ENTREPRENEURIAL ECONOMICS: REVISING THE ECON 101 COURSE

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Abstract

The typical course in economics begins with the assumption that there exists a demand for goods and services. It is also assumed that a capital stock of facilities that produce final goods and services just exist somehow, do not have to be created, and that economics are concerned with wealth distribution from these facilities to the exiting demand. In reality, all such capital must have been previously created. Its only source must be human capital ideas of imagination and creativity, otherwise known as entrepreneurship. Entrepreneurship, where it succeeds, creates its own demand in the minds of people who do not know what they want until it is shown to them. A new CDR growth model that accounts for entrepreneurial capital and capital stock, and combines them with democracy and rule of law, is discussed for inclusion in the beginning university course in economics.

Keywords: Political economy; Entrepreneurship; Capitalist; Capitalism; Democracy; Rule of Law.

JEL: A20, A22

INTRODUCTION

As best as one can tell, the frameworks for capitalism, democracy and rule of law: Magna Carta of 1215, the English King Charles II 1662 royal charter for the study of science, and the New York 1811 limited liability law created the perfect storm for the start of the industrial revolution around 1776-1840. Before the advent of science, the human DNA had to change if man was to survive, advance from the middle to the top of the food chain and achieve through physical ability. Science reintroduced human capital, the genesis of wealth, by way of a cognitive revolution. Commensurate with the cognitive scientific industrial revolution, countries that represent ten percent of the world's population comprised mainly of Western Europe and its American descendants have experienced unprecedented economic growth. They became rich and continue to get richer. At the same time ninety percent of the world's population remains impecunious. This includes the approximately two hundred and forty years since Smith (1776) became the father of economics. Traditional economics has not come anywhere close to eliminating poverty. It is truly enigmatic that economics can do so much for ten percent of the world and yet so little for ninety percent. Jones C.I. and Vollrath D. (2013) suggest that a critical difference between astronomy and economics is that the economic universe can be potentially re-created by economic policy. That economic policy can shape the course of growth and

development. If that is true it is high time that economic policy help the poor. So, it is time to re-examine economic growth theory, its descriptive properties and its prescriptive properties.

The purpose of this paper is to present a modern pedagogy for introducing university economics. Very little attention has been given to entrepreneurship in first year economics textbooks (Kent, 1988 and Kent & Rushing, 1998). The explosion of entrepreneurship education (Ronstadt, 1986, Sexton and Upton, 1987) has been undertaken by management departments in schools of business. Their courses provide guidance to students interested in starting their own business (U.S. Small Business Administration, 1986). They do not provide an education in the economic theory of entrepreneurship. In this paper a traditional introductory course is reviewed for its entrepreneurship content and suggestions are made for modifying said course to introduce entrepreneurship. The most recent capitalism (C), democracy (D) and rule of law (R) Ridley (2017a, b, c) CDR growth model is chosen. The model is an estimator of real per capita gross domestic product adjusted for purchasing power parity $G=f(C,D,R)$. In this paper a capitalist is defined as a person who deploys his personal capital so as to maximize his benefit. Capitalism is defined as a method of organizing capital. It is measured by total market capitalization C and includes entrepreneurial human capital plus capital stock. Market capitalization is the value of outstanding shares of stock sold on the capital markets. Democracy is defined as a measure of participatory governance and management. Rule of law, the reverse of corruption, is defined as a measure of the enforcement of property rights where property is a legal expression of an economically meaningful consensus by people about assets, how they should be held, used and exchanged. The CDR model is the first to show that standard of living is dependent on C, D and R (see North, 1991 on institutions), and is independent of natural resources, government spending, country size, location, culture, and physical characteristics of the population. It forms an economic theory of entrepreneurship and indicates that all countries can enjoy a high standard of living. Multivariate model development and estimation is beyond the scope of this paper and the ambit of any principles course to which it may apply. But, it must be demonstrated that the source of wealth is entrepreneurial human capital. So, the CDR model is demonstrated on fact based worldwide empirical data and the results are given in the appendix. The particular course and the particular entrepreneurship model are not important. Each professor can start with their own syllabus, and there are other entrepreneurship models (see for example Gunter (2012)for an arrangement of Schumpeterian and Kirznerian entrepreneurs). But, the model must recognize the source of wealth as the human idea of imagination and creativity if it is to best engage the student. Furthermore, it must recognize the importance of an entrepreneurial environment containing D and R institutions.

