

A CONCEPTUAL FRAMEWORK ON ADJUSTED NET SAVING RATE AS THE INDICATOR FOR MEASURING SUSTAINABLE DEVELOPMENT IN MALAYSIA

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Abstract

The approach to employ gross domestic product (GDP) as the measurement of income for a nation has been in practice since decades ago. Economists, from various school of thoughts however, have debated for its fallacy of measuring well-being. Maintaining the equal utility levels of consumption and income to be passed onto future generations endlessly is the ultimate goals in economic theory. This idea of constant utility marked the emergence of the term ‘sustainable development’. The initial idea which proposed the basis for sustainability can be traced from the saving and investment rule, where an adequate level of saving should be provided for investment and subsequently reach the optimal economic growth. Optimal rate of economic growth, in further should be enhanced to achieve sustainability by the means of increasing investment and/or replenishing the resources extracted during economic production process. The recently launched New Economic Model under the 10th Malaysian Plan has a continuing objective on sustaining high economic growth. Placing ‘sustainable development’ as the keyword, the term has now become a focus when designing national policies. Economic growth's framework is now being accompanied with the concept of ‘sustainable development’. Sustainable development means leaving enough capital resources for future generations; or at least equal opportunities as the ones that present generation enjoyed. In this paper, the proposed indicator to measure sustainable development for Malaysia is “Adjusted Net Saving” rate. A positive ANS rate is much desired since it would indicate a sustainable path of development progress while negative rate should be avoided as it implies otherwise. This paper aims to present a conceptual framework on ANS rate and discuss its advantages on being a useful tool to measure sustainable development in Malaysia.

Keywords: *Adjusted Net Saving Rate, Sustainable Development, Economic Growth, Malaysia*

1.0 Introduction

The concept of saving in the economy has been the central interest among researchers in the field of growth and development. Saving is a core aspect of development and is often being regarded as an important input in order to promote long run economic growth (Keynes, 1936). The traditional calculation of saving is derived from the Keynesianism’s definition of savings, which is the residual between income and consumption. The important role of saving in economy have been mentioned as a key vehicle that builds an economic connection among the past, the current, and the future of a country (Temple, 1999). While for a country’s saving rate; normally denoted as the national saving rate, consists of the total public and private sector’s saving plus with balance on net current transfers, usually been expressed as a percentage of gross national income (GNI). This so-called “gross national saving” (GNS) has been considered as one of the famous indicators to economists when looking at a nation’s present wealth value. The amount of saving available in a country shows the level of capital available for investment. Greater saving means that the economy has large funds available for investment opportunities which could further enhance the economic growth. Economic growth is normally measured by the increasing level of production/output in the economy; that is the growth

rate of gross domestic product (GDP). The correlation between GNS and economic growth has long been discussed in many series of researches, nonetheless for its definition, concept, determinants and so forth. Relatively, saving has been treated as exogenous in the growth model by (Solow, 1956) via a transition path, which exposed that level of output to an economy is a function of capital and labour. However, numerous studies have found its' significant indirect contribution towards economic growth, such as by (Ando & Modigliani, 1963; Deaton, 1997; Modigliani, 1970) and (Carroll & Well, 1993). In addition to this, (Mohamed Ariff & Cheen, 2001) emphasized that the level of savings should be one of the main concern by policymakers in order to maintain adequate resources for higher economic output.

