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Book review

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The Measure of Progress: Counting what Really Matters

by **Diane Coyle**

Princeton University Press, 2025.

"When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind."

William Thomson Kelvin, *Electrical Units of Measurement*

At the very beginning of the book, Diane Coyle gives a clue as to what the book is about. She points out that the current System of National Accounts (SNA), including the all-important figure for GDP, dates from the 1940s, when "physical capital was the binding constraint on growth in the postwar era, natural resources seemed free, and the pressing economic policy challenge was seen as effective demand management so the Great Depression could never recur" (p. 4). The economic environment at the beginning of the 21st century is quite distinctive. The author emphasises that nature is now the binding constraint, as extreme weather will destroy much of physical and human capital, biodiversity loss will reduce agricultural productivity, and new zoonotic diseases are likely to emerge as humans press further into natural habitats. Furthermore, Coyle points out that the main economic policy challenge is now on the supply side: restarting the economy's productivity engine to drive improvements in living standards, at a time when there are headwinds such as climate shocks, conflict, and ageing societies. The author emphasises: "The central argument of this book is therefore that this 1940s measurement framework, the SNA and other standard economic statistics extending it, is no longer adequate for understanding the economy, and in fact in some ways actively hinders understanding. The structure of the leading economies has changed so much in the past nine decades that the framework is a distorting lens, or even a set of blinkers. A new one is needed" (p. 15).

With that "central argument", the reader vaguely acknowledges what the book is about – although the aim of the book is missing – supports the academic effort of the author, but from the beginning, wonders whether "a new one is needed" or the incumbent SNA should be solely enhanced, however radically. Furthermore, it is

reasonable to support the case for change by noting that technological change over the last few decades has been significant and that products have changed substantially, including the introduction of entirely new ones.

Taking that into account, it is evident to the reader that the incumbent SNA, despite some gradual changes since the 1940s, is not well suited to measuring the value created, its dynamics, and the economic progress of humanity, understood as the total welfare of human beings. So the crucial questions are twofold. First, what are the main flaws of the incumbent SNA? Second, how to fix these flaws, i.e. how to appropriately measure the economic progress, if any? Both questions are, in essence, highly technical and require impeccable knowledge of both the nuts and bolts and the politics of economic statistics and measurement.

Diane Coyle's track record in the field is substantial. Her publishing record in the last decade includes a thorough explanation of the concept of GDP and its history (Diane Coyle 2014), a debate on the relations between market and the government in which she emphasises market failures more than the government failures (Coyle 2020), and a book in which the main flaws of the incumbent SNA are flashed out, and also a rather vehement criticism of the adversarial culture of academic economists is not only provided but suggested as a reason for the lack of the academic progress in the field of measurement (Coyle 2021). Whether the reader subscribes to the insights in these books or not, Coyle's credentials for the job are impeccable.

The reader is somewhat puzzled by Chapter 1 of the book ("Political Arithmetick"). The chapter title is nothing but the title of the 1690 book of William Petty, a pioneer of economic statistics, in which he introduced the concept of national income and wealth and saw land and labour, not gold, as the true source of the country's prosperity. According to the author "The title he chose for his book is apt: statistics and their categorisation are indeed political" (p. 23). What is the chapter about? The reader learns about the concept of Total Factor Productivity (TFP), the famous "residual" in the growth accounting procedure, famously described as "the measure of our ignorance" by Moses Abramovitz (1956), driven primarily by technological progress, as a measure of economic growth beyond that accounted for by growth in inputs used. In short, TFP is an approximation of economic progress, at least from the production side. The reader then learns that TFP growth in the most advanced economies has stagnated in recent decades, especially since 2000. This empirical insight is not disputed, but there are competing explanations for the slowdown. The author correctly refers to these explanations, such as Robert J. Gordon (2016) and Nicholas Bloom et al. (2020), who claim that technological progress has been slowing down, and Erik Brynjolfsson, Daniel Rock, and Chad C. Syverson (2021), who are techno-optimists, who assert that technological progress needs time to increase TFT, without subscribing to any of them. Nonetheless, the reader wonders whether this slowdown in TFP growth is real, for whatever reason, or is it bogus, due to inappropriate measurement.

Since the title of the book contains words "measurement" and "counting", not "TFP" and "technological progress", the reader infers, although nothing is for sure, that the disappointing TFP growth is bogus and that it is a result of the measurement problem. The author gives some support to that view with a rather pessimistic evaluation: "The more research I have done on economic statistics, appreciating the practical

challenges and inherent conceptual challenges, the less certain I am that we know anything solid about today's economy" (p. 29). At the end of the chapter, Coyle points out "This book is concerned with the statistics intended to measure what is happening in the economy, and it starts from the presumption that the conceptual framework underpinning today's statistics is redundant. The prevailing statistical lens distorts perceptions and is leading to bad decisions and outcomes" (p. 32). The reader now, with the caveat that perhaps there may be other reasons for bad decisions and outcomes aside from bad data, has, after the distraction, however vague, again an idea of what the book is about. What happened to the sluggish TFP growth in advanced economies remains unclear, but the intuition is that measurement error is to blame.