The current consensus in economic thought is that R is necessary for economic growth (Gwartney and Lawson, 2003, Leblang, 1996, Keefer and Knack, 1997). However, the case for D is not so clear until now. Przeworski and Limongi (1993) reviewed 18 studies on various data samples ranging from 1949 to 1992 on the question of democracy and economic growth (see Adelman and Morris, 1967, Dick, 1974, Huntington and Dominguez, 1975, Weede, 1983, Kormendi and Meguire, 1985, Kohli, 1986, Landau, 1986, Sloan and Tedin, 1987, Marsh, 1988,

Pourgerami, 1988, Scully, 1988,1992, Barro, 1989, Grier and Tullock, 1989, Remmer, 1990, Pourgerami, 1991, Helliwell, 1992). The findings were split equally between yes and no, and no findings at all (see Barro (1996), Przeworski and Limongi (1997) for more on democracy). Therefore, the conclusion of the review was that the answer is as yet unknown. This paper uncovers and clears up the reason for the confusion by presenting a statistical cross country regression model that includes both a positive D term and a negative interaction term (C·D·R) that contains D. The signs are easily explained as a positive D effect and negative friction between C, D, and R, where all three make significant contributions to explaining G. These will be discussed more, later in this paper.

Traditional introductory economics assumes that supply and demand for goods and services exist. There is an upward sloping supply curve and a downward sloping demand curve. Attached to the supply curve are hypothetical producers of goods that the producer believes to be in demand, the prices of which determine the quantity supplied. Attached to the demand curve are consumers who always know what goods they want, the prices of which determine the quantity demanded. The source of wealth is the facility where the goods are produced. The mission of this element of economics then is to understand how the goods are produced, distributed, exchanged and consumed (Cowen and Tabarrok, 2015). Throughout, the traditional economic thought process is designed on the Malthusian (1798) assumption of scarce resources. But, the CDR growth model suggests that the source of wealth is the unlimited human ideas of imagination and creativity. All the evidence observed for the past two thousand years suggest that massive human population growth is unlimited by what was thought to be scarce resources and that each person brings their own wealth into the world (Simon, 1981).Isolated communities fare poorly (Sowell, 2016). As the internet enables coordination of individual knowledge throughout the economy, democratic countries only grow richer. But, the internet cannot create democracy where it does not already exist. The internet is a financial highway for incoming capital and for the flight of money at the first sign of instability.

The remainder of the paper is organized as follows. The essence of traditional economics pedagogy that begins with land, labor and capital is briefly reviewed. A modern economics pedagogy that begins with human capital and a growth model based on capitalism, democracy and rule of law is proposed. Some of the terms used in the extant literature require modification in order to arrive at the CDR model. Some of the terms are not defined anywhere in the literature. Concepts such as capitalist, capitalism, entrepreneurship and other consequential terminologies, are defined explicitly in nomenclature at the end of the paper.

TRADITIONAL ECONOMICS PEDAGOGY
Traditional economics pedagogy does not tell us definitively where wealth comes from. That in itself renders it growth descriptive, unable to be growth prescriptive. To be growth prescriptive, economics must account for the genesis of wealth (Docherty, 2014). It must tell us where wealth comes from. The extant theory that wealth comes from land, labor and capital is grossly deficient in that it has not stood up as new technologies have developed over time. The theory that wealth

derives from an aggregate production function such as Q=f(K,L)=$AK^{\alpha}L^{1-\alpha}$, where A is the total factor productivity and α and 1-α are output elasticity's of capital and labor respectively, K is the fixed part of physical capital stock and L is human capital (Solow, 1956)or $Y_t = f(A_t, K_t, H_{Yt}) = A_t^{\sigma} K_t^{\alpha} H_{Yt}^{1-\alpha}$, where A_t is total stock of ideas, K_t is physical capital, and H_{Yt} is human capital(Jones, 2002), 0<α<1,must also be reconsidered. There cannot be any such thing as an aggregate production function when the function maps physical units of inputs to physical units of outputs from a single machine and the inputs are different types of items. Also, it is a fallacy of composition to think that we can simply jump from microeconomic conceptions to an understanding of production by society as a whole (Cohen and Harcourt, 2003, Ridley and Ngnepieba, 2018).While A_t might contain the entrepreneurship elements in C, neither one of these models accounts for the D and R institutions for an entrepreneurial environment.

Another problem is that the aggregate production function does not explain the source and evolution of K. K is fixed capital stock. But machines of various types, computers and recording devices, and training of people such as technicians and technologists, are not the source of capital. The source of all capital is human capital ideas of imagination and creativity. Therefore, K is a reinvestment of income that in a prior time period was income from the conversion of human capital ideas into income, less depreciation and obsolescence. That is, K is endogenous capital stock. The production function does not account for the original exogenous human capital. The original human capital is exogenous entrepreneurial capital. This disambiguation is discussed further below in the subsection on entrepreneurship.

Yet another problem with the aggregate production function is its requirement for varying degrees of skills in labor. That is, human capital is confounded with physicality. But, skills are related only to human intelligence not brawn. Human capital knowledge that is learned from entrepreneurship activities becomes skill and takes the form of capital stock. The human being has the ability to convert skill in a seamless fluidic adaptation to a machine or tool such that the capability or capital stock of the machine or tool is automatically expanded. In extant economic theory labor would have to be such that economics would violate its own original tenet of comparative advantage in which labor is homogenous (Ricardo, 1817). The production output from homogenous labor is by definition proportional to units of labor. Therefore, labor must be corporeal, all the same, and there is no skilled and unskilled labor. The representation of ideas as a separate variable (A_t)by Jones (2002) is an attempt to get at entrepreneurship, except it does not resolve this issue because it leaves human capital and labor mixed inside of H_{Yt}, implying skilled and unskilled labor.

