



Feasibility of the Development of Green Economy: Dualities in Exogeneity and Endogeneity

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Abstract

Green Economy is designed to increase global “green” research, to motivate political “green” decisions, and to support “green” investments. Specifically, this paper offers three dimensions of green economy: economic perspective, political perspective, and ethical perspective to illustrate a sustainable approach of the green economy. There aren’t perfect solutions to solve a problem, so does implementing sustainability as a tool to solve environmental problems. However, there are still many economists looking for a perfect “free lunch” in sustainability, which they are overly optimistic about their sustainable calculations, but end up shooting themselves in the foot. Thus, the answer to the development of the green economy should be within the duality of “benefits and costs”, “conflicts”, and “opportunities and challenges”. Overall, the paper is constructed in a format of exogenous dualities that consists of “benefits and costs”, “conflicts” and “opportunities and challenges”.

Keywords: *Green Economy, duality, sustainability, exogeneity, endogeneity*

1. Introduction

“The truth is: the natural world is changing. And we are totally dependent on that world. It provides our food, water and air. It is the most precious thing we have, and we need to defend it.” --- David Attenborough

The modern economic model in today’s society exacerbates climate change, triggers unfair distribution of wealth and increases extinction of species. The transformation to a new economic model is needed to cope with the current problems so that we will be living in a world that is supportive to human well-being, builds social equity, and mitigate risk of social scarcities. Thus, the pathway towards this new model of economy is called green economy, which is designed to increase global “green” research, motivate political “green” decisions, and support “green” investment.

The paper begins to answer three essential questions: “what it is”, “how it is”, and “where it is”. These questions provide a very basic understanding for the green economy. “What it is” covers the multiple definitions of green economy, and its principles of application to the world. “How it is” gives us a better understanding of the world through the sustainable approach of the green economy and shows the differences from traditional economic approaches.

“Where it is” covers the goals of the green economy, and specifically on what we have achieved and what will be achieved in the long run. However, the paper doesn’t introduce the relationship between green economy and sustainable development; instead, the paper includes the green economy within the scope of sustainable development for better understanding. Moreover, the word “sustainable development” is meant towards “the development of green economy” along the paper due to a possible bias of wording that the idea cannot be fully distinguished.

Fundamentally, the paper offers to readers three dimensions of green economy: economic perspective, political perspective, and ethical perspective. In economic perspective, the conversations are based upon the Aggregate Production Function, $Y=zF(K, N)$, which measures the total output of macroeconomics through the influences of the green economy. For each of the variables such as productivity, capital, and labor, the paper utilizes Solow's growth model and Diamond-Mortensen-Pissarides (DMP) model for the purpose of looking at those variables individually for their influences under the green economy. Moreover, the section of economics incorporates knowledge in physics to improve readers’ understanding of functions of the world so that the implementation of green economy is in a better position to solve the environmental problems. In

political perspective, the paper offers three “conflicts” that can trigger the thinking of a green economy in the political system. As James Madison said, “If men were angels then no government would be necessary” [18]. This reveals that “conflict” is inevitable in the current political system, and it is the way to incorporate or to infuse the green economy in it. Moreover, the wording for “green economy” switched up to “sustainable development” (as mentioned earlier that sustainable development meant to be the development of green economy) because of a possible misleading. For example, if the wording doesn’t change, then readers can hardly distinguish between politics and economy despite the fact that they are in different sections. In other words, economy and politics should be completely separated not only by the separation of sections but also by the separation of wordings that might elicit the thinking about economy in the section of politics. In ethical perspective, the paper makes an assumption that the society approves sustainable development for future implementation, and thus brings forward a guideline to follow and rise a challenge when following the guideline of sustainability.

Overall, the paper is constructed in a format of exogenous dualities that consists of “benefits and costs”, “conflicts” and “opportunities and challenges”. At the end, the paper returns to people themselves that concludes with a powerful idea of endogenous duality, which individual preference is the alternative key to open the truth of development of the green economy.

2. Green Economics Overview & General Discussion

2.1 What is the Green Economy?

In 1989, *Blueprint for a Green Economy* was published, and this was the very first time that a practical policy measuring the “green” growth was being enplaced to give social science a brand-new ideology. This also set up a milestone for sustainable development in terms of economy for the incoming 21st century. As such, the green economy takes on the responsibility to promote a low-risk environmental condition between human and nature, which focuses on an approach that promotes a harmonious economic relationship between them. However, what’s unfortunate is that there is no single internationally agreed definition to define the term Green Economy. According to *A guidebook to the Green Economy* published by UN Division for Sustainable Development (UNSD), there are currently eight separate definitions identified, and the most widely cited one is from UN Environment Program (UNEP), “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient, and socially inclusive” [1]. Despite the definitions don’t

