

The Construction of Production: Locating the Production Boundary in Conventional and Marxian National Accounts

Daniel Urban¹

Abstract: This paper seeks to illuminate the concept of the production boundary while demonstrating the incommensurability of conventional and classical political economy based national accounting aggregates. We begin by noting that national accounts represent empirical constructs, inherently shaped by theory, rather than facts in themselves. The production boundary and Kuznets' scope, value, and netness together provide a useful conceptual framework with which we shall compare perspectives with respect to the production of aggregate income. Conceptions of the production boundary provide the relevant vision to be used in constructing national accounting aggregates, but such conceptions have varied over time. Thus, we shall explore these varied visions across the history of economic thought, giving particular attention to the neoclassical and Marxian paradigms. Following this, we shall consider the history of national accounting as the practical, empirical application of the production boundary in constructing aggregate income measures. Here we shall note the distinction between the neoclassical vision of the production boundary and that underlying our official national accounting aggregates. That is, conventional national accounts are constructed from a Keynesian-influenced cost-based accounting framework providing a measure that little reflects the Marshall-Becker-utilitarian definition of production. Nor do these accounts reflect the Classical-Marxian vision of production, however, such measures can be constructed. Thus, finally, we shall develop an alternative measure of aggregate production through implementation of a Marxian production boundary. In doing so we conclude that the conventional and Marxian conceptions of production are incommensurable and discuss suggested implications for empirical work.

JEL Codes: B14, B51, C82, E01, E11

Keywords: National Accounts, Production Boundary

¹ PhD candidate at the University of Missouri, Kansas City & Visiting Instructor at Franklin & Marshall College, Lancaster, PA.

Outline

Contents:	Page Number
Section 1 - Introduction	3
Section 2 - The Production Boundary: Visions of Scope, Valuation, and Netness	6
2.1 - Empirical Constructs	
2.2 - The Production Boundary	
Section 3 - The Production Boundary and Unproductive Labor in the History of Economic Thought	15
3.1 - Classical Political Economy	
3.2 - Marx's Production Boundary	
3.3 - The Utilitarian Boundary	
Section 4 - Constructing Production via National Accounting	30
4.1 - Early Developments from Marshall to Keynes	
4.2 - From Keynes to U.S. Gross National Product	
4.3 - Deviations of GDP from the Utilitarian Production Boundary	
Section 5 - Constructing Marxian Political Economy Consistent Aggregate Data	40
5.1 - Prior Estimates of Marxian Categories	
5.2 - A Brief Narrative of Operations for Constructing Marxian Aggregates	
5.3 - The Empirical Significance of the Production Boundary – Marxian and Conventional Measures Compared	
Section 6 - Conclusions	56
References	58

Section 1 - Introduction:

“It is a very serious mistake to assume that “facts” are somehow *given* independently of any conceptual framework. Even a brief study of the history of national income accounts quickly demonstrates that the data we are confronted with at any given time is the numerical representation of particular theoretical categories.” – Shaikh (1978, p. 240)

“GDP is the way we measure and compare how well or badly countries are doing. But this is not a question of measuring a natural phenomenon like land mass or average temperature to varying degrees of accuracy. GDP is a made up entity. The concept dates back only to the 1940’s.” - Coyle (2014, p. 4)

This paper seeks to explicate the theory-laden nature of national accounts. That is, while national accounting aggregates (i.e. GDP²) are frequently taken as “given” they are, in fact, the result of human (social) construction, inherently dependent on the underlying theoretical framework used by national accountants. Indeed, if we are to measure the gross domestic product, we must already have a (theory-based) definition of what constitutes “production” to be quantified. In the terminology of national accounting this definition is known as the “production boundary” – essentially the line of demarcation between activities considered “production” and everything else. The location of this boundary has been the subject of much debate throughout

² Throughout the paper what I shall be calling “conventional accounts” (or representing for simplicity by GDP) should be understood to include a wide range of underlying less-aggregated statistics including the National Income and Product Accounts (NIPAs), Fixed Asset Accounts (FAAs), Input-Output (IO) Tables. Essentially, the general range of macroeconomic measures now produced by the BEA or as defined by the scope of the United Nations System of National Accounts (UN-SNA). The “conventional” moniker refers to both their status as official (state-produced) accounts and that they represent the most widely used and generally accepted aggregate statistics, but this paper will be developing an alternative, and therefore “unconventional”, set of accounts.

both the history of economic thought and the history of national accounting, but awareness of this debate has waned and now appears quite minimal even among academic economists.

This paper contends that our modern national accounts are constructed incommensurately with both the mainstream neoclassical-utilitarian perspective and that of the classical political economists. To do so we first note the theory-laden nature of national accounts qua empirical constructs. We shall do this utilizing the concepts of a production boundary and Kuznets' "scope", "valuation", and "netness" to provide a conceptual framework for analyzing and understanding the diverse visions of production guiding the construction of measures of national income and product.

The following section applies these theoretical concepts to a comparison and analysis of several perspectives on the production boundary from the history of economic thought. Particular attention is devoted to developing our understanding of the neoclassical-utilitarian and Marxian paradigms.

Section four switches focus toward the practical application of the production boundary via national accounting. We shall limit our focus to a single narrative that serves to highlight the departure of our modern systems of national accounts from the mainstream utilitarian minded tradition in economics. That is, we shall note differences in both vision and motivation separating traditional economic theory from the production boundary implemented in official national accounts.

The fifth section briefly describes the construction of Marxian accounting aggregates and notes the crucial differences that emerge. In doing so, we shall demonstrate that the production

boundaries espoused by Marx, as exemplar of the classical approach, and official systems of accounts are not only theoretically divergent, but also empirically incommensurate.

A brief conclusion follows, discussing implications for Marxian empirical work and potential extensions.

Section 2 - The Production Boundary: Visions of Scope, Valuation, and Netness:

2.1 – Empirical Constructs:

Stone's (1951) essay discussing "The Role of Measurement in Economics" provides a clear explication of the relationship between underlying theory and the construction of empirical measures. The first thing one should note about any measure of economic income, output, or production is that all such measures are constructed on the basis of prior theory. That is, empirical constructs are not "facts" to be taken independent of theory, but rather "numerical representations of particular theoretical categories." We can better understand this distinction with a consideration of Stone's "primary facts" and "empirical constructs", noting that national accounts are a subset of the latter.

Primary facts are, for Stone (1951, pp. 9-11), comprised of descriptive material and historical data. Of course, some of this material will not involve measurement at all, or only in rough form, such as descriptions of organizations or institutions. Many the quantitative primary facts stem from "natural" record keeping (i.e. accounting) but this tends to be on a small scale and be specific to the firm or organization at hand. Governments and other organizations also directly collect (i.e. surveys) varieties of data for both economic and noneconomic purposes. The key is that primary facts exist; however difficult it may be to find and measure them, they are there for the measuring. As Stone suggests:

"It is not as a rule hard to find a definition for items of this kind and the problem of obtaining information about them lies largely in the administrative and technical difficulties of collection." (p. 9)

In addition to the primary facts that make up this body of descriptive material, Stone recognizes what he terms “empirical constructs” – which become our primary focus. Stone explains:

“On the other hand there are many items, similar to primary facts in having a counterpart in the actual world, but which are not capable of being apprehended in the same simple manner.” (p. 9)

Perhaps, he posits, this difference is merely one of degree. But he proceeds to note that:

“No amount of searching in primary records, that is the originating entries, actual or imputed, in the books of a firm or individual, will enable us to detect the income that has been made. To ascertain income it is necessary to set up a theory from which income is derived as a concept by postulation and then associate this concept with a certain set of primary facts.” (p. 9)

The primary empirical constructs we are concerned with are aggregate measures of income and production exemplified by GDP. Stone suggests:

“In attempting to give quantitative expression to empirical constructs, such as the national income, it is now generally recognized that a theoretical basis is necessary and that this basis should be the conscious concern of economists...” (p. 2)

However, decades later this recognition does not appear quite so general. Therefore, this paper seeks in part to suggest that a deeper focus on the theory-construct relation is necessary, arguing the significance of this theory-laden nature merits further discussion.

Of course, the theoretical basis for any given empirical construct may not always be perfectly explicit. To quote Keynes (1964, p. 383):

“The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back. I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas.”

Even when only implicit, the “gradual encroachment of ideas” that enslaves practical men to the ideas of economists and academic scribblers takes the form of what Schumpeter calls “vision”.

Schumpeter (1954, p. 42) notes that ideology provides the “vision” underlying, informing, and guiding the development of theory. Below we shall be tracing the varied visions informing key developments in economic theory and national accounting. Schumpeter suggests that ideology “enters on the very ground floor, into the pre-analytical cognitive act with material provided by our vision of things” with “this vision [being] ideological almost by definition” because “it embodies the picture of things as we see them.” He further suggests that “the way in which we see things can hardly be distinguished from the way in which we wish to see them.” Fortunately this is where empirical work comes in - data doesn’t lie! Except, unfortunately, as we have just noted our national accounts data are constructed, and constructed for according to a vision-inspired-theory, at least implicitly.

As Lichtenstein (1983, pp. 7-10) explains:

“A vision may be defined to be a general perspective of reality which gives direction and purpose to further intellectual activity within a discipline. ... A vision is an expression of

how we think society works and of what the major problems confronting society are. ...

As far as economics is concerned, a vision is the conceptual “raw material” for economic analysis. It is the preanalytic, precognitive act, to use Schumpeter’s terminology.”

It thus follows that this “vision” will impact, at least to an extent, even the most detached and scientific economist. Lichtenstein (1983, p. 10) further posits a causal linkage from ideology to vision to theory, suggesting:

“Since a vision is a world view of the economic process, it is on the one hand based on an ideological foundation and on the other hand the basis for economic theories of the economy.”

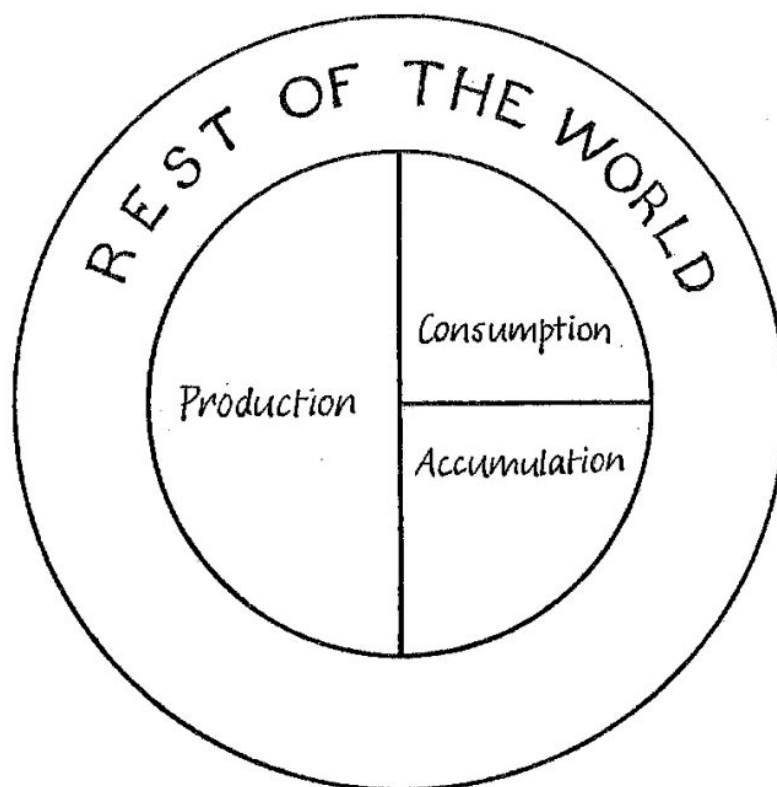
One could also see this linkage extending further from theory to practice, as will be suggested in the context of national accounting. We must, therefore, keep this linkage in mind as we consider several visions of production.