Yet another problem is that the assumption that the inputs to the production function are founded in scarce natural resources (Malthus, 1798). We now know myriads of ways in which new discoveries of natural resources, energy and methodologies have forced the land, labor and capital premise to yield to various technologies and technological ages. Introductory economics discusses natural resources, geographical latitude and government fiscal policy. But, the

importance of these tends to be overstated. They are discussed further herein the subsection on the source of wealth.

A MODERN ECONOMICS PEDAGOGY

In the foregoing traditional economics account of wealth, it is assumed that factories exist and they are operated with raw materials and natural resources. But, the question remains, where do factories come from? As explained by Steve Jobs (1955-2011) "A lot of times, people don't know what they want until you show it to them," and the alleged statement by Henry Ford (1863-1947) "If I had asked people what they wanted, they would have said faster horses," demand side Keynesian financial economics can only act on existing products (see O'Donnell, 1989, 1996 on Keynesian economics). It cannot stimulate the creation of new products and wealth. The source of wealth is actually the ideas of imagination and creativity of the human mind. That is, wealth is all in the mind (Ridley, 2017a). And, the true source of natural resources is the mind (Ridley, Davis and Korovyakovskaya, 2017) and the knowledge of science (Harari, 2015). See also Beinhocker (2006) and Ridley (2010).The last fifty years has seen massive economic growth due the digital influences from companies like IBM, Microsoft, Amazon, Google, Apple, Intel, etc., unrelated to natural resources.

The process of converting human capital to tangible wealth includes the development of machinery and the teaching of entrepreneurial technological knowhow to other people (Faria, et. al., 2016).It can also include the programming of computers and storage in recording devices. Not unlike division of labor that creates surplus capital (Smith, 1976), this division of human capital creates surplus wealth (Ridley, 2017b). Furthermore, since imagination is unlimited, wealth must also be unlimited. This is the basis of a compelling argument that economic growth should be credited to entrepreneurship, where entrepreneurship is the process of starting a business, typically a start-up company offering an innovative product, process or service. See alsoCDRindex.blogspot.com and Ridley, 2017c.Recognizing this, Ridley (2016), Ridley, Davis and Korovyakovskaya (2017), and Korovyakovskaya and Ridley (2017), developed a modern pedagogy for entrepreneurship. Ridley and Khan (2018) is the first to compute the values of ideas.

The Source of Wealth: intangible versus tangible

The G=f(C,D,R) model for year 2014 data and 79 countries that represent practically all the people in the world is reproduced in the appendix. The CDR epistemology comprises a regression model and corresponding vexillographical chart. The fitted CDR function is CDR index = 1.53C + 0.14D + 0.23R - 1.21C·D·R, where G= CDR index (highest G-lowest G) + lowest G, highest G=\$83,066 and lowest G=\$1,112.That is, a function that serves as an index that can be used to compute G in any year for any country where C, D and R are known, and the highest and lowest G in the world are known. The CDR model explains 83% of the variation in G with a straight line. The residuals (not shown) are random, implying that there is no omitted variables bias.

C comprises both exogenous entrepreneurship capital and endogenous capital stock. The endogenous capital stock component can bias the estimated model thereby requiring special econometric methods that are beyond the syllabi of introductory economics. Suffice it to say that the model was re-estimated for years 1995 through 2016 for which data were available and the results were approximately the same. This establishes that after adjusting for country factors of production, the conversion of C to G is global time invariant. The conversion is always the same in all countries and is governed by the natural laws of science. It places the former dismal science as it relates to economic growth theory on a sound scientific footing. The time invariance of the CDR model implies that dynamic modeling is unnecessary. What is often described as high country productivity is actually its ability to attract capital. In this model R creates stability that attracts C and D is a virtue that creates additional pathways for the efficient deployment of C. Tangible wealth includes natural resources. But, CDR theory shows that after controlling for C, D, and R, natural resources explains only a negligible 6% of the variation in g. Furthermore, there is the problem of the Dutch disease paradox that natural resources can be responsible for (Ebrahim-zadeh, 2003). See also Auty, 1993, Sachs and Warner, 2001, Ross, 2001, Sala-i-Martin and Subramanian, 2003, Humphreys, 2005, Wadho, 2014. Ridley (2017b) gives a didactic account of how bauxite negatively impacted the Jamaican dollar. So, the natural resources variable was dropped from the CDR model. Geographical latitude explains only 4% of the variation in G. Furthermore, latitude can play no role in policy making since a country cannot change its latitude. Government spending had no impact on the model R_{adj}^2. So, latitude and government spending were also dropped from the CDR model.

