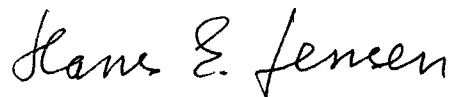


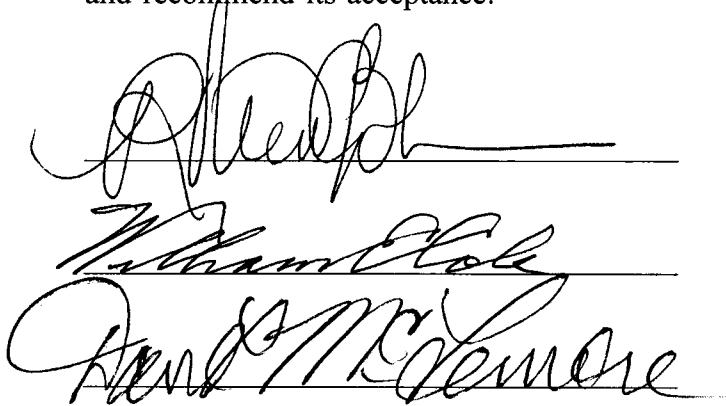
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I am enclosing, herewith a dissertation written by James H. Ullmer entitled "The Macroeconomics of Nicholas Barbon and Sir William Petty: Were Their Theoretical Innovations Inevitable?" I have examined the final copy of this dissertation for form and content and recommended that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Economics.



Hans E. Jensen, Major Professor

We have read this dissertation
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Accepted for the Council:



Associate Vice Chancellor
and Dean of The Graduate School

THE MACROECONOMICS OF
SIR WILLIAM PETTY AND NICHOLAS BARBON:
WERE THEIR DISCOVERIES INEVITABLE?

A Dissertation
Presented For The
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

James Henry Ullmer
May 1996

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DEDICATION

To my mother, Angeline Banascynski, with love and gratitude.

ACKNOWLEDGEMENTS

This dissertation would not have been possible without the assistance of a number of scholars. Most notably, I am indebted to Professor Hans E. Jensen who served as my dissertation chairman. His support and scholarly advice were essential during the writing of this document and made its completion possible. Moreover, he served as a mentor throughout my graduate studies. Professors William E. Cole, Robert Bohm, and Dan McLemore also served on my committee. I would like to thank them for their constructive comments and encouragement during this enterprise. They too were crucial to the successful completion of this research. I would also like to thank Donna Kemper for her secretarial services, without which this document could not have been produced. However, whatever errors remain in this document are solely my responsibility. Finally, thanks are in order for the Economics Department at The University of Tennessee for providing me with the necessary financial support, both in the form of a teaching assistantship and a fellowship provided by the J. Fred Holly Excellence in Economics Fund, to complete my Doctorate Program.

ABSTRACT

The notion of how a discipline acquires knowledge has twin hypotheses. Discovery may be the result of individual genius or it may simply occur when certain existential factors arise in a society. Robert Merton is the most well-known proponent of the latter supposition and cites as empirical evidence for this notion, simultaneous and independent discoveries of similar concepts, which he terms "multiples." Opponents of this thesis, such as Nicholas Georgescu-Roegen, criticize the idea for several reasons. For example, there is the problem of long-delayed discovery, as well as the notion that scholars may write before their time, and finally the fact that the argument is largely tautological in nature.

This research offers an additional hypothesis for the Mertonian theory of inevitable discovery and thereby, helps to blunt some of the criticisms. This new thesis asserts that for discovery to be inevitable, certain existential factors must arise and two or more scientists must share a similar conceptualized reality. Hence, new existential factors only provide the necessary conditions for inevitable discovery, while the sharing of similar conceptualized realities supplies the sufficient conditions. To evaluate this proposition, the conceptualized realities and macroeconomic principles of two late seventeenth century English economists, Sir William Petty and Nicholas Barbon were evaluated and compared.

The results of the study indicate that these two writers of economic tracts did indeed share similar conceptualized realities, thus, establishing sufficient conditions for

discovery. They were both the sons of artisans and had similar educational experiences in that they each studied medicine in the Lowlands as it was then taught.

The new proposition was then evaluated in two ways: First, their individual theories were compared and then, their overall macroeconomic analyses were contrasted. In regards to the first comparison, four of their respective individual economic theories can rightly be classified as what I have termed, "mini-multiples." I have defined mini-multiples as simultaneous independent discoveries found within the respective corpora of thought of two or more economists.