coming into one single agreeable format, UNEP provides a guideline, which includes five principles of green economy shall follow: the wellbeing principle, the justice principle, the planetary boundaries principle, the efficiency and sufficiency principle and the good governance principle [11]. The wellbeing principle prioritizes investment and access to sustainable natural systems that can be built from the collective action which will create genuine shared prosperity. The justice principle promotes the equitable distribution of opportunity and outcome that leads into a long-term perspective on the economy and creating wealth in terms of social justice which results in non-discriminatory society. The planetary boundaries principle acknowledges the limited substitutability of natural capital with other capital so that investing in innovation towards the natural system becomes critical and essential because it provides services that underpin the economy and nature’s cultural values and diversification. The efficiency principle recognizes that there must be a significant global shift from consuming natural resources to sustainable levels if we are to remain within planetary boundaries, and the principle embraces new models of economic development that addresses the challenge of creating prosperity within planetary boundaries. The good governance principle states that the green economy shall be supported by institutions and governance levels with adequate capacity to meet the respective roles in accountable ways so that decision making procedures at local economies will be maintained to safely serve the interest of society. Thus, the idea of the green economy is a tool that eventually goes down to solve the global environmental issue at the same time to keep remaining in a stable and productive growth in social welfare.

2.2 How is Green Economics Different from Neoclassical Economics?

Neoclassical economics allocates the resources available to society in a way to maximize social welfare, and so does at the sustainable level. For example, economists tend to value the tool of efficacy analysis that decides on the trade-offs among tangible material in the environment, and this would be called Pareto-optimal. At the optimum, the state of the economy is used efficiently such that it is theoretically impossible to make anyone economically better off without making someone else economically worse off. Thus, neoclassical economists borrow terminology from existing theories of economic growth to sustainable development. The essential form of sustainable development from the perspective of neoclassical economists is that, at the optimal, the accumulation of welfare will cause the society to have either positive externality or negative externality in the environment. Hence, neoclassical economists largely rely on the market mechanism to solve what’s arising in sustainable development. However, this makes the environmental benefits too difficult because of

diversification of preferences. “People’s preferences as self-interested, market-oriented consumers are often not consistent with their public policy opinions as socially minded citizens” [10]. In other words, there will be a social problem of deadweight loss in the supply and demand situation at the micro-level that creates a negative externality. In the future, as the growing population, in addition to solving the negative externality and removing the deadweight loss become real the challenge for neoclassical economists from what they have been believed to be the tool mainly within the market system. In short, the advantage of neoclassical economy is able to utilize meaning in monetary terms that can make in the language of influential decision makers; the disadvantage of neoclassical economics is based on the neoclassical framework that can be argued as many sources as possible of other problems in the society, particularly divergence of interest between micro and macro, so there is critical point for neoclassical be the approach to sustainable development.

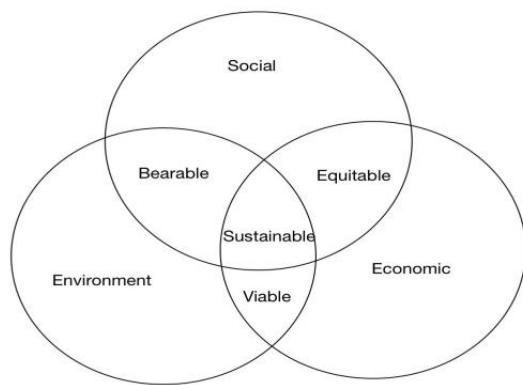


Figure 1. Neoclassical economics approach; the environment is part of the neoclassical economic system (self-generated) (for non-commercial use only) [20].

The methodology of neoclassical economics is changed dramatically when it has been added one other dimension: natural capital. Although one dimension is being added into the methodology, green economists employed the natural capital to make other derivatives, which included, as stated in the principle, ecology, politics, finance, ethics...etc. Natural capital is an idea of natural resource endowment, and humans depend on this endowment for a whole range of important benefits including health and sustenance [2]. In other words, the discipline of economics is now being considered under the discipline of the environment because of the natural capital, whereas neoclassical economics is independent from the discipline of the environment. Hence, the perspective of sustainable development has been changed dramatically. Through the lens of green economics, sustainable development now becomes the analysis of both inside and outside of the market system. Particularly, green economists understand sustainable development from the evaluation of the environment in terms of

natural capital. One aim of the evaluation is to balance the demand and supply, “The elementary theory of supply and demand tells us that if something is provided at zero price, more of it will be demanded than if there was a positive price” [2]. If by treating the environment as zero price for natural capital, then we will never protect the environment due to the incentives of none stopping consuming it. One take away from the theory is that resources and environment serve economic function and should have positive economic value; hence, the dimension of natural capital will be put forward not only economically but also politically for practice to incentivize environmental improvement. However, this doesn’t mean that the green economy is the perfect fit for approaching sustainable development, because the challenge is now in how to achieve sustainable economic development meanwhile enhancing human well-being.