To convert intangible G to tangible wealth, G must be distributed to all the units of production in terms of C that is as a fraction of G. In general, consider *m* countries, *i=1,2,3,...m,* where country *i* contains n_i microeconomic production units of monetary value $v_{ij} = f(f_{ij}G_{ij}, w_{ij}) = A_{ij}(f_{ij}G_i)^{\alpha_{ij}} w_{ij}^{1-\alpha_{ij}}$, where f_{ij} is the fractional allocation of total capital and w_{ij} is the monetary payment for corporeal labor. Here, fixed capital stock K is replaced by total capital C (entrepreneurship human capital and capital stock) and G=*f*(C,D,R).The aggregate production for country *i* is given by $\sum_{j=1}^{n_i} A_{ij}(f_{ij}G_i)^{\alpha_{ij}} w_{ij}^{1-\alpha_{ij}}$.The global aggregate for all *m* countries is $\sum_{i=1}^{m} \sum_{j=1}^{n_i} A_{ij}(f_{ij}G_i)^{\alpha_{ij}} w_{ij}^{1-\alpha_{ij}}$.

Entrepreneurship: information theory of economics
So, what is a modern economics pedagogy that begins with an economic theory of entrepreneurship? Entrepreneurship is the process of starting a business, typically a start-up company offering an innovative product, process or service. It distinguishes itself from the expansion of routine business for which the outcomes are well known. Contrary to the standard economics curriculum, it cannot be reduced to a simple career choice between a job and self-employment in pursuit of profit incentive versus wages. To do so would be to ignore the human spirit that is involved. When successful, the rich entrepreneur continues to innovate. This is despite their inability to eat more than three meals daily, drive more than one car at a time, live

in more than one house at a time, etc. This is evidence that entrepreneurship is an act of giving rather than one of taking.

We know from the CDR index model that intangibles are what create wealth and tangibles like natural resources are negligible. Furthermore, negligent financial management can mark the onset of the natural resources curse. Combined with capital stock, including knowledge, both of which continuously depreciate, equilibrium leads eventually to poverty. Knowledge is about the past and entrepreneurship is about the future. New entrepreneurial human capital ideas are the source of wealth. But, to be wealth effect positive, ideas must create disequilibrium. That is the nature of innovation. With no more innovation, there is a return to equilibrium (see also Schumpeter (1911), pp. 43 & 81, Knight(1921), pp. 264-266, Schumpeter (1928), p. 241, Weber (1930), p.67, Hayek (1945), p.523, Lina and Siegel (2007), p.21, and Spulber (2009), p.194, Schumpeter (1954), Roncaglia (2005)).

Capital is typically converted via a production process into products and services. R is necessary to attract C and D is necessary to create additional pathways that deploy C effectively. New ideas appear to us as quanta of information that must be detected and acted on (Gilder, 2013, Romer, 1990). But, a low D, low R high noise environment blocks exogenous innovative C. A high D, high R low noise environment is required for the detection of human entrepreneurial ideas. Sometimes it is the people who no one imagines anything of, that do the things that no one can imagine. Heterogeneous exogenous catalysts D and R are government variables that provide positive social equilibrium effects. Heterogeneous variables do not change their form. Exogenous variables are external to the process, do not get used up, and at the end of process are ready for reuse as before. Catalysts do not take part in the process (Berzelius, 1835).The process by which exogenous innovative C is converted to products is depicted in Figure 1. The variable g is the standardized version of G used to estimate the CDR model (see Appendix).
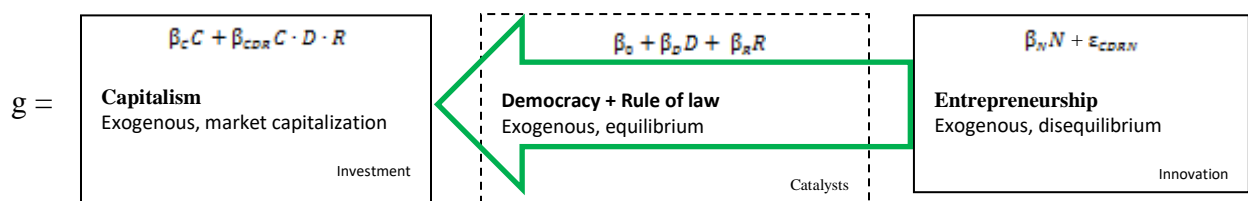

Figure 1. Conversion of exogenous innovation C to g through a DR channel.