Secondly, the "central messages," a term coined by Don Patinkin, of these two economists also appears to be an example of independent, multiple discoveries. Petty's central message of a demand-driven economy that periodically experiences low levels of output and employment is echoed in the writings of Barbon. Consequently, this study indicates that the macroeconomic theories and analyses, that have as their underlying structure Petty and Barbon's conceptualized realities, do indeed seem to be examples of multiple discoveries.

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PART I
INTRODUCTION

CHAPTER I

PURPOSE AND APPROACH

Some adherents to the sociological theory of the development of science contend that, to a large extent, the acquisition of knowledge is dependent on the "existential factors" in a society (Georgescu-Roegen, 1983, p. xii). The fullest exposition of this theory of knowledge is presented in The Sociology of Science by Robert Merton (Merton, 1973). According to his interpretation of the development of science, when conditions are right, discovery in the form of new theories, or perhaps even a new paradigm,¹ is inevitable.

As empirical evidence for the inevitability of discovery and invention when conditions are ripe, Merton cites simultaneous and independent discoveries of similar "experiments and theories" which he terms "multiples" (Merton, 1973, pp. 357, 343-370; emphasis added).² Later, Merton provides an explanation for what he means by ripe conditions with the following: "Such occurrences [the appearance of multiples] suggest that discoveries become virtually inevitable when prerequisite kinds of knowledge accumulate

¹Thomas S. Kuhn developed the concept of a paradigm and defined it as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (Kuhn [1962] 1970, p. viii). The discipline of economics was in a pre-paradigm phase in the seventeenth-century. A pre-paradigm situation is considered by Kuhn to be evidence of a discipline that is in an embryonic stage and "As a result, early fact-gathering is a far more nearly random activity [and independent] than the one that subsequent scientific development [the existence of a paradigm in a discipline] makes familiar" (Kuhn, [1962] 1970, p. 15). This situation is aptly described by the phrase "Everyman his own economist" (Johnson, 1937, p. 3).

²See William F. Ogburn and Dorothy S. Thomas (1922) for the origination of this idea. On the basis of 148 cases of independent, multiple discoveries and inventions spanning the years 1530-1895, they concluded that these innovations and discoveries became virtually inevitable because of cultural conditions and social developments.

in man's cultural store and when the attention of an appreciable number of investigators becomes focused on a problem ..." (Merton, 1973, p. 371).

The sociology of science has long had a companion hypothesis in opposition to the theory of inevitable discovery. That theory holds that the acquisition of knowledge in a discipline is for the most part the result of the efforts of the undeniable genius of the great men and women of science. An example of that type of genius in economics would be the works of the great innovators³ of economics such as Adam Smith, Alfred Marshall and John Maynard Keynes.

Merton attempts to reconcile these two apparently opposing theories by first admitting that there are obviously people of genius in every science. Then he notes:

... great scientists will have been repeatedly involved in multiples. First, because the genius will have made many scientific discoveries altogether; and since each of these is, on the first part of the theory, a potential multiple, some will have become actual multiples. Second, this means that each scientist of genius will have contributed the functional equivalent to the advancement of science of what a considerable number of other scientists will have contributed in the aggregate, some of these having been caught up in the repeated multiples in which the genius was actually involved (Merton, 1973, pp. 366-367).

Consequently, the evidence of scientific genius is not inimical to the theory of existential factors in a society bringing about an environment conducive to inevitable discovery. On the contrary, the existence of multiples is empirical evidence for the hypothesis that scientific discovery is often the result of scientific genius. Therefore, Merton concludes: "Far from being incompatible, the two [the theory that the acquisition of knowledge is

³Hans Jensen formulated the term innovating economist in adopting the Kuhnian idea of a paradigm for the history of economics. An innovating economist is one whose "extraordinary" research leads to the discovery of a new paradigm (Jensen, 1976, p. 262).

dependent on 'existential factors' and the theory that the acquisition of knowledge is contingent on genius in science] complement one another" (Merton, 1973, p. 366).

Nicholas Georgescu-Roegen rejects what he terms the "inevitability theorem" (Georgescu-Roegen, 1983, p. xiv), the origin of which he attributes to Karl Marx and Friedrich Engels (Georgescu-Roegen, 1983, p. cxxxiii,n). By implication he accuses Merton of harboring the notion of inevitability, because it (the inevitability theorem) underlies the Mertonian theory of multiples.

