SDG8 – SUSTAINABLE ECONOMIC GROWTH AND DECENT WORK FOR ALL

Concise Guides to the United Nations Sustainable Development Goals

MADHAVI VENKATESAN

Northeastern University, USA

GIULIANO LUONGO

The Niccolò Cusano University, Italy

emerald PUBLISHING

United Kingdom – North America – Japan – India
Malaysia – China

CONTENTS

LIST OF FIGURES AND TABLES

Figures

Chapter 1

Tables

2

ECONOMIC GROWTH

INTRODUCTION

Targets 8.1, 8.2, 8.4 and 8.9 of SDG 8 all address GDP as a metric to evaluate progress relative to their attainment. Targets 8.1 and 8.2 use direct measures of GDP and per capita GDP while 8.4 focusses on decoupling economic growth from environmental degradation. The focus of 8.9 relates to growth in the share of GDP attributable to tourism with the caveat that tourism be modified to be consistent with sustainability.

GDP, given its market-based valuation and the exclusion of externalities, such as pollution in its calculation, is not inherently a measure of sustainability. In fact, GDP values can increase as a result of environmental remediation and human health care expenses, highlighting that the metric can benefit from detrimental impacts to environmental and human welfare. Additionally, given that GDP relies on market valuation, it fails to capture the social value of unpaid work, in essence through exclusion, undervaluing the social benefit of child-rearing and elder care.

This chapter provides an overview of the relationship between economic growth, as measured by GDP, and

sustainability. Discussed in the sections below are the relationship between GDP based economic growth and energy production; energy production and climate change; the concept of decoupling; and the role of consumption in economic growth and in achieving sustainable economic growth. The discussion surfaces informational asymmetries between economic agents and provides a foundation for the discussion of Decent Work in Chapter 3 and the discussion of the goals of SDG 8 in Chapter 4.

MEASURING ECONOMIC GROWTH

GDP is the global indicator of economic growth. GDP was a development of the twentieth century and was constructed to provide the US government with an assessment tool to assist with wartime planning and production needs. Since its introduction in the 1930s, GDP has become the standard global metric for measuring economic progress. The widespread use of the metric resulted in GDP being declared 'One of the Great Inventions of the 20th Century' by the U.S. Department of Commerce (2000).

GDP was established to be an indicator of production capacity. The benefit of GDP is that it provides a quantitative snapshot of an economy at a point in time and over time can provide an indication of the increase in production capacity. The use of the indicator for social evaluation purposes, such as standard of living, was strongly advised against by many economists, including the creator of the metric, Simon Kuznets. In a 1934 report to Congress, Kuznets stated, 'The welfare of a nation can scarcely be inferred from a measurement of national income'. In spite of warnings and concerns, the calculation of GDP has been used to impute the welfare

of a country by dividing the aggregate value of GDP by the population of a country to derive per capita GDP. This value in turn has been used to compare countries. Though in aggregate cross-country comparisons, GDP offers an ability to quantitatively compare production output, the indicator cannot provide insight with respect to the evenness of the distribution of production output. In this manner GDP is limited, the relative disparity between social classes cannot be discerned. Based on pure assessment of the components of the indicator and how it is assembled, it can be strongly argued that GDP does not provide an appropriate assessment of well-being. Given disparities in income, power and social hierarchies, GDP does not provide a measure of social progress or quality of life, attributes that it nonetheless has been assigned by proxy (Boarini & D'Ercole, 2013; Jones & Klenow, 2016; Stewart, 2005) (Table 1).

GDP itself is a static value derived from the aggregated value of the final sale of goods and services in an economy at a specific point in time. The change in the value over time reflects growth in production and consumption and is the measure of economic growth in a country. Theoretically, the higher the growth in GDP, the higher the level of overall employment and the closer the rate of unemployment to its natural rate, which is country specific and typically defined in Western countries as being composed of primarily frictional or voluntary unemployment. Given the assumption of static supply in the short-run, low unemployment with stable prices signals that an economy may be operating at its potential GDP, which is defined as being where all resources available for production are being fully utilised. However, indicators of employment strength and price stability require interpretation. Arguably, social dynamics and employment trends, such as labour force participation rates, may obscure the interpretation

Table 1. Components of GDP.

By definition, GDP measures the market value of all (gross) final goods and services (product) produced within a country (domestic) at a specific point in time. From this perspective, GDP provides an aggregate value but no detail with respect to the distribution of goods and services, quality or standard of living of a country's inhabitants. However, given the relationship between employment, disposable income and consumption, there is an implied connection between employment growth and GDP. As a result, employment is a significant predictor for GDP growth and to the extent that increased GDP growth is a target metric for countries relative to their measurement of progress, employment growth and quality are also routinely evaluated.

GDP can be calculated by assessing total income generated in an economy or total expenditures made within an economy at a specific point in time. The components of the expenditure calculation of GDP include consumption (C), investment (I), government (G) and net exports

(X – M), the formula for which is exports minus imports.

GDP = C + I + G + (X – M)

C: Consumption spending, C, is spending by households on goods and services, with the exception of new housing. Included in household expenditures are durable and non-durable goods as well as medical care and education.

I: Investment spending consists of the purchase of goods and services that will be used in the production of future goods and services. The expenditures include production facilities, inventory and new housing.

G: Government spending includes spending on goods and services by local and state and the national government, but it does not include transfer payments. *Transfer payments* do not reflect a direct purchase of a good or service; rather they reflect a reallocation of tax dollars. The expenditures of transfer recipients are already included in consumption spending, justifying their omission from G in the calculation of GDP.