2.0 Economic Growth and Sustainable Development

As mentioned above, maintaining higher economic growth would be a favourable objective for nations worldwide. For more than half a century, GDP have been a principal role to indicate economic growth progress. However, in recent decades, there were growing concern on whether GDP itself indeed is the best indicator for measuring social and environmental quality of an economy. As GDP only produced the monetary value of total output, which is how much an economy have been productive for the previous fiscal year. It would not and could never address social issues like- how much the people have enjoyed the prosperity?, even though wealth has been accumulated, what about the depletion of natural resources it have brought to the economy? What are the plans by the government to ensure that these depleted resources are being replaced? Gaining prosperities and wealth to be enjoyed by present generation is certainly a great achievement, but to ensure that it would sustain to the next generations would be a far greater challenge. Up to this point, economists concluded that GDP alone does not intended to measure well-being. In fact, the high score on GDP explicitly shows how much an economy have been produced, without accounting how much damage it have brought. This new shift in paradigm has come to discuss whether GDP is actually an appropriate indicator to measure sustainable development. The concept of sustainable development was firstly mentioned in a report by (IUCN, 1980) which brought the issue and term of 'conservation' to prevent irreversible damage to living resources. It was only in 1987 that a commonly accepted worldwide definition of sustainable development have been derived. The Brundtland Report published in 1987 (Brundtland et al., 1987) defines sustainable development as - "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*". This concept aligns with modern economic theory proposed by revisiting the earlier Solow growth model (Solow, 1974, 1986) and (Hartwick, 1977) which suggested that resources extracted or damaged should be reinvested to achieve optimal growth and intergenerational equity. Moreover, endogenous growth theory by (Romer, 1990) also suggested that technological change were the result of capital investment that would prolong and maintain sustainability. (World Bank, 1997) designed the measurement of wealth, by including the rate of saving as the important element to the economic growth and further arrive to sustainability. This paper provide its' preliminary perspective by discussing the concept of saving in the economic growth and sustainable development.

3.0 Sustainable Development – Framework and Measurement

The conventional indicator for economic growth originated from a growth model by (Solow, 1956). The model initially proposed level of output as a function to the total capital and labour and a revisit in (Solow, 1974) reassumed the property of diminishing returns; where technological progress is perceived as the increasing productivity to achieve growth. In the theory of intergenerational equity presented here, GDP has been debated to be a suitable indicator. The discussion was further enlightened possible ways to go beyond achieving economic growth, which is to sustain development progress. Following this, (Hartwick, 1977) introduced the Hartwick's Rule, an economic framework with the maintenance of a constant stream of consumption into the infinite future; through saving and investment rule that ensure to keep capital 'intact'. This is the basic sustainable development conditions for economies to indicate nominal wealth across generations. In practice, sustainability is

usually measured through sustainable usage of natural environment. In addition to natural capital, the society should also supply future generations with a sufficient amount of social (human) and natural capital. For natural capital that exhaustively used up during production, it would become a limitation to the economy's potential growth. This has been discussed earlier in (Dasgupta & Heal, 1974) which suggest knowledge, technological progress should come along way under economic uncertainty in order to gain optimal depletion. In other words, welfare should be maintained over generations. This concept of welfare was initially discussed by (Weitzman, 1976). Through some formulation applied on capital goods for production, the article proposed that the welfare justification of net national product should be a proxy for current discounted value of future consumption. This idea of streaming wealth from current generation to the future evolves the concept of 'greening' the national account, as in (Asheim, 1994). Net National Product (NNP) indicator proposed in this article assumes the possibility to measure current consumption without reducing the ability of future consumption. Prior to that, (Pearce, Markandya, & Barbier, 1989) has already suggested the general thought that saving as changes in wealth. Turner & Pearce (1992) provided the preliminary recommendation to include depletion of natural resources and environment in the national accounts. The underlying concept of 'weak' sustainability assumes non-existence of threshold in the critical natural assets resources. It regards that all resources, while being utilized, can be replaced by reinvesting it into economy. Through this article, the idea that saving (or can be perceived as changes in wealth) is crucial for sustainable development. In (Pearce & Atkinson, 1993), the authors presented estimates of depletion and degradation for 20 economies in order to examine the saving behaviour in these countries. The findings enlightened some issues where many countries are found to be unsustainable, since their gross savings are less than total sum of capital and environment depreciation. This measurement is famously known as Adjusted Net Savings (ANS). It is a comprehensive indicator for measuring sustainable development from the perspective of saving as a capital investment and wealth accumulation. This economic dimension of sustainability suggests that for a sustainable development path, an economy should maintain a positive value of ANS rate. The explanation on this indicator is explained further following next section.

4.0 ANS rate for Measuring Sustainable Development – Theoretical Framework

Measurement of welfare in the critical assessment of different types of resources, discoveries and various types of pollutants is presented by (Hamilton, 1995; Hamilton, Atkinson, & Pearce, 1997). The similar work as the one presented by previous authors have brought an idea to possibly calculate ANS rate for countries worldwide, as to indicate whether a country is on right track of sustainable development. The World Bank constructs the estimation of adjusted net saving rate for various countries by making adjustments to the GDP and GNS figures, respectively. Ando & Modigliani (1963) and (Carroll & Well, 1993) were among the first authors that presented a theoretical construction of ANS rate through national savings; with practical methods applied by World Bank in estimating the indicator. The calculation method were conducted similarly on every countries and is publicly available in the online database (World Development Indicator, WDI).