Georgescu-Roegen cites three reasons for his rejection of the Mertonian approach, the first two of which are duly noted by proponents of the idea. First, in some instances, the necessary existential factors for a discovery are present long before it is made. Merton acknowledges this problem when he renders the following: "This recurrent fact of long-delayed discovery raises distinctive problems for the theory advanced here [the theory of multiples], but these are not unsolvable problems" (Merton, 1973, p. 369).

Secondly, Georgescu-Roegen considers the proof necessary to validate the theory to be largely ex-post-facto in nature. William F. Ogburn and Dorothy S. Thomas note this when they concede: "We do not always know beforehand what the necessary constituent cultural elements are that go into the making of an invention" (Ogburn and Thomas, 1922, p. 91; emphasis added). Georgescu-Roegen reiterates this concession with the following analogy: "The inevitability theorem is tantamount . . . to a theory of mushrooms according to which the only way to find out whether a mushroom is poisonous is to eat it" (Georgescu-Roegen, 1983, p. xvi).

Joseph Schumpeter wrote about economists who he felt "wrote above their time"

in the "sense that they failed to receive the attention and exert the influence which, enlightened by hindsight, we should deem appropriate" (Schumpeter, 1954, pp. 463-464). Specifically, he mentions Antoine Cournot, Jules Dupuit, Hermann Gossen and William Lloyd, whom he credits with discovering the marginal utility principle; as well as Samuel Longfield, Johann von Thunen and John Rae who he notes were the original developers of the marginal productivity principle.

Georgescu-Roegen picks up on this Schumpeterian idea and cites it as his third reason for rejecting the inevitability theorem. He makes the following observation: "But the idea that people may think, write, compose music, paint, or sculpt above their time is in direct contradiction to the teachings of another discipline, known as the 'sociology of knowledge'" (Georgescu-Roegen, 1983, p. xii; emphasis added). In the parlance of Georgescu-Roegen, the term sociology of knowledge is akin to Merton's sociological theory of multiples. In his preface to The Laws of Human Relations, (Georgescu-Roegen, 1983), Georgescu-Roegen cites Gossen as the best example in economics of the phenomenon of people who write above their time. The third stricture by Georgescu-Roegen is in the opinion of this writer not a valid criticism of Merton's thesis. The fact that a scientist responds intellectually to a given cultural situation does not guarantee that he will have followers.

Nevertheless, Merton's inevitability theorem is incomplete and, therefore, leaves itself open to the first two aforementioned criticisms from Georgescu-Roegen. As it is now constructed, the Mertonian theorem deals only with factors that are necessary for a discovery. However, the factors emphasized by Merton, namely, the presence of

certain existential factors in a society, may not be sufficient for the appearance of scientific discovery. An additional hypothesis is necessary to provide sufficient conditions.⁴

In his introduction to a collection of essays by Karl Mannheim, Paul Keckskemeti provided a foundation for the conceptualization of a sufficient condition for discoveries. He did so when he observed that the social actuality cannot be "'known' in the same way as natural objects get to be 'known'" (Keckskemeti, 1952, p. 31). Hence, an innovating social scientist must substitute something knowable for the unknowable actuality. This surrogate has come to be referred to as an innovator's "conceptualized reality" (Jensen, 1994).⁵ Such a reality consists of an image of actuality built from philosophical-theoretical, historical and empirical factors that influence the direction and content of the innovator's research.

Hence, it appears to this writer that for the inevitability theorem to be valid necessary and sufficient conditions must be present in a society. The necessary conditions for scientific discovery are provided by the existential factors that exist in a particular society at a given point in time. The sufficient conditions necessary for the inevitability doctrine to come into play in the social sciences are that two or more investigators experiencing the same existential factors conceptualize them in similar

⁴The term "sufficient" is not meant in the strict mathematical sense, but only indicates that discovery is more likely to occur.