(X – M): Net exports reflect the net amount of purchases by foreigners of domestically produced goods (X) relative to the amount of foreign goods purchased in the domestic market (M). Net exports provide the status of the balance of trade between countries and are influenced by and also as a result of relative demand between trading parties, influence foreign exchange rates. Foreign exchange rates reflect the demand of one currency relative to another.

of GDP values. As a result, both the perception of GDP and the assignment of a GDP value as being potential GDP in any given period is more art than science. Additionally, to the extent that resource prices may not adequately reflect the true cost of a given resource due to the externalisation of non-market costs associated in production, consumption and waste, a focus on GDP growth (Lepenies & Gaines, 2016) may be a causal force in social and environmental justice issues as well as inequity in income distribution. Since GDP can only capture market costs, unpaid work is not factored into the value; thereby excluding child-rearing, eldercare and household responsibilities, attributions that have intrinsic value to family and community social structure. Neetha (2010) noted that the exclusion of unpaid work, much of which is allocated to women, promotes a perception of subordination in the value of women relative to men, leading to an economic bias, sociocultural bias and a measurability bias in favour of male value. Alternatively, GDP captures military spending, health care costs, pollution abatement expenses and environmental reclamation, among other expenses that could be stated as not having direct value to improvement in the quality or standard of living of individuals. For this reason, a GDP focus can promote the appearance of strong near-term growth as measured in production output but at the price of long term sustainable growth. Thus, a perversion exists with a GDP measure, as provided in an analogy by Anielski (2002),

> *An economic hero is a terminal cancer patient going through an expensive divorce, whose car is totalled in a twenty-car pile-up … The economic villain, according to the GDP, is the healthy person in a solid marriage who cooks at home, walks to work and doesn't smoke or gamble.*

ECONOMIC GROWTH AND ENERGY PRODUCTION

Given that GDP is a measure of production capacity, there is a direct relationship between GDP growth and resource utilisation and this includes energy. Energy is both a supply input to production and a commodity demanded for direct consumption. However, causality between energy production and GDP growth on an aggregated scale (e.g. regional, global) is ambiguous (Bruns, Gross, & Stern, 2014). Results point to a lack of universal causality between energy consumption and economic growth in multi-country assessment. Empirical studies conducted on the relationship between energy consumption and economic growth have yielded mixed results with

> *some studies show[ing] causality running from energy consumption to economic growth, others report[ing] causality running from economic growth to energy consumption, while some studies find no causality or bi-directional causality. There is absence of consensus on the relationship between energy consumption and growth. (Ahmad & Ahmed, 2014)*

Research conducted on the relationship between GDP and energy use where the evaluation included the development status of a country has surfaced the relationship of development stage to energy use. Ferguson, Wilkinson, and Hill. (2000) found a strong correlation between increases in wealth over time and an increase in the consumption of energy. Chontanawat, Hunt, and Pierse (2008) commented,

> *Causality from energy to GDP is found to be more prevalent in the developed OECD countries compared to the developing non-OECD*

> *countries; implying that a policy to reduce energy consumption aimed at reducing emissions is likely to have greater impact on the GDP of the developed rather than the developing world.*

In a study of energy consumption and economic growth specific to G7 countries Bildirici (2013) concluded that 'an increase in energy consumption directly affects economic growth and that economic growth also stimulates energy consumption in that country'.

The relationship between energy use at the consumer level and GDP status has also been assessed. Research on energy utilisation relative to in-country income distribution has pointed to individual consumption levels within both developed and developing countries as being the basis of the observed causal relationship between GDP and energy use and also the potential rationale for ambiguity of results in aggregated country studies. This was indirectly noted by Peterson (1963) who proxied average country income by per capita GDP and noted that 'the greater a nation's output of goods, the greater is its consumption of energy. Thus, energy policy should focus on the consumer'. More recently Satterthwaite (2009) stated,

> *Responsibility for greenhouse gas emissions should be allocated to individuals and households, not nations. It should be based on the greenhouse gas implications of their consumption. The wealthiest fifth of the world's population is likely to account for more than 80% of all human-induced greenhouse gas emissions and an even higher proportion of historic contributions – past emissions that are in the atmosphere and are driving climate change. Although most of these*

> *people live in high-income nations, a significant and growing proportion live in the more successful low and middle-income nations.*

Satterthwaite's comments also allude to the distribution of GDP growth and the related outcome of income polarisation.

Fig. 1 depicts the externalities related to energy use as proxied by global carbon dioxide ($CO_{2)}$ and Fig. 2 details the trajectory of global GDP growth. In viewing the two graphics there does appear to be a superficial relationship. However, as the studies cited have noted, the graphics may mask the impact of development status on the contribution to CO_2 levels as well as in-country energy consumption differences tied to income. In both cases, however, energy prices with respect to their failure to capture the impacts of externalities, in this case global climate change, may be reflected in the consumption of energy for production and direct consumption.

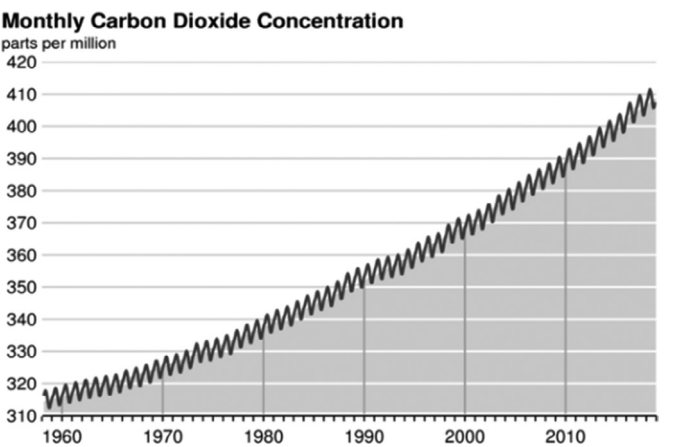

Fig. 1. Atmospheric Carbon Dioxide Concentration: 1960–2018. *Source*: Keeling et al. (2001).