Productivity is a keyword in Chapter 2 of the book ("Productivity without Products"). Again, Coyle addresses the sluggish TFP growth considered in the previous chapter, and again, Coyle refers the authors with opposing views, without siding with any of them. What is new is standard growth-accounting catechesis, with the nuts and bolts of the TFP calculation. Non-specialists will definitely skip these pages, and growth economists, those familiar with the growth accounting procedure, will raise their eyebrows, grind their teeth, and disappointedly whisper to themselves: What's new in it? The author would have done a much better job had she explained the concept to non-specialists, i.e., the philosophy of the TFP as a famous residual. TFP calculation is bread and butter for growth economists anyway, and they understand TFP's philosophy. As to the productivity growth deceleration, the author consumes pages and pages in sheer description, like: "For example, manufacturing has contributed substantially to the productivity slowdown in the United States, the United Kingdom, Sweden, Greece, the Netherlands, and Austria but actually made a small positive contribution in Denmark and Italy" (p. 51). The reader becomes nervous, even melancholic, asking whether this will be the staff for the rest of the chapter, perhaps the rest of the book.

Then, out of the blue, comes the following insight: "Aggregate growth accounting requires the assumption of constant returns to scale and competitive input markets; neither is valid in any industrialised economies" (p. 54). This insight is absolutely correct if the word "perfect" is substituted for "competitive", but the author does not even bother to contemplate how reality deviates from the assumptions and what the consequences of this deviation are for the estimate of TFP and its dynamics. Is it underestimated (biased downward) or overestimated (biased upwards)? The reader infers that it is reasonable to assume that advanced economies operate under increasing, not constant, returns, as fixed costs dominate variable costs in industries at the technological frontier that employ state-of-the-art technology. The increasing returns shift the production function upwards and increase TFP. As to the imperfect production factors markets, the reader comments that it is effectively about friction in the labour market (save asymmetry of information, capital markets are rather competitive), that can go both ways, decreasing wages from the perfect market equilibrium level due to monopsony/oligopsony on the local labour markets (Eric A. Posner 2021) or increasing them due to unionisation, with countervailing effects on the value of the engaged labour, hence without unambiguous result to the TFP dynamics. Alas, the author provides no clues.

Furthermore, the reader ponders whether the GDP is somewhat underestimated and whether the downward bias increases over time; this would explain both the sluggish growth of the GDP and TFP. Graciously, Coyle moves into this territory, referring to technological progress as process innovation rather than product innovation. "Process innovations are often overlooked in discussions of productivity; attention is more readily captured by the excitement of scientific discovery and new devices" (p. 57). It is iconic Ford's conveyor-based assembly line that is perhaps one of the most significant process innovations in the 20th century, but it only produced the same product (equally iconic Model T – Tin Lizzy), although, due to the cost decrease, it was sold for a much lower price. The GDP dropped *ceteris paribus*, the car became a widespread consumer good, and utility, measured by consumers' surplus, increased, not only in spite of, but because GDP dropped, due to vertical innovation (Philippe Aghion and Peter Howitt 1992) of the production process. In short, the dynamics of consumer welfare need not follow GDP as currently measured in the SNA. Furthermore, process innovation is a feature of manufacturing and perhaps high-tech services, but there have been very limited process innovations and productivity improvements in labour-intensive services. It was recognised almost half a century ago as a Baumol disease (Willian J. Baumol 1967). The reader ponders whether a steady increase in the share of labour-intensive services in advanced economies can account for the sluggish growth of TFP.

The other important component of measuring economic activity and progress is time; therefore, the author notes developments in that field. The starting point is the "full income" approach: summing up available time (sleeping hours are subtracted) and earned income in monetary terms (Garry S. Becker 1965). The author emphasises that there are competing approaches to incorporating time into the SNA. "One […] is to view the shadow value of unpaid time as equal to the market wage, representing the opportunity cost of leisure or of household work, as the United Kingdom's Office for National Statistics (ONS) does. Another is to view the shadow value of time as equal to the market price of household chores, the wage rate of household workers, as used by the US Bureau of Economic Analysis" (p. 69). This insight is so typical of the book. The reader believes that this description is factually correct. Nonetheless, there is nothing more about it. The author does not subscribe to one or the other approach; the author does not provide the pros and cons of these two approaches. Furthermore, the reader learns only about facts for the US and the UK. How things are done in other advanced economies, let alone emerging economies, remains a mystery. Since the author is aware that these two approaches produced different results and that the difference is not constant over time, it is somewhat puzzling that the author does not even recognise the question of the extent to which GDP measurements are comparable across countries. The reader wonders whether there is any initiative toward international convergence in the method for imputation of time, but the book remains silent on the matter. It is unfortunate that the book has the word "measurement" in its title.