⁵A formal rendering of the precept is provided by Jensen in the following "...as I view it, a conceptualized reality is an experimentally conditioned, subjectively conceived, factually structured, and mentally formulated approximation to, or image of, the actual socioeconomic order of the contemporary society" (Jensen, 1983, p. 70).

terms. That is, they tend to interpret that which they conceive of as contemporary phenomena from the same point of view. This would occur because they have been exposed to similar philosophical notions; in particular, identical notions of cause-and-effect relationships. Therefore, if and only if existential factors are ripe for discovery, and a number of scientists share the same conceptualized reality, i.e., they wear the same kind of philosophically and conceptually tinted "intellectual spectacles," does the inevitability doctrine hold in the social sciences.

The establishment of this potentially more inclusive theory of the inevitability doctrine requires that the historian select the proper time period and place, as well as the proper subjects for consideration. The time period and place under consideration should be one where new existential factors are emerging which necessitate new explanations, particularly new notions of cause-and-effect relationships among the new phenomena which are coming about. Specifically, if it is apparent that unique socioeconomic conditions were emerging during the historical time period and place being scrutinized, the first two objections of Georgescu-Roegen can be blunted, and more importantly, necessary conditions for the more evolved inevitability theorem can be established. Sufficient conditions for the more inclusive inevitability theorem can then be established if it can be shown that two contemporaneous economists did indeed share a similar conceptualized reality.

A time period and place where newly emerging existential factors seem to be evident is the second half of the seventeenth-century in England.⁶ The semi-feudal

⁶See Christopher Hill ([1961] 1980) for a thorough discussion of the revolution in economic, political, religious and artistic ideas in England during this time period.

economic society that had previously existed was becoming one in which markets were evolving into the major economic force in society. Custom as the principal allocator of goods and services gave way to the institutions of the newly emerging capitalist system. During this time period, both product and labor markets became increasingly free as employers and workers were freed from various government regulations and controls. For example, the establishment of industrial monopolies and governmental support of price fixing by trade associations was abandoned in England. At the same time the English government ceased to grant special privileges to individual companies. Also, the process of individual bargaining between employers and employees became the norm for the setting of wage rates and working conditions. Finally, the underlying precept absolutely necessary for the establishment of a capitalist system, namely property rights, became institutionalized as the common law triumphed over the prerogative courts.

The macroeconomic fluctuations that are part of all capitalist systems were becoming increasingly apparent in the new market system of Great Britain. These newly emerging socioeconomic phenomena required new explanations as to cause-and-effect. Consequently, this time period and place provide the necessary conditions for the inevitability theorem to be operable in economics. The newly emerging existential factors, which were evident in society as capitalism arose, provided a milieu in which discovery should be inevitable.

As explained above, for discovery to be truly inevitable, sufficient conditions must also be present. Also, as intimated above, it is assumed in the present study that such conditions exist when two or more social scientists simultaneously formulate similar

conceptualized realities. It is my contention that two English writers of pamphlets on economic matters, Sir William Petty and Nicholas Barbon, did so in the period under consideration. This hypothesis will be substantiated in Chapter IV, after the salient features of the conceptualized realities of these two economists of the mercantilist⁷ period have been presented in Chapters II and III.

I would like to offer other reasons for studying the macroeconomic writings of these two contemporaneous seventeenth-century scholars. An overriding reason is that a perusal of their writings indicates that these two scholars invented fairly sophisticated macroeconomic analyses and then, formulated policy recommendations based on their analyses. Sir William Petty was chosen as one subject for this research because in the literature, even though his macroeconomics is referred to sporadically, he is largely treated as an anticipator of Adam Smith. For example, M. Beer makes the following observation: "He [Petty] is the pioneer of the English economics of production he must be regarded as the initiator of English classical economics: he laid the foundations on which his successors - Smith and Ricardo - could erect their structure"

⁷Mercantilism was a type of European economic thought that was dominant in the period from roughly 1500-1776. It is often simplistically referred to as a coherent body of thought with the primary objective being the accumulation of bullion (which the mercantilists supposedly conceived of as wealth) through a favorable balance of trade. William D. Grampp (1952) disputes this analysis and states that full employment and not bullion was the ultimate goal of mercantilism. In any case, mercantilism does not lend itself to a simple or coherent definition. The proper perspective is provided by Henri Chambre who is quoted by Fernand Braudel to the effect that "there are as many mercantilisms as there are mercantilists" (Braudel, 1982, p. 542; emphasis added). This perspective is consistent with Johnson's observation above. See Eli F. Heckscher (1955) and Lars Mangusson (1994) for in-depth analyses of Mercantilist thought. The first volume of Heckscher's work deals largely with Mercantilist policies. The second volume is concerned primarily with the economic theories underlying Mercantilist policies.