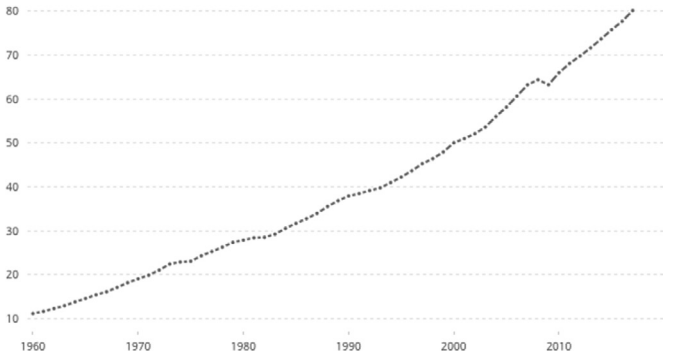

Fig. 2. Global GDP (Constant 2010 US Dollars). *Source*: World Bank (2019).

ENERGY PRODUCTION AND CLIMATE CHANGE

Fossil fuels consist mainly of carbon and hydrogen. When fossil fuels are burned, oxygen combines with carbon to form CO_2 and with hydrogen to form water (H_2O). These reactions release heat that is used for energy. The amount of CO_2 produced depends on the carbon content of the fuel, and the amount of heat produced depends on the carbon and hydrogen content. Because natural gas, which is mostly methane (CH_4), has a high hydrogen content, combustion of natural gas produces less CO_2 for the same amount of heat produced from burning other fossil fuels. For example, for the same amount of energy produced, burning natural gas produces about half of the amount of CO_2 produced by burning coal (Energy Information Agency, 2018). Both CO_2 and CH_4 are greenhouse gases. CO_2 is estimated to remain in the atmosphere for thousands of years while CH_4, which is a significantly more potent greenhouse gas, has a shorter atmospheric lifetime of approximately a decade (Environmental Protection Agency, 2017).

Global CO_2 emissions from energy in 2017 grew by 1.6%, rebounding from the stagnant volumes during 2014–2016, and faster than the 10-year average of 1.3%. Declines were led by the US (-0.5%). China and India accounted for nearly half of the increase in global carbon emissions, with India's increase attributable to coal. European Union (EU) emissions were also up (1.5%) with Spain accounting for 44% of the increase. Among other EU members, UK and Denmark reported the lowest carbon emissions in their history (BP, 2018).

As depicted in Fig. 3, oil is the world's dominant fuel source, making up just over a third of all energy consumed. In 2017 oil's market share declined slightly, following two years of growth. Coal's market share fell to 27.6%, the lowest level since 2004. Natural gas accounted for a record 23.4% of global primary energy consumption (BP, 2018); in 2013, combustion of natural gas accounted for 18.5% of the total emissions from fossil fuels (Boden, Marland, & Andres, 2016). Renewable power hit a new high of 3.6% (BP, 2018).

According to data from BP (2018) the primary emitters of CO_2 in 2017 were developed countries and Brazil, Russia, India and China (BRIC).

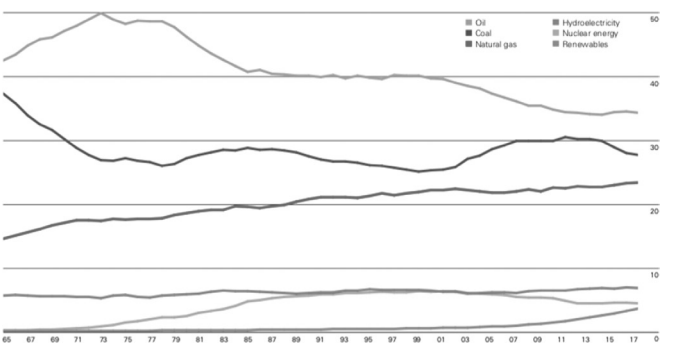

Fig. 3. Shares (%) of Global Primary Energy Consumption by Fuel Source. *Source*: BP (2018).

Though the BRIC countries were among the top ten global emitters of greenhouse gases in 2017 and for nearly a decade preceding, as presented in Fig. 4, the cumulative impact of the United States from the period of industrialisation to 2011 exceeds the greenhouse gas emission contribution from any other individual country. The countries and the EU with the exception of Canada as presented in Fig. 4 are all ranked among the top ten highest GDP producing nations based on estimates for 2017, with China ranked first with the EU and United States following as second and third, respectively.

Given the literature related to the relationship between income and energy consumption, it is of note that the median incomes of the United States, Canada and a few EU classified countries appear routinely in the top ten of global median incomes. This suggests that there may be both a relationship between economic growth and energy production, as well as, individual income and energy production as suggested by

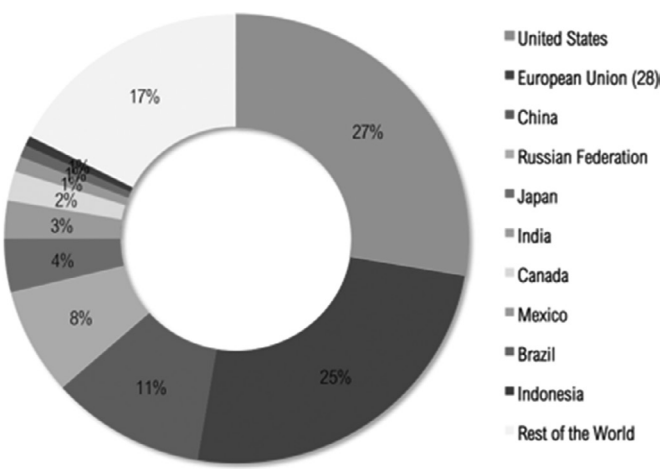

Fig. 4. Cumulative CO_2 Emissions 1850–2011 (% of World Total). *Source*: Ge, Friedrch, and Damassa (2014).

the literature (Bildirici, 2013; Ferguson et al., 2000; Satterthwaite, 2009). However, the causal relationship between economic growth and rising median income as well as the historical trend in median income needs to be placed in context. Data for developing countries does reveal an ambiguity between economic growth and significant increase to median income due to multiple reasons, including population growth rates (Sasaki, 2011), but primarily attributed to labour force skill classification, regulatory support for labour and inability to unionise (Catagay, 1996; Hensman, 2000; Ross, 1997). This will be discussed in greater detail in Chapter 3.