2.2 – The Production Boundary:

Our focus in this paper remains the measurement of aggregate production. Thus, it serves to understand the production boundary as embodying the relevant and defining vision by which empirical measures of economic activity are constructed. This understanding illustrates the importance of the production boundary as foundational in the construction of national accounts. That is, given that the production boundary is used to construct empirical measures of “the” economy, the national accountant’s vision will most certainly come into play. As Boss (1990, pp. 274-9) explains, there is no single universally “correct” production boundary. Rather, value judgements must be made with respect to a number of issues inherent to defining a production boundary.

Stone (1972, p. 32) uses a “geometrical analogy” in conceptually describing the production boundary, reproduced as Figure 1 below. Following Stone, we can think of an economy or realm of economic activity as an encircled subset of all activities or of the global economy.³ We shall rely upon the former understanding of economic activity surrounded by, but distinct from noneconomic activities.⁴ Given this bounded economy, we could draw a line through the middle to demarcate between activities constituting production and those that do not. The boarder around the production half of the encircled economy constitutes a visual rendering of the production boundary. We can further divide nonproduction activities into consumption and accumulation. The key here is to understand that such distinctions, such lines, must be drawn in any attempt to define and thereby quantify an economy qua the output, income, or production thereof. That is, the question is not if, but rather where the lines should be drawn.

Figure 1:



³ Interactions with the rest of the world are beyond the scope of this paper.

⁴ Consider here Polanyi's [1944] notion of the economy as “disembedded.”

To help answer this question, Kuznets (1973, p. 583-4) provides us with a trio of core criteria or components to be defined when boundary drawing. He suggests that “these questions were the foci of repeated discussions in the economic literature going back now some two centuries, or longer.” Specifically, the prospective national accountant must make determinations of “scope” (elsewhere “inclusion”), “netness”, and “valuation”. In an earlier article, Kuznets (1948) explains that these criteria are not determined by the use of accounting, but rather, they must be defined by the (national) accountant *a priori*.

By “inclusion” or “scope”, Kuznets means both the defining of the boundary between the economic and noneconomic realms and the distinction between productive and unproductive activities. That is, scope refers to both what is to be included in “the economy” as well as what constitutes production activities within the economy. We can consider the external boundary of our economy in Figure 1 as the first component of scope – demarcating the economic from the noneconomic. The internal boundary between production and nonproduction (consumption, accumulation) economic activities denotes the latter as unproductive.

The internal production boundary also represents “netness”. As Kuznets (1973, p. 583) defines it, “netness” means “distinguishing between costs and returns, between intermediate and final products.” Clearly, netness therefore plays a central role in constructing a measure of output. Indeed, netness refers to the very distinction between input and output. A major contention of Kuznets throughout his writings was the treatment of war production and other “regrettable necessities” as part of final product despite being of dubious direct utility.

As Boss (1990, p.6) highlights, “the sovereign boundary-drawer could relabel *as productive yet intermediate* goods and services that would otherwise appear as final product or as transfer out of final product”(emphasis in original). As we shall see, from the Classical-Marxian perspective

many activities ought to be considered social consumption, implying a relabeling in the opposite direction suggested by Boss, but clearly representing the significance of such a distinction.

Valuation refers to what Kuznets (1973, p. 583) defines as a “meaningful weighting system” that allows the user to “combine the diverse costs and net economic products.” This particular consideration does not appear in our geometrical representation above, but rather provides the definition of what is to be measured within our boundary and the units of measurement.

Defining value requires a theory of value to inform one’s vision, and in this regard economics is not lacking. Yet great divides separate various schools of economic thought based on differences with respect to theories of value. As will be discussed shortly, an essential distinction can be made between subjective and objective theories of value.

First, however, it appears prudent to note that in the practical applications of national accounting we generally find a consistent means of valuation – money prices. It is essential, therefore, that we keep in mind the distinction between this unit of valuation and the drastically differing conceptions of what is being (or should be) measured by money-units. That is, in constructing a measure of production we are faced with the ontological query of “what is” production. Thus while all approaches measure production with money, we shall find that “what is” being measured by money ostensibly differs between perspectives, largely based upon differing theories of value.

More attention is paid below to the scope and netness elements as our inquiry traces developments across the histories of economic thought and national accounting. We shall also consider the correspondence (or lack thereof) between money prices and value to be measured in greater depth. For now, however, let us briefly focus on the visions informing valuation, or rather theories of value, as it serves as a fundamental break between the Classical-Marxian and

neoclassical-utilitarian approaches. While there are differences within these larger frameworks, they can be clearly demarcated based on whether they view value as arising from subjective psychological evaluations (utility) or determined by objective, external, and material factors in the sphere of production.

Lichtenstein (1983, pp. 27-56) provides a rich discussion of the differences between subjective theories of value, originating in utilitarian philosophy, and objective theories of value, which he traces back to Aquinas, although our concerns are limited to the emergence of classical political economy with Adam Smith. He suggests the former underlies the neoclassical approach, and the latter underlies post-Keynesian and Marxian approaches, akin to we have been calling Classical-Marxian. Both sets of theories seek to explain the same phenomenon – exchange value or price – but provide “markedly” different answers. As Lichtenstein (p. 28) suggests “so different are these approaches that they lead to entirely different opinions about the proper scope of economics.” And the proper “scope” of the production boundary for that matter!

Lichtenstein (1983, p. 41) highlights a “common thread” unifying economists reliant upon an objective theory of value. The “first common viewpoint” stems from the understanding that the value of a commodity can be explained exclusively from an examination of the sphere of production. That is, the “laws of capitalism” (i.e. “natural” or long-run price determination) are to be found in production. A second corollary can be derived from this regarding the significance of demand qua human desire qua marginal utility. Specifically, the utility of a product serves as a precondition to price only; once a good is demanded, in the long run the conditions of production are what determine its price.

The subjective theory of value can be illustrated via Gossen’s laws. The first law, which Lichtenstein (1983, p. 47) notes was also described by both Bentham and Bernoulli, is our

standard principle of diminishing marginal utility. The second, the “familiar equimarginal principle” or (“equal-bang-for-buck” condition as my intro students know it) notes the utility maximization criteria represented mathematically by $(MU_x/P_x) = (MU_y/P_y)$. The key result from these laws in tandem is that what consumers are willing to pay for a good depends on their subjective utility evaluations, which thereby determine the resultant market price.

Lichtenstein (1983, pp. 54-56) summarily considers four areas of substantial disagreement between subjective and objective theories of value. First, as just discussed, each provides a different explanation of the source of value. “Philosophically speaking, the objective approach says that value is produced in the material universe, whereas the subjective approach says it is produced in the minds of individuals” (p. 55). This leads to the second difference regarding what each perspective views as the “most important” areas of economic activity. The objective theory promotes and emphasis on production, what the subjective approach stresses the importance of exchange. With respect to the “beginning point for economic analysis” – our third difference – Lichtenstein suggests “classical value theory naturally leads the economist to study the social relationships that characterize production.” In contrast, the subjective approach displays an individualistic bent, leading to the individual as the basic unit. The fourth distinction pertains to differing conceptions of social relations, akin to the distinction between “consensus” and “conflict” based social theories. The objective theories tend to be concerned with a class stratified society, suggesting conflict, while subjective theories tend to focus on the harmonious interactions of free and self-interested individuals. We need not concern ourselves with more details of these differences – let it suffice to note that differing theories of value stem from markedly different “visions.” We now turn our attention to the way in which these different visions inform theories of the production boundary.

Section 3 - The Production Boundary and Unproductive Labor in the History of Economic Thought:

3.1 – Classical Political Economy:

Given our differing perspectives with respect to the source of value, we now turn to the question of defining production. As suggested, the production boundary provides the relevant criteria. But visions regarding the location of this boundary have changed dramatically throughout the history of economics. These differing visions, however, serve to highlight the significance of boundary-drawing, as each boundary essentially redefines our understanding of “the” economy, specifically with respect to scope and netness, which in turn shapes our evaluation of economic performance at the aggregate level and the relative contributions of different activities. As Kuznets noted, such questions are not new and as we shall see, they have not disappeared. For instance, the financial sector’s contribution to GDP grew (!) in response to the 2008 crisis, while at the same time spurring questions for many as to whether finance produces at all.

For many early contributors, a key demarcation depends on the distinction between productive and unproductive labor. While the distinction has fallen out of favor and widespread usage, our prior discussion of visions, empirical constructs, and the production boundary ought to highlight the fact that in some sense the distinction must always be made. Indeed, the history of the discipline from moral philosophy to modern neoclassical economics can in part be viewed through the changes made to the definition of production. The distinction between productive and unproductive labor merely represents a subset of the broader question “what is production?”

Boss (1990, p. 271) notes that Werner Sombart once suggested “hell hath no more fitting punishment for the sins of the political economist ... than to spend eternity studying the chapters

on productive and unproductive labor out of some nineteenth-century textbook.” Unfortunately, to better understand the progressive evolution of the production boundary we must now take a brief detour through hell. But we can fortunately recall from the introduction Shaikh promises us “even a brief study” shall suffice!

As suggested, every economic perspective includes, at least implicitly, a conception of the production boundary. This is only to say that when theorizing with respect to the production, distribution, and consumption of goods and services in a society, one must have a notion of what constitutes production, and what does not. An examination of the history of economic thought reveals that subsequent developments within the discipline can often be marked by changes in this boundary.

The French Physiocrats, are probably best known for their highly restrictive production boundary. As exemplified by Francois Quesnay and his *Tableau Economique*, the Physiocrats provide an early model of an economic system, a proto-input-output model, if you will. This model also includes an explicit production boundary which excludes all activities except for agriculture as unproductive or “sterile”. The general idea is that only nature has the capacity to generate more material outputs than inputs, while manufacturing merely changes the shape of the materials furnished by nature.

Boss (1990, p. 32) discusses the logic behind the physiocrat’s distinction, which appears remarkably similar to that invoked by Marshall over a century later. That is, Quesnay argued that only agriculture could be productive based on an understanding of physical production and a physical surplus, and as man can only alter the shape of matter but not create it, production is limited to the agricultural (and extractive) activities. In Quesnay’s case he appears prescient of thermodynamics, though this understanding would have been available (and likely known) to

Marshall. Despite this similar reasoning to Marshall, Quesnay nonetheless has an understanding of a divided economy that produces in one part and redistributes a surplus to unproductive dependent or subsidized classes.

While explicitly critical of this demarcation, Smith's own boundary also appears overly restrictive to most modern readers. That is, he limited his concept production to exclude services in general. This restriction has been widely criticized, notably by Marx, but were we to wish to quantify a Smithian production boundary, services must clearly fall outside.

Should we seek to quantify a Smithian measure of production, our efforts would likely be in vain. Adam Smith provides both inconsistent theories of value and theories of production. As Lichtenstein (1983, pp. 31-4) notes, at different points of his *Wealth of Nations* [1776] Smith espouses two different labor theories of value, a labor-embodied view, and a labor-commanded view. To further complicate the matter, as Boss (1990, pp. 42-50) highlights, Smith defines production with a money-profit criteria in some instances, and elsewhere with a physicalist material product definition. The former has a bit in common with Marx, as we shall see below, but the latter physicalist interpretation has plagued the discipline ever since, frequently being mistakenly attributed to Marx. Some of this complication arises from the conflation of services and servants, this conflation itself likely a result of the material conditions of Smith's time. That is, Smith considered the labor of personal servants to be consumption from revenue rather than production (Marx would agree with this part), but given the lack of a sizeable service economy Smith would lump all services in with the work of servants. Despite the insurmountable inconsistencies, it remains clear that Smith was engaged in boundary drawing.