(Beer, 1938, pp. 167-168).

More recently, Frank Amati and Tony Aspromorgous echo this opinion: "Sir William Petty is important in his own right as the father of political economy and more specifically, as the founder of classical political economy, that school which had its culmination in the Ricardian economic theory" (Amati and Aspromorgous, 1985, p. 127). Petty's conceptions in the area of macroeconomics are highly original and need to be treated as a whole to be fully appreciated. Moreover, some of his ideas reappear more fully developed nearly two centuries later in The General Theory of Employment, Interest and Money (Keynes, [1936] 1964).

A second reason for studying the scholarship of Sir William Petty is that he applied the then novel inductive approach of Sir Francis Bacon when he, Petty, studied economic phenomena.⁸ Petty described his Baconian approach as follows:

The method I take to do this is not very usual; for instead of using only comparative and superlative Words, and intellectual Arguments. I have taken the course . . . to express my self in Terms of Numbers, Weight, or Measure, to use only Arguments of Sense, and to consider only such Causes, as have visible Foundations in Nature; leaving those that depend on mutable minds, Opinions, Appetites and Passion of particular Men to the Considerations of others (Petty, 1690, p. 244).

Bacon felt that this method was just as appropriate for the human sciences as it was for

⁸Sir Francis Bacon (1561-1626) desired to erect a philosophical framework which would enable man to understand the underlying laws of nature. The purpose of this knowledge would then be to better mankind's condition. Sir Francis was highly critical of the metaphysical approach employed by most of the Greek philosophers, especially Aristotle. For example, Bacon strongly disparaged the use of the syllogism. This abstract, deductive approach was also the method employed by the medieval scholastics and was still, at the time of Bacon's writings, the preferred method of science. Bacon believed, however, that a systematic and thorough arrangement of empirical information was the method which would best reveal underlying natural laws.

the natural sciences and Petty agreed.⁹ Thus, Sir Francis provided much of the philosophical and methodological inputs for Petty when he constructed his conceptualized reality.

Nicholas Barbon, although not as well known as Petty, is considered because his ideas appear to be very similar to Petty's. Hence, he also is an anticipator of Keynes. There is, therefore, a high degree of probability that the writings of Petty and Barbon constitute multiples. To repeat what was said above, this is a matter that will be explored in a later chapter.

An example of Nicholas Barbon's anticipation of Keynes is provided by Schumpeter when he notes the following about Barbon's theory of the rate of interest: ". . . we have been sketching a most interesting line of doctrinal development [a theory of the rate of interest], which starts with Barbon and runs a course that . . . ends with Keynes" (Schumpeter, 1954, p. 1119). Consequently, there appears to be a possible lineage of thought, at least in some analytical areas, that may have its genesis with Barbon or Petty and comes to full fruition in the writings of Keynes. This leads to a high probability that the macroeconomic writings of Barbon, when compared with Petty's compositions, will reveal the existence of multiples.

A second reason for studying the macroeconomics of Nicholas Barbon is that the literature dealing with this economist is sparse and sometimes erroneous. In fact, studies of his macroeconomics are conspicuous by their almost total absence. The fullest

⁹In the preface to The Political Anatomy of Ireland (Petty [1691b] 1899, p. 129), Petty acknowledged this intellectual debt with a reference to Bacon's Advancement of Learning (Bacon [1605] 1952).

treatment of Barbon's thought is contained in The Origins of Scientific Economics: English Economic Thought 1660-1776 by William Letwin (Letwin, 1963). His discussion of Barbon's work is limited to one chapter, however. There is, therefore, a need for a more thorough interpretation of Barbon as a macroeconomist.

The strategy to be employed in achieving the objectives of this study may be summarized as follows. In Part II of the dissertation, Chapters II through IV, the conceptualized realities of both Sir William Petty and Nicholas Barbon will be developed and compared in the following manner. In Chapter II, a brief biography of Petty will be provided as a prelude to exploring his conceptualized reality. Before examining his ideologically tinted view of the world, the possible motivation for his embarking on the task of economic analysis, as well as the sources of his conception of the real world will be explored. Finally, with this as the underlying basis, an interpretation of his conceptualized reality as to the interaction of economic actors, economic processes and institutions will be provided.

