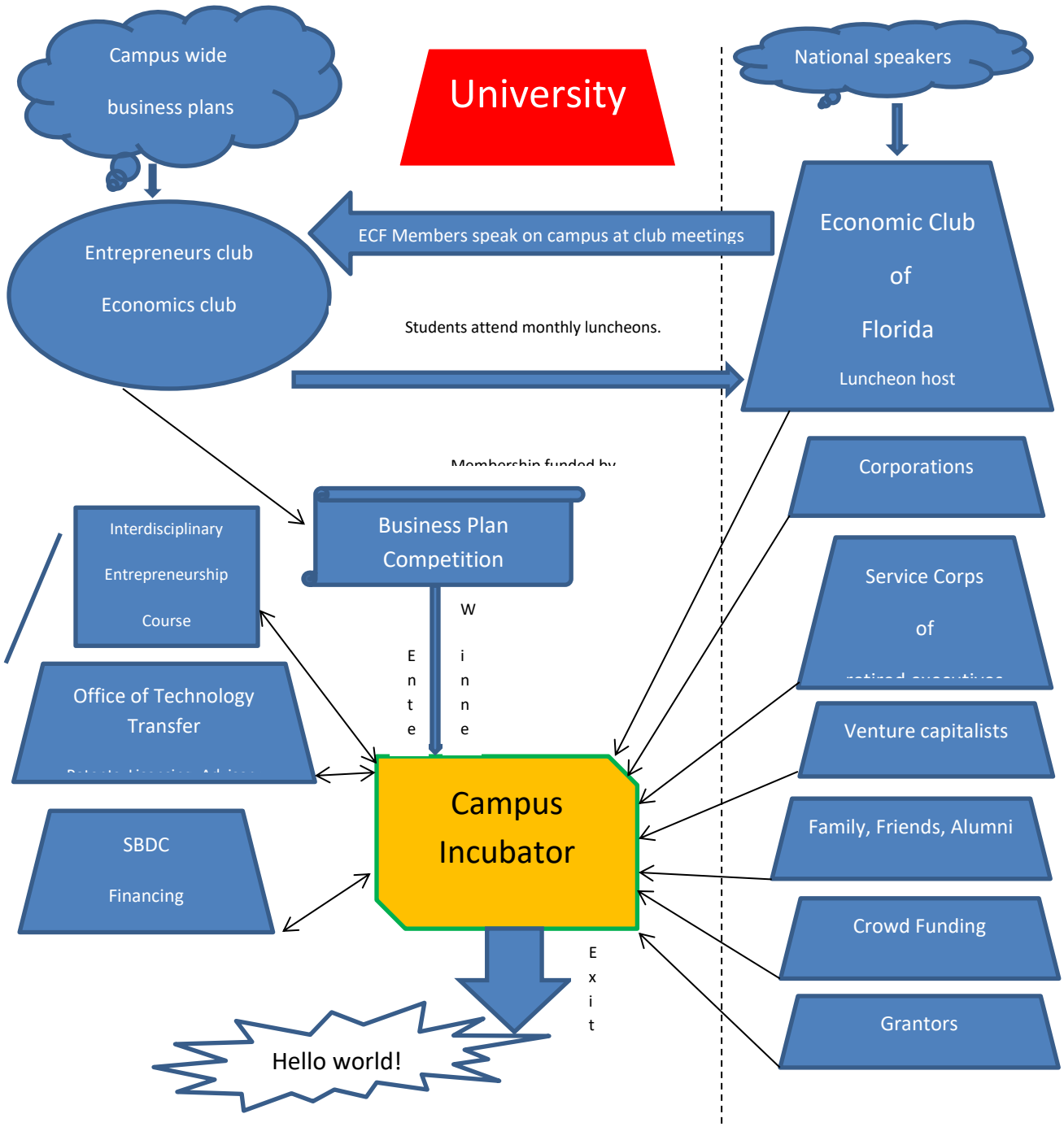


FIGURE 7

INTEGRATED ENTREPRENEURIALLY MUNIFICENT INCUBATOR SUPPORT MECHANISM, EDUCATIONAL DEVELOPMENT & COMMUNITY TRANSFORMATION SCHEMATIC