Chapter 3 ("Dematerialisation") explores the implications of the increasing dematerialisation of economic value for understanding the changing structure of production and, hence, the limitations of current statistics. "It covers three phenomena: manufacturers that do not make anything, manufacturers producing services rather than (or as well as) physical goods, and the shift to a subscription-based production model" (p.

73). The first phenomenon is known as factoryless goods production (FGP). A typical example of the arrangement is Apple's production of the iPhone, as the hub company manufactures none of these objects. The consequence of the division of labour along the lines of the global value chains (GVCs), which require, contrary to the vertically integrated production, the reorganisation and reallocation of steps in the production process to "tasks", many of them in different countries. Accordingly, every iPhone model is designed at Apple's headquarters (Cupertino, California), from which the dispersed manufacturing process (both components and the final product) is controlled. Once the iPhone is manufactured, its wholesale and retail distribution is handled by Apple's specialised divisions worldwide, alongside other Apple products. Hence, corporations are bundling some activities/tasks (design, wholesale, etc.) and unbundling the others (all manufacturing tasks) and that, according to the author "are not well measured in available statistics, which is problematic for analysing the boundaries of the firm and creation of value added, of productivity and employment, or even for assessing the often-discussed decline of manufacturing" (p. 74). Nonetheless, aside from the decline in manufacturing, it is uncertain how deep the measurement problem is, because the relations between the firms to which the task is allocated are nothing more than contract-based market transactions involving available quantities and market prices, so GDP can be obtained, as can foreign trade statistics. The reader ponders whether the flawed GDP measurement could be due to biased transfer prices in transactions between firms within the same parent company, driven by tax optimisation or other commercial motives of multinational companies. Strangely enough, Coyle does not mention transfer prices at all as the cause of the measurement problems, nor that there is an OECD initiative to apply the price yardstick of the arm's-length principle for just taxation of multinational companies, as if it does not exist at all.

The second phenomenon of "dematerialisation", which exacerbates the problem of delimitation, is the servicisation of manufacturing, focusing not only on direct sales to customers but also on increasing the share of value creation in post-sale services for durable goods, such as regular maintenance, repair, and failure prevention. A typical example is Rolls-Royce, an aeroengine manufacturer, which provides not engines themselves but the service of engines to airlines that purchase them (as a crucial part of the aircraft manufactured by aerospace companies such as Boeing or Airbus). The service is known as "power by the hour", and has also been described as "Engines as a Service". The arrangement is that "Instead of customers buying an aircraft engine outright and separately arranging maintenance and support, they enter into a long-term agreement with Rolls-Royce. Under this agreement, the customer pays a fixed fee based on the number of engine flight hours or cycles. The buyers have reduced operational risks and more predictable costs, spending less on engine parts inventory, repair facilities, technicians, and engine liability insurance. For its part, Rolls-Royce has an ongoing revenue stream. It can also benefit from economies of scale through its detailed know-how, investments in infrastructure, and extensive monitoring of engine performance, making it harder for specialist service providers to compete" (p. 82). This is clearly a Pareto-improving arrangement with genuine efficiency gains for both parties. As for measurement, the problem remains the separation of the added value of companies such as Rolls-Royce between manufacturing and services, ostensibly for

industrial policy purposes. Be that as it may, it seems that it is much more important that passenger aircraft fly safely and that airlines' costs decrease as a result of servicisation.

A subscription-based production model is the third phenomenon of "dematerialisation", linked to the servicisation of manufacturing and the emergence of entirely new industries. As for manufacturing, customers do not effectively buy durable goods; they only subscribe to the stream of services provided by those goods. "The claims by John Deere, for example, mean that farmers who bought costly equipment have been prevented from trying to repair the vehicles by software locks that stop them from working at all; they are required to take them to a specialist dealer and perhaps have to wait several days for the repair" (p. 94). In many durable goods, software prevents the owner from using them as they would like. That brings the issue to the court in the US, an interesting development in terms of contract and tort law, but the reader struggles to see what this has got to do with the measurement of GDP.

Subscription to entirely new, constantly evolving services, driven by relentless innovation, is of greater interest to SNA considerations. A typical example is Cloud computing data centres. Firms are moving their databases to specialised Cloud computing firms by subscribing to their services. A reasonable move, given the cost-cutting for ICT equipment and personnel. On balance, subscription costs for Cloud computing services are lower than the costs of running a firm's own computing infrastructure. Accordingly, Cloud computing become a significant industry in terms of creating value. Nonetheless, the problem is how to measure the value of the services provided by Cloud computing. Customers select a subscription type that provides a bundle of services, thereby granting them access to those services. These bundles are constantly changing, as the industry is highly innovative and new services replace incumbent ones (vertical innovation). The author points out that this creates a major problem with price adjustment: the deflators needed to calculate the "real" added value are almost impossible to construct correctly. Coyle conjectures that, because of this, the value created by Cloud computing is underestimated, and that the properly calculated GDP of advanced economies is larger than the currently reported figure.