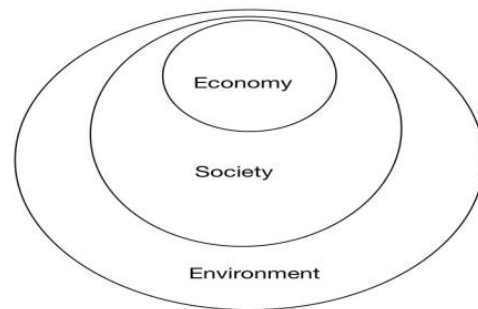


Figure 2. Green economic approach; the economy and society are to be within the environmental sphere (self-generated) (for non-commercial use only)[20].

2.3 Where We are Right Now and Where We Will Be Heading in the Green Economy?

In 2008, due to the aftermath of the 2007 financial crisis, the term green economy was revived in the public eyes. Green economy was conducted in response to this crisis in which UNEP “championed the idea of green stimulus packages”. Specifically, UNEP launched the Green Economy initiative to provide both analysis and investment in sectors that needed a reform to be environmentally friendly. Moreover, the report from UNEP called Global Green New Deal (GGND) prepared the government with three indicators: (i) economic recovery; (ii) poverty eradication; and (iii) reduced carbon emissions and ecosystem degradation (United Nation). Through these three indicators, there are governments such as China, European Union and the United State taking the lead in multiple funding areas including renewable electricity production; building retrofits; incentive schemes for low-carbon vehicles; energy network expansion; green transport infrastructure; and clean energy research and technology investment. For example, one of the largest global green stimulus spending was a railway infrastructure development in

China, which was almost USD 100 billion from 2010 to 2012; from 2008 to 2009, the US initiated the USD 32 billions of subsidies of feed-in tariffs(wind) as to incentivize the growth of utilizing green energy [14].

Additionally, in February 2010, UNEP has further defined and promoted the concept of green economy and to contribute this work through the preparatory process for the UN Conference on Sustainable Development in 2012 (Rio+20). The Rio+20 conference provides partnership with countries to improve production processes and consumption practices to reduce wasting resources. For example, “The UN Environment is supporting Mongolia in the implementation of the National Green Development Policy, integration of the green economy into local level development plans, Sustainable Development Goals indicators and greening of key sectors” (United Nation). These multi-stakeholder partnerships accelerate the development of the green economy globally so that countries would take the natural capital into a serious account for future investing evaluation.

The Environment and Trade Hub enables countries to use trade and investments as vehicles for future developing agenda. As UNEP noted, the *2030 Agenda* provided a platform and interaction between countries for the “green” diffusion. Moreover, the agenda delivers seventeen sustainable development goals for partner countries to implement*. In the vision, the *2030 Agenda* is a call for the future action to shift our world from consuming nonrenewable energy to renewable energy for the purpose of gaining higher welfare into the whole society.

3. Economic Perspective of Green Economy

3.1 Economic Benefits

3.1.1 Productivity Potential

Speaking of economic measure, the Solow growth model is the basis for the modern growth theory that gives an access to a long-run economic growth by looking at the exogenous variables. The model explains, in this section, an essential prediction that technological progress in terms of the green economy is necessary for sustained increases in standard of living. For remarkable economic growth in the last three decades, China has become the second largest economy in terms of gross domestic production. However, the costs of nonrenewable energy spending tolerate people’s living conditions in terms of environmental quality. Data has shown that pollutants such as dust and sulfur dioxide (SO₂) have increased dramatically, accounting for about 30% (respectively) of the world’s total emissions in 2012 [17]. In the same sample period, the GDP growth rate was about 14.4%. In comparison, the averaged green productivity growth rate was about 9.1%. While the GDP

growth rate comes from two sources: first input such as capital, labor and energy; second input such as total factor productivity (TFP) in a macro scale. If we are assuming the two sources are the exogenous variable as Solow growth model defines, then it can be concluded that “heavy independence on energy use and pollution emission does stimulate the GDP growth, however, the green productivity growth in China is only moderate and mainly slower than GDP growth” [17]. The conclusion implies that, without heavy independence on nonrenewable energy used, China could still generate a considerably high annual growth of GDP if they increase the innovation for the green economy and to conduct it as their primary exogenous variable. Therefore, it is imperative for China to achieve a considerable goal of resources conservation for environmental protection in which an increasing share of total factor productivity (TFP) is necessary. Back to the Solow growth model, since green economy innovation contributes an increase in TFP (z) that isn’t bounded above, and it will then theoretically generate a higher capital to economy every time as TFP (z) increases. Consequently, this is true for other developing countries that taking the innovation of transformation to the green economy is a way for increasing the standard of living while maintaining the same high growth rate of GDP, and it is a way for the developed countries to fight with the diminishing of capital.