What is of significance in evaluating the relationship between energy production and climate change is the role of energy in economic growth. It does appear that successful implementation of SDG 8.1, which targets an annual GDP growth rate of 7% for developing countries, will need capacity building related to renewable energy within both developed and developing countries. For developed countries, as recommended by Ocampo, Rada, Taylor, and Parra (2009),

> *Rich country energy/labour ratios can be reduced (or energy productivity increased relative to labour productivity) substantially by technological innovation and social rearrangements … if such innovations do work out, then perhaps they can be passed to developing economies before the momentum of their population growth overwhelms all possibilities for combating global warming. Given the environmental constraints and considering that only 16 percent of the world's population lives in rich countries and almost all population growth is in the poor ones, realistic prospects for successful economic performance and poverty alleviation may not be very bright.*

McCluney (2008) notes the need for balance in economic development given its energy dependence and impact to climate change. He reflects,

> *The greatest challenge facing us is to improve the lot of the poor without greatly increasing the inefficient and polluting use of fossil fuels. Reduced consumption by the rich countries and energy conservation are two immediate options. Development of new and renewable energy sources is another.*

The IPCC cites with high confidence that coral reef degradation resulting from anthropogenic climate change will negatively impact island communities and livelihoods, including tourism (IPCC, 2014). Disease, dehydration and heat exhaustion are anticipated as well given expectations of further global warming conditions. As a result, by 2100, climate change is predicted to reduce labour productivity by 11–27% in the tropics, which could reduce economic output in affected sectors by 8–22% (Wright, Huq, & Reeves, 2015).

DECOUPLING GROWTH

Economic growth has been achieved through the use of resources and the advancement of technology, where the latter has promoted more efficient use of resources. However, growth has not been without adverse consequences to the environment. Atmospheric greenhouse gas emissions are one of a number of externalised impacts related to the coupling of economic growth with environmental exploitation and degradation. Sustainable development challenges the present context of growth by relying on a decoupling of economic growth rates and environmental impacts. Decoupling is defined by the OECD as 'breaking the link between "environmental bads"

and "economic goods"' (OECD, 2002). Decoupling would yield a lower rate of increase in environmental degradation relative to economic growth (e.g. GDP) (OECD, 2002):

> *Decoupling can be either absolute or relative. Absolute decoupling is said to occur when the environmentally relevant variable is stable or decreasing while the economic driving force is growing. Decoupling is said to be relative when the growth rate of the environmentally relevant variable is positive, but less than the growth rate of the economic variable.*

There has been considerable discussion as to whether growth can continue with decoupling. Ecological modernisation theory posits that while economic development requires inputs and generates waste, both of which contribute to various forms of environmental problems, the magnitude of economic development's impact on the environment is likely to decrease through time. As a result, decoupling is likely to occur first in developed countries. In contrast, the treadmill of production theory suggests that the national-level environmental impacts of economic development should remain stable or perhaps increase in magnitude through time, regardless of whether countries are relatively more developed or less developed. Jorgenson and Clark (2012) test both theories with respect to CO_2 emissions and developed/developing country status. Their findings corroborate that there is a decrease in emissions in developed countries due to technological progress and also that emissions are correlated with developing status. However, they suggest that exploitation of regulatory differences may be a stronger contributing factor to the variation in emissions. In other words, the measured emissions increase in developing countries may be the result of the movement of production to nations having lower

production costs and environmental regulatory standards (Dick, 2010; Goldemberg & Siqueira Prado, 2013; Jorgenson & Clark, 2012; Leonard, 1998; Roberts & Parks, 2007). Further, to the extent that present emissions and environmental degradation in developing countries is related to developed country demand (Knight, 2014), an assessment of social norms related to consumption may be beneficial, as values related to consumption may need to be augmented to promote alignment to global sustainability.

Sustainable development is quite different from a sustainable transition. Sustainable development is a steady, directional, progressive journey towards some global point in the future where society achieves equity in a way that ceases to harm the environment, supported by economic growth. A sustainable transition is a much more fundamental shift, where philosophy, practice, ethics and behaviour are transitioned into a new state, reaching through every level of society. Given the significance of consumption in economic growth in Western countries, especially the United States, the achievement of a successful sustainability transition will be dependent on an understanding of consumption impacts and an incentive among economic agents to modify choices to align with long-term, inter-period sustainability objectives.

Many consumption behaviours (i.e. immediate gratification, conspicuous consumption) can be characterised as legacies inherited from previous generations; they may reflect the knowledge and understanding contemporary to their adoption. As a result, they may be inconsistent with sustainable outcomes given present-day information and assessment techniques. In this manner, the lagged nature of societal behaviours may promote undesirable environmental and social outcomes that interfere with the long-term success of economic systems relative to the sustainable use of resources, leading to or maintaining the persistence of unsustainable

outcomes as defined by resource over-exploitation, degradation and depletion. From this perspective, given today's world of increasing human population size and consumption rates, there is a need for increased awareness of the motivation of present behaviours and the evaluation of these behaviours relative to the promotion of sustainable outcomes.

To the extent that individual economic agents, producers, or consumers of a good or service are bound by rationality that does not include addressing the impact of externalised or non-quantified costs, the economic discussion does not promote or position the assessment of alternative outcomes. Implicitly and endogenously, the economic discussion establishes and maintains a consumption to production circular flow, focussing on the gratification of consumption and profit-taking from production, and seemingly eliminating the assessment of externalities and holistic dynamics.