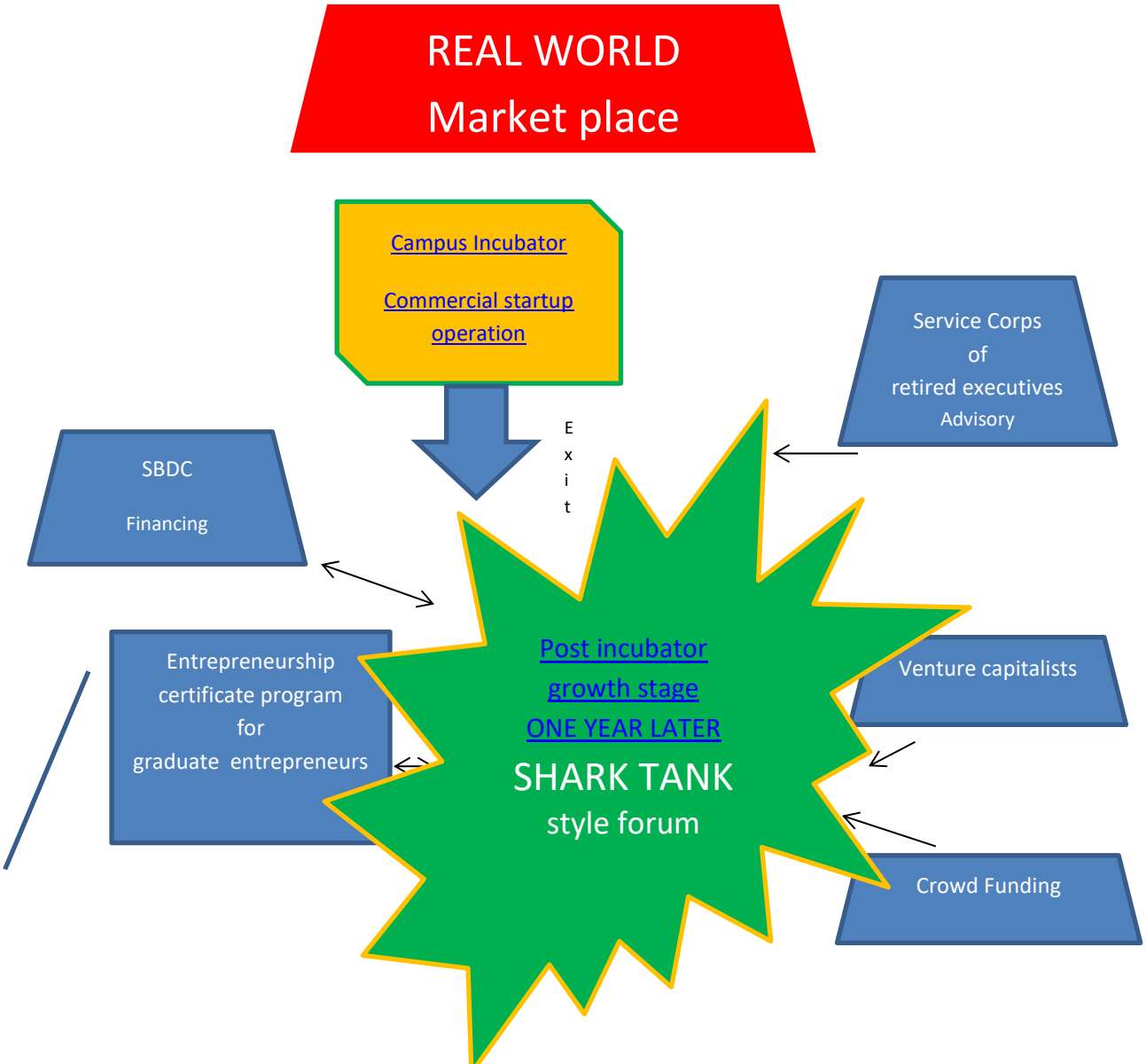


We know from Gladwell (2008) and Ridley and Davis (2009) that professional competence requires 10,000 hours of dedicated experience. That is, the equivalent of forty hours per week for five years. By definition, students will not have this experience. This poses an insurmountable problem. Barahona, Cruz and Escudero (2006) found that graduates are more likely to be entrepreneurs if their education was complemented with business and travel experience. Still, only some of this experience can be obtained through corporate internships. Therefore, the remaining lack of experience must be supplemented by placing an experienced angel investor on the startup management team or advisory board, as needed.

The Small Business Development Center (SBDC) and the Service Corp of Retired Executives (SCORE) are sources of advice on business plan writing, financial planning and loan acquisition. The university Office of Technology Transfer is available to assist with intellectual property acquisition such as copyrighting, patenting, and licensing.

FIGURE 8

SECOND STAGE POST INCUBATOR INVESTMENT BASED ON INCOME STATEMENT AND BALANCE SHEET



Executive education

If there is one constant throughout the vicissitudes of time, it is change. Technology is continuously evolving, demanding the periodic renewal and upgrading of skills. To that end, entrepreneurs who have attained an undergraduate degree and who have been practicing in the real-world business for two or more years can benefit from executive education. They and other business leaders can study for a graduate certificate in entrepreneurship (Figure 8).