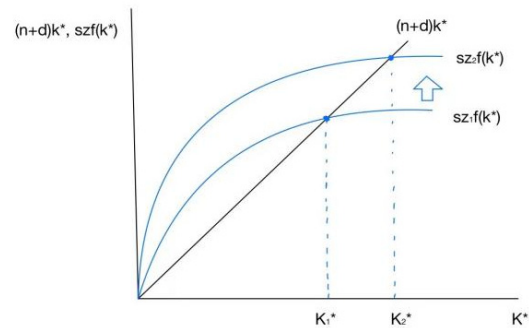


Figure 3. Solow Growth Model with innovation of TFP(z) increases (for non-commercial use only)

3.1.2 Employment Potential

The Diamond-Mortensen-Pissarides (DMP) model was used as an economic measurement for how employment in the green economy generates an extra market share. The assumption in the DMP model in this section is for the initial state to be equilibrium so that we can change certain exogenous variables for the purpose of understanding. Due to the positive effect of the green economy on labor productivity above, it’s worth noting that the increase in labor productivity would also have a chain-effect in employment in terms of search and match. For example, a paper by Georgeson and Maslin named *Estimating the scale of the US green economy within the global context*, and they found that “the US green

economy is estimated to represent \$1.3 trillion in annual sales revenue and to employ nearly 9.5 million workers; both of which have grown by over 20% between 2012/13 and 2015/16” [13]. To put the data in analysis, the green economy represents 7.13% of the US GDP in 2015, and 9.5 million workers represent an 8% of total US working population (116.31 million employees in 2013). Although this data alone cannot tell us that the green economy produces better than harm to the total employment, the numbers still have their significance to be evaluated in terms of an increase in production and consumption in the green economy and in the economy as whole for which the US should consider. On a larger scale, sectors such as energy, agriculture, design, tourism and transportation will all experience an increase because the innovation in the green economy has been grown up. According to the Research Institute of Organic Agriculture (FIBL) and International Renewable Energies Agency (IRENA), the organic agriculture market is growing around the world, and particularly in

the US, the organic food sales increased by 6.4% in 2017 and reaching USD 53,704.68 million; the renewables energy sector has increase of employments of 5.3% in 2017 with respect to 2016 [16][8]. Back to the DMP model, an increase of innovative productivity in the green economy would lead to the increase of the total surplus in the economy. Due to the increase of total surplus, the labor wages will also increase as the worker gets the same share of a larger pie. As profit is higher, the vacancies become more attractive for firms, so labor market tightness rises, and this will affect the supply side that the consumer searching for work becomes more attractive as wage is higher and the chances of finding work are higher. Therefore, according to the DMP model, what we will see theoretically is total employment rises, unemployment rate falls, vacancies rise, total output (GDP) increases. In fact, the theoretical model matches reality very well on how the increasing innovation of the green economy can contribute to the overall economy and employment.

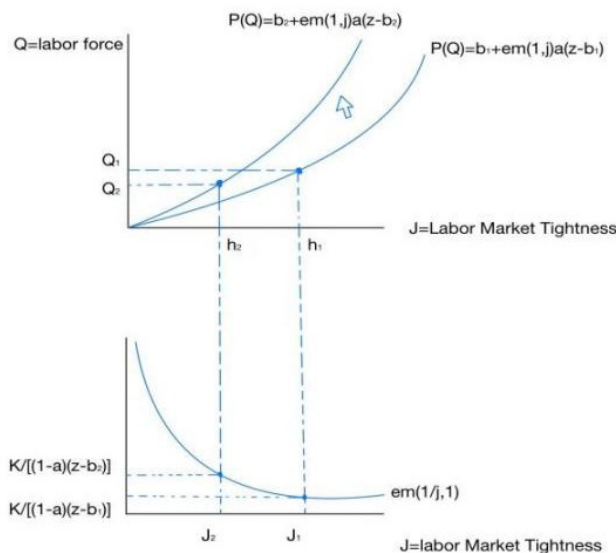


Figure 4. DMP Model with TFP (z) increases (for non-commercial use only)

3.1.3 Human Capital vs Natural Capital

The modern growth theory should also be looked into the growth itself, which is in terms of endogenous variables. The “endogenizing” technique of modern growth theory is accounting the investments in human capital: the investments to human capital relies on some non-zero input that will eventually have an outcome of a non-zero output. However, the idea of endogenous growth of human capital ignores the aspect from the second law of thermodynamics that all resources within the intermediate production process will be turned into a flow of high entropy energy and is ultimately released into the environment. The flow of high entropy, by its

definition, means that the resources at this stage cannot be further decomposed for any other production process, or it’s meaningless in the perspective of economics. For example, hydroelectric power will be meaningless if we reverse the process from hydropower to water energy. Hence, the law contradicts the theory of human capital that an unbound upper limit of growth in productivity for infinitely substituting the resources and environmental services isn’t achievable. This implies a conclusion that the increase of human capital will lead to an unsustainable economy which the society doesn’t expect. Ecosystems and their services now become the essential for a “better” endogenous growth model, which is accounting for the natural capital. Unfortunately, due to