Ricardo (*Principles* [1817]) relies upon a labor theory of value, with Lichtenstein (1983, pp. 34-5) noting that he endorsed a labor-embodied view. Ricardo dismissed scarcity as of importance

only in rare cases, instead endorsing an objective theory of value where utility is a requirement by not determinant of exchange value. Of course, Ricardo was never fully satisfied with the labor theory of value. Near the end of his life, Ricardo wrote:

“I have been thinking a good deal on this subject lately but without much improvement – I see the same difficulties as before and am more confirmed than ever that strictly speaking there is not in nature any correct measure of value nor can any ingenuity suggest one, for what constitutes a correct measure for some things is a reason why it cannot be a correct one for others.” (Sraffa, 1970)

Although such a measure is not found in nature, one can be found in Sraffa (1960) in the “standard commodity”.

While Boss (1990, p. 77) notes that Ricardo generally avoids discussion of productive and unproductive labor, he does maintain a restrictive production boundary in terms of netness. Ricardo considered the state to be a drain – not an input, but rather social (unproductive) consumption

Mill (2004 [1848]) presents another inconsistent case. Despite earlier work that relies upon a utilitarian position, his *Principles* includes a section on the distinction between productive and unproductive labor. Boss (1990, p. 84) suggests this inclusion is out of convention. In any case, it serves to highlight the weight such considerations used to hold when Mill, raised under the tutelage of Bentham, and later becoming a sophisticated utilitarian philosopher in his own right still finds himself confronting the definition of production.

In a moment we shall consider Marx as the culmination of the classical tradition, and suggest that he provides a consistent and useful production boundary. But for now it is worth dwelling

on a pair of distinctions with a problematic history, that of productive and unproductive labor and production and nonproduction activities. What Smith called the “humiliating appellation of unproductive” appears to generate an almost visceral reaction due to both the pejorative connotation and long history of inconsistent usage. For example, Brennen (2006) addresses the value-laden, ideologically-biased, and transitory nature of the productive and unproductive labor distinction across a number of developments, noting clearly the frequently gendered nature of such distinctions. However, deserving as such critiques may be, they generally miss a more essential point. That is, what the classical economists were reaching for with their productive and unproductive distinctions should be understood as a subset of the larger issue of production versus nonproduction activities.

A key issue for what might be inclusively defined as the classical political economy tradition is not merely that some person or category of worker is unproductive – though this is usually how it is framed and phrased – but rather that some activities themselves are better understood as forms of social consumption. Beyond this, the view that some activities produce, while others consume, gives rise to the concepts of surplus and transfer. Such concepts remain crucial from the classical political economy informed perspective, but have been abandoned by the neoclassical-utilitarian paradigm. In light of the various critiques and widespread abandonment, it appears worth noting that, as Angle (1986, pp. 297-8) suggests, that the “surplus theory of stratification” stands as the most well-known and generally accepted theory of the inequality of wealth – at least among sociologists, anthropologists, and archeologists. Harris (1959, p. 185) further suggests that this “surplus theory is so widely accepted among anthropologists that many regard it as an innocuous truism.” Thus, a core contribution the classical political economy paradigm, regardless of one’s particular stance on productive and unproductive labor, is to

suggest that there is a meaningful distinction to be made between production and consumption activities at the aggregate, social level.

3.2 - Marx's Production Boundary:

Marx (*Capital* Vol 1, 1990 [1867]) painstakingly defines his vision of a production boundary that critically differs from those presented above and below. Marx's vision represents a more comprehensive, complete, and consistent version of the general surplus approach developed throughout classical political economy. Using a thoroughly developed labor theory of value, he defines an explicit production boundary: wage labor exchanged against capital resulting in new (or additional) use values (as commodities) that possess greater exchange value than that of the capital laid out in advance.

This succinct paraphrasing of Marx's boundary highlights a key component of his framework that we must keep in mind when considering his approach and the distinction between it and the neoclassical paradigm. That is, Marx is focused on the production of exchange value qua capitalist production, not the production of use values qua production in general. The nuance of this distinction will be dealt with below, but it seems important to note from the outset that Marx is explicitly *not* concerned with well-being or utility production.

Thus it serves to first discuss production in general, or production as such regardless of economic 'mode', so that we can later demarcate this from capitalist production in particular. As Savran & Tonak's (1999, p. 120) note:

“Only through a clear understanding of the fact that productive labor for capital is a subset of productive labor in general can one avoid this time of theoretical impasse which

leads to a total obliteration of the distinctions between [productive and unproductive labor] under capitalism.”

Failure to understand this distinction leads Boss (1990) to generally assert that the classical economists, including Marx, were guilty of an “input-output error” when defining some activities as necessary yet unproductive. Thus, we clearly need to understand the distinction between production and nonproduction activities generally so we can later define the capitalist subset.

Shaikh & Tonak (1990, pp. 2-3) provide a useful clarifying distinction with their understanding of outcomes as distinct from output. Utility is an outcome, but Marx was concerned with the production of output. As Shaikh & Tonak clearly state, “not all outcomes are outputs.” They cite personal consumption activities, which result in the maintenance of individuals, but does not constitute producing new wealth. Likewise, Shaikh & Tonak contend “that the same reasoning applies to other social activities” including state activities, such as policing and national defense, as well as private activities, such as advertising or finance. We must note an important implication: this understanding suggests these activities have to be provided for by consuming surplus value produced elsewhere – the surplus and transfer approach.

To more concretely define production activities we can follow Shaikh & Tonak (1994, pp. 2-3) who rely upon an unconventional extension of Lancaster’s (1968) “vector of characteristics” approach. That is, for any given commodity (using Marx’s broad definition, including services) we can imagine a list of associated properties. Some of the properties are “relevant to the commodity as an object of social use, while others would be relevant to it as an object of ownership” with production activities being defined as those that enhance the former.

We can thus demarcate Shaikh & Tonak's (1994) conception of outputs as distinct from outcomes. Activities that enhance (increase) the stock of social use values, even if only instantaneously as in the case of productive services, are production in that they contribute something we can define as an output. Activities that result in other changes (i.e. a change of legal claim to possession) clearly result in outcomes, but to define such as output appears dubious.

To define the properties relevant to commodities as objects of social use we might readily interject the same list that Becker (1981, see below) relies upon to define final utilities – Bentham's (1963, pp. 33-4) enumeration of the simple pleasures and pains. In more simple terms, however, we might suggest the relevant properties are those of use to the final consumer. From this standpoint, it does not seem controversial to suggest that many economic activities have definitive outcomes, and in many cases may be necessary for the ongoing reproduction of society, but yet do not in any way directly increase the utility generating characteristics of the social stock of wealth.

For example, the act of a sale clearly does not alter the thing being sold with respect to its properties as an object of social use. A sale distinctly represents a transfer of ownership, altering a legal claim to the object. Consider that the application of a five-finger discount does not diminish the socially useful properties of the item and thus has no impact on net social output. It most certainly results in a negative outcome for the victim, but this only serves to highlight the fact that what has occurred is a(n involuntary) redistribution of output. The act of a sale (as opposed to theft) thus alters the balance sheets of both buyer and seller, but neither method of transfer alters the net social wealth qua aggregate final consumption.

Now that we are able to more clearly demarcate production and nonproduction activities we can investigate the particular and nuanced criteria of a Marxian production boundary. We must immediately note is that many activities defined as production in the general sense above will be considered unproductive from the standpoint of Marx's analysis of capitalism. Marx's production boundary must therefore be understood to incorporate only capitalist production activities. We shall see that only activities within the circuit of capital – value in the process of expansion under the conditions of private ownership and control over the means of production and production process – are capable of being productive in Marx's technical definition. Productive labor must be paid out of capital with the expectation of exploitation. Yet many activities that constitute necessary production in a going society will not fall under this definition. They then appear as “unproductive production” because they are not capitalist production, and thus fall outside Marx's capitalism-based production boundary.⁵

The capitalistic employment criteria is directly and explicitly illustrated by Marx (1990, p. 1047):

“It is possible for work of one type (such as gardening, tailoring etc.) to be performed by the same working man either in the service of an industrial capitalist or on behalf of the immediate consumer. He is a wage-labourer or a day labourer in either situation, only he is a productive worker in the one case and unproductive in the other, because in the one he produces capital and in the other not; because in the one case his work is a factor in the self-valorization process of capital and in the other it is not.”

⁵ The linguistic contradiction of “unproductive production” appears due to the technical nature of Marx's definition, and should serve to highlight that “unproductive” in Marx's terms is not pejorative. It is a positive distinction, not the normative and “humiliating appellation” that Smith bemoaned.

Further noting:

“The distinction between productive and unproductive labour depends merely on whether labour is exchanged for money as money or for money as capital.”

Our understanding can be illuminated through further consideration of “unproductive production” activities, dispelling the seemingly oxymoronic nature of such. Household production provides a clear example. While the feminist critique of GDP notes the exclusion of household production from national product, from Marx’s standpoint it is actually appropriate that such activities not be counted. Household labor most certainly contributes use value, but it is also clearly not engaged in for-profit commodity production. Even if some of the outputs from household production (say, a loaf of bread) were sold on the market, household production does not involve capitalist class relations and without exploitation no surplus value is produced or realized.⁶

It should become clear now that there is an inherent disconnect between Marx’s capitalistically defined output and well-being. Assume that Jane hires a maid through a privately owned, for-profit cleaning service. When Jane marries her maid, the capitalistic production of exchange value decreases, while (assuming Jane’s partner continues to clean) well-being remains constant. Samuelson’s classic example thus takes on new meaning from the perspective of Marx’s production boundary and, later, Marxian national accounting. That is, the problematic result is entirely anticipated – the movement of a production activity out of the capitalist circuit reduces

⁶ Future research building on the insights and data from this current project will use ATUS data to estimate the encroachment of capitalism into areas once relegated to household production. This will serve to highlight the possibility that much of the growth of the capitalist economy does not represent increasing well-being, but instead a reduction of the informal household sector which must be compensated by an increased subsistence basket.

exchange-value production without impacting use-value production. Thus, it *should* be represented by a decline in measured national product.

We can further develop our understanding of these distinctions by considering Jane again, only this time she directly hires a maid. In this case the maid is privately, but not capitalistically, employed. She is paid out of Jane's revenue, representing a pure cost, without any intent of selling the maid's output for a profit. When Jane marries her maid now, well-being still remains constant, but in this case national product, if measured from Marx's perspective, both should and would remain unaffected.

There is thus an inherent disconnect between the production of well-being and Marx's capitalist production to be measured. But that is precisely the point. Marx sought to study capitalist production, not production in general.

Capitalistic employment, however, represents only part of the necessary demarcation for Marx's production boundary. We now have to incorporate both the criteria for production in general and capitalistic employment in order to define Marx's boundary. The circuit of capital model helps to make this necessary combination clear.

Recall that in the capitalist production process we begin with a quantity of money capital (M), which gets used to purchase inputs of variable and constant capital (C+V), these inputs are used in some production process (P), resulting in the output of some new commodities (C'), to be sold for (hopefully) more money capital (M') at the end of the circuit. Olsen (2017) provides a key inference in noting that production activities entail only one "moment" in the circuit. That is, industries that include the (P) portion of the circuit within their sphere of activity engage in production; those that do not include this moment are thus nonproduction. Moments (M-C) &

(C'-M') are circulation, and the value of their "outputs" included in what Shaikh & Tonak (and section 4 below) refer to as the primary flows of an economy as they serve to realize value from product, although they do not count as producing in and of themselves.