CONCLUDING REMARKS

The static case study method of teaching has been employed for many years. A logical replacement, better for creating an entrepreneurial mindset, is technology based dynamic live case study with color graphics animated computer simulation. The success of this was demonstrated by the seven student publications involving twenty five students in just two semesters referenced in this paper. Students can create key elements of a case, collect the related data, analyze them and develop comprehensive pro forma technical and economic evaluations, cash flow and income statements, and balance sheets. These are required to understand the business and to apply for financing. When obtained by computer simulation, these documents are more realistic. Live case study provides some experiential learning and real-life contact with real business operations. That notwithstanding, the creation of startup business by students presents the insurmountable problem of student professional inexperience. This demands the presence of an experienced angel investor on the startup management team, or advisory team, as needed.

Entrepreneurship involves risk. Education, research, development, best practices and application of the scientific approach can reduce risk. There will be some favorable and unfavorable outcomes. Complete risk avoidance is easily attainable by simply doing nothing at all. Except that that is not entrepreneurship. Doing nothing produces no outcomes, neither good nor bad. Experienced people know not to try anything new. Students know that they should try everything new. A meeting of these two mindsets might produce the requisite synergy. Computer simulation is not an optimization tool. It is a method for developing and evaluating realistic alternatives, including risk classification, and selection of a best case scenario. Chance favors those who are prepared. So, it is not about being right. It is about doing what is right. That way, risk is reduced and outcome expectation is maximized. Knowing is important but how to deal with the unknown is even more important.

In addition to structured education, entrepreneurial students need a club to provide a family away from home. Time spent in entrepreneurially munificent incubators provide needed guidance, nurture and visibility. Visits to local and other incubators provide needed exposure to complement the entrepreneurial mindset. A weekly televised forum on entrepreneurship involving students, faculty, and visitors, and broadcast on the university TV channel and/or satellite radio, can provide special interest exposure of incubator companies to potential investors, general exposure to future university freshman recruits, and favorable public relations in general.

A CDR index was introduced for the first time in this paper. The positive wealth-health, and CDR index relationship paradigm is indisputable today. Recommendations for future studies include the formal measurement of the CDR index. Then, the wealth-health CDR relationship can be calculated. This may lead to a source of useful CDR analytics that serve to change the zero-sum mindsets of academicians; and of those communities and governments that have yet to

recognize that low CDR is the real obstacles to their economic success. Economic success is a function of the CDR index, not the visible characteristics of people in a country. In the archetypal model for entrepreneurship education, diversity has the potential to expand the pool of innovators and thereby increase the size of the world's economy, to the benefit of all people. A plus sum mindset in which the best ideas can rise to the top.