the Law of Thermodynamics, it is still impossible for economists to find out the solution for a high flow of entropy resources to a low flow of entropy resources, but it is possible to slow down the process of production endogenously; in other words, economists should have eyes on the services of the ecosystems in natural capital. The idea is that society can artificially create a decrease from high flow of entropy to low flow entropy in a sustainable way to protect the ecosystem through the green economy. For most cases, the problem arises as follows: “The accumulation of wastes slows the rate at which natural capital can process waste material, as when sewage reduces the ability of aquatic ecosystems ability to process organic material” [22]. As the green economy approaches, the natural capital should have values added in order to reduce the wastes or to utilize the wastes as a reproduction for the society. According to the US Environmental Protection Agency (EPA), “the total generation of municipal solid waste (MSW) in 2018 was 292.4 million tons”, and “the total MSW recycled was 69 million tons plus 17.7 million tons of food was managed through animal feed, anaerobic digestion, biochemical processing, donation, land application” [6]. In addition, “Apple Inc. has received nearly 1 million devices through Apple programs per year. In 2018, the company refurbished more than 7.8 million Apple devices and helped divert more than 48,000 metric tons of electronic waste from landfills” [9]. This shows a potential for the wastes in human capital can be mitigated through the value that the society should take in natural capital for its foundation to human capital, and the valuation of natural capital constraint the tradeoff in human capital in terms of many forms of hurting the ecosystem services. However, the challenge exists in some ecosystem services that are irreplaceable, which the services cannot be reproduced through green economy, but the problem can be answered by the question itself that our world is closed in which economists cannot violate the Law of Thermodynamics.

3.2 Economic Costs

3.2.1 Productivity Pitfall

For the consumers to choose the side between green product and conventional product, they should also understand the implicit cost or the tradeoff of what it takes to make one product to be “green”. Tesla, Inc. is an American company producing electric vehicles with what they specify as clean energy. Explicitly, the electric vehicle runs more efficiently in terms of miles per gallon (MPG) than the gasoline vehicle, which economically one productivity is higher than the other. However, the implicit costs of making the electric vehicle actually produce more carbon dioxides than making the conventional gas. For example, “manufacturing a mid-sized electric vehicle with an 84-mile range results in about 15 percent more emissions than manufacturing an

equivalent gasoline vehicle. For larger, longer-range electric vehicles that travel more than 250 miles per charge, the manufacturing emissions can be as much as 68 percent higher” [28]. Remember that for most vehicles, they have the same productivity to the consumers economically, a private transportation from one place to the other, and it has a similar “life span” between electric and gasoline vehicles. Thus, the differences between the electric vehicle and conventional vehicle implies the idea that the company shifts the pollution from explicit to implicit (or an even more costs to it) and hoping for it doesn’t have the negative environmental impact, but the truth is being unveiled.

Additionally, the following question arises as the society balances the tradeoff between green economy and conventional economy: does consumer be better off in the standard of living when encountering the green economy? Food is a source of nutrition that provides a healthy human being for daily productivity, while organic food is the innovative product of the green economy, and it usually has a higher price than the non-organic food. According to Consumer Report, “Organic food usually costs 47% more than conventional food” [5]. Despite the solution that organic farming methods can be better than traditional methods, the implicit problem is that the society should be skeptical towards whether or not the consumer would be truly better off in living in the world of green economy, because the extra organic food prices shows that consumers are actually becoming poorer. The reason is simple, consumers spend more of their income on today’s consumption on eating organic food, but they don’t realize that they could have been richer if they save the money or to invest the money in financial tools to generate a higher living standard or to actually spend the extra money on their environmental education. Therefore, reflecting back to the Solow model, the innovation of the green economy in terms of increase in productivity (z) should be reconsidered for its unbounded increase in economy.

3.2.2 Employment Pitfall

The interaction between green economy and employment has never been simple as it appears explicitly. Green economy creates side effects to employment that will lead to a negative outcome. As the data has shown, the cost of the creation of green jobs are often not economically viable. For example, “in most of the EU countries, one creation of a green job is equivalent to almost five non-green jobs” [12]. The data reveals the longer-term costs are difficult to quantify with uncertainties in their magnitude because of the side-effect in the innovation of green jobs. Not only is it difficult for countries to keep up with green job missions, but also harder to mitigate the negative effect when non-green jobs were destroyed. For example, “up until 2011, Green programs in Spain destroyed 2.2 jobs for every

green job created and each green megawatt installed destroys 5.28 jobs on average elsewhere in the economy” [12]. The data reveals an unexpected result because while only considering the quantity of jobs but failing to recognize the implicit costs of the green economy is not totally correct. In fact, the investment on the green economy is still growing unimaginably fast due to the current recognition of climate change, and the sudden close down from Covid-19 gives an opportunity to the government signing the green stimulus packages for a sustainable economy recovery. However, beyond the scope of economics, consumers relied largely on employment in the Covid-19 circumstance, which they have seen their employment status as the way to survive. Thus, it is now to reconsider the tradeoffs of whether or not countries are willing to sacrifice the social welfare of consumers for the economy.