Widespread digital technologies enable a new form of interaction between the service provider and the customer, thoroughly discussed in Chapter 4 under the title "(Dis)intermediation". The example provided by the author is straightforward: digital self-service scanning at supermarket checkout. According to the author, this is the trajectory of a broad substitution of capital (physical and intangible) for paid labour. As for the economic statistics, paid labour productivity, as measured, has increased, thanks to capital deepening. The author claims that value added and total factor productivity growth are probably higher. On the paid-for time-saving productivity metric, the changes look positive. But there is an unmeasured input: the shopper's unpaid labour. The author rightfully points out that "true" productivity gain is lower. "The focus of this chapter is on processes of disintermediation by digital platforms and their implications for interpreting economic statistics and assessing the pace of progress" (p. 99).

There is no doubt that these "do-it-yourself" digital activities, which the author labelled "digital intermediation services", have been growing over the last decade, and she links the beginning of that trend to the launch of the iPhone in 2007. Coyle claims

that this immense change since 2007 is pretty much invisible in official economic statistics. The reasons for this "[…] is that what we think of as the economy is defined by a production boundary excluding activities people undertake for themselves, outside paid employment, and there is much more do-it-yourself digital activity now" (p. 104). The author refers to the long-standing debate over whether and how to value non-market economic activities, which predates the origins of the national accounts in the 1940s. She points out that there is little useful data on the extent of non-market activity – this is becoming a familiar refrain when it comes to digitisation – but there is evidence of the growing scale of digital disintermediation of marketed activities, with substantial implications for measurement and the conceptual implications of taking household production seriously, and this includes household capital goods purchases, and the increased prevalence of contingent (or gig) employment. The author concludes "Among the gaps in the landscape of economic statistics and concepts are more frequent and granular time-use data including on all digitally mediated activities (WFH work, home production such as online banking, leisure); better data on purchases of household capital and personal purchases of capital equipment for work; better data on gig and related modes of work; and more thought about the implications of taking seriously time to consume" (p. 124). The bottom line, the reader succinctly concludes, is that the more unpaid labour, the bigger the unrecorded added value and GDP, and the smaller the utility, due to less leisure time. As to the Doyle's "better data" request, collecting data requires resource engagement, and all resources have opportunity costs. This is Economics 101. Nonetheless, this has not been mentioned in the book, written by an economist.

Chapter 5 ("Free") deals with many services, most of them digital, and some goods that we do not pay for today. They are zero-priced. This is not surprising, as the author points out that "For many digital services, marginal cost is effectively zero, so a zero price would represent efficient pricing" (p. 128). Yet the utility for customers is positive and, in some cases, high (e.g. free smartphone navigational aids). Accordingly, some value is produced by the providers of these services, but it cannot be recorded in standard market transactions because the price is zero. The reader concludes, *prima facie*, that some imputed price should be recorded in the national accounts. Along these lines, the author points out that "There have been several different proposals about how to measure these free digital services. This poses a problem for GDP and the national accounts because the absence of a price results in a zero on the expenditure side of the accounts, whereas, in the familiar circular flow conception, the output, income, and expenditure sides of the accounts should be equal. Ignoring a ubiquitous phenomenon does not seem a satisfactory approach, however. In the absence of any consensus about what to do, the SNA25 revision will encourage official statisticians to create 'satellite' digital accounts rather than integrating free digital services into the core accounts" (pp. 128-129). What actually are "satellite" digital accounts, and what are their relations with the "core" national accounts, remains a mystery for the reader.

The three proposals imputing the value of the free digital service to its users are through imagining it as a barter of attention for the service, already used in the national accounts for advertising-funded TV; using stated preference methods to estimate the

additional consumer welfare created and add this to GDP; and incorporating the zero price services into a price index to incorporate in the calculation of real-terms GDP (p. 130). Although the three proposals are described in detail in the book, as usual, the author does not subscribe to any of them. The reader ponders that the first one is the imputation of the value of the free services already used on the national accounts, which contradicts the problem that the author points out in the previous paragraph: according to the circular flow conception, the output, income, and expenditure sides of the national accounts should be equal. Furthermore, any imputation, such as the rent imputation for owner-occupied housing, would break the circular flow concept, yet this imputation is implemented from the start of the SNA. Something is definitely wrong with this line of argument. Furthermore, the third proposal specified by the author is the one that is designed to "incorporate digital services in the core accounts". If so, why is a "satellite" digital account needed?

The reader's nightmare of this chapter continues within the value of data. "Data is often not free, but one rationale for including it here is that the value of data collected by tech companies can be considered an alternative estimate of the scale and impact of free digital products" (p. 145). Hence, the reader concludes that there are not three but four proposals for the valuation of free digital products. Fair enough. Now, the question is how to value data. The author's bottom line is somewhat expected. "There is no agreement about how to value data, given that the value depends on how it is used and is so heterogeneous" (p. 147). The reader dashes to the next chapter.