Economics evaluates efficiency with respect to the 'use of resources to maximise production and consumption, not by the moral desirability of the physical methods and social institutions used to achieve this end' (Nelson, 1995). The factors that are included in an economic evaluation are limited to the tangible quantifiable costs, and the costs are overlooked where either a market or a regulatory oversight has not provided a monetary justification. From this perspective, the impacts of consumption decisions on the environment, economic disparity, or endangerment of other species are not an issue. The market mechanism disenfranchises the consumer from the welfare of those impacted by his or her consumption and promotes the perception that price alone is indicative of the true cost of a good. Nelson (1995) notes, 'The possibility that consumption should be reduced because the act of consumption is not good for the soul, or is not what actually makes people happy, has no place within the economic value system'. The underlying assumption is that consumers are driven to want more.

As a result, economic modelling assumes that reduction in consumption in the current period is only addressed through the lens of an increase in consumption in a later period. That the assumption of insatiable want may be taught and a learned behaviour, reinforced through a market model, is not even addressed in economics (Knoedler & Underwood, 2003).

Markets do fail to produce optimal outcomes. Sometimes this is due to the myopic focus of market participants as in the case of externalities, and in other circumstances, it can be attributable to the lack of excludability as in the case of common goods. To some extent, cultural values dictate the significance of the adversity related to the creation of externalities or abuse of common goods. The use of market models (e.g. cap and trade, taxes) has been the regulatory mechanism to modify socially non-optimal outcomes, but through relying on the market mechanism rather than simultaneously including mechanics to promote cultural change, the majority of regulatory interventions to date have had limited to questionable success.

For long-term traction, sustainability is dependent upon holistic and routine evaluation of economic and societal frameworks. These frameworks need to be assessed and modified as part of an ongoing continuous improvement process. Fundamentally, what may have been viewed as appropriate action at a point in time may no longer serve the same purpose due to changing environmental, social and cultural parameters. However, the members of a society have to be both empowered and cognisant of the need for this type of evaluation in order for efficiency and ultimately sustainability to be a realised inter and intragenerational attribute. From this perspective, the deployment of consumer education programmes targeted at defining responsible demand and conscious consumption are a requisite foundation for sustainability (Junyent & Geli de Ciurana, 2008).

CONSUMPTION AND ECONOMIC GROWTH

Consumption of energy is both direct and indirect. Direct consumption of energy is specific to gasoline for transportation and use of energy for heating and cooling systems, while indirect energy use is embedded in the consumption of goods and services and their use of energy as inputs. Cultural orientation towards consumption implicitly surfaces the perception of the human relationship with the environment as either one of symbiosis or dominion. In the case of the former, arguably stewardship would prevail. In the context of perceived dominion, the economic system would likely fail to assess intrinsic value of resources, as resource value would be dictated based on the value of the natural resource to the human system. Further and significant, the inclusion of time effects as they relate to the preservation and/or regeneration of resources would determine if one period's stewardship or dominion impacted future access, availability and viability of a resource.

Our present global society builds on an institutionalised Western perspective of the environment as a resource for human use; this in turn is implicit to global economic systems and their focus on GDP. GDP is embedded within the prevailing neoclassical discussion of the Production Possibilities Frontier (PPF) and similarly, our policy interest in ensuring that we seek to maximise production subject to resource constraints at any given point in time. In the case of production this conforms to policy, monetary and fiscal, that seeks to maintain or establish the economy at its peak in business cycle terms, which is equitable to the attainment of potential GDP.

The underlying and guiding assumption of production and consumption decisions is premised on neoclassical consumer theory, which defines individuals in an economy as having insatiable desires to consume. This assumption is reflected in

the PPF where efficiency is defined as any production combination found on the PPF line (Fig. 5). On this line, the economy is maximising production relative to resource constraints. Combinations of output along this can only be attained by allocating the resources in a way that maximises production relative to inputs (e.g. land, labour and capital). To the extent that the allocation of resources at a given point in time considers intergenerational equity and threshold extraction rates consistent with the prevention of resource depletion, and enables repopulation for renewable resources, the trade-off decisions may or may not be consistent with sustainable resource utilisation.

Furthermore, to the extent that a society is taught or maintains the social norm of stewardship, and thus satiation of needs relative to that of wants, the efficient allocation of resources may not embody the maximum production. Instead an economy may not fully use observable resources given consideration of their availability from a long-term perspective.

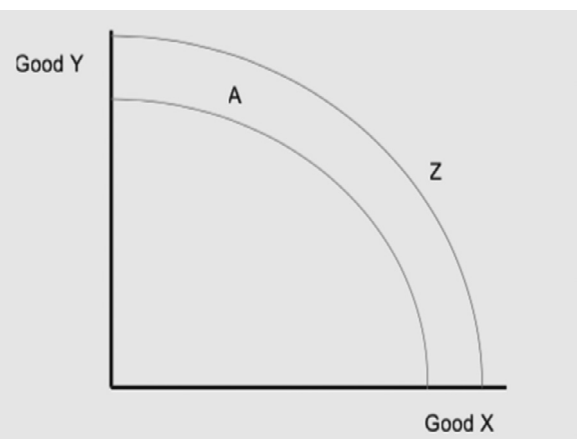

Fig. 5. Production Possibility Frontier. *Source*: Venkatesan (2017).

In Fig. 1, the PPF line labelled Z represents a society for which insatiable wants have been embedded into the culture and the PPF represents the maximum production possible in economy-given resource availability at a given point in time. This society must rely on the identification of new resources and technology to enable future consumption, resulting in an outward shift of the PPF over time. On the other hand, the society depicted as operating on PPF A, while having the ability to attain PPF Z, would be inconsistent with full resource utilisation. Society A, though representing a society that is guided by the cultural value of intergenerational equity and the satiation of needs relative to the balance of environmental and social sustainability, would be inefficient based on prevailing economic theory. The Z economy would consider A to represent an inefficient use of resources if some resources were left idle.