3.2.3 Natural Capital Pitfall

As we have discussed the implementation of natural capital as a way to slow down the process of creating waste to the environment, it is also to consider the implicit costs of taking this natural capital into our economy. Carbon tax is a tax intended to reduce the carbon dioxide emissions by implementing a higher price of supply to decrease the demand for it, and it is a representation of valuing the natural capital. However, the concern is that a carbon tax makes the usage of energy less affordable to an extent that will diminish economic growth. For example, a recent study from Capital Alpha Partners illustrates a carbon tax started at USD 49 per metric ton and increases by 2 percent annually. They came to a result that if offsetting those carbon tax with lump sum rebates to households, the loss of potential GDP that could be generated without carbon tax will equal between USD 3.75 trillion and USD 5.92 trillion over the 22-year forecast period [15]. This shows an economically damaging to social welfare, and this might lead to a long-term fiscal challenge as the carbon tax is being implemented persistently throughout federal, state and local government. Moreover, carbon tax is implicitly creating a monopoly that only clean energy can win in the market. As President Obama put it, “the point of pricing carbon is to finally make renewable energy the profitable kind of energy in America” [29]. This reveals an information that carbon tax doesn’t incentivize a free-market mechanism because government intervened in certain economy growth through manipulating the prices of intermediate process in sustainable development, and the process of manipulation itself might at the end change the ideology of individuals’ opinion towards protecting the environment from mandate of virtue to mandate of price (keep this idea in mind as we go along the paper). Therefore, the tradeoff at valuation of natural capital shows a negative impact on growth in economy and social welfare, but it doesn’t mean that it is not possible for natural capital to have benefits outweigh costs.

4. Conflicts in Political Perspective of Green Economy (sustainable development)

4.1 Ideal vs Reality

Is the ideal parallel to reality or the ideal intersect with reality from a political point of view? To answer the questions, we need to understand that an ideal political thought is the main source of pushing the political reality moving forward, and the ideal political thought only exists in Utopia, no other places. From the political perspective, Utopia is governed by *Natural Law*, which is an ideal political thought when nature is in the state of absolute equilibrium, and it states that humans possess intrinsic sense of right and wrong that governs our reasoning and behavior, which according to Blaise Pascal that “there are no doubt natural laws, but fair reason once corrupted has corrupted all”. As sustainable development in *Natural Law*, people and environment are in the state of equilibrium in which human’s action will not be against the equilibrium state. Hence, the one of the urgent political questions for reality is, as Jacques Rousseau said, “can reality be brought back to the “Golden Age” by having the ideal political thought in mind”.

Unfortunately, the difference between ideal and reality is that the ideal is in the constant motion of time that one action before will not affect the one action after, but reality is in the accelerative motion of time that the one action before will “accelerate” the one action after. Therefore, this illustrates the dimension of time in reality in which it can destroy any state of equilibrium in any period. Although this means that the current world will never be in the state of Utopia, there is still one fundamental political tool that pushes the world to intersect with Utopia. Thus, in reality, social contract becomes the foundation for all political policy that builds up the present political system. In terms of sustainable development, social contract will get in close to the *Natural Law* in the Golden Age: people give up some of their rights in order to get the benefits of living in civil society [24]. This means that the government brings in individuals’ consents to take on the responsibility for generating a sustainable living condition in society. While people feel unsafe towards their benefits, those who give up their rights have the power to reclaim and overthrow the government’s intervention. As example, the Paris Agreement is a social project that triggers the political incentives to pursue a future for humanity. The London School of Economics and Political Science comment that “France has taken on a great ambition: to view the Paris Agreement on climate change as the foundation for a social contract--- a social project that can provide people with a decent standard of living through the ‘ecological transition’ towards sustainable development” [21]. This means that France takes on the responsibility to partner with other countries’ governments in sustainable development for future

sustainability, but it is the world citizens' responsibility to supervise the third party to avoid future behavioral misconducts. Hence, in other words, even though political reality cannot provide the society with a perfect equilibrium, it is undoubted fact that the political reality is consolidating its framework for an inside "utopia".

4.2 Individualism vs Collectivism

Individualism emphasizes on personal achievement and individual benefits; collectivism emphasizes on group's achievement and social benefits. These are the political philosophies and ideologies that countries are based on, which the ideologies contribute a foundation of belief to people's behavior that might impact the political decision in sustainable development. For countries having a higher level of individualism such as the United States, Australia and the United Kingdom, they share a similarity in terms of religious society: Protestant society. For countries having higher levels of collectivism such as China, Japan and South Korea, they also share a similarity in terms of religious society: Confucianist society. When these two different religious societies represent a very large proportion of populations in the world, it is decisive to consider the understanding of individualism and collectivism's opinion on environmental issues for the political decision in sustainable development. For example, Confucian states a harmony of man and nature in which "earth grows nature, nature raises men and women". Confucius recognizes that our human consciousness is built upon nature, which humans should respect for all that nature has given to us. In *Analects of Confucius*, people hunt animals but never slay on those that breed the youth. The idea of Confucian illustrates a social behavior in a collectivism that the relationship between human and nature is identically the same, because human is nature and nature is in fact human. Therefore, countries that uphold the political philosophy of collectivism should take nature within the group of humans that one cannot be separated from the other. Speaking of sustainable development, collectivism defends the political opinion that sustainability matters for humans the same as humans matter for sustainability. In comparison, the relationship between Protestant and nature has a different understanding for political decisions. For example, In the book of *Genesis*, "God said, let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth" [25]. This reveals the identity that God has given to man, and the identity is obtained through the relationship between man and God. In addition, mankind's relationship with God gives people an obligation to act faithfully and accordingly upon nature; that is to say, human beings are God's agent in his creation to govern on his behalf. This shows an inequality relationship between man and nature in the