The title of Chapter 6 ("Borders") is clear, though not unequivocal (borders between what?). This is perhaps the only thing that is clear in this chapter. The reader is puzzled and definitely cannot answer the simple question: What is this chapter about? It is not likely that the author can provide a concise and straightforward answer. Just to share some insight from this chapter. "A handful of companies have become so powerful that only the systematic use of state power can ensure they share the value that they create, and the value that they extract in monopoly rents, with workers and consumers. To achieve this, governments will need to ensure they operate a technology stack that gives them points of control over powerful companies. While the concept of digital public infrastructure is mainly prominent in the context of economic development, it has the potential to be considered as a far broader concept, a digital scaffolding to deliver the public good" (p. 174). Whatever that means.

Chapter 7 ("Value") deals with the crucial issue of national accounts: converting nominal values, typically GDP, into real values, i.e. adjusted for price changes. Since inflation, however small, is a dominant monetary phenomenon of the modern age, crucial issues are deflators. Constructing a deflator when there is no change in the bundle of products (i.e., no new products and no products that are no longer available), and no change in product quality, would be a straightforward exercise. Price indexes do the trick. Nonetheless, the reality is quite different: the product bundle (including free products) and quality have changed rapidly in recent decades. The author points out that several methods can be used to address these changes.

Mentioning rather crude and imprecise "match models" method, Coyle emphasises "The approach more prominent in the academic literature is hedonic price adjustment. This method requires data on quantifiable characteristics of quality – such as

memory and processing speed for computers. The hedonic regression estimates an implicit price for each characteristic. The price differential due to quality change can be used to adjust the index" (p. 189). The problem with hedonic prices is that they are not observable. Rather, they are implicit prices for each attribute/feature of the product, which are econometrically estimated in hedonic regressions, a rather sophisticated procedure, demanding substantial human resources (with substantial human capital), and that is informatively very demanding. In short, it is questionable whether the hedonic price approach is a useful tool for mass-scale price indexes of new and improved-quality products. The author is aware of these shortcomings as she points out, "The other conventional methods available for tackling new and improved products involve econometric estimation, so they are too resource intensive and slow to be useful for constructing regular economic statistics" (pp. 189-190). The reader concludes that the "match models" method is still used with some rules of thumb, which is not promising, especially in the case of completely new products, incomparable to anything existing.

Accordingly, it is unsurprising that the author notes that authoritative U.S. reports have estimated the extent to which consumer price inflation has been overstated because the effects of new goods and technological quality improvements have been omitted. The review of these reports suggests that there has been no consensus on the exact magnitude of the error, but there is agreement that it has been substantial and that the accurately measured real GDP rates have been higher. Including hedonic price estimates in some case studies, such as smartphones, demonstrated that the increase in consumers' welfare was even larger.

The first sentence in Chapter 8 ("Wealth") is a bold statement, more suitable to the popular press than the academic book in the field of economics. "WE ARE ALL MUCH POORER than we think" (p. 205, capital letters in original). The reader soon learns that the author refers to the environments and the environmental damage inflicted over the last two centuries. One way the damage is caused is through increased demand and the extraction of non-renewable natural resources. Coyle refers to the finding in the literature (Ed Conway 2023) that "In 2019, the latest year of data at the time of writing, we mined, dug and blasted more materials from the earth's surface than the sum total of everything we extracted from the dawn of humanity all the way through to 1950" (p. 205). The environmental impact is further amplified by the overexploitation of renewable resources (e.g., overfishing) and the emission of pollutants, including carbon dioxide, which contributes to global warming.

Sustainability, the author points out, is generally thought about in terms of the environment. But sustainability is a broader concept for her, as she subscribes (at last she subscribes to something) to the Robert M. Solow (1991) definition: that we leave to the future the option or the capacity to be as well off as we are. So, it is about the next generation's standard of living. Ultimately, sustainability is an economic concept. The author's approach to sustainability is to consider "comprehensive wealth", and she recommends introducing stocks into national accounts alongside flows. "… we are completely habituated to working with the flows that are measured in the standard SNA statistics, yet sustainable progress requires measuring the quantity and quality of the assets that generate the required flows of services, too. In effect, the economy needs a comprehensive balance sheet" (p. 210). A comprehensive "balance sheet" suggested

by Coyle should be accepted as a metaphor, because a balance sheet, as a standardised accounting template of a company, inevitably has two sides: assets and liabilities. The chapter about wealth makes it evident that the author considers only one side: assets. These assets are in the book labelled as capital, even though in the accounting balance sheet, capital (equity) is on the liability side, not the asset side.