For both societies, using a GDP definition of progress, the PPF would presumably be representative of the attainment of potential GDP. However, for the society depicted as operating on A, for which Z was also accessible, GDP would be lower as would be GDP growth rates over time. The focus on GDP omits the qualitative value the society derives from the preservation of resources for future periods and the related inter-temporal sustainability of consumption.

McCluney (2008) suggests that reduction in consumption is needed by developed countries to reduce the environmental burden and social justice implications of the present trajectory of consumption within those countries. He notes that there is a moral dilemma at present, given that developed countries have been able to grow and develop high standards of living by environmental exploitation but are now seeking to eliminate the same channels that enabled their development within the developing world. Addressing population pressures, climate impacting energy utilisation rates, and finite growth

prospects, he concludes with questions that are extremely relevant to action on climate change and surface the significant role of consumption:

> *Do the industrial countries owe anything to those in underdeveloped countries living lives of misery? Will the industrial world be willing to alter its own system to benefit the starving billions elsewhere? How much should the industrialised countries be willing to sacrifice for the sake of the underdeveloped world? Is it moral to conclude that we should not make such sacrifices, or is the very question born of a fallacious understanding of what it takes to live well? (McCluney, 2008)*

CONSUMPTION AND SUSTAINABLE GROWTH

In most Western developed countries, consumption is a significant driver of GDP growth. To the extent that GDP is the standard metric of economic progress and economic progress is a focus due to the perception that progress equates with a higher standard of living, consumption has also become a targeted metric. From this perspective, nearly everything in an economy can be related to consumption, from maintaining full employment, to maintaining stable inflation and low interest rates, to the built-in obsolescence of the goods we purchase. Even the assumptions embedded in economics incorporate consumption: consumers are assumed to have insatiable wants.

Marketing and advertising have played a strong role in fostering consumption by creating 'marketed demand', which essentially is demand that arises as a result of marketing and advertising. However, the responsibility of consumption has

not been fostered, developed, or perhaps even understood by consumers.

Consumers have become increasingly distanced from the production process of the goods they are consuming, and as a result, they are not cognisant about the impact that their consumption demand has on the degradation, exploitation and depletion of planetary resources. Instead, what consumers are aware of is price. Fundamentally, consumers have focussed on market price and have delegated the inclusion of value parameters, including environmental and social costs, to producers, but producers are incentivised to minimise cost and maximise return. Externalising costs are beneficial to producer profit maximisation. As a result, unfortunately, there is a failure in the incentive matching between consumers and producers. In most cases, due to the externalising of costs and externalities, market prices do not reflect the true cost of a good. Individuals can purchase more resources because not all costs are captured in their production; in essence, reliance on market prices can enable unsustainable consumption (Venkatesan, 2017).

From this perspective, consumption plays a significant role in the sustainability of the planet. Responsible consumption is requisite, and this can be promoted through education and the coalescing of the consumer base, where the common ground can be founded both on the self-interest assumed in economics and the trending cultural value of holistic assessment.

Further, given the significance of consumption in the calculation of GDP as well as the focus on GDP as an indication of economic strength, consumption is a significant driver of economic growth and as a result a focal point of monetary and fiscal policy.

Consumption choices are based on demand and supply of a good and are identified with satisfying a need or a want. The impact of consumption decisions can be significant when

there is asymmetry of information; fundamentally, there is a relationship between economic and environmental outcomes and consumption choices. Purchases affect labour and environmental resource use. However, most purchase decisions are made through a market mechanism, where the consumer is not explicitly made aware of the entire production process, prices are inclusive of only market costs of production exclusive of the impact of externalities, and waste is not a factor in the consumption decision. This limitation in information transparency often creates a disconnect between the social and environmental justice sensitivities of a consumer and the realities of their consumption choice in enabling and maintaining the values that they espouse.

Consumption decisions can have a significant ripple effect throughout a single economy as well as the finite global resource base. Consider for example the life cycle of milk cartons. Polyethylene lined, printed paper milk cartons have been created for the transport and preservation of milk from the production to the consumption stage. However, the components of the carton were not developed with waste disposal in mind; rather, increasing distribution and sales were the rationale for the carton. As a result, largely related to the focussed basis of its creation, the milk carton serves a consumption purpose without consideration of the impact to the environment and potential future human and animal health due to its non-biodegradable or non-reusable composition. This illustration on a broader consumption scale provides a simplified perspective to evaluate the underlying values captured in consumption decisions. From this perspective, production for consumption may be expressed as a myopic activity, focussed on near-term satiation of a need or want to the exclusion of the evaluation of the impact or ripple effect of the satiation.

Consider the price of a t-shirt produced in an emerging market: it will include the cost of the labourer who cut and

sewed the shirt, but not the social cost resulting from the lack of a living wage (given the price differential from his payment for labour and the return to the producer who will sell the product at a US boutique) and the limited to non-existent safe working conditions. The price does not include the carbon footprint related to the ultimate transportation of the t-shirt to the store, or the waste cost related to the landfilling of a shirt that cannot biodegrade because it is not made of natural fibres. In net, the cost of the consumption of the t-shirt is only partially borne by the purchaser; other societies and the environment subsidise the price. The outcome, a price that is not reflective of the true cost of the resources used, allows a developed society to have more than needed, to satisfy wants, while unknowingly using more resources and creating environmental and social externalities. The developing country labourer subsidises the consumption due to lack of labour market strength and in this manner it becomes quite obvious the vicious cycle that exists between poverty and consumption. Poverty enables over-consumption through enabling the maintenance of low prices in developed countries. In the developing world, the pervasiveness of poverty limits self-funding for infrastructure, sanitation and sustainable choices; this fosters a dependency trap that only promotes survival not a focus on quality of life.