In Chapter III, the same process will be followed in presenting the conceptualized reality of Nicholas Barbon. Then, having fully explored the conceptualized realities of both Petty and Barbon, the question of whether they conceptualized existential factors in similar terms, will be addressed. If it can be shown that there is a high degree of similarity between the conceptualized realities of these two late seventeenth-century English economists, then sufficient conditions will have been established for the substantiation of my new version of the inevitability theorem.

Before such a substantiation can be undertaken, however, it is necessary that the

macroeconomics of both Sir William Petty and Nicholas Barbon be thoroughly analyzed. Those analyses will be presented in Part III of the dissertation, Chapters V and VI. In Chapter V, with Petty's conceptualized reality serving as a backdrop, his macroeconomics will be examined. First, the monetary economics of this scholar will be presented. Secondly, Sir William's synthesized system of macroeconomic principles will be interpreted. Finally, the policy prescriptions of this economist will be offered. The major sources to be used in the interpretation of Sir William Petty's work are reprints of his original pamphlets in The Economic Writings of Sir William Petty (Hull, 1899, 2 volumes), The Petty Papers (1927, 2 volumes) and The Petty-Southwell Correspondence 1676-1687 (1928).

Then, in Chapter VI, the synthesized macroeconomic principles and accompanying policy recommendations of Barbon will be presented and analyzed in a manner similar to that which was employed in the presentation of Petty's ideas on the same subject. Barbon's major economic tracts are interpreted here and include A Discourse of Trade (1690), and A Discourse Concerning Coining the New Money Lighter in Answer to Mr. Lock's Consideration about Raising the Value of Money (1696). When appropriate, references will also be made to Barbon's minor works. These particular publications are more normative in nature and probably are the reason that Barbon is dismissed by some historians as a "projector." The works include A Letter To A Gentleman In The Country, Giving An Account of the Two Insurance Offices; The Fire Office and Friendly Society (1684a), An Answer to a Letter to a Gentleman in the Country Giving An Account of the Two Insurance Offices, the Fire

Office and Friendly Society (1684b), and An Apology for the Builder, or, a Discourse Shewing the Cause and Effects of the Increase in Building (1685).

In the final Part of the dissertation, Chapters VII and VIII, I will offer my observations as to whether the macroeconomic writings of Sir William Petty and Nicholas Barbon do indeed offer some empirical evidence for the more evolved inevitability theorem that has been advanced here by combining the proposition of Merton *et. al.* with the Jensenian theory of conceptualized reality. In Chapter VII, my new version of the inevitability theorem will be examined by determining whether the individual macroeconomic theories independently discovered by these two economists represent multiples. Then, in Chapter VIII, the new theory will be critiqued by comparing the overall macroeconomic structures of Petty and Barbon. Let us begin our journey with a look at the conceptualized reality of Sir William Petty.

PART II
CONCEPTUALIZED REALITIES

CHAPTER II

SIR WILLIAM PETTY'S REALITY

In order to formulate the conceptualized reality of Sir William Petty, or any economist for that matter, it is incumbent that a short biography be provided. The exercise of presenting such a sketch of the scholar's life should bring out some of the major events of his life that had influence on the way in which he viewed socioeconomic phenomena and thereby help to illuminate the sources of his subjectively conceived conceptualized reality.

The Life of Sir William Petty

Sir William Petty (1623-1687) was born in Romsey, England; a small port town in Hampshire.¹⁰ His father was a clothier by trade which, perhaps, explains why John Aubrey, a contemporary of Petty, describes Petty's greatest childhood delight as " . . . to be looking on the artificers, e.g. smiths, the watchmaker, carpenters, joiners, etc: and at twelve years old could have worked at any of these trades" (Aubrey, 1983, p. 242).¹¹ As a teenager, William set out to sea as a cabin boy on a merchant ship. It was during this service that he had the misfortune of breaking his leg and, subsequently, being set

¹⁰The first extensive biography of Petty was written by one of his descendants, Lord Edmund Fitzmaurice (Fitzmaurice, 1895). A more recent treatment of Petty's life is provided by E. Strauss in his monograph simply entitled Sir William Petty (Strauss, 1954).

¹¹Aubrey wrote a series of brief biographies on some of his contemporaries. He was well-acquainted with Sir William Petty and even referred to him as "my especial friend" (Aubrey, 1983, p. 241).

ashore at Caen on the French Coast.¹² This twist of fate left the young Petty to shift for himself and he recounted his misfortune in Latin so well that the Jesuit fathers of Caen not only cared for him but admitted him as a pupil to their college (Hull, 1899, vol. 1, p. xiv).