The author starts with the assumption that "If an economy's total stock of wealth –appropriately defined and measured – rises, economic welfare will increase" (p. 210). According to this insight, the reader ponders, there is no need to record flows, as they would be calculated only as the change in stock (theoretically, that is what they are, save TFP). Nonetheless, this insight contradicts the already-quoted insight from the same page of the book, in which Coyle advocates recording stocks alongside flows. One way or the other, the reader is eager to get the details, as traditionally the devil resides in these quarters. Coyle fully subscribes to "Six Capitals" approach "that is now becoming increasingly popular in business: physical or produced capital and human, natural, social, institutional, and knowledge/intangible capital. These are a mix of the material (physical, natural, human) and non-material (the rest)" (p. 211). Some of these types of capital are self-explanatory; the reader knows very well what the physical and human capital are about. The rationale for natural capital is indisputable, with an ever-increasing footprint of human activities on the environment. Knowledge/intangible capital is easy to comprehend, but the difference between social and institutional capital remains elusive. The author explains. "In much of the economic literature, social capital is either measured as 'trust' from survey data or referred to as 'institutions', considered as fundamentally important for economic development (e.g., Daron Acemoglu and James A. Robinson 2012) and perhaps measured by some composite indicator" (p. 214). The reader is somewhat confounded: is social capital about "trust", i.e. culture in Mokyr's sense (Joel Mokyr 2017) or is it about institutions, as the rules of the game, in North's sense (Douglas C. North 1990), rather recently further developed and championed by the followers (Acemoglu and Robinson 2012)?

It is not disputable that these capitals should be recognised as essential to the wealth of any single nation and of the world. That is beyond any doubt. Nonetheless, the book is about national accounts, so it is about measurement and its quantitative results – numbers. The relevant question is how to provide the numbers about the stock, i.e. the volumes of these capitals. *Prima facie*, some of the capitals, like physical capital, are easy cases. They can be accounted for in both volume and value, at least for physical capital (i.e., assets) on companies' balance sheets. Perhaps their valuation is not entirely accurate, but one can get a rough idea. Nonetheless, the author does not acknowledge that substantial physical capital is owned by households, not by companies, beginning with owner-occupied housing and extending to other physical assets, including those needed for work-from-home. The approximation of housing value could be the estimates used by the local tax administration for property tax purposes. However, these estimates are unreliable, even in advanced economies, and they are not done regularly. Hence, many of these estimates are not only unreliable but also obsolete. Another problem, this time acknowledged by the author, is that physical infrastructure, usually owned by the government, cannot be easily accounted for in either volume or (especially) value.

There are surveys of human capital, along with proxy measures such as years of schooling. Still, these are far from perfect, and the most important variable is the effort the individual invests in his/her human capital, which is not observable. The Human Development Index (HDI) is a useful statistic, but it is a very crude measure of the volume of human capital and is not part of national statistics. Of course, it is not, as national statistics deal with monetary values, so the question is how to value a given volume of human capital. What should be the price associated with the quantity? Alas, there is no market price for it. Which price should be used instead?

The same question is even more pronounced when it is applied to the issues of dealing with social and institutional capital from a national accounts perspective. There are various analyses of these capitals (usually based on surveys or expert evaluations), particularly of institutional capital, some of which are global, such as the Fraser Institute's Index of Economic Freedom (for economic institutions) and Freedom House's Freedom in the World index (for political institutions). The methodologies of both indices are well-developed and comparable over time, but this is, again, a subjective expert evaluation. Furthermore, these indices are "physical" rather than monetary variables. They represent the volume of something, but not its value, measured in monetary units. Again, the question is which price should be used to achieve a monetary variable suitable for national accounts, this time, the balance sheet.

The author provides a magical wand answer – shadow process. The prices that are not observable but reflect the implicit or true economic values of resources that lack a market price. Accordingly, the prices for natural, human, social, and institutional capital must be calculated. Effectively, these capitals account for all the capitals/assets that are not recorded in the company's balance sheet, i.e., on its asset side, regardless of whether it is physical (tangible) assets or intangible assets (Jonathan Haskel and Stain Westlake 2018). So the question for the people in charge of any statistical office is: how to do it?

The first way forward, according to Coyle, is the stated-preferences approach, though it must be refined and systematically used. Nonetheless, she is aware of very negative "… sentiment in the economics profession toward the method of surveying people to ask how much they would be willing to accept (WTA) to lose an amenity or willing to pay (WTP) to gain it" (p. 217), referring to Jerry Hausman (1994) who provides a vehement critique of the stated-preference approach to valuing a new good. Furthermore, Hausman (2012) provides a comprehensive criticism of the stated-preferences approach to the formulation of the shadow prices. Coyle refers to both these contributions.

Furthermore, the author is quite aware that the stated-preferences approach is hardly a good choice for, say, natural capital shadow prices. "A significant limitation, however, is that the method is well suited to economic products that people understand, but not to those more distant from everyday life, whether that is biodiversity or the Apache open-source software that underpins the internet" (p. 218). The reader could only imagine what the answer, while drinking beer from the bottle at the bar, of an average respondent to the survey in West Virginia with a long coal-mining personal history (a legitimate member of a representative survey) to the question "How much are you willing to pay to preserve biodiversity worldwide?" might be. It seems that the

hypothetical answer to this question would not be suitable for publishing in an academic journal. Furthermore, the reader considers that, besides being obviously unreliable, the resources required to conduct such surveys would be immense, with substantial opportunity costs. Additionally, for comparability, these surveys must be conducted in a similar manner across countries. The probability of that happening is rather small.