The circuit of financial capital (M-M') makes it clear that production does not play a role.

Instead, this circuit simply entails the purchase of a claim on future income and thus finds itself among "secondary" or redistributive flows. If I borrow money for my (productive) business, engage in production, realize surplus value, and finally pay back the debt with interest, it seems quite clear that interest payment constitutes a disbursement out of value produced in my circuit. Financial capital merely redistributes claims on future income, it does not directly produce the income – "purchases" from the financial sector are thus better understood as royalty payments.

Other industries (such as legal services) may be found outside the circuit of productive capital, as they are not directly involved in the production or subsequent realization of new value. These can be considered overhead costs – *faux frais* – and as such, these secondary flows will be treated as royalty payments as well. Such activities are funded by the redistribution of surplus value produced elsewhere. While they may be deemed socially necessary for (re)production to take place, a fundamental insight of the classical political economy framework is that these are nonetheless forms of consumption and that must be supported out of the social surplus. In constructing Marxian accounts we shall treat payments for these activities as royalties, akin to interest and rent.

We can thus understand Marx's production boundary with the distinctions between production and nonproduction activities, capitalist and noncapitalist employment, and production as a particular moment of one type of circuit of capital. Table 1 helps to summarize the Marxian production boundary, highlighting the oft neglected multifaceted nature.

Table 1:

	Production	Nonproduction
Capitalistically employed	Productive	Unproductive
Non-capitalist social relations	Unproductive	Unproductive

3.3 – The Utilitarian Boundary:

the objective theory of value based production boundaries defined by Marx and the classical economists are not, of course, representative of the modern mainstream paradigm. The neoclassical school instead espouses a utilitarian based subjective theory of value. This understanding also has a long history, with Condillac and Say representing early proponents. As Boss (1990, pp. 54-67) notes, Say preempts Marshall in the assertion that only utility can be produced. Say also provides an early critique of the classical approach, suggesting the productive and unproductive labor distinction represents “confusion.”

Indeed, concerns over the production boundary were so prominent among the classical economists that Marshall explicitly targets the issue in his infamous *Principles*. Wasting no space in deliberation, Marshall asserts that all we ever “produce” are utilities. Quoting Marshall (1890, pp. 116) at length:

“Man cannot create material things. In the mental and moral world indeed he may produce new ideas; but when he is said to produce material things, he really only produces utilities; or in other words, his efforts and sacrifices result in changing the form or arrangement of matter to adapt it better for the satisfaction of wants. All that he can do in the physical world is either to readjust matter so as to make it more useful, as when he makes a log of wood into a table; or to put it in the way of being made more useful by nature, as when he puts seed where the forces of nature will make it burst out into life. It

is sometimes said that traders do not produce: that while the cabinet-maker produces furniture, the furniture-dealer merely sells what is already produced. But there is no scientific foundation for this distinction. They both produce utilities, and neither of them can do more: the furniture-dealer moves and rearranges matter so as to make it more serviceable than it was before, and the carpenter does nothing more.”

While our Marxian perspective would suggest the trading activity results in outcomes rather than output, the contrasting Marshallian understanding can be illustrated with a classic Edgeworth-Bowley exchange box, whereby the outcome of trade is increased (“produced”) utility. This is clearly represented by Marshall’s (1890, p. 117) statement that “if we had to make a fresh start it would be best to regard all labor as productive except that which failed to promote the aim towards which it was directed, and so produced no utility.” The utilitarian perspective is not unique to Marshall, who builds on the early marginalists, regularly citing Menger, Jevons, and Walras. But Marshall is highly influential, championing what Studenski (1958, p. 20) refers to as a “comprehensive production concept, and by the force of his authority influenced all modern economists (Marxists excepted) to adopt it.”

Becker, in characteristic fashion, takes the neoclassical view to its logical, albeit extreme conclusion. Boundary busting Becker (1981, pp. 7-9) posits that the consumption of marketed goods and services is itself the final phase of production, turning purchased X-goods into the utility-generating Z-goods. That is, we do not even usually purchase utilities on the market, but rather purchase a number of inputs (X-goods), with which we then engage in own Z-good production in order to realize the utility. Although not explicitly listed or discussed, a footnote tells us that Becker is relying upon Bentham’s (*Principles of Morals and Legislation*, Chapter 5) “enumeration” of the simple pleasures (& pains) as defining the final Z-goods. Just because the

neoclassical production boundary is all-inclusive does not negate its existence as a boundary nonetheless. The Marshall-Becker-utilitarian boundary is simply so expansive as to include all successful intentional activities, recalling that for Becker there are no noneconomic activities to be reckoned.

We should, however, be careful to note the timeframe of Becker's work. That is, while it represents the most developed theoretical perspective on the production boundary from the neoclassical framework, Becker's work appears only after the major developments of national accounting have already occurred. Thus, we should understand Marshall to represent the neoclassical theory known to burgeoning national accountants. That being said, Becker's views appear to be the logical extreme to which the marginalist-utilitarian perspective inevitably leads, therefore, for the rest of this paper we shall conflate Marshall and Becker into a unified neoclassical perspective. Another reason for highlighting Becker's contribution despite it appearing after the major developments of national accounting is that Becker's framework provides a crucial understanding of what ought to be measured if we are looking at an inclusive definition of the production of utility. From a pure utilitarian standpoint it is this that should be measured, but as we shall see, it is distinctly not what national accounts are made to measure.

This brief historical sketch has only aimed to highlight the diversity of (visions of) production boundaries.⁷ In so doing we have also more clearly explicated and demarcated the neoclassical-utilitarian and Marxian conceptions. We next turn our attention to the development of official national accounts, which given their conventional status are sometimes taken to represent the neoclassical vision. As we shall see, this is not the case.

⁷ For a deeper discussion, see Boss (1990) and the author's forthcoming doctoral dissertation.

Section 4 - Constructing Production via National Accounting:

4.1 – Early Developments from Marshall to Keynes:

We now turn our attention from “pure” theory toward the complicated mess that is application. That is, we must consider the practical application of the production boundary through the development of national accounting. For brevity, we will not spend time discussing the long history of national income estimation, nor shall we consider the diverse efforts that shaped early national accounts in many countries.⁸ Rather, we shall examine one central narrative, entailing a direct path from Marshall and his *Principles* to the development of the framework that underlies most modern systems of national accounts. Of particular interest here, we shall see, is that the resulting system appears to involve the functional adoption of an apparently objective theory of value – an accounting approach reliant upon costs of production.

We can see the early history of national accounting leading up to the invention of GNP (later GDP), the NIPA’s, and the first UN-SNA as a parallel history of Marshall’s legacy. On the one hand, *Principles* serves as a seminal contribution to the neoclassical-utilitarian theoretical approach. But on the other, *Principles* contains an early elaboration of national income. As Tily (2009, p. 334) notes, while Marshall provides an early discussion of national income and defines a production boundary, in doing so he unfortunately conflates the concepts of production and income. Thus the old Cambridge adage goes “it’s all in Marshall”.

More specifically, Marshall’s (1890, pp. 139-144) chapter on income provides both an utilitarian and a money based definition. Presciently, Marshall laments lacking two distinct words to succinctly represent the distinction between a person’s total income and money income. While

⁸ For more on these topics, see Studenski (1958), Mitra-Kahn (2011), Coyle (2014, 2016), Boss (1990), and Vanoli (2005).

total real income represents “every fresh utility”, the money income connotation is more consistent with general usage. That is, in colloquial terms, income means money income, not utility. Thus, Marshall seeks to define national income on a “fresh utility” basis, only to concede that money measures are frequently made. At least, he notes, money income provides a better measure of economic prosperity than money measures of wealth.

Crucially, however, Marshall (1890, pp. 139-144) cautions that “all estimates of a nation’s richness based on a mere money measure are necessarily misleading” for the same reasons the conflation of utility and money income is misleading. Logically following from our discussion above, Marshall’s production boundary would have us include “very fresh utility”, even the benefits derived from the use of our furniture! While modern national accountants employ imputations to address some of the unmonetized utility incomes, these appear woefully inadequate to the monumental task. Clearly, our national accounts would appear quite different had they been developed in accordance with Marshall’s warning.

Of course, we can and shall directly trace the development of our modern money measured national income accounts to none other than Marshall’s own students. It will yet be another of Marshall’s students, as well as long-time colleague at Cambridge, who cements these money measures as the framework for official statistics: John Maynard Keynes. Keynes plays a “multifaceted” and highly influential role in the development of the modern system of national accounts. Keynes also (eventually) abandons Marshall’s utilitarianism in favor of an objective theory of value! But first we have some history to cover.

Tily (2009, pp. 332-334) discusses three phases in the development of official national accounts in the U.K.; these developments also serve as the foundation of virtually all modern systems of national accounts. The three phases can be divided into first, a period of early work, second,

Colin Clark's seminal contributions leading up to the development of official systems, and third, the formal and official construction of U.K. national accounts by Stone and Meade under the guidance and support of Keynes. These phases represent a shift from early, isolated, and sporadic estimates of national income to official statistics and the adoption of a formal accounting approach, as illustrated in Keynes' seminal *How to Pay for the War*.

Regarding the first phase Tily (2009) suggests three primary drivers of the early phase of development of national accounts in the U.K. The first is the leading role provided by Marshall's (1890) *Principles* which includes the definition of a production boundary and an early national accounting framework, as noted above. Following Marshall's lead, the second key driver is the pioneering practical work undertaken by Arthur Bowley, Alfred Flux, and Josiah Stamp.⁹ Bowley and Flux, we should note, were both students of Marshall at Cambridge, and all three explicitly cite Marshall in their work. The third driver appears through institutional developments increasing "the availability of wages, population and tax data and then the instigation of censuses of production." Censuses of production provide business-oriented cost-based primary facts from which aggregate measures are empirically constructed.

Clark, as per Tily (2009, pp. 342-7), plays a central role in the development of national accounting in the U.K. prior to the establishment of official accounts. As Simon Kuznets is generally better-known in the U.S (and would go on to receive a "nobel" for his efforts) we should note that his work applied Clark's method to the US. In addition, Colin Clark provides a

⁹ Arthur Bowley, national accounting pioneer, is also the same Bowley of Edgeworth-Bowley exchange box fame. While Edgeworth first used the box diagram, Bowley's version is largely responsible for its popular usage (see Humphrey (1996) for more on this). This connection merits mention because Bowley represents a direct connection between Marshall's two theories (utility vs national income) and their subsequent, contradictory development. Bowley's box provides a clear explication of the neoclassical-utilitarian inclusive production boundary, while national accounting follows the alternative accounting approach path.

clear and direct piece of linkage between Marshall and the development of a more Keynesian-inspired system of national accounts. Clark paid tribute to the pioneering efforts of Bowley, Flux, and Stamp, although he was still quite critical of the “disgraceful condition of British official statistics”. Tily suggests that the theoretical development of the multiplier by Kahn (1931) and Keynes (1936) gave impetus to the development of official national accounts as it provided a testable macroeconomic hypothesis with major policy implications. This impetus worked through Clark who subsequently provides the first set of accounts using all three approaches to national income (output, income, expenditure), closing his work with an analysis based upon Keynes’ fundamental equations. Clark’s work would go on to be celebrated and used by Keynes (not without criticism, of course), and serve as the most developed and immediate predecessor of the eventual official system formalized by Keynes, Meade, & Stone, and later adopted in the U.S.

4.2 – From Keynes to U.S. Gross National Product:

As Boss (1990, p. 228) notes, “comprehensive annual national income and product accounts are creatures of the Keynesian revolution.” While critiquing certain implications of that sentiment, Tily (2009, p. 332) notes that Keynes’ role was “multifaceted”, including providing both the theoretical framework as well as practical and political support. That is, Keynes was influential in the development of the UK accounts, as a user, advocate, and even producer of some estimates.