Revising the econ 101 course

In order to incorporate the new CDR growth model, it is necessary to revise the extant economic curricula in a small number of ways. Although only few, the implication of the revisions is profound. And, there is no need to push any topics out to make room for entrepreneurship. The presentation and explanation just need to be modified. In order to fit the limited number of pages in this paper, only a single syllabus for an introductory course will be considered. Other courses

can be revised similarly. The first item to include is the CDR model itself as the genesis of wealth. It is not a competitor of the production model. It is a prerequisite to the production function. It provides the initial human capital to the production function. Without CDR, the creation of wealth will be negligible. Furthermore, there will be no growth. A few other topics are revised where appropriate to account for the CDR effects. The selected course is that of Professor Randall Holcombe of Florida State University (Holcombe, 2013), and co-author of Gwartney, Holcombe, Lawson (1999, 2004, 2006). He and others identified the importance of economic freedom. And, the D and R components of the CDR model are economic freedom-like variables in the way they impact economic growth (see also Mailer and Miller, 2017).The course is titled "Introduction to Economic Thinking (ECO2000)"and is listed in the State of Florida, USA as a principles course for non-majors. Principles courses are also listed for economics majors. So, ECO2000 is the most rudimentary. Professor Holcombe's syllabus and course outline are particularly well articulated, making it easy to identify subtopics related to entrepreneurship. For example, the first subtopic "Spontaneous social order" is perfect for introducing entrepreneurship albeit in this paper the preferred title is "The genesis of wealth." The textbook is "Economics and Contemporary Issues, 7th ed., by Moomaw and Olson."The original topics 1-12 in the syllabus are listed in the left column in Table 1. The centre and right columns list descriptions and reasons for the revisions, respectively.

Table 1
Introductory Economics Course (*changes in italics*)

Traditional Topics	*Proposals in italics*	**Rationale for change/addition/removal**
1.Spontaneous social order A. Do we take our wealth for granted? Why are we rich? B. Language, money, markets. C. The results of human action but not of human design. D. The problems of coordinating the individual knowledge of everyone in the economy.	**1.** *The genesis of wealth* A. *Wealth is all in the mind Ridley (2017a).* B. *Market capitalization (C).* C. *Democracy (D).* D. *Rule of law(R).* E. *Entrepreneurship.* F. *Real per capita gross domestic product adjusted for purchasing power parity G=f (C, D, R).*	The source of wealth is human capital entrepreneurial ideas of imagination and creativity. Capitalism is a method of organizing capital. It is measured by total capitalization and includes human capital plus capital stock. Rule of law (R) establishes stability that attracts capital. Democracy (D) creates additional pathways for the effective deployment of capital (C). The internet enables coordination of individual knowledge throughout the economy. D and R are catalysts. CDR generates intangible wealth that is subsequently converted to tangible wealth. Natural resources account for 6% of G. Latitude account for 4%.
2. Economics and prosperity. A. Economics is the study of how we use what we have to get what we want. B. Adam Smith and the division of labor. "The division of labor is limited by the extent of the Market."	**2. Economics and prosperity.** A. Economics is the study of *wealth creation and* how we use what we have to get what we want. B. Adam Smith*: Division of labor.* "The division of labor is limited by the extent of the market." *Denis Ridley (2017b): Division of*	The source of wealth must be acknowledged to permit each new born person to bring their own wealth into the world. Said wealth must be released through human capital entrepreneurial ideas of imagination and creativity, and conversion from intangible wealth to tangible wealth of goods and services via a production process. Capital is comprised of entrepreneurship and capital stock of machines, knowledge learned from entrepreneurs, computers and recording devices. Just as division of labor creates surplus capital,

C. David Ricardo and Thomas Robert Malthus: Economics as the dismal science. D. How long has the world economy been growing? E. Capital and labor productivity.	*capital. Wealth is unlimited.* C. David Ricardo and Thomas Robert Malthus: Economics as the dismal science. *Dennis Ridley(2017a-b): CDR predicts 83% of variation in growth.* D. *Massive growth began with the industrial revolution.* E. Capital and *corporeal labor* productivity.	the division of human capital creates surplus wealth. If human imagination is unlimited, then wealth is unlimited. Magna carta, scientific and cognitive revolution, democracy, rule of law, and the limited liability company created the perfect storm for the start of the industrial revolution and unprecedented economic growth. The human being has the ability to convert skill in a seamless fluidic adaptation to a machine such that the capability or capital stock of the machine is automatically expanded. All labor is corporeal.
3. Some key concepts for economic thinking. A. People respond to incentives. B. The Production Possibilities Curve and Opportunity cost. C. Gains from trade: 1. Exchange is a positive sum game. 2. People earn income from providing benefits to others. 3. Comparative advantage. D. Compound interest and the "rule of 72." E. How you can get rich. Pay attention to this lecture!	**No change**	
4. Supply and demand. A. How markets determine prices and quantities. B. Market efficiency and the "Invisible Hand." C. Interference with markets. D. Stock market prices and the efficient markets hypothesis. E. Wage determination and the marginal product of labor. F. Karl Marx and the labor theory of value.	**No change**	