The second way forward is – surprise, surprise – hedonic prices. In the case of natural capital, Coyle suggests that "…the basic approaches such as hedonic regressions and estimates of defensive expenditure are well known and used in the environmental economics literature" (p. 218). The problem is that the defensive expenditure refers to the money people spend to protect themselves from negative environmental or social conditions. Again, this amount is not observable, so it must be obtained through surveys, with all the drawbacks of the stated-preferences approach. In short, back to square one – the second way forward is based on the (flawed) first. The author refers to the contribution of Eli P. Fenichel and Josjua J. Abbott (2014), which demonstrates an empirical approach to estimating environmental shadow prices, rooted in both standard capital theory and biological science, where the price equals the marginal service flow from the natural asset. The contribution estimates a range of empirical values for Gulf of Mexico fish stocks as an application, and the method requires assumptions and approximations. The reader contemplates that "a range of empirical values", "assumptions" and "approximation" are not exactly promising words for any measurement. Even if this method, which was applied for a specific locality, is enhanced to be applied globally, for example, for global warming, however unlikely that is, the open question remains on shadow prices for social and institutional capital, whatever the difference between the two may be. For example, how can hedonic prices be obtained for inclusive institutions (Acemoglu and Robinson 2012)? It seems that the knowledge about the prospects of life on exoplanets is more robust than the hedonic prices of the "inclusive" institutions. So much about the balance sheet of "comprehensive wealth".

The reader eagerly expects Chapter 9 ("A New Framework?"), not only because it is the final chapter of the book, but also because of the expectations for concise and focused recommendations for the improvement of the incumbent SNA, and creating, if not a completely new framework, according to the title of the chapter, then at least an enhanced framework for economic statistics. Alas, disappointment is substantial. The chapter is unnecessarily long and merely repeats the arguments and general strategic recommendations already presented in the book. The author sticks to her "balance sheet" recommendation, despite being aware of many drawbacks, though not all of them. A subtle sentence from another review of the book, "one of the book's great achievements is that it makes economic measurement problems feel fascinating rather than arcane" (Karen Dynan 2025, p. 1554), confirms that the book does not offer reasonable solutions. A pity.

There are a few things about the book that are beyond, not just reasonable, but beyond any doubt. The book is about an extremely relevant and important issue – the measure of economic progress. With substantial, even tectonic, technological and structural changes in the global economy in the last few decades, the issue of

measurement become acute, even urgent by the standards of economic statistics organisations. Another point, beyond any doubt, is that the author is highly knowledgeable about the issue. Coyle's previous publishing record, long list of references in the book, and her handling of the technical issues clearly demonstrate her competence in the area. Unfortunately, these two conditions are only necessary, not sufficient, for a first-rate academic book.

What is desperately missing is a clear aim for the book, a consistent plan for achieving that aim, and finally, relentless execution of that plan. Because all that is missing, on many, thankfully not all, pages, there is nothing but boring passages in which the author seems to vigorously demonstrate that she is acquainted with the contributions of the other authors, without subscribing to any of the conflicting views. This level of analysis is, unfortunately, more like a geek student's paper than an academic book by a prominent and prolific author. Just to get the idea about that, one randomly selected passage from the book follows. "There is some evidence that the correlation of life satisfaction with GDP growth (a stationary time series) remains positive over time (Betsey Stevenson and Justin Wolfers 2013), although this is disputed (Richard Easterlin and Kelsey J. O'Connor 2022). However, some people are unpersuaded by statistical and empirical challenges to the paradox, insisting that the Easterlin results demonstrate that economic growth does not contribute to happiness" (p. 237). Formulation "some people" is not even allowed on *Wikipedia*.

As for economic measurements, this book is definitely not for beginners in the field. A reasonable suggestion of Dynan (2025) for these readers is to start with Coyle (2014) as a primer. Since the author of this review is not a specialist in SNA, he is not in a position to evaluate to what extent SNA specialists (rather rare birds even within the economists' tribe) will be excited by the insight in this book. What is definitely thrilling in this book, even for non-economists, is a sketch of the contemporary global economy that describes, in broad strokes, how it operates. The reader became accustomed to factoryless goods production (FGP), global value chains (GVCs) – a follow-up to Richard Baldwin (2016) contribution – the servicisation of manufacturing, and subscription-based production model. On top of it, there are all those "free" services that are provided and are not paid for, at least not in money. These sections of the book are an enjoyable read, not only for economists.