Sustainable consumption requires that consumers base consumption decisions on the holistic impact of their consumption choices. The values embedded and communicated within demand and supply determine the manner in which a need is satisfied. Explicit awareness of present behavioural assumptions inclusive of the 'unlimited wants' of consumers, the profit maximisation motivations of producers to meet investor returns, and the understated resource depletion resulting from externalised or understated costs, offer the potential to modify active and embedded behaviour.

SUMMARY

GDP is the global metric for economic progress. The metric is based on the market value of final goods and services sold within the geographic borders of a given country. The limitation of the calculation of GDP to market value in conjunction with firm profit maximisation and consumer insatiability, two endogenised tenets of neoclassical economics, has resulted in externalities to the environment and societies. Externalities are observable in environmental degradation, and depletion of environmental resources as well as in exploitation of labour markets.

The most significant environmental impact attributed to economic growth has been the increased speed in climate change as a result of fossil fuel-based energy production and the growth in energy dependence in both direct consumer use and in the production of consumer goods. However, there is a distinction in the use of energy. Developed countries' use of energy is significantly higher than that of developing countries, with the United States being the cumulatively highest contributor to greenhouse gas emissions. Interestingly, the causality between emissions and stage of development is ambiguous, with some studies noting a negative correlation between development state. However, research does point to a relationship between energy use and income and a relationship between regulation and emissions discharge.

Consumption choices in developed countries impact global emissions directly through demand for products without responsibility for the externalities associated in their production. Evidence suggests that profitability parameters on the part of businesses promote a circumvention of regulatory restrictions on the production and responsibility for externalities, leading to production shifting to developing countries where regulations may be limited and the focus on

GDP growth may result in the trade-off between environmental and social protection to growth in production capacity. Decoupling economic growth, which allows for growth with reduced environmental impact, will require investment in alternative energy sources through technological progress in developed countries and technology transfer to developing countries to enable their sustainable development.

Given the strength of the consumer expenditures in developed countries' GDP, sustainability transformation to sustainable development may be catalysed through education that promotes a shift in consumption value orientation to include a responsibility for the holistic impact of a given consumption choice. The result would potentially lead to internalisation of externalised costs of production to ensure sustainable use of environmental resources as well as labour. In the case of labour, decent work, the focus of Chapter 3, an outcome of conscious consumption would potentially be found in improved working conditions and wages, most significantly in developing countries. Codification of the value shift embodied in sustainability transformation results in regulation that establishes an ongoing framework for sustainable development.

Chapter 2

Ahmad, W., & Ahmed, T. (2014). Energy sources and gross domestic product: International Evidence. *The Pakistan Development Review*, *53*(4), 477–490.

Anielski, M. (2002). The Alberta GPI: Economy, GDP, and Trade. Retrieved from https://www.pembina.org/reports/01.GPI_EconomyGDPandTrade_techrpt.pdf

Bildirici, M. (2012). Economic growth and energy consumption in G7 countries. *The Journal of Energy and Development*, *38*(1/2), 1–30.

Boarini, R., & D'Ercole, M. (2013). Going beyond GDP: An OECD perspective. *Fiscal Studies*, *34*(3), 289–314.

Boden, T. A., Marland, G., & Andres, R. J. (2016). *Global, regional, and national fossil-fuel CO_2 emissions*. Oak Ridge, TN: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy. Retrieved from https://www.osti.gov/biblio/1389328

Boran, I. (2006). Benefits, intentions, and the principle of fairness. *Canadian Journal of Philosophy*, *36*(1), 95–115.

BP. (2018). BP Statistical review of world energy. Retrieved from https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf

Bruns, S., Gross, C., & Stern, D. (2014). Is there really granger causality between energy use and output? *The Energy Journal*, *35*(4), 101–133.

Bureau of Economic Analysis. (2000). GDP: One of the great inventions of the 20th century. Survey of Current Business, *80*(1), 9–14.

Burkart, K. (2009). How do you define the 'green' economy? Retrieved from http://www.mnn.com/green-tech/research-innovations/blogs/how-do-you-define-the-green-economy

Catagay, N. (1996). Gender and international labor standards in the world economy. *Review of Radical Political Economics*, *28*(3), 1247–1255.

Chontanawat, J., Hunt, L. C., & Pierse, R. (2008). Does energy consumption cause economic growth? Evidence from systematic study of over 100 countries. *Journal of Policy Modelling*, *30*(2), 209–220.

Day, G. S., & Aaker, D. A. (1970). A guide to consumerism. *Journal of Marketing*, *34*(3), 12–19.

Dick, C. (2010). Do environmental characteristics influence foreign direct investment growth? A cross-national study, 1990–2000. *International Journal of Comparative Sociology*, *51*, 192–210.

Energy Information Agency. (2018). Energy and the environment. Retrieved from https://www.eia.gov/energyexplained/index.php?page=environment_where_ghg_come_from

Environmental Protection Agency. (2017). Understanding global warming potentials. Retrieved from https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

Fagg, J. (1981). The fundamental principles of economics. *Journal of Economic Issues*, *15*(4), 937–942.

Ferguson, R., Wilkinson, W., & Hill, R. (2000). Electricity use and economic development. *Energy Policy*, *28*(13), 923–934.

Ge, M., Friedrch, J., & Damassa, T. (2014). 6 Graphs explain the world's top ten emitters. Retrieved from https://www.wri.org/blog/2014/11/6-graphs-explain-world-s-top-10-emitters

Goldemberg, J., & Siqueira Prado, L.T. (2013). The decline of sectorial components of the world's energy intensity. *Energy Policy*, *54*, 62–65.

Hensman, R. (2000). World trade and workers' rights: To link or not to link? *Economic and Political Weekly*, *35*(15), 1247–1255.

IPCC. (2014). *Climate change 2014: Synthesis report*. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R. K. Pachauri & L. A. Meyer (Eds.)]. IPCC, Geneva, Switzerland.