Coyle (2014) notes Keynes’ (1940) lament over lack of good statistics in his *How to Pay for the War*. Keynes’ appendix provides a preliminary formulation of national income, demonstrating how it could be used for war planning. Coyle suggests that the British treasury secretary was so

impressed with Keynes' piece that it led him to commission Stone and Meade "to develop what became the first set of national accounts and GDP."

Boss (1990, pp. 189) discusses Keynes' advice to Meade and Stone, noting Keynes' very direct influence over and interaction with the pair. For instance, Keynes advocated for the treatment of all government purchases as final, ensuring war spending would not cause national income to decline. While both Meade and Stone would go on to win "Nobels", Meade was recognized for other work. Stone's seminal contributions are better known in part because, as Boss (1990, p. 230) notes, Stone served as principal consultant in development of first UN-SNA.

Besides the government being treated as net, what of the Keynes-Meade-Stone production boundary? The national accounting approach developed in the U.K. and later used in the U.S. "sought to work out a national income system that would explain the current business situation in Keynesian terms" as noted by Carson (1975, p. 169). Or, as Gilbert (1945) adamantly states, "I can only repeat that we are not trying to measure welfare, but the value of production from a business point of view."

This point is important to clearly note. As Harcourt (1981, p. 39) suggests, Keynes eventually abandons Marshall's theories almost entirely. Crucially, this involves the adoption of a normal-cost pricing hypothesis - an objective theory of value. That is, Keynes espoused the view that prices were determined by the "normal" cost of production, not utilities, marginal or otherwise. Our resulting Keynesian-influenced national accounts thus not only do not measure welfare, they were not constructed with the intent to do so.

For the United States, Kendrick (1970, pp. 306-9) discusses Kuznets' early contributions and the later dominance of the Keynes-Meade-Stone framework. While early on Kuznets, who had been

“borrowed” from the NBER, directed the first series of estimates of national income, his work was just that – income estimates. The full development of an accounting system follows the adoption of the Keynes-Meade-Stone framework by Gilbert *et al* (1947) who produce the first official national income and product statistics.

Carson (1975, p. 166) names Alvin Hansen and Lauchlin Currie as instrumental in the introduction of “Keynesian thinking to popular Washington economics”. Later, while Currie is serving under FDR, he recommends one Milton Gilbert (already of a Keynesian orientation) to Department of Commerce Secretary Hopkins, who appoints Gilbert as chief of the new Industrial Economics Division. Gilbert is later (1941) appointed as the chief of the National Income Division. It will be Gilbert and his team that implement the Keynes-Meade-Stone accounting framework in the US. Gilbert *et al* (1947) provide basic revisions, eventually resulting in the consolidation toward the 1947 official national income and product statistics. Of course, many revisions have been made to the way we calculate national income. Yet, as Carson (1975, p. 180) suggests, “it may be noted that the essential framework set forth in 1947 remains intact.”

4.3 – Deviations of GDP from the Utilitarian Production Boundary:

When discussing the deviations of conventional national accounts (GDP) we must first recall that the divide can be traced back to and stems directly from Marshall. That is, given his differing treatments of national (money) income and production qua producing utilities it should come as no surprise that a single measure cannot well represent both concepts. We shall address three sets of issues leading to the problematic deviation of conventional national accounts from mainstream economic theory. The first is Kuznets’ critique of the figure based on distinctions of “netness”. The second is the plethora of causes of price-utility-value deviations. We shall also

discuss a new criticism, arising due to the inherent differences between the subjective-value-biased utility theory and the objective-value-biased accounting approach.

Coyle (2014, p. 13) notes the heated debate between Kuznets and Gilbert's team from the Commerce Department. The key issue was that while the measurement was useful for the government, in particular from the perspective of fiscal policy, it was problematic from the standpoint of welfare. That is, Kuznets "specifically saw his task as working out how to measure national economic welfare rather than just output." Coyle suggests that part of the reason Kuznets' view was rejected was that his, and older models, would all show national income shrinking if private output consumption suffered due to war.

Beyond this, Kuznets (1948, pp. 151-63) expresses a number of concerns over the formalized Department of Commerce series, generally focused on issues relating to the measure of welfare. He suggests that to better define "netness" we need to consider the relevant end goals. This entails for him the relevant netness criteria of "the provision of goods to individuals qua ultimate consumers as the criterion by which to distinguish net final products of economic activity." While Kuznets' welfare orientation is ostensibly more amenable to the utilitarian paradigm, his criticisms of the resulting official measures were rejected or ignored. The essential argument of Gilbert *et al* (1948) is that they were explicitly not trying to measure welfare. They intended to measure "the value of production from a business point of view." Thus we get a modern production boundary, as defined by the BEA (1970): "the basic criterion used for distinguishing an activity as economic production is whether it is reflected in the sales and purchase transactions of a market economy."

With respect to price-utility deviations, Marshall (1890, p. 179) suggests that perhaps this need not concern us as, while the absolute utilities of any given commodity may vary, "we may

suppose utilities which have the same money power to be fairly equal.” However, we must consider the dubiously strong assumption required for this. That is, “provided the prices, which we are considering, are those paid in two markets where the average wealth of the purchasers is equal.” This equality of wealth is, of course, not a compelling assumption at this time. Thus Marshall cautions that:

“We must however always be careful not to regard the total utilities of things as fairly represented by their money measure when one of the things is consumed chiefly by the rich and the other chiefly by the poor.”

No such considerations have been made in our national accounts, and to the author’s knowledge no attempts to do so have been proposed as of yet. In addition to the inequality based problem, prices are known to deviate from utility-values in the presence of imperfect competition; no such corrections have been proposed or made in official national accounts. Moreover, for price-based national accounts to even indicate changes in the production of utilities over time, we have to assume constant preferences. To some extent this issue has been addressed by the use of hedonic price indices, accounting for the differences in the qualities of produces, but not directly accounting for shifts in tastes and preferences. Thus, as Hicks (1940, p. 122) asserts:

“The measurement of economic welfare and the measurement of productivity are in fact quite different things; their coincidence under optimum conditions is a special property of that particular state of affairs. ... In practice, nearly every doubtful point about the Social Income is clarified by separating out these two distinct aspects.”

Going further, we might note that since Becker’s Z-goods – first order goods – can be represented by Bentham’s “enumerated” pleasures and pains, there arises a further problematic

disconnect between prices and marginal utilities. That is, higher order goods are not valued directly for their utilities but rather for their capacity as inputs. Thus, market purchases of X-goods are based on marginal productivities provided to end users in the production of marginal utility granting Z-goods.

A final issue arises due to the inclusive neoclassical definition of production and the objective-theory-of-value-biased nature of the method of accounting. As Bos (1997, p. 197) notes, the SNA and complying systems of accounts have a “general principles of valuation” defined by “current exchange value”. Importantly, this basis of valuation optimally provides the “consistency required by a national accounting system”. The crucial point here is that this “consistency” requirement proves problematic for subjective valuation; thus the accusation of objective-theory-of-value-bias in the nature of accounting.

Let us consider again the “production” of utilities through trade, as illustrated with an Edgeworth-Bowley box. An inefficient initial allocation can be improved upon – utilities raised – simply through voluntary trades (reallocation). From the standpoint of well-being we can clearly see the improvement of resources moving from an agent who values them less to someone who values them more. But let us consider the same transactions from the standpoint of the social, aggregate balance sheet. No additional resources come into existence, and the current exchange values have not changed, so the social balance sheet clearly remains unchanged while entries move from one agent to another, thereby increasing total utility. Herein lies the problem of accounting based upon a subjective theory of value – inconsistent valuation.

This seems to suggest that even if utility is a valid and useful concept for individuals and microeconomic theory, it is simply not possible to consistently aggregate subjective valuations or construct meaningful accounts of such on an aggregate level. This might further suggest

inherent problems using a micro-utility-founded macroeconomic framework, but such a discussion is beyond our current scope.

We can now take a moment to evaluate the conformity of our national accounts to the utilitarian approach. Do these accounts measure utility production as per the Marshall-Becker understanding? Clearly no. Do these accounts measure welfare? Not really. As we have seen a there are plethora of breakdowns between the two.

We can also evaluate the suitability of these accounts to the classical-Marxian approach. While they have not been constructed explicitly for this purpose, the adoption of the production cost accounting approach suggests that the components are potentially commensurate, even though the aggregates are not. Thus we now turn to the process of constructing production measures explicitly in line with the classical-Marxian approach.

Section 5 – Constructing Marxian Political Economy Consistent Aggregate Data:

5.1 – Prior Estimates of Marxian Categories:

“The ‘productive-labor theory of value’ affects nearly every aspect of Marx’s grandiose project of social analysis. Key ratios of his economics, movements of which are supposed to seal capitalism’s fate, take on different numerical values depending on which citizens count as productive laborers and where the line around capitalist or ‘commodity’ production is drawn.” (Boss, 1990, p. 90)

As Shaikh & Tonak (1994) and Basu (2015) note, there has been a fairly long history of attempting to generate Marxian national accounts, covering most of the period over which official (conventional) national accounts have been generated. Shaikh & Tonak (1994, pp. 152-209) provide a thorough critical analysis of prior empirical estimates of Marxian measures, most of which is beyond our current scope, but this substantial literature merits at least some discussion. We first should note the extensive pioneering work of the Japanese, including 56 sets of estimates of the rate of surplus value in Japan between 1924 and 1980, but most are not available in English. In the English literature, Shaikh & Tonak denote three general groups formed according to differing treatments of production and nonproduction activities: those that reject the productive and unproductive distinction, those that rely upon Marx’s distinction (albeit with differences from the final Shaikh & Tonak approach), and those that substitute an alternative distinction. Baran & Sweezy (1966) provide a notable example of the latter, with their concept of surplus as “the excess of total produce over necessary use” clearly departing from Marx’s surplus value concept.

Given our discussion of the production boundary above it becomes clear that the productive-unproductive labor distinction is paramount to accurately representing Marx's theory. Therefore, we shall neglect the other approaches in our current discussion. We should note here that the Shaikh & Tonak approach appears as the definitive culmination of this tradition.

In the literature demarcating productive and unproductive labor, Shaikh & Tonak (1994, p. 161) note that Varga "provides the earliest set of sectoral estimates of the rate of surplus value."

Moreover, they note that his method remains influential. Varga used manufacturing census data and subtracted the wages of production workers (variable capital) from net value added to arrive as surplus value. Gilman (1958) and later Mandel (1975) adopt and further develop Varga's method.

Shaikh & Tonak (1994, p. 174) suggest that Mage (1963) "raises the discussion of the relation between Marxian categories and national income accounts to an entirely new level." In particular, they note:

"he is the first to really address the issues at a general (as opposed to sectoral) level, and the first to attempt estimates in both price and labor value quantities – although he fails at the latter."

While they applaud Mage's "sophisticated" analysis, they note that he fails to provide a systematic mapping between conventional and Marxian categories. This is something Shaikh & Tonak extensively seek to rectify. A brief and partial discussion of this mapping will follow below.

Shaikh & Tonak (1994) note that Wolff (1977) publishes the first known attempt estimating Marxian aggregates using input-output tables. Yet while later work (Wolff (1987)) provides "a

rich and interesting extension of his earlier analysis” Shaikh & Tonak note that, unfortunately, Wolff still treats all unproductive activities – including trade - as royalties.

Shaikh and Tonak (1994) also discuss Khanjian (1989) who provides both labor value and money rate estimates of surplus value, based on the procedure from Shaikh (1975). A crucial result here is the demonstration of minimal (6-9%) price-value deviations, with generally similar trends in rates of exploitation. This result is important to note because the procedure discussed below only constructs money-value estimates on the basis that these minimal price-value deviations suggest money estimates provide a sufficiently reliable set of measures.