When he returned to England in 1640, he spent some months with the Royal Navy. Subsequently, "'when the civil war betwixt the King and Parliament grew hot,' he joined the army of English refugees in the Netherlands and 'vigorously followed his studies, especially that of medicine,' at Utrecht, Leyden, and Amsterdam" (Hull, 1899, vol. 1, p. xiv; emphasis added). By November of 1645, Petty had made his way to Paris. Subsequently, he became acquainted with Thomas Hobbes:¹³ Just as Hobbes had been employed as an amateur secretary by Francis Bacon, he (Hobbes) employed Petty as a guide in his study of anatomy (Strauss, 1954, p. 28). "Throughout his life Petty remained a sincere admirer of Hobbes's genius" and a "great friend" (Strauss, 1954, p. 29; Aubrey, 1983, p. 160). The influence of Hobbes on Petty was substantial, as we shall later see. In 1646, Petty returned to Romsey where he took up for a brief period the clothier business of his father. The following year Petty went to Oxford where he became successively Doctor of Physics, a member of the Royal College of Physicians, Fellow and Vice-Principal of Brasenose College, and finally, Professor of

¹²Aubrey recounts that in a conversation Petty informed him that at about twelve or thirteen "the most remarkable accident of life (which he did not tell me) [happened to him], and which was the foundation of all the rest of his greatness and acquiring riches" (Aubrey, 1983, p. 242). This was most probably the event to which Petty was referring.

¹³Thomas Hobbes (1588-1679) was a noted political theorist and philosopher of science. His most famous work is Leviathan (1651), a monograph in which he strongly advocated absolute rule.

Anatomy in 1651 at the age of twenty-seven (Aspromorgous, 1988, p. 399). During this same period, he was appointed Professor of Music at Gresham College. Petty was a resident of Oxford from 1648 to 1652, when he left (Aubrey, 1983, p. 243). Subsequently, he was appointed physician general to the Cromwellian Army in Ireland and Clerk of the Irish Council. For the next seven years, Petty remained in Ireland performing a myriad of duties.

It was during this period that Petty conducted the Down Survey of Ireland, a work which laid the foundation for his fortune and constituted his earliest title to fame (Hull, 1899, vol. 1, p. xvi).¹⁴ After completion of the Down Survey, Petty was appointed a member of the commission which distributed the so-called "army lands," which he had surveyed, to the appropriate financiers of the invading army, as well as to soldiers and officers. Petty himself obtained a substantial amount of property in Ireland through this process, the largest parcel being in County Kerry. This forfeiture procedure, as mentioned above, was the foundation for Petty's future wealth. However, the windfall was somewhat of a mixed blessing because it required him to constantly travel between England and Ireland in order to resolve the perpetual litigation over the titles to property and taxes.¹⁵

¹⁴The Down Survey was conducted in order that the forfeited lands of the defeated Irish rebels could be distributed among those who provided support for the army's operation. The survey consisted of measuring and recording all forfeited lands so that they could be redistributed.

¹⁵The newly created Irish landowners, such as Petty, felt threatened after the Restoration in 1660. However, a royal letter dated January 2, 1660 secured to Petty all the property that he held as of May 7, 1659 and the Acts of Settlement and Explanation confirmed ownership (Hull, 1899, vol. 1, pp. xxiii-xxiv). Despite the decrees and repeated promises of Charles II, Irish Catholics challenged several of the confiscatory

In 1659, Petty returned to London, where he usually resided for the next seven years. After he arrived, Petty became a participant in the debates of James Harrington's¹⁶ Rota club,¹⁷ which were polemics designed " . . . to test the mechanism of the Venetian ballot and to debate important political issues" (Downs, 1977, p. 129). John Aubrey notes "Sir W. Petty was a Rota man, and troubled Mr. James Harrington with his Arithmetical proportions, reducing Politics to numbers" (Aubrey, 1983, p. 240). He agreed with the proposition that Parliamentary representation should be based on property, which was a fundamental feature of Harrington's scheme of constitutional reforms (Strauss, 1954, p. 94).