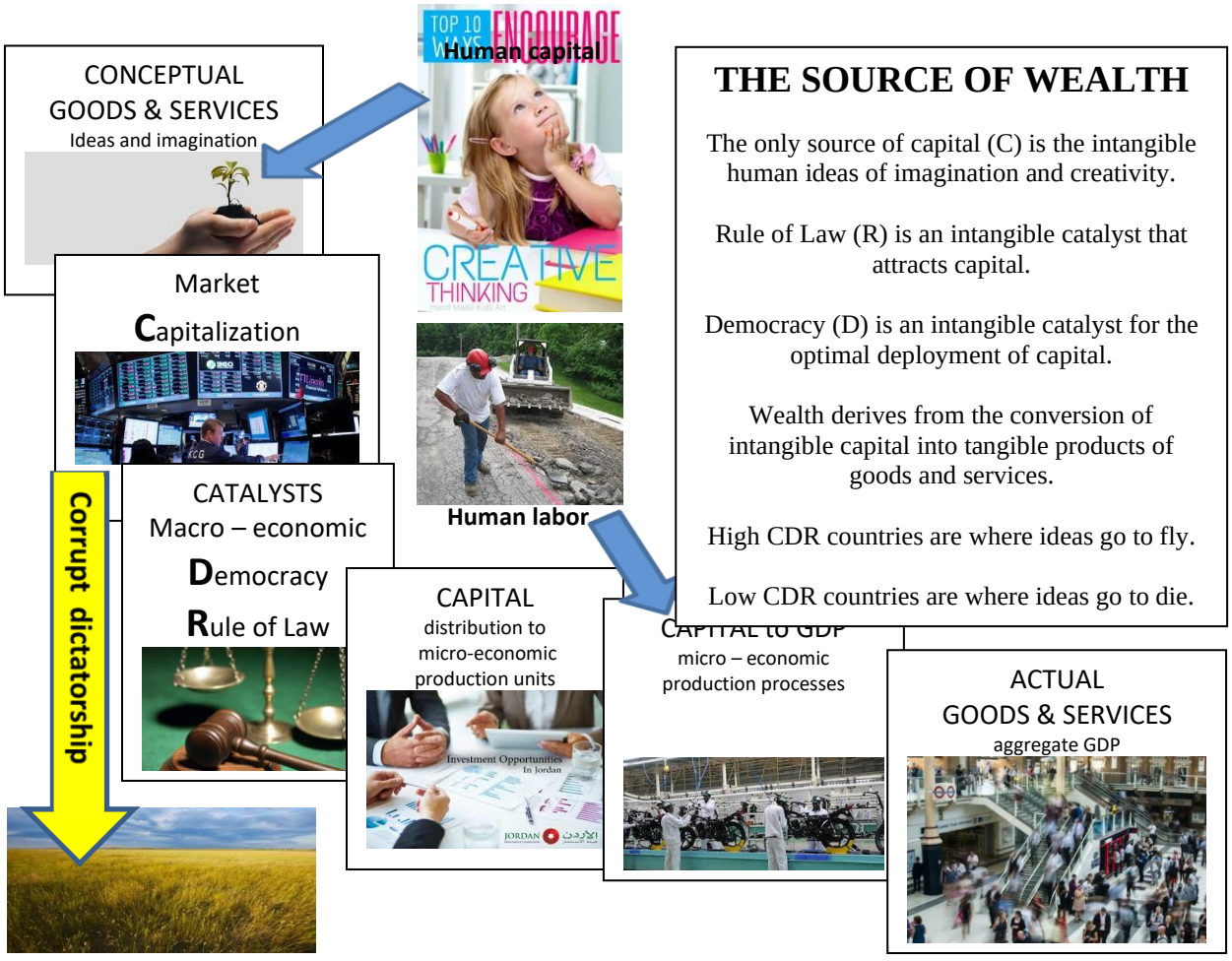
The Mystery of Wealth

Wealth & Poverty Demystified Econometrically

One source of wealth watches over another

General theory of economics

CDR supply side scientific growth law unveiled
From confusion to clarity



ENTREPRENEURSHIP

"Dennis Ridley has written a fascinating study of the ultimate enigma in economics, the mystery of wealth, using the ultimate tool of modern science, information theory."
George Gilder, author of Life After Google, Knowledge & Power, and twenty other books.

“This book is well written. It is a mind changer. It gives a thorough and complete economic theory of entrepreneurship. It comes alive when the theory connects entrepreneurship, capitalism, democracy and rule of law to the industrial revolution. While the findings are contrary to popularly held beliefs, the explanations, demonstrations and proofs are compelling and undeniable. It provides a convincing case that the only source of wealth is entrepreneurship via human ideas of imagination and creativity. Therefore, entrepreneurship education must be redesigned to exploit this understanding. Economics education will change forever.”
Randall Holcombe, Ph.D. Economics, Virginia Polytechnic Institute and State University, USA.

“The author has done a nice job of two stage least squares to separate total capital into exogenous human capital and endogenous capital stock of knowledge, recordings and machines, etc. The finding that human capital is 85% just tells how very much capital stock is subject to depreciation and obsolescence. I would not have guessed that natural resources contribute only 6% to GDP. I always thought it contributed much more and was the most important factor in economic development. Similarly, it was surprising but interesting to learn that geography only contributes 4% to GDP.”
Aryanne D. de Silva, Ph.D. Psychology, University of Notre Dame, USA.

“Many authors have suggested that capitalism, democracy and rule of law are important for economic growth, but CDR is the first mathematical model to predict approximately 90% of GDP. I was surprised so I obtained the data from the book and tested it myself. The results were astonishingly. Finally, we have a sound scientific economic growth model. The implication is that the conversion of capital to GDP is determined by the laws of natural sciences and is the same in all countries in the world. What is commonly thought to be differences in productivity is actually the differences in the amount of capital that countries can attract for conversion to GDP. It is now clear that the true and only source of wealth is human capital ideas of imagination and creativity and it can only be converted in the presence of catalysts: democracy and rule of law. Poor countries can now focus on these features of society with confidence that life can get better. Noneffective strategies such as government spending can be put to bed. There is no good reason why the implementation of the CDR concept cannot serve to end poverty and build middle class societies all around the world.”
Pierre Ngnepieba, Ph.D. Mathematics, University of Grenoble-Alpes, France.

“The author provides a pedagogical suite of proposals for revising entrepreneurship, economics, engineering and mathematics courses. They include sample syllabi designed to better develop science, technology, engineering and mathematics (STEM), and entrepreneurial concepts and creative thinking in higher education. This is the definitive economic theory of entrepreneurship.” *John Washington, JD, University of Florida, USA.*

The CDR model quantifies the proposition “Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society that he has in view. But, the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to society… He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. By pursuing his own interest, he frequently promotes that of the society more effectually than when he really intends to promote it.” *Adam Smith, LL.D., University of Glasgow, Scotland. Father of modern economics and capitalism.*