Basu (2015) suggests that Shaikh & Tonak’s work (1994, *Measuring the Wealth of Nations*) represents “the culmination of the previous literature on this issue and also the most comprehensive work till date.” The author wholeheartedly concurs with this assessment, but in addition to their seminal work we shall also rely upon the updates and improvements to the Shaikh & Tonak method developed by Mohun (2005, 2010, 2014) and Paitaridis & Tsoulfidis (2012). Beyond this, the availability and structure of the underlying data have changed considerably since the original work was done. We now have access to data with greater detail and frequency than before, and on the whole the changes (i.e. NAICS, FISIM, more below) appear to be improvements not only from the conventional perspective, but for our purposes as well. Thus, we shall seek not only to clarify the Shaikh & Tonak procedure, but to update it as well. In particular, we shall note a few further developments emerging from the author’s forthcoming dissertation.

5.2 – A Brief Narrative of Operations for Constructing Marxian Aggregates:¹⁰

The general framework for generating classical-Marxian-theory-consistent aggregates involves manipulating conventional accounts to estimate total value, constant and variable capital, and crucially surplus value. That is, the reason for calling the aggregates under development Marxian-political-economy-*consistent* is to highlight that this endeavor is only an attempt to shape existing data to be generally consistent with Marx's theory, and not the construction of pure Marxian aggregates from the ground up. As Basu (2015) succinctly summarizes, such manipulations involve “operationalizing” two important distinctions: productive and unproductive labor, and production and nonproduction activities. The former distinction is made in the calculation of variable capital, the latter appears in the IO-based estimates of total value and product.

While many alternative aggregates generally take the aggregated GDP picture as given, and then modify the aggregate according to their desired change (i.e. subtracting environmental degradation or military expenditure), from the perspective of classical political economy (as exemplified by Marx) this will not suffice. Our national accounts include much presumptive “output” from sectors that would be better classified as unproductive (nonproduction). Thus we must start at a lower level of aggregation in order to demarcate between activities that are or are not productive. The use of the IO framework has been selected in order to work with the data at a disaggregated industry level.¹¹

¹⁰ For a comprehensive, step-by-step account detailing the raw-data to final aggregate procedure, see the appendix of the author's forthcoming dissertation.

¹¹ Note that *symmetric* IO tables are required for the following procedure, and the BEA provides dual Make-Use tables instead. See the prior footnote.

Perhaps the most significant part of this process is, unsurprisingly, the practical determination of the location of the production boundary. As noted, a key difference between Marxian and conventional BEA estimates is the redefinition of certain activities as forms of social consumption, with their respective revenues being viewed as unproductive transfers, and thus not counted as part of intermediate use (productive consumption). Instead, these revenues should be seen as disbursements from value added elsewhere. By using IO tables we can obtain the required disaggregated information on interindustry flows in addition to final demand and value added. This is important because it allows us to redefine intermediate transactions that should be considered royalty transfers or purchases of unproductive inputs.

While the demarcation should be made at the level of the individual activities themselves, this is not possible as no such data exists. Given the available data, the demarcation between production and nonproduction activities is made at the industry level. That is, in the IO tables we must determine whether each industry includes production activities or not, and thereby redefine our political economy based aggregates to only include the productive industries within the production boundary.

Recalling Marx's definition of productive labor as productive of new (surplus) value and exchanged against capital, the relevant criteria for our production boundary is whether or not an activity directly results in new use value either in the form of a good or service, with an exchange value greater than that of the collective inputs ($M' > (C+V)$). The productive industry breakdown used approximates that used by Shaikh and Tonak (1994), save for the change of industrial classification systems since their work.¹² The "exchanged against capital" criteria is

¹² The industrial classification system used by the BEA changed from the SIC to the NAICS since Shaikh & Tonak's (1994) book. In general, the NAICS system is superior, providing more detailed divisions and a number of other

assumed to be implicitly met given that our data come from records of monetary transactions in a capitalist economy. Government activities and self-employed persons present exceptions to this, however, and shall thus be located outside the production boundary.

Given our production and nonproduction industrial classifications, how do we use them to construct our aggregates? Superficially we could choose to add up the gross output and final demand or value added from the production sectors alone, but again this would be inappropriate. A further clarification must be made. We cannot simply define all of our industries as either production or not, and then only consider the output of production industries. This is because some activities involve the realization of value produced elsewhere – the essence of the trade sector. Among the nonproduction sectors we must also demarcate between distributive (primary sector, trade) activities, which realize value from production activities and fall within the primary circuit of capital, and others that do not (secondary sector activities, i.e. financial capital) and are thus funded through royalty payments.

This complication arises due to the structure of the input-output tables. That is, while trade activities are inherently circulatory (thus nonproduction) their revenues (trade margins) represent a form of unequal exchange. As the BLS (2012, pp. 1-4) makes explicit, the “output” of the trade services “is not directly measurable, so margin prices are calculated as a substitute”. The final selling price of a good (purchased from a retailer) can be decomposed into an original producer’s price, a wholesale margin, and a retail margin. This final selling price, however, is determined by the use of labor in the production process, prior to the goods being marketed. From this perspective we can see that the trade sector is funded out of surplus value produced

improvements beyond the scope of this paper. For more on this and the exact industrial breakdown see the appendix of the author’s forthcoming dissertation.

elsewhere, transferred via unequal exchange at discounted (pre-margin) prices. It seems interesting to note that this trade-margin calculation directly fits Marx's understanding of trade activities as unproductive. Only with the trade margins included, thereby using the gross output of both production and trade sectors, can we determine the total value of output, what Shaikh & Tonak (1994, p. 52) term the "primary flows". The gross output of such primary flows serves as the basis for our estimates of Marxian total value (after some modifications, discussed below).

To clarify, let us consider a simplified IO model of an economy (illustrated in figure 2) with three industries: manufacturing (production), trade, and banking (royalties), each purchasing intermediate "inputs" from the others as in the conventional framework. Each industry buys "inputs" from itself and the other two, giving us nine intermediate transaction combinations. While netted out of conventional measures of value added and final demand, each transaction gets counted as contributing to gross or total output and product. From the Marxian perspective, many of these transactions ought not to be treated as intermediate inputs (productive consumption), but rather final purchases (distributions or use of the surplus), and one (banking transactions with banking) should not contribute to gross output at all (pure redistribution of revenues).

Only the manufacturing industry (in our simplified example) engages in production activities. The trade industry, however, is responsible for realizing (selling) the value produced in manufacturing. While trade remains an unproductive activity, we count purchases of trade "output" as part of the primary flows because they represent the realization of new value produced elsewhere and thus should be understood as part of total product. Recall that trade sector output stems from unequal exchange represented by margin prices, and these margins represent a flow of value from manufacturing to trade, suggesting that they too ought to be

included in our estimation of newly produced value. Thus total product is the sum of all purchases of primary sector output, and total value is all purchases by the primary sector.

A key distinction is that while all purchases of primary sector “output” are counted, with the exception of intermediate purchases by the production industry, they are treated as constituting final demand or value added in the Marxian framework rather than intermediate inputs.

Purchases of and by the banking (royalty) sector (excluding own purchases) are likewise counted as either constituting a distribution of value added or purchases in final demand. As this sector is inherently unproductive, like the trade sector, its “inputs” cannot be deemed intermediate, but instead should be understood as part of the overhead costs (*faux frais*) of the capitalist system at large. Thus, such inputs consume the output produced elsewhere which represents a reduction in the available surplus rather than a contribution to it (albeit potentially necessarily for the continuity of the social system). The purchase of banking “output” by the banking sector itself is entirely excluded from the estimate of gross value and product as these transactions are pure redistribution flows.

Figure 2 (directly below) illustrates this understanding of the intermediate flows.¹³ The **bold** entries represent intermediate inputs to the manufacturing industry, while the grey entries are intermediate in the conventional framework, but part of the surplus from Marx’s perspective. The underlined entries compose the elements of total product, and the italicized entries compose the elements of total value. Crossed-out entries are not included in Marxian estimates of gross output and product.

¹³ Compare Shaikh & Tonak (1994) Figure 3.11.

Figure 2:

	Production	Trade	Royalties	FD	Σ
Production	<u><i>Mpp</i></u>	<i>Mpt</i>	<i>Mpr</i>	<u>FDp</u>	<u>GPp</u>
Trade	<u><i>Mtp</i></u>	<i>Mtt</i>	<i>Mtr</i>	<u>FDt</u>	<u>GPt</u>
Royalties	<i>Mrp</i>	<i>Mrt</i>	<i>Mrr</i>	FDr	GPr
VA	<i>VAp</i>	<i>VAt</i>	<i>VAr</i>		
Σ	<i>GOp</i>	<i>GOt</i>	<i>GOr</i>		

Of the nine transactions treated as intermediate in the conventional framework, eight will appear in our Marxian estimates of value and product, and but only two transactions are included as intermediate inputs (productive consumption) into the productive sector (manufacturing): ***Mpp*** and ***Mtp***. The basic idea here is that primary flow inputs to production activities are treated the same whether in Marxian or conventional terms. The manufacturing industry purchases of goods or services from manufacturing and trade represent the purchase of new output to be consumed productively – their value is conserved and transferred through to later final product – which constitutes constant capital (C) sans relevant depreciation.

Of the other seven transactions, six represent unproductive consumption better classified as forms of value added or final demand. That is, purchases of royalties (i.e. financial services) by the production and trade sectors, as well as purchases of production and trade products by the trade and royalties sectors, represent real costs for these industries, but are paid for out of revenue – not capital – and as such are not consumed productively. Rather, these represent unproductive inputs – faux frais of production, consumed for unproductive/nonproduction activities.

The last entry, M_{FF} , gives us a pure royalty flow – the purchase of banking services by banks, which can be viewed purely as a transfer, rather than representing new output.

Given this understanding of the Marxian production boundary within an IO framework, we can now implement this boundary on our tables. While we could now calculate preliminary values for Marxian total value (TV) and total product (TP) by summing the columns (rows, respectively) for the primary sector industries, several additional steps are still required to construct our Marxian aggregates. First, we must estimate variable capital and depreciation in order to subtract them and determine surplus value. We also need to correct the tables for the BEA's use of imputations and to remove ground rent from the primary sector flows. A description of the process for final calculation appears below, following the treatments variable capital, depreciation and imputations.

In order to estimate variable capital (V) - the money value of productive labor inputs – we must first find the number of productive workers (by industry) for each of our productive sectors, as defined above. Second, we need to calculate the average wage (employee compensation) for production workers in these industries. These two pieces combined (multiplied) give us variable capital by industry, and aggregated (across production industries) give us V. Conceptually, the process is as simple as that. Functionally, this gets complicated by the fact that the requisite data are not simply provided in this form – these pieces must each be generated from multiple tables provided by the BEA and BLS. Mohun (2005) provides important improvements on parts of the Shaikh & Tonak (1994) method, but the general procedure remains the same.

To accurately represent Marx's constant capital (C) we cannot only include the intermediate inputs from the IO table, but must also include depreciation of fixed capital (in production industries) to fully represent the pass-through value of dead labor. While all measures of

depreciation are problematic, the current-cost estimates are utilized because this measure reflects Marx's view on the changing market value of inputs. That is, the pass-through value transferred from fixed capital depends on the current market value of the fixed capital being used.