5. Profits guide resources toward activities that increase wealth. A. Profits are a reward for enhancing the wealth of the economy. B. Losses are a penalty for squandering the wealth of the economy. C. Entrepreneurship is the key to economic progress. 1. The process of entrepreneurial discovery. 2. The environment conducive to entrepreneurship. 3. Ludwig von Mises and the socialist calculation debate.	**5. Profits guide resources toward activities that increase wealth.** A. Profits are a reward for enhancing the wealth of the economy. B. Losses are a penalty for squandering the wealth of the economy. C. Entrepreneurship is the key to economic progress. 1. The process of entrepreneurial discovery. 2. The environment *required for* entrepreneurship ~ *CDR*. 3. Ludwig von Mises and the socialist calculation debate.	The environmental that is not only conducive but required for entrepreneurship comprises capitalism (C), democracy (D) and Rule of Law (R). The source of wealth is human capital entrepreneurial ideas of imagination and creativity. Capitalism is a method of organizing capital. It is measured by total capitalization and includes human capital plus capital stock. R establishes stability that attracts capital. D is a virtue that creates additional pathways for the effective deployment of C. D and R are catalysts. CDR generates intangible wealth that is converted to tangible wealth. Entrepreneurship is an act of giving and entrepreneurs are a gift to mankind. They give up their leisure time to perfect products and their manufacture to make them affordable to the common man so as to promote increased leisure time for all. A high D, high R low noise environment is required for the detection of human entrepreneurial ideas. Heterogeneous exogenous catalysts D and R are government variables that provide positive social equilibrium effects. Heterogeneous variables do not change their form. Exogenous variables are external to the process, do not get used up, and at the end of process are ready for reuse as before. Catalysts do not take part in the process.
6. Economic efficiency. A. Monopoly. 1. Barriers to entry and monopoly profits. 2. Transitional profits and the return to entrepreneurship. 3. Government-produced barriers to entry. B. Other market failures. 1. External benefits 2. Public goods 3. External costs 4. Imperfect insurance markets	**No change**	
7. The role of government. A. Protect individual rights. B. Protect freedom of exchange. C. Protect private property.		

D. Enforce a rule of law. E. Address problems with markets. 1. Externalities and public goods. 2. Money and monetary policy. 3. Infrastructure and investment. F. The role of government in: 1. Health care. 2. Crime and drugs 3. Education 4. Poverty.	**No change**	
8. Private ownership provides incentives for wealth creation. A. Incentives with private ownership. B. Private versus public property. C. Applications: Endangered species and natural resource conservation.	**No change**	
9. Economic indicators A. Income indicators like Gross Domestic Product. B. Nominal versus real GDP. C. Price level indicators like the Consumer Price Index D. Government's share of GDP. E. Aggregate supply and aggregate demand. F. Unemployment: the natural rate and deviations from it.	**No change**	
10. Monetary Policy. A. Money and the equation of exchange. B. Real versus nominal prices and interest rates. C. The concept of full		

employment. D. Short-run and long-run impacts of money. 1. Interest rates. 2. Price level. 3. Real income. 4. Employment.	**No change**	
11. Money and banking. A. The Free Banking Era. B. The role of government in the monetary system. 1. The origins of the Federal Reserve System. 2. The role of the Federal Reserve System. 3. Monetary policy and the Great Depression. Milton Friedman's monetarism.	**No change**	
12. Economic policy. A. Stability versus fine-tuning. John Maynard Keynes and economic policy. B. International trade and trade barriers. C. Human and physical capital, and per capita income. D. Competition and monopoly. E. Public policies toward wealth and poverty.	**12. Economic policy.** A. Stability versus fine-tuning. *Demand side:* John Maynard Keynes and economic policy. *Supply side: Dennis Ridley (2017a-b) and economic policy.* B. International trade and trade barriers. C. Human and physical capital, and per capita income. D. Competition and monopoly. E. Public policies toward wealth and poverty. *Growth requires CDR. Ridley (2017c).*	As explained by Steve Jobs (1955-2011) "A lot of times, people don't know what they want until you show it to them," and the alleged statement by Henry Ford (1863-1947) "If I had asked people what they wanted, they would have said faster horses,"demand side financial economics can only act on existing products. Since people do not naturally know what they want. Demand side policy cannot stimulate the creation of new products and wealth. The creation of an entrepreneurial environment will tap into the only source of wealth and growth, the mind. A negative income tax in which the government pays a living wage supplement to all employed people is a source of micro intrapreneurship wealth. Welfare supported unemployed people are dead capital that cannot produce wealth. Economic growth is independent of natural resources, government spending, country size, location, culture, and physical characteristics of the population. Rule of law improves as corruption is reduced, contracts are enforced and property rights are clarified.

CONCLUDING REMARKS

This paper brings to the attention of economics professors the need to explain the true genesis of wealth. The Ridley (2017a, b, c) CDR growth model was selected, not to compete with the production function but as a complementary prerequisite to the production function. Students that lack an entrepreneurial family background and who think that the only source of wealth is

always already established in existing factories and distribution networks might easily see no relationship to their life and be discouraged from entrepreneurship (see also Celuch, Bourdeau, Winkel (2017),Tognazzo, Gubitta and Martina (2016)). The real tragedy of the poor is the poverty of their aspirations (Adam Smith).The CDR model identifies the source of wealth as being the human ideas of imagination and creativity. Therefore, even the poorest person is a carrier of the source of wealth and might more easily see themselves as a potential entrepreneur when so exposed through the modified course (see also Ridley, 2017c).