Jones, C., & Klenow, P. (2016). Beyond GDP? Welfare across countries and time. *The American Economic Review*, *106*(9), 2426–2457.

Jorgenson, A., & Clark, B. (2012). Are the economy and the environment decoupling? A comparative international study, 1960–2005. *American Journal of Sociology*, *118*(1), 1–44.

Junyent, M., & A. M. Geli de Ciurana. (2008). Education for sustainability in university studies: A model for reorienting the curriculum. *British Educational Research Journal*, *34*(6), 763–782.

Leonard, J. (1988). *Pollution and the struggle for the world product*. Cambridge, MA: Harvard University Press.

Lepenies, P., & Gaines, J. (2016). *The power of a single number: A political history of GDP* (pp. 1–8). Columbia: Columbia University Press.

Keeling, C. D., Piper, S. C., Bacastow, R. B., Wahlen, M., Whorf, T. P., Heimann, M., & Meijer, H. A. (2001). *Exchanges of atmospheric CO_2 and $^{13}CO_2$ with the terrestrial biosphere and oceans from 1978 to 2000*.

I. Global aspects, SIO Reference Series, No. 01-06. Scripps Institution of Oceanography, San Diego, CA.

Knight, K. (2014). Temporal variation in the relationship between environmental demands and well-being: A panel analysis of developed and less-developed countries. *Population and Environment*, *36*(1), 32–47.

Knoedler, J. T., & Underwood, D. A. (2003). Teaching the principles of economics: A proposal for a multi-paradigmatic approach. *Journal of Economic Issues*, *37*(3), 697–725.

Kraft, J., & Kraft, A. (1978). The relationship between energy and GNP. *Journal of Energy and Development*, *3*(2), 401–403.

Kuznets, S. (1934). *National income, 1929–1932*. Cambridge, MA: NBER.

McCluney, R. (2008). Population, energy, and economic growth: The moral dilemma. In S. Newman (Ed.), *The final energy crisis* (pp. 151–161). Ann Arbor, MI: Pluto Press.

Neetha, N. (2010). Estimating unpaid care work: Methodological issues in time use surveys. *Economic and Political Weekly*, *45*(44/45), 73–80.

Nelson, R. H. (1995). Sustainability, efficiency, and God: Economic values and the sustainability debate. *Annual Review of Ecology and Systematics*, *26*, 135–154.

Ocampo, J., Rada, C., Taylor, L., & Parra, M. (2009). *Growth and policy in developing countries: A structuralist approach* (pp. 37–57). New York: Columbia University Press.

OECD. (2002). *Indicators to measure decoupling of environmental pressure from economic growth*. Paris, France: OECD.

Organisation for Economic Co-operation and Development (OECD). (2002). *Indicators to measure decoupling of environmental pressure from economic growth*. Paris: OECD.

Peterson, W. (1963). Energy consumption and economic growth. *Challenge*, *12*(1), 38–39.

Ribeiro, M. A., Silva, F. F., & Figueiredo, P. M. (2013). Discussing the notion of decent work: Senses of working for a group of Brazilian workers without college education. *Front Psychology*, eCollection. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/26941678

Ricardo, D. (1911). *The principles of political economy & taxation* (p. 8). London: J. M. Dent & Sons.

Roberts, T., & Parks, B. (2007). *A climate of injustice: Global inequality, North-South politics, and climate policy*. Cambridge, MA: MIT Press.

Sasaki, H. (2011). Population growth and north-south uneven development. *Oxford Economic Papers*, *63*(2), 307–330.

Satterthwaite, D. (2009). Big emitters: how growth in consumption drives climate change. Retrieved from https://pubs.iied.org/17077IIED/?a=david+satterthwaite&p=4

Schweiger, I. (1964). Gross national product, consumer spending, saving, and housing. *The Journal of Business*, *37*(1), 28–31.

Schweitzer, A. (1981). Social values in economics. *Review of Social Economy*, *39*(3), 257–278.

Scopelliti, D. (2016). Consumer spending: Past and present. *Monthly Labor Review*. Retrieved from https://www.bls.gov/opub/mlr/2016/beyond-bls/consumer-spending-past-and-present.htm

Shah, M. (1999). Synthesis of ecology and economics: Towards a new theoretical paradigm. *Economic and Political Weekly*, *34*(46/47), 3293–3298.

Skene, K. (2015). *Sustainable economics*. New York, NY: Greenleaf Publishing.

Stewart, K. (2005). Dimensions of well-being in EU regions: Do GDP and unemployment tell us all we need to know? *Social Indicators Research*, *73*(2), 221–246.

U.S. Department of Commerce.(2000). GDP: One of the Great Inventions of the 20th Century. *Survey of Current Business*. *80*(1), 6–10.

UNESCO (Culture Sector). (2000). *World culture report*. Paris, France: United Nations.

Venkatesan, M. (2017). *Economic principles: A primer, a framework for sustainable practices*. Charlotte, NC: Kona Publishing and Media Group.

World Bank. (2019). GDP growth. Retrieved from https://data.worldbank.org/indicator/NY.GDP.MKTP.KD?end=2017&start=1960&view=chart

World Commission on Environment and Development (WCED). (1987). *Our common future*. Oxford: Oxford University Press.

Chapter 3

Agarwal, B., Humphries, J., & Robeyns, I. (2003). A special issue on Amartya Sen's work and ideas. *Feminist Economics*, *9*(2–3), 3–12.

Artecona, R., & Cunningham, W. (2002). *Effects of trade liberalization on the gender wage gap in Mexico*. Policy Research Report on Gender and Development Working Paper Series, No. 21. World Bank, Washington, DC. Retrieved from http://documents.worldbank.org/curated/en/860271468049793708/Effects-of-trade-liberalization-on-the-gender-wage-gap-in-Mexico

Bavier, R. (2008). Reconciliation of income and consumption data in poverty measurement. *Journal of Policy Analysis and Management*, *27*(1), 40–62.