The ANS idea was officially introduced by the World Bank in 1992. It is in fact an extension from the traditional calculation of gross national saving – where this 'augmented' GNS rate incorporates the calculation of natural resources depletion and environmental degradation (such as pollution) along with the addition of human capital formation. The derivation of ANS rate calculation is shown in Figure 1.

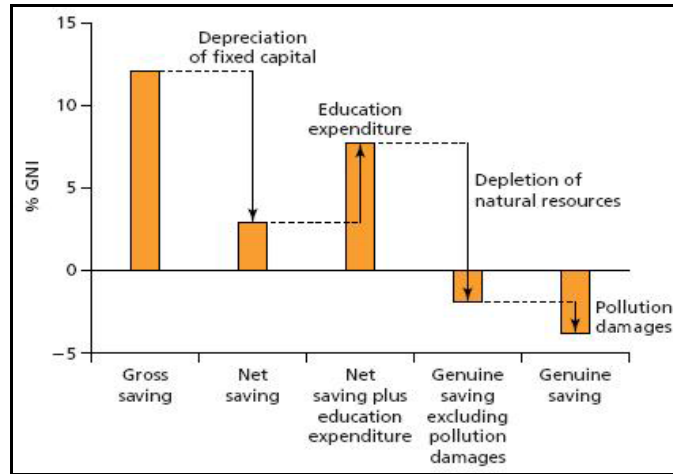


Figure 1: Method of Calculation for Adjusted Net Saving Rate

Source: World Bank (1998)

All these capitals assets were expressed in monetary unit, as ratio to gross national income (GNI) and given as:

$$ANS = \frac{GNS - Dh + CSE - \sum R_{n,i} - CD}{GNI} \dots\dots\dots \text{Equation 1}$$

Where

- ANS = Adjusted Net Saving Rate
- GNS = Gross National Saving
- Dh = Depreciation of produced capital
- CSE = Current (non-fixed-capital) expenditure on education
- R_{n,i} = Rent from depletion of natural capital *i*
- CD = Damages from carbon dioxide emissions
- GNI = Gross National Income at Market Prices

Given it's drawback as a 'weak' indicator for sustainability, the indicator is still being perceived to be able to comprehensively explain how much an economy is saving (or rather investing) for future generation. According to (Thiry & Cassiers, 2010), ANS rate indicator is among the most frequently favoured by economists; due to its unique characteristic of augmenting the net GNS rate calculation by including human capital development (indicated by public expenditures on education) and deducting depletion on natural resources together with environmental degradation (pollution). Theoretically, a basic framework for sustainable development can be drawn out as in Figure 2.