The introductory course should begin with the genesis of wealth based on the aggregate CDR growth model G=f(C,D,R). Then, progress to micro production functions that convert intangible wealth of human capital ideas into tangible wealth of goods and services. The micro production function should be a single unit in which capital is a fraction of G, labor is replaced by corporeal labor, and the value of the production is summed up and reconciled with gross domestic product. An economic theory of entrepreneurship based on the CDR growth model should be included. Other topics should be modified to reflect the implication of the CDR model, namely global time invariance of the conversion of capital to standard of living, dependent on capitalism, democracy and rule of law, and independent of natural resources, government spending, country size, location, culture, and physical characteristics of the population.

Nomenclature

Endogenous	Generated from within a system.
Entrepreneurship	The process of starting a business, typically a startup company offering an innovative product, process or service.
Epistemology	The investigation of what distinguishes justified belief from opinion.
Exogenous	Generated from outside a system.
Capitalist	A person who deploys his personal capital so as to maximize his benefit.
Capitalism	Mechanism for the collection and assembly of capital.
Catalysis	The creation of alternative pathways to enable a process.
CDR index	The vector inner product (dot product) of the global constant [1.53 0.14 0.23 -1.21] and the country [C D R C·D·R].
Company	The instrument of capitalism for the profitable investment of capital.
Democracy	Private work force idea participation and periodic election of public representatives (catalyst for the process of generating G from capital).
Gross domestic product	The monetary value of all the finished goods and services produced within a country's borders in a specific time period.
Intrapreneurship	The employee practice of entrepreneurial activity inside a large business without incurring the associated risk.
Micro intrapreneurship	The low skill employee practice of micro entrepreneurship in variance reduction, quality improvement or customer relations at a business by virtue of proximity to a task.
Natural resource rents	Surplus value of natural resources after all costs and normal returns are accounted for.
Property rights	Property is a legal expression of an economically meaningful consensus by people about assets, how they should be held, used and exchanged.
Rule of Law	Reverse of corruption (protection of shareholder and other property rights) (catalyst for the attraction of capital).
Virtue	Self-governing human property that promotes fairness and justice without the need for central government.

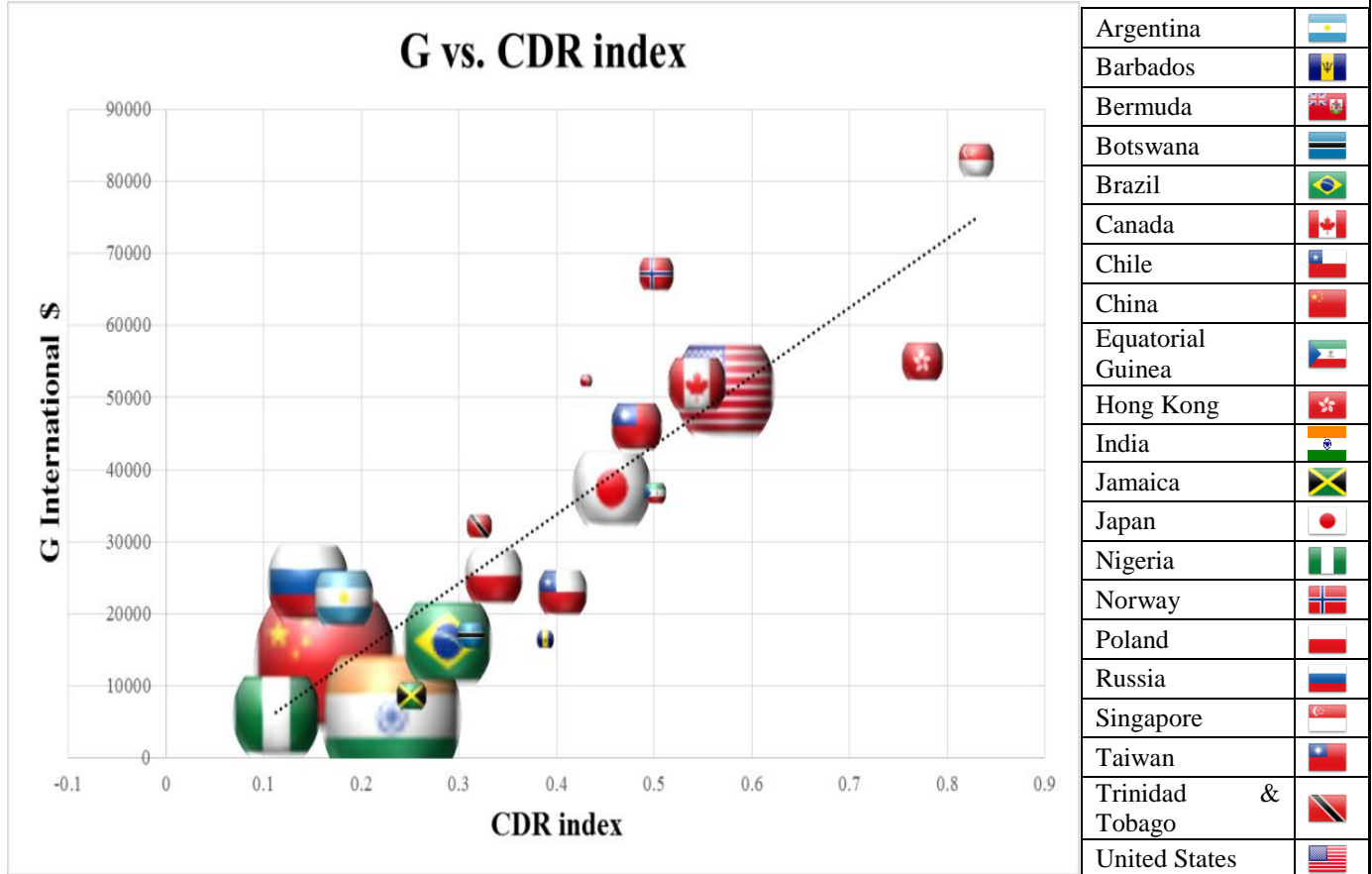**APPENDIX: the Source and Mechanism of change in Wealth**