eyes of Protestant society. However, the inequality doesn't mean for nature to be ranked below human beings; rather it represents a meaning that the relationship between human and nature is stewarding and being stewarded. "the LORD God took the man and put him into the garden of Eden to dress it and to keep it" [25]. Being the work of God, humans are given a duty of stewardship, a responsibility of humans caring and managing nature while holding respect towards nature. With the manner of individualism, even though the priority of individuals is higher than the priority of nature, it still matters to not forget the "true" relationship between man and nature that humans are responsible for all of the action. Therefore, countries that uphold the political philosophy of individualism will seek a political decision that is sustainable and meanwhile for it to achieve a higher living standard for individuals.

4.3 Globalism vs Regionalism

Human being has been always searched for a "permanent equilibrium" in all field of studies, which is the eventual steady state in terms of all kinds, but this will consistently and habitually make human falling into an illusion that "we are currently at the equilibrium". At the moment when we define a "country" for its equilibrium, the illusion will arise that people will endow the meaning of a "permanent equilibrium" of boundary to where they live. However, the truth is that we should be aware of the dynamic of time because it puts the phrase "a country is defined" into a question mark. Particularly, the dynamics of time can "destroy and rebuild" the definition of boundary and the process of which is called the transformation of regional political development to global political development. This implies both opportunity and challenge to sustainable development when encountering this political transformation. The opportunity of the political transformation from region to global is to provide a framework for public consultation and to disclose environmental information that relates to sustainable development. For example, a policy of Digital Silk Road initiative in China provided an economic and cultural link between China and African countries. In other words, the policy provides a solid base to trigger the function of "dynamic of time" in a positive direction that "rebuilds" the definition of boundary. According to the data, China Telecom Huawei signed a USD 182 millions deal for constructing the information and communications technology (ICT) networks, and Tanzania was upgraded from no internet application to world-class access, which has developed local ICTs and internet industries [23]. This shows that once digital media was built in African countries, it will narrow the gap of inequalities between Africa and elsewhere around the world. To put this in another way, even though countries have a physically identified boundary in between, the opportunity of the political transformation from regional development to global development

produce an idea of boundaryless in terms of sustainable development, and the countries can now be able to share the similar goals for developing a sustainable society. However, since the political transformation of development is on track with the dynamic of time, which means that it is nonreversible. So, the transformation from region to global has its opportunity costs of which accelerates the ecological dangers. As Karl Marx states that, “The need of a constantly expanding market for its products chases the bourgeoisie over the entire surface of the globe. It must nestle everywhere, settle everywhere, establish connections everywhere. The bourgeoisie has through its exploitation of the world market given a cosmopolitan character to production and consumption in every country” [19]. Hence, the challenge of the political transformation from regional development to global development is within the progress of the transformation itself because of the dynamic of time, and thus the countries should consider the possible worst case happened to the ecological system before completely speeding up the pace to globalization.

5. Ethical Perspective of Green Economy

5.1 Opportunity in Ethical Social Behavior to Sustainable Development

As society progresses, we will be living in a sustainable world that isn't just about economics and politics. Living well can also be defined as to live well ethically and virtuously. Plato and Aristotle emphasized on having the virtues character, a trait can be exercised contributing to fulfill the distinctive human function such as integrity, honesty, trustworthiness, sense of responsibility and so forth [30]. So, the fundamental evaluation of virtues is the nature of a good human being that can be able to distinguish the virtues and vices. Based on the virtue theory, being a virtuous character is the combination of having enough of the virtues and lacking enough of the vices. When implementing the virtue theory to social development, it implies that the relationship between sustainability and ethical social behavior is idealized through the virtues of individuals that enhance the quality of sustainability to live better in societies. “Achieving sustainability may have to start with the change of individual behavior but it can only be achieved globally” [7]. This reveals a “common good” which can be achieved when all individuals are included to behave in an action that a virtuous person characteristically would do for pursuing a sustainable world. Fortunately, people are prepared by the guideline for the ability to find out what is virtuous to do for sustainable development. And the guideline of virtuous acts is established by Randall Curren and Ellen Mertzger who have suggested five behavioral principles of sustainability ethic in their book, *LIVING WELL NOW AND IN THE FUTURE: WHY SUSTAINABILITY MATTERS* [4].