However, the resulting estimate of production industry depreciation still overestimates the depreciation component of constant capital by including more than just the pass-through wear of constant capital inputs. Shaikh & Tonak (1994) simply use this basic NIPA estimate, but an improved measure is now feasible, as developed in the author's forthcoming dissertation. As a partial remedy, we can use information gleaned from NIPA 7.13 on the differences between BEA and IRS depreciation data to see greater detail with respect to particular components of depreciation, and thereby deflate the original estimates in a theoretically consistent fashion. This is done by taking our estimated value of production industry depreciation and removing the elements attributed to accidental damage, intellectual property, financial assets, and exploration costs. These elements of depreciation do not constitute the use of constant capital, and therefore should not be viewed as passing through the value to the final product. Thus, the deflated depreciation measure appears more appropriate.¹⁴

With respect to imputations, Moulton (2002, p. 3) notes that they:

¹⁴ Another problem appears with respect to this measure of depreciation – it includes an estimate for revaluation, or what Marx called “moral depreciation” which ought not be included in C, and instead represents a pure loss of value. Moral depreciation refers to the loss of value (of constant capital) via technological obsolescence or a reduction in the going market price of the asset. Consider the argument with respect to current-cost depreciation above. Only the wear-of-capital-in-production component of depreciation should be counted as constant capital. Fraumeni (1997) discusses the BEA's measure of depreciation, noting this two-component nature, and clearly demarcating between the two. However, while separating such is clear from a theoretical standpoint, it represents an intractable empirical problem as calculating the respective components does not appear feasible. In short, while an improvement over the original Shaikh & Tonak procedure, this measure still overstates the true value being conserved in production, but the exact extent of such is unclear. No practical empirical procedure has been found to properly remove moral depreciation, so no further correction is made.

“generally arise for one of two reasons: (a) own-account production that takes place within the production boundary of the system, such as services the produced by owner-occupied dwellings, or (b) transactions that are not directly associated with an exchange of money between the transacting parties because the transactions involve barter, transactions in kind, or bundling the provision of a service with a financial transaction, such as depositing funds in a bank.”

From the Marxian standpoint, imputations due to reason (a) should not be included in new output because own-account production is not capitalistic production. Thus we must remove the imputed value of owner-occupied housing rentals from our primary sector flows. The procedure followed here is identical to that of Shaikh & Tonak (1994).

Imputations due to (b), however, potentially represent flows of new output that are not included in survey statistics due to the lack of explicit monetary transaction. Financial services furnished in exchange for interest, for instance, do not receive explicit payment, but are clearly a disbursement of new value in many cases (i.e. in the repayment of a loan used to purchase productive capital the interest is paid via new output of surplus value).

Following the introduction of the 1993 United Nations System of National Accounts (UN-SNA), the treatment of financial intermediaries (primarily banks) was changed to include an imputed purchase of financial intermediation services indirectly measured (FISIM) to treat interest payments as the purchase of a “service”. Prior to this, under the 1968 SNA, a fictitious industry was added to purchase such services, but to balance the table this industry had to have a negative gross value added (GVA) equal to the sum of its purchases. Thus, the value added of all other industries would sum to greater than GDP.

The 1993 SNA recommends the imputation of FISIM so that these interest payments can be attributed to actual (presumptive) users. This involves adding the purchase of FISIM “services” by industries as intermediate transactions and as part of final demand. The total gross output of all industries remains constant, while the GVA of the finance sector increases by the amount of FISIM supplied to final demand. The other effect is that the intermediate purchases from finance (of FISIM) increase, but this corresponds to an equal decrease of GVA by the purchasing industry.

While the industrial breakdown of interest flows provides more transactional detail and is therefore an improvement over past national accounting systems, the method of calculation used does not represent a fully Marxian-consistent understanding of the flow. The FISIM imputation is based upon the spread between the nominal rate for a financial asset (loan) and low-risk or risk-free reference rate. For example, if my manufacturing business takes out a \$1k loan at 10% interest, and the risk-free reference rate on a treasury is 5%, then (assuming a one year loan) \$50 will be subtracted from my value added and added to my intermediate inputs as a purchase of FISIM. From the Marxian perspective this is an improvement in that it allows us to better trace these surplus transfers. However, a more correct method would be to use the entire interest charge, thus allowing us to trace the entire transfer. The base rate subtraction method is used to account for the presumptive opportunity cost incurred when making a loan, with the risk-free comparison rate standing in for such. While this understanding is important in the neoclassical framework, from our Marxian standpoint we are concerned with the entire flow. In our simple (but likely unrepresentative) example, half of the royalty transfer disappears! Empirically we do not make attempt to calculate this distinction and generate a Marxian FISIM as the complexity of the original calculations and lack of data make it impractical, and the effect likely small.

After making the necessary adjustments, aggregating the gross value (product) of the primary-sector industries provides a Marxian consistent estimate of total gross value (product). We can then decompose this measure into Marx's key components of C, V, and S. Total value less constant capital (production industry inputs from the primary sector and depreciation) and variable capital (compensation of production workers in production industries) leaves a remainder of surplus value.

5.3 – The Empirical Significance of the Production Boundary – Marxian and Conventional Measures Compared:

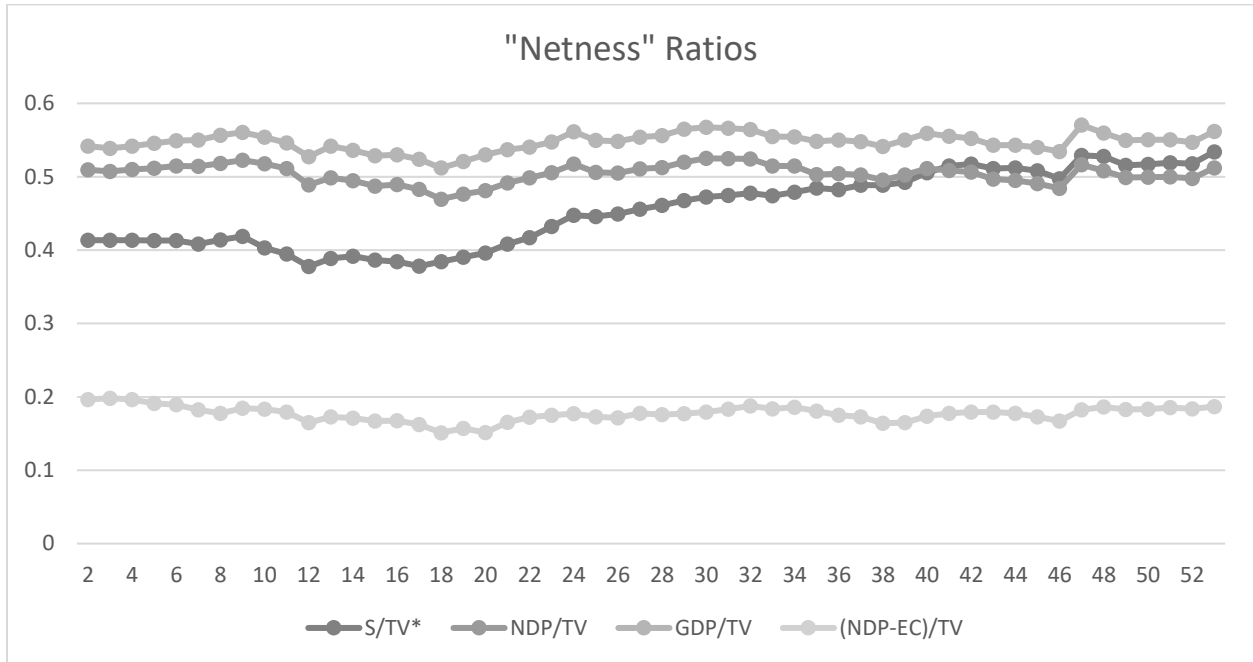
After this much consideration and calculation it seems fair to query concerning the worthwhileness of these efforts. Yes, Marxian measures ought to be different in theory, but in practice how do the results compare? To answer, let us compare several pairs of conventional (GDP-NIPA) and Marxian measures, noting the clear and compelling differences.

One of our recurring themes has been the concept of netness – the division between inputs and final product. Figure 3 highlights a meaningful distinction between Marxian and conventional measures by comparing netness ratios. Marx's netness is defined by his concept of surplus value. As Figure 3 demonstrates, the ratio Marxian of net product – surplus value – to total value has a markedly positive trend over the past several decades, while conventionally measured ratios of net product to total output show nothing of the sort.¹⁵ The Marxian measure thus interestingly suggests a rise in aggregate net productivity qua final output per input, while conventional measures show no change. Further, as Marx (1913, p. 407) emphasized, one of the “best points” in *Capital* is its “treatment of surplus-value regardless of its particular forms.” If

¹⁵ For conventional measures of “netness” we have used final product via GDP, NDP, and NDP less compensation of employees, each over total value, as there is no strict conventional corollary to the Marxian categories.

we use the standard empirical constructs provided by bourgeois economics we are not testing the “best points” of Marx.

Figure 3:



One proximate cause of this increased net productivity from a Marxian perspective would be an increase in the rate of exploitation, as provided by Figure 4. Of course, a set of Marxian measures without exploitation would be woefully incomplete. Figure 4 illuminates the difference between a Marxian consistent measurement of exploitation as surplus value divided by variable capital compared with conventional approximations. While Marx’s understanding of exploitation has clearly increased over time, comparable, conventionally measured ratios indicate no apparent change.

Figure 4:

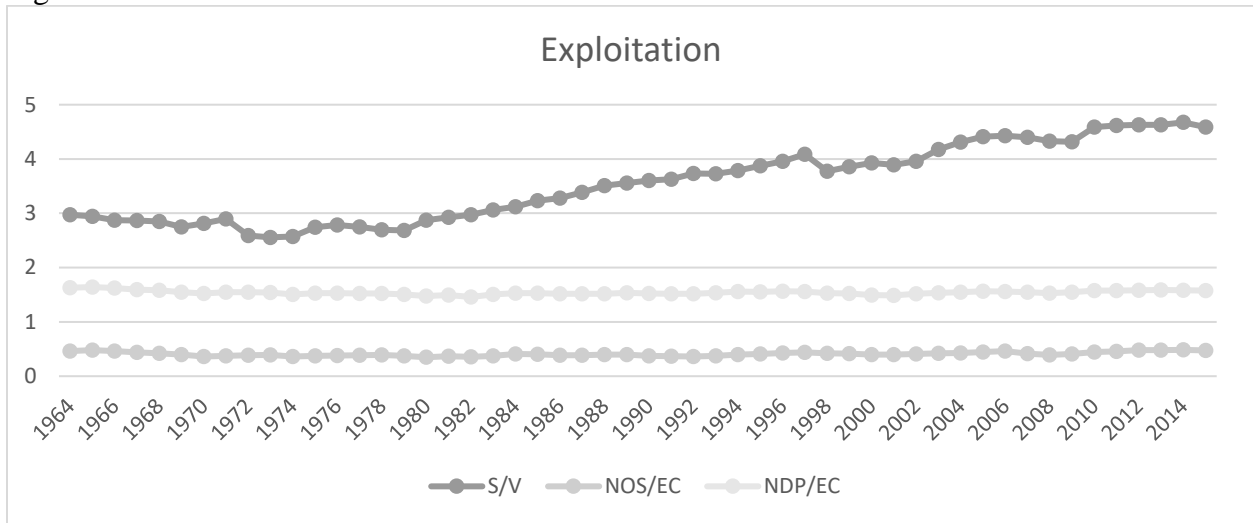
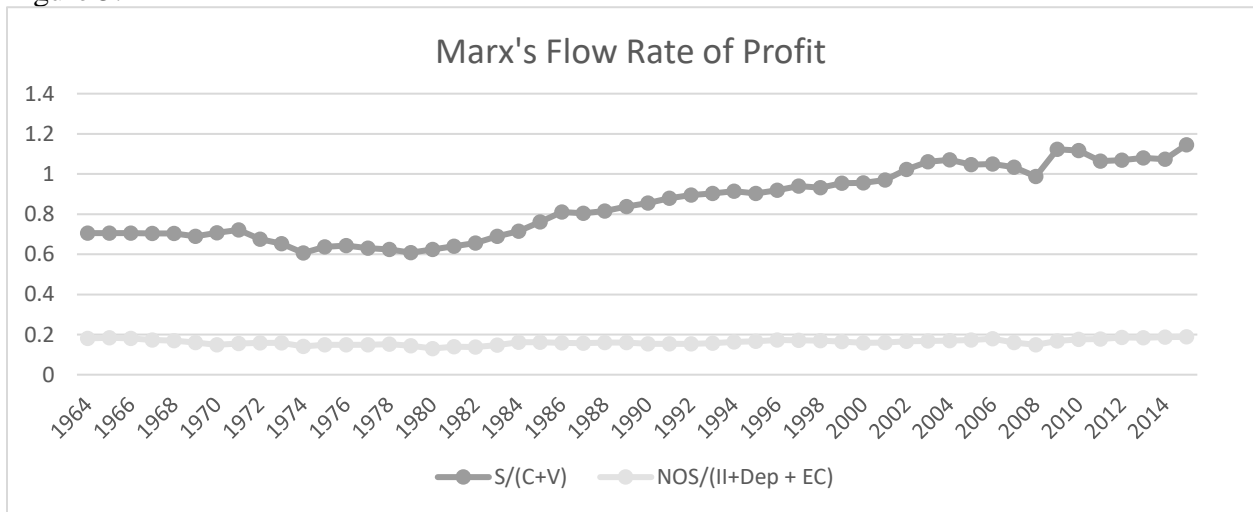