Reading the book creates one dilemma for economists, both SNA specialists and others. The dilemma is whether the principle "Some numbers are better than no numbers" should be accepted in economic statistics. Learning from the book about multiple technical difficulties in getting numbers in many cases, even more difficult if some of Coyle's proposals are accepted, the author of this review does not subscribe to this principle. On the one hand, if some numbers are at least trustworthy, if they can be obtained with relatively small additional resources' engagement, then and only then some numbers are better than no number. On the other hand, if the numbers are not trustworthy, then it is more appropriate not to have them as a fig leaf. It is better to have a completely naked body as evidence that we are not able to measure some phenomenon than to have some illusions about it. Those who know details of how sausages are made, or could be made (shadow prices, for example), by and large prefer to be vegetarians. On top of it, economists should stick to the marginal quality – an

essential principle of their trade. Only if the marginal benefits of some measurement are bigger than its marginal costs, then it is efficient to proceed with the measurement. Otherwise, drop it!

Measurements in economics, especially at the macroeconomic, i.e., national, level, are not straightforward. So, it is important to keep in mind that the epigraph of this review, i.e., Lord Kelvin's words, refers to measurement in physics. Many relevant people consider that economics is a science. Even the Nobel Prize in Economics is officially titled the *Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel*, referring to economics as a science, although in plural. Nonetheless, economics will hardly become physics. Accordingly, let us not pretend that we economists are physicists. Please disregard the epigraph.

References

Abramovitz, Moses. 1956. "Resource and Output Trends in the United States since 1870." *American Economic Review*, 46(2): 5-23.

Acemoglu, Daron, and James A. Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. London: Random House.

Aghion, Philippe, and Peter Howitt. 1992. "A Model of Growth through Creative Destruction." *Econometrica*, 60(2): 323-351. http://dx.doi.org/10.2307/2951599

Baldwin, Richard. 2016. *The Great Convergence: Information Technology and the New Globalization*. Cambridge, M. A.: Belknap Press of Harvard University Press.

Baumol, William J. 1967. "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis." *American Economic Review*, 57(3): 415-426.

Becker, Garry S. 1965. "A Theory of the Allocation of Time." *Economic Journal*, 75(299): 493-517. http://dx.doi.org/10.1111/ecoj.12157

Bloom, Nicholas, Charles I. Jones, John Van Reenen, and Michael M. Webb. 2020. "Are Ideas Getting Harder to Find?" *American Economic Review*, 110(4): 1104-1144. http://dx.doi.org/10.1257/aer.20180338

Brynjolfsson, Erik, Daniel Rock, and Chad C. Syverson. 2021. "The Productivity J-curve: How Intangibles Complement General Purpose Technologies." *American Economic Journal: Macroeconomics*, 13(1): 333-372. http://dx.doi.org/10.1257/mac.20180386

Conway, Ed. 2023. *Material World: A Substantial Story of Our Past and Future*. London: W. H. Allen.

Coyle, Diane. 2014. *GDP: A Brief but Affectionate History*. Princeton: Princeton University Press.

Coyle, Diane. 2020. *Markets, State, and People: Economics for Public Policy*. Princeton: Princeton University Press.

Coyle, Diane. 2021. *Cogs and Monsters: What Economics Is and what It Should Be*. Princeton: Princeton University Press.

Dynan, Karen. 2025. "The Review of the Measure of Progress: Counting what Really Matters, by Diane Coyle." *Journal of Economic Literature*, 63(4): 1552-1568.

Easterlin, Richard, and Kelsey J. O'Connor. 2022. "Explaining Happiness Trends in Europe." *Proceedings of the National Academy of Sciences*, 119(37). http://dx.doi.org/10.1073/pnas.2210639119

Fenichel, Eli P., and Joshua J. Abbott. 2014. "Natural Capital: From Metaphor to Measurement." *Journal of the Association of Environmental and Resource Economists*, 1(1): 1-27. http://dx.doi.org/10.1086/676034

Gordon, Robert J. 2016. *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War*. Princeton: Princeton University Press.

Haskel, Jonathan, and Stian Westlake. 2018. *Capitalism without Capital: The Rise of the Intangible Economy*. Princeton: Princeton University Press.

Hausman, Jerry. 1996. "Valuation of New Goods under Perfect and Imperfect Competition." In *The Economics of New Goods*, ed. Tinothy F. Bresnahan and Robert J. Gordon, 207-248. Chicago: University of Chicago Press.

Hausman, Jerry. 2012. "Contingent Valuation: From Dubious to Hopeless." *Journal of Economic Perspectives*, 26(4): 43-56. http://dx.doi.org/10.1257/jep.26.4.43

Mokyr, Joel. 2017. *A Culture of Growth: The Origins of the Modern Economy*. Princeton: Princeton University Press.

North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, M. A.: Cambridge University Press.

Posner, Eric A. 2021. *How Antitrust Failed Workers*. Oxford: Oxford University Press.

Solow, Robert M. 1991. "Sustainability: An Economist's Perspective." In *Economics of the Environment*, *4th ed*, ed. Robert N. Stavins, 505-513. New York: W. W. Norton.

Stevenson, Betsey, and Justin Wolfers. 2013. "Subjective Well-Being and Income: Is there any Evidence of Satiation?" *American Economic Review*, 103(3): 598-604. http://dx.doi.org/10.1257/aer.103.3.598