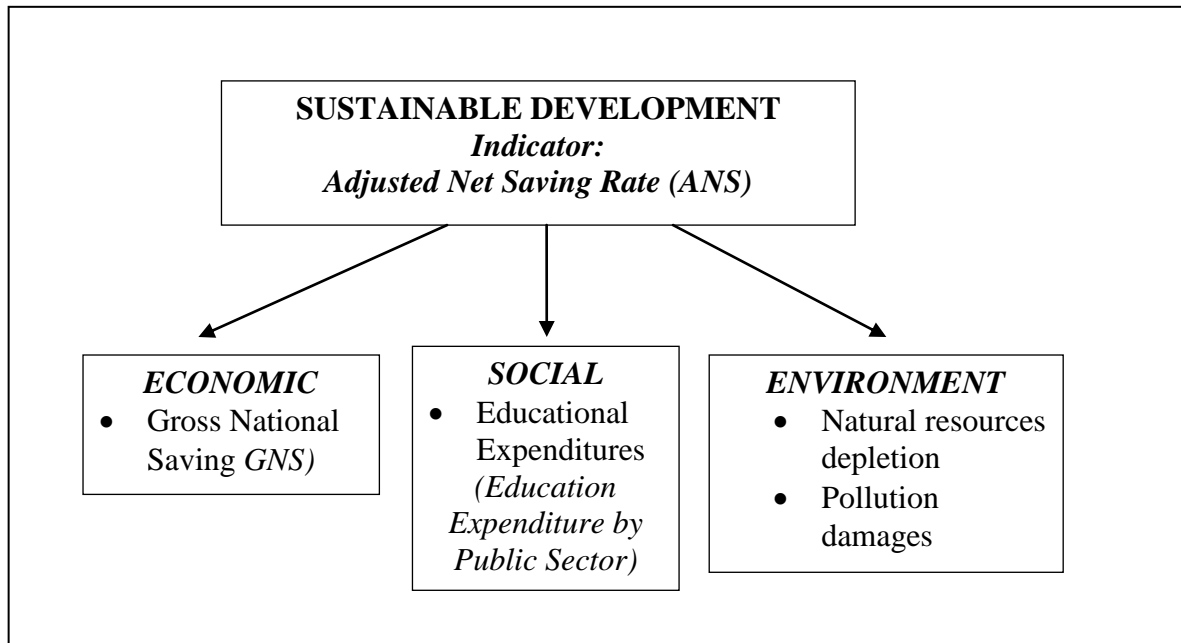


Figure 2: Theoretical Framework of ANS Rate

(Source: World Bank, 1997)

5.0 ANS Rate as the Indicator for Sustainable Development in Malaysia

Since gaining independency in 1957, Malaysia has prospered a rapid economic growth mainly through effective development plans which drawn a substantial investments and industrialization processes. By assessing through the conventional GDP indicator, Malaysia in generally, has sustained a positive economic growth trajectory. However, there are growing concerns that the conventional GDP maybe insufficient to reflect the sustainability of a country, as it implicitly and explicitly unable to measure the changes in capital and pollution impacts. Furthermore, a critical fear to policymakers is whether Malaysia's economy is moving on the right track of sustainable growth path. Even though the shortfall of the GDP indicator as a true measure of aggregate economic performance has drawn intention to many, the need for alternative indicators has also become an increasingly important issue. ANS rate calculation pointed out that the operational definition of sustainable development in the weak sustainability paradigm is that the total stock of capital, including, man-made capital, human capital, natural capital and even social capital should be maintained as a necessary condition to maintain future well-being.

From the World Development Indicator (WDI) Report provided by the World Bank, ANS rate in Malaysia indicates a positive cyclical trend from 1970 until 2012; with maintaining positive signs through the years (Figure 3). Unlike GDP growth which faced some turbulence along the years (the worst negative downturn was in 1998), positive ANS rate had given us the clue that Malaysia indeed is on sustainable path. However, by seeing the cyclical trend of the positivity should impel a thorough study on what actually drives the ANS trend in Malaysia.

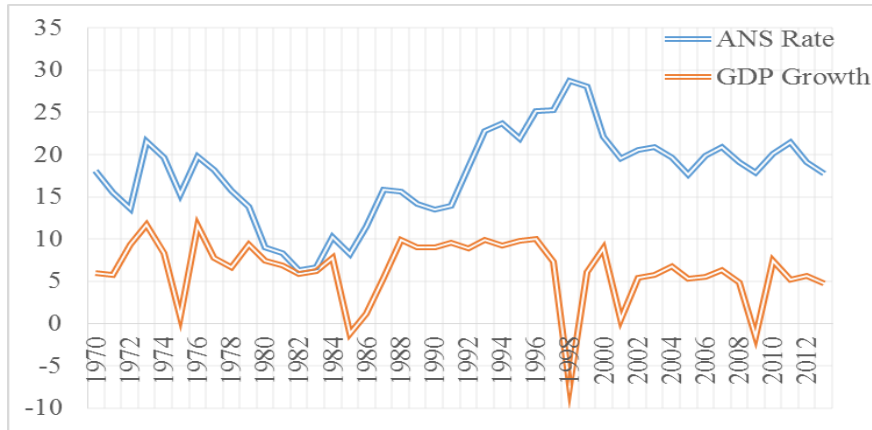


Figure 3: Adjusted Net Saving Rate and GDP Growth of Malaysia (1970 - 2012)

Source: World Bank's World Development Indicator Report (various years)

The discussion is now extended to examine the component of ANS in Malaysia. Mathematically derived, the positive ANS rate can be easily obtained if net saving and investment in education are greater than depletion in natural resources and environment. Figure 4 additionally show how was the progress of each component in ANS rate for Malaysia from 1970 until 2012.