1. *Take care to ensure that the totality of human practices is ecologically sustainable.*

2. *Take care to ensure that the throughout requirements of human practices are compatible with the projected provisioning capacity of natural system*

3. *Seek fair terms of cooperation conducive to sustainability. Actors whose actions affect each other have an obligation to cooperate in negotiating fair terms of cooperation in living in a manner that is collectively sustainable.*

4. *Do not obstruct transparency and cooperation with regard to sustainability*

5. *Do not subject individuals or collectivities to detrimental reliance. Do not cause anyone to be in a position of fundamental reliance on hazardous or vulnerable systems or resources---system or resources that cannot be relied on without exposure to unreasonable risk to their fundamental interest.*

5.2 Possible Ethical Challenges to Sustainable Development

Without awareness of mental processing information, scientists show that it is still possible for people to capture information and then produce the correct outcome in the brain. This is called intuition, which is a mode of thinking that appears unconsciously, and this has always been referred to as “gut feeling” behavior. The opposite to intuition is the mode of conscious thinking that processes information mentally and we call it: Reasoning. The ethical challenge of the green economy, in fact, arises in the relationship between the intuition of “gut feeling” and the reasoning to sustainable development in terms of environmental protection. The argument is as follows:

Premise 1: Environmental protection shall be followed by intuition rather than reasoning.

Premise 2: Some people have the intuition to do environmental protection, but some people don't have the intuition to do environmental protection.

Premise 3: Government obligates all people to do environmental protection such as waste sorting, so all people will then do.

Conclusion: Government is incorrect about the common sense of environmental protection, and thus should make changes.

The argument rebuts the government's compelling reasoning to environmental protection, and the argument raises an ethical challenge of should people today violate the government's rules of conduct and choose to follow their own intuition on environmental protection. One recent example is that at the meeting of 15th Shanghai Municipal People's Congress (January 21, 2019), the

“Regulations of Shanghai Municipality on the Management of Domestic Waste” was formally passed, and the regulation strictly mentions the corresponding penalty if individuals fail to waste sorting in community (Shanghai, 2019). This illustrates the people in Shanghai are currently mandatory to do waste sorting without exception. Hence, the ethical challenge to consider is whether or not people should place the obligation of environmental protection on top of the intuition. Moreover, the same ethical challenge also resonates with the challenge in the view of economics that the government is setting up the mandate of price to substitute for the mandate of virtue. Therefore, the sequential question leaves for consideration is the following: if people place the intuition on top of obligation, how can the government be able to improve the intuition for future’s better environmental protection.

6. Conclusion

Knowing a fact that everything has duality is the prerequisite understanding of the paper. There aren’t perfect solutions to solve a problem so does implementing sustainability as a tool to solve environmental problems. However, there are still many economists looking for a perfect “free lunch” in sustainability, which they are overly optimistic about their sustainable calculations, but end up shooting themselves in the foot. Thus, the answer to the development of the green economy should be within the duality of “benefits and costs”, “conflicts”, and “opportunities and challenges”. Fortunately, there are economists who have realized these dualities and observe them closely. The recent book by 2019 Nobel Prize winner Abhijit Banerjee, *Good Economics for Hard Times*, integrates multiple dualities in the field of economics, politics and ethics into one important information that seems to make the world getting closer to the truth of implementing the green economy. Banerjee points out that “many behaviors of energy consumption are consistent and habitual” [3]. This illustrates the essential dualities that not only reveals the exogenous way of thinking in economics, politics, and ethics but also endogenous way of thinking, which is in terms of people themselves (It’s the duality within the thinking of people who habitually makes either a “better” choice to the environment or a “worse” choice to the environment). Hence, the solution can be both exogenous and endogenous, and this makes the implementation of a green economy more directive and ideal to solve the existing environmental problem while maintaining the growth. In order to know how people behave habitually, the economists should get down on the field to investigate socially and culturally. For example, one successful randomized experiment called *Habit Formation and Rational Addiction: A Field Experiment in Handwashing*; in the experiment, researchers found out if individuals are initially incentivized by rewards when washing hands,

then after several weeks, although the rewards were cancelled, the same individuals still habitually washing hands as they were incentivized. The experiment presents a powerful idea to implement green economy endogenously by turning people’s habit from making the “worse” choice of sustainability to a “better” choice of sustainability, and the outcome will look like: people remember to turn off their lights before leaving the room; people are more likely to take public transportation; and people are less willing to use plastic as their primary shopping bag; and even people will habitually place the mandate of virtue on top of mandate of price for sustainable development. Therefore, beyond the exogenous dualities of economics, politics and ethic, endogenous duality of human being in terms of habitual preferences in selecting the different ways of usage for energy consumption can push the implementation of development of green economy forward for the future’s better standard of living; a living that is in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities, and it is low carbon, resource efficient, and socially inclusive”!

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