Figure 5 demonstrates a comparable trend disparity, this time between measures of the aggregate flow rate of profit. That is, we again find a noticeable trend in the Marxian consistent measure, and not in the conventional equivalent. The aggregate rate of profit stands as a central element of Marx’s framework, and numerous studies have sought to identify the trend thereof.

Unfortunately, it appears all too common to test this trend on the basis of conventional account based measures of profit, even when otherwise sophisticated econometric approaches are utilized (see, for example, Basu & Manolakos (2013)).

Figure 5:



Section 6 – Conclusions:

We may briefly conclude by again noting that national accounts are theory-laden empirical constructs. While we have only one single set of official, state-sponsored accounts, this paper has confronted a variety of perspectives regarding the production boundary that differ from that embodied by gross domestic product. Indeed, even the mainstream tradition in economics represents a significant theoretical departure from applied practice.

As such, we have also considered the construction of an alternative set of accounts that more consistently represents the classical-Marxian surplus and transfer approach. The resulting measures differ greatly from comparable estimates based on conventional GDP-NIPA aggregates. This has important implications for empirical work in the classical-Marxian tradition. In particular, empirical studies and econometric work dealing with Marxian concepts and categories must be done using specifically constructed Marxian-consistent measures, as conventional proxies display divergent trends and therefore will not suffice. To paraphrase Stone, the theoretical basis of national accounts qua empirical constructs must be our conscious concern.

However, the measures described and developed in this paper represent only a partial picture of the aggregate economy from the Marxian standpoint. For one, by focusing exclusively on production, we ignore issues related to the distribution and transfer of the surplus. Future work building on Olsen (2011), can remedy this by populating a Marxian Social Accounting Matrix (SAM) thereby providing a coherent representation of nonproduction value flows. In addition, the Marxian focus on market production leaves aside questions of well-being. Future research to remedy this aspect will use ATUS data to estimate the encroachment of capitalism into areas once relegated to household production. This will serve to highlight the possibility that much of

the growth of the capitalist economy does not represent increasing well-being, but instead a reduction of the informal household sector which must be compensated by an increased subsistence basket. Further, our understanding of both the value flows and well-being will be enhanced by estimating the net social wage, thereby accounting for private-public distributional issues as well.

References:

- Angle, John. (1986). "The Surplus Theory of Social Stratification and the Size Distribution of Personal Wealth." In *Social Forces* 65(2): 293-326.
- Baran, P. and P. Sweezy. 1966. *Monopoly Capital*, New York, Monthly Review Press.
- Basu, Deepankar. 2015. "A Selective Review of Recent Quantitative Empirical Research in Marxist Political Economy", Working Paper, UMASS
- Basu, D. & P. Manolakos. 2013. "Is There a Tendency for the Rate of Profit to Fall? Econometric Evidence for the U.S. Economy, 1948-2007", in *Review of Radical Political Economics* 45 (1) 76- 95
- Becker, G. 1981. *A Treatise on the Family*, Cambridge, Harvard University Press.
- Bentham, J. 1963. *An Introduction to the Principles of Morals and Legislation*, New York, Hafner.
- Bos, F. 1997. "Value and Income in the National Accounts and Economic Theory" in *Review of Income and Wealth*, Series 43, No. 2, 173-190
- Boss, H. 1990. *Theories of Surplus and Transfer*, Boston, Unwin Hyman.
- Brennan, D. 2006. "Defending the Indefensible? Culture's Role in the Productive/Unproductive Dichotomy" in *Feminist Economics*, 12(3), 403-425
- Bureau of Economic Analysis. 1970. *Readings in concepts and methods of national income statistics*, Washington, Department of Commerce.
- Carson, Carol. 1975. "The history of the United States National Income and Product Accounts: the development of an analytical tool" in *Review of Income and Wealth*, 21
- Coyle, D. 2014. *GDP: a brief but affectionate history*, Princeton, Princeton University Press
- Coyle, D. 2016. The Political Economy of National Statistics, Economics Discussion Paper Series EDP-1603, University of Manchester
- Fraumeni, B. 1997. "The Measurement of Depreciation in the U.S National Income and Product Accounts" in *Survey of Current Business*, July, 7-23
- Gilbert, M., G. Jazi, E.F. Denison, and C.F. Schwartz. 1948. "Objectives of National Income Measurement: A Reply to Professor Kuznets" in *The Review of Economics and Statistics*, Vol. XXX, No. 3, 179-195
- Gilman, J. 1957. *The Falling Rate of Profit*, London, Dennis Dobson
- Harcourt, G. 1981. "Marshall, Sraffa and Keynes: Incompatible Bedfellows?" in *Eastern Economic Journal*, Vol. VII, No. 1.
- Harris, M. (1959). "The Economy Has No Surplus?" in *American Anthropologist* 61: 185-99.

- Hicks, J.R. 1940. "The Valuation of Social Income" in *Economica*, (May) 105-124
- Kahn, R. 1931. "The Relation of Home Investment to Unemployment" in *Economic Journal*, 41(163), 173-98.
- Kendrick, J. 1970. "The Historical Development of National-Income Accounts" in *History of Political Economy*, 11, 284-315
- Keynes, J.M. 1940. *How to Pay for the War*, London, Macmillan
- Keynes, J.M. 1991 [1936]. *The General Theory of Employment, Interest, and Money*, San Diego, Harcourt.
- Khanjian, A. 1989. Measuring and Comparing the Price and Value Rates of Surplus Value in the U.S., 1958-1977, Ph.D. dissertation, Department of Economics, New School for Social Research.
- Kuznets, S. 1973. "Concluding Remarks" in *The Measurement of Economic and Social Performance*, Milton Moss (ed.), New York, Columbia University Press & NBER.
- Kuznets, S. 1948. "Discussion of the New Department of Commerce Income Series" in *The Review of Economics and Statistics*, Vol. XXX, No. 3, 151-179
- Lichtenstein, P. 1983. *An Introduction to Post-Keynesian and Marxian Theories of Value and Price*, New York, M.E. Sharpe.
- Mage, S. H. 1963. "The Law of the Falling Tendency of the Rate of Profit: Its Place in the Marxian Theoretical System and Relevance to the United States," Ph. D. dissertation, Department of Economics, Columbia University, New York
- Mandel, E. 1975. *Late Capitalism*, London, New Left Books.
- Marshall, A. 1890. *Principles of Economics*, New York, Macmillin and Co.
- Marx, K. [1867] 1913. *Marx-Engels Collected Works*, Vol. 42
- Marx, K. [1867] 1990. *Capital: A critique of political economy*, vol. I. London: Penguin Classics.
- Meade, J.E. & R. Stone. 1941. "The Construction of Tables of National Income, Expenditure, Savings and Investment" in *The Economic Journal*, 51:202/203, 216-233
- Mill, J.S. 2004 [1848]. *Principles of Political Economy*, Amherst, Prometheus.
- Mohun, S. 2005. "On measuring the wealth of nations: the US economy, 1964-2001", in *Cambridge Journal of Economics*, 29, 799-815
- Mohun, S. 2006. "Distributive shares in the US economy, 1964-2001", in *Cambridge Journal of Economics*, 30, 347-370
- Mohun, S. 2009. "Aggregate capital productivity in the US economy, 1964-2001", in *Cambridge Journal of Economics*, 33, 1023-1046

- Mohun, S. 2014. “Unproductive Labor in the U.S. Economy 1964-2010”, in *Review of Radical Political Economics*, 46, 355-379
- Moulton, B. 2002. *Presenting Imputations in the National Income and Product Accounts*, Working Paper, (OECD Statistics Directorate?)
- Olsen, E. 2017. “Productive and Unproductive Labor” in *Handbook of Marxian Economics*, New York, Routledge.
- Olsen, E. 2011. “Modeling the Economic Surplus in a SAM Framework” in *American Journal of Economics and Sociology*, 70:5, 1175-1207.
- Polanyi, K. 2001[1944]. *The Great Transformation*, Boston, Beacon.
- Ricardo, D. 2004 [1817]. *The Principles of Political Economy and Taxation*, New York, Dover.
- Savran, S. & E.A. Tonak. 1999. “Productive and Unproductive Labour: An Attempt at Clarification and Classification” in *Capital & Class*, 23:2, 113-152.
- Schumpeter, J.A. 1994 [1954]. *History of Economic Analysis*, New York, Oxford University Press.
- Shaikh, A. and E.A. Tonak. 1994. *Measuring the Wealth of Nations*, New York, Cambridge University Press.
- Shaikh, A. 1978. “An Introduction to the History of Crisis Theories” in *U.S. Capitalism in Crisis*, U.R.P.E., New York.
- Smith, A. 2000 [1776]. *The Wealth of Nations*, New York, Random House.
- Sraffa, P. 1960. *Production of Commodities by Means of Commodities*, Cambridge, Cambridge University Press.
- Sraffa, P. 1970. *The Works and Correspondence of David Ricardo*, Cambridge.
- Stone, Richard. 1951. *The Role of Measurement in Economics*, Cambridge, Cambridge University Press.
- Stone, R and G. Stone. 1972. *National Income and Expenditure*, London, Bowes and Bowes.
- Studenski, P. 1958. *The Income of Nations*, New York, New York University Press.
- Tily, George. 2009. “John Maynard Keynes and the Development of National Accounts in Britain, 1895-1941” in *Review of Income and Wealth*, 55:2, 331-359.
- U.S. Department of Labor, Bureau of Labor Statistics. 2012. “Wholesale and retail Producer Price Indexes: margin prices”, *Beyond the Numbers* 1 (8) 1 – 4.
- Vanoli, A. 2005. *A History of National Accounting*, Washington, IOS Press.
- Wolff, E. 1977, “Unproductive Labor and the Rate of Surplus Value in the United States, 1947-67,” in P. Zarembka (ed.), *Research in Political Economy*, Vol. I, Greenwich, JAI Press.

Wolff, E. 1987. *Growth, Accumulation and Unproductive Activity*, New York, Cambridge University Press.