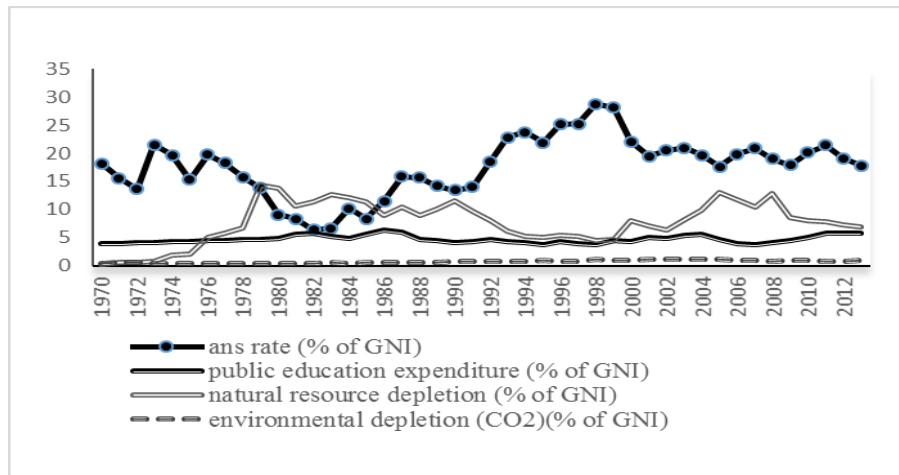


Figure 4: Component of ANS Rate in Malaysia (as % of GNI), 1970 – 2012

(Source: World Development Indicator report, World Bank, 2015)

Although ANS rate for Malaysia has been in positive sign since nearly half a decade, its volatile progress became an interesting issue to be discussed. It was clearly seen that natural resources were highly depleted during 1970 – 1980 and in 2005 – 2008. Natural resources depletion is a ratio between stock of remaining natural resources and its' reserve lifetime – usually capped at 25 years. It is critical to say that Malaysia deplete it's natural resources at an average of 15% yearly, small number in ratio but is large amount when the figure is converted into monetary value. This should be an alarming issue for the policymakers when designing appropriate development plan and vision. Public expenditure in education, on the other hand, maintained throughout the years with contribution around 5 percent in average. World Bank treats all education expenditure were made by the public sector, and it is assumed that a dollar invested into education sector would rise a dollar worth of human capital (Susana & Vincent, 2005). The environmental damages, measured by carbon dioxide emissions was also stable without reaching 2 percent of GNI. Each tonne of carbon dioxide emitted were calculated as \$20 of damage costs, by World Bank which appeared in the manual book by (Bolt, Matete, & Clemens, 2002). Damage costs of CO2 in Malaysia is proportionately at 2 to 3 percent of GNI and this figure is maintained throughout the years. By observing through the performance and contribution of each component towards ANS rate in Malaysia, it can be said that these components

should be monitored as it also could directly influence the Malaysia's sustainable development trajectory. Even though Malaysia has a good track in ANS rate, identifying the significant factors which could deteriorate sustainable development is a critical issue to be highlighted. This is very much consistent with the country's vision to obtain a high-income nation status by year 2020- as growing a high-income nation should not only by accumulating wealth, but must also preserve nature and conserve environment for future generation's well-being. The positive track record had furthermore required a possible construction of conceptual framework on ANS rate indicator for Malaysia, in complementing the outcome from government's successful development plans for the economy.

6.0 The Conceptual Framework of Sustainable Development in Malaysia

For a resource-rich country like Malaysia; "resource dependence" characteristics have made efforts to measure 'true rate' of saving becoming difficult, since natural resources and environmental depletion do not appear in standard national accounts (when we employ GDP as the present income indicator). It is an advantage when ANS indicator solve these issues by measuring the change in value of a specified set of assets, on top of measuring capital gains. Economic theory suggests that the present value of wellbeing is increasing, if a country's net saving is positive and the accounting includes a sufficiently broad range of assets. From the above discussions, the conceptual framework for the ANS rate indicator for Malaysia could be drawn out and suggested in the (Figure 5). From Gross National Saving (GNS) we could obtain information on how much the nation is saving (in monetary form), while deducting depreciation on produced assets provide us the more detail value of national saving to get the net (national) saving. Based on the fact that educational expenditure is essential and by every respect must be borne by the public sector, it should be included after net national saving is obtained. Public sector's expenditure in education depicts government's contribution in generating social capital for the nation, thus, would accelerate human capital development. In here, the authors suggest the inclusion of private sector' investment in education to the comprehensive measurement of ANS. This approach have been suggested by (Ferreira & Moro, 2010) which calculated the ANS for Ireland. The rationale to include private sector's investment in education here is to justify their contribution towards human capital development in Malaysia. Finally, the rate of genuine saving (ANS rate), is obtained after depletion of natural resources (minerals, fuels and energy) and environment (air pollution) have been accounted for. The sign of ANS rate (positive or negative) would imply whether the Malaysian economy is on a possible track of sustainable development.