Petty's renewed residence in London allowed him to resume relationships with the scholarly group that previously had been collegial members of the Philosophical Society at Oxford and now met periodically at Gresham College. On July 25, 1662, this informal association received a royal sanction as the Royal Society for the Improving of Natural Knowledge, popularly referred to as the Royal Society, of which Sir William

decrees of the Cromwellian period. The Court of Innocents which was instituted by Charles to decide these disputes showed a partiality to Catholic claims. It was this situation which required Petty's constant attention.

¹⁶James Harrington (1611-1677) was a political theorist who advocated a democratic form of government which could best be described as an aristocratic republic. See The Commonwealth of Oceana (Harrington, [1656] 1992) for the utopian model of his proposed system of government. For short biographies of Harrington, see Stephen (Stephen, 1950, pp. 1318-1320) and Aubrey (Aubrey, 1983, pp. 124-127).

¹⁷The short-lived Rota club met from the late fall of 1659 until February 20, 1660 (Downs, 1977, pp. 129-130). At that time, when the Restoration was imminent, political meetings of that type were highly dangerous to the participants. Evidence of this risk was Harrington's own imprisonment in the Tower in 1660.

Petty was a charter member.¹⁸ It was upon the incorporation of the Royal Society that William Petty was knighted. The orientation of this Society was largely positivist in nature, due to the influence of the novel inductive approach that had been pioneered by Sir Francis Bacon a half-century before.

The minutes of the Royal Society indicate that Sir William played an important role in developing its constitution and also was an active participant in its intellectual activities. While having a broad area of interests, Petty's primary intellectual concerns were, not surprisingly, political economy and naval engineering. Political Arithmetic was evidence of the former while his proposal for a double-bottomed ship was evidence of the latter.¹⁹

During this same time period, Petty established a friendship with Samuel Pepys, who in his diary gives us a closer look at what type of individual Sir William was.²⁰ Pepys makes this admiring observation in his dairy entry dated January 27, 1664:

¹⁸For a history of the Royal Society in the seventeenth-century, from its inception as the "invisible college" to its official recognition as the Royal Society for the Improving of Natural Knowledge and its subsequent history, see the first three chapters of The Royal Society 1660-1940 by Sir Henry Lyons (Lyons, 1944).

¹⁹Petty considered Political Arithmetic written in 1676 and published posthumously in 1690 to be his best work in economics. This is not an opinion shared by most historians of thought including this one. Political Arithmetic is a mere exercise in descriptive statistics, while Petty's other works such as his Treatise on Taxes, Verbum Sapienti and Quantulumcunque Concerning Money are more original and thorough in their treatment of economic theory.

²⁰The Diary of Samuel Pepys (Pepys, [1825] 1971) is a famous diary kept by Pepys, whose entries run from January 1, 1660 to May 31, 1669, covering over nine years of the diarist's life. Besides presenting an intimate look at many of his colleagues, it offers a thorough look at what life was like in the seventh decade of the seventeenth-century in England, especially in the circles that he and Petty traveled in.

. . . at noon to the coffee-house, where I sat with . . . Sir William Petty, who in discourse is methinks one of the most rational men that ever [I] heard speak with a tongue, having all his notions the most distinct and clear (Pepys, [1825] 1971, vol. 5, p. 27).

The statement is indicative of the high esteem in which Sir William Petty was held by some of his contemporaries.

During the remaining twenty years of his life, Petty lived alternatively in London and Ireland as his business and other affairs dictated. In Ireland, he established an iron and copper works, as well as a fishing operation on his most significant property, which was located in Kenmare in County Kerry. Petty paid close attention to these enterprises as evidenced by his making the difficult overland journey from Dublin to County Kerry at least twice a year (Hull, 1899, vol. 1, p. xxv).

Throughout this period, Sir William's large holdings of land, especially in County Kerry, required him to deal with the counter-claims raised by the Court of Innocents, as well as questions regarding taxes. In regard to the latter, Petty submitted to the Privy Council a plan for abolishing the whole system of "farming",²¹ and for the introduction of large reforms, including a "heavy ale' license, which he felt would have introduced order and regularity into the collection of the taxes, and would have greatly increased the royal revenue" (Fitzmaurice, 1895, p. 251). He was, for the most part, unsuccessful in this attempt at reform.

²¹The custom was still to "farm out" the collecting of the royal revenues to the highest bidder. The farmers of the Irish Revenue, of whom Sir James Shoen