Argentina	
Barbados	
Bermuda	
Botswana	
Brazil	
Canada	
Chile	
China	
Equatorial Guinea	
Hong Kong	
India	
Jamaica	
Japan	
Nigeria	
Norway	
Poland	
Russia	
Singapore	
Taiwan	
Trinidad & Tobago	
United States	

Figure 2. Year 2014 G vs CDR Index for 79 countries (line). Bubble size (21 countries) is the square root of population. This model was re-estimated for years 1995 to 2016 with similar results. For additional comments on the countries listed see Ridley (2017a, 2017b).

Standardized g model

The ordinary least squares *g* model is specified as follows:

$$g = \beta_0 + \beta_C C + \beta_D D + \beta_R R + \beta_{CDR} C \cdot D \cdot R + \beta_N N + \varepsilon$$

where, the intercept β_0 and the coefficients $\beta_C, \beta_D, \beta_R, \beta_{CDR}, \beta_N$ are all dimensionless,

ε is arandom, normally distributed error with a mean of zero and constant standard deviation,

and where all model variables are standardized as follows:

$g \qquad\qquad = \dfrac{G - \text{lowest } G}{\text{highest } G - \text{lowest } G}$

$G \qquad\qquad$ = per capita real gross domestic product per capita (PPP)

C (Capitalism) $= \dfrac{\text{per capita capitalization} - \text{lowest per capita capitalization}}{\text{highest per capita capitalization} - \text{lowest per capita capitalization}}$

D (Democracy) $= \dfrac{\text{lowest democracy rank} - \text{democracy rank}}{\text{lowest democracy rank} - \text{highest democracy rank}}$

R (Rule of law) $= \dfrac{\text{lowest corruption rank} - \text{corruption rank}}{\text{lowest corruption rank} - \text{highest corruption rank}}$

N (Natural resources) $= \dfrac{\text{per capita total natural resource rents} - \text{lowest per capita total natural resource rents}}{\text{highest per capita total natural resource rents} - \text{lowest per capita total natural resource rents}}$

These transformations standardize the variables and ensures upper and lower bounds on $0 \le g, C, D, R, CDR, N \le 1$.

Democracy and corruption are rank ordered, where the highest=1 and the lowest = the number of countries. G is measured in \$/capita/year.

$\hat{g} = 1.53C + 0.14D + 0.23R - 1.21C{\cdot}D{\cdot}R + 0.38N$

$t =$ *(6.60) (1.69) (2.60)   (4.40)   (5.59)*   F ratio = 81.

Partial correlations (contributions to R^2_{adj}):

  59%   5%   10%   3%   6% $R^2_{adj} = 83\%$.

Where ^ denotes estimated or fitted value and G can be estimated from

$\hat{G} = \hat{g}$ (highest G-lowest G) + lowest G.

Highest G=83,066. Lowest G=1,112.

The CDR index $= 1.53C + 0.14D + 0.23R - 1.21C{\cdot}D{\cdot}R$ comprises positive C, D and R effects and a negative component due to friction from democracy that reduces G from what it might otherwise be if there were perfect agreement amongst decision contributors. The contribution from N is negligible and can be dropped from the model.

Click here for spreadsheet data and calculations.

Data sources
Capitalization(US\$mundi)http://www.indexmundi.com/facts/indicators/CM.MKT.LCAP.CD/rankings
Democracy rank   http://democracyranking.org/wordpress/rank/democracy-ranking-2014/
Corruption rank   https://www.transparency.org/research/cpi/
Total natural resources (% of G)http://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS
Democracy rank & corruption rank for Bermuda set to that for United Kingdom as the governing country
Democracy rank & corruption rank for Hong Kong set to that for United Kingdom as the recent & last governing country
Barbados (high CDR) and Equatorial Guinea (high G) are too small for attention by the reporting agencies.

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