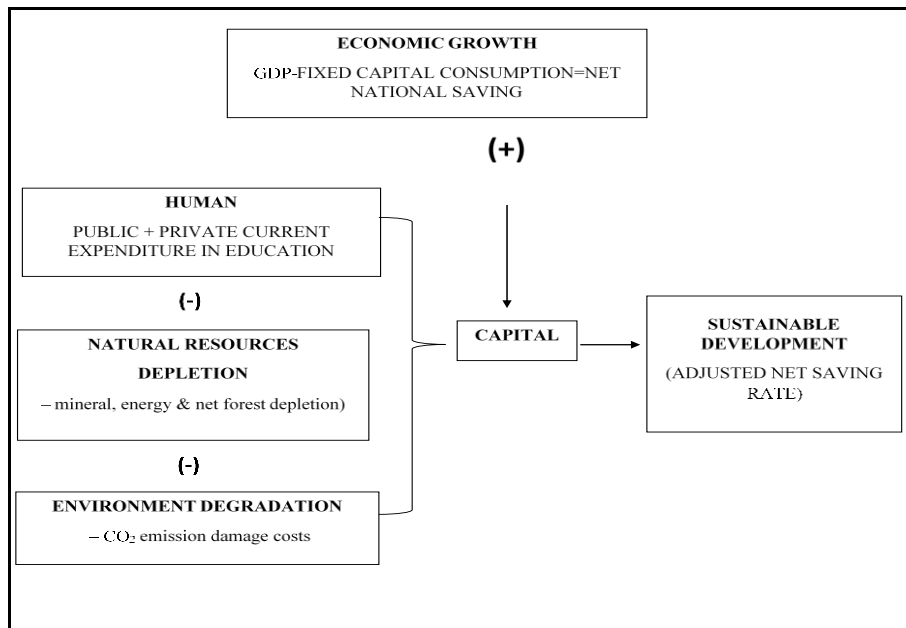


Figure 5: Conceptual Framework of Sustainable Development's Indicator in Malaysia (ANS)

7.0 Conclusion

Sustainable development was mainly concerned on the ability to maintain a constant stream of consumption into the infinite future. This can be achieved using saving and investment rule that ensures the aggregate stock of physical and natural capital remains constant over time. ANS rate has the advantage in showing the measurement path to sustainable development for exhaustive resource dependent economy like Malaysia. The inability of many resource-rich economies to achieve long-term welfare improvements to the failure of government to offset the depletion of natural resource stocks with sufficient investments in physical capital and human capital; consequently, their total wealth -the sum of physical, human, and natural capital declines.

This paper was a preliminary attempt to suggest a conceptual framework for calculating ANS rate in Malaysia as the indicator to measure sustainable development. The main proposal of this paper is to recommend the four important elements which constitute the character of sustainable development – economic indicator (national saving), human capital indicator, natural capital and environmental capital indicators. The author had also suggested that private sector's investment in education to be account for in the framework. The role of private sector in education in Malaysia should not be neglected since their contribution were significant in recent years. While for the other indicators, Malaysia should aware of their volatility and cyclical trend over for this almost fifty years. Any disturbance to the economic cycles might infer some shocks to the resources that will bring more depletion toward natural resources and degrading environmental quality.

With the adjustment made on the calculation of national saving, economists have brought the new idea to measure sustainability; by extending the concept on how current's saving should be adjusted to reflect future well-being (sustainability). By these means, ANS rate is therefore could assist policymakers in committing their countries to achieve "sustainable" development pathway. ANS is intended to provide decision makers with a clear national level indicator, signifying them of how relatively simple sustainable investment policies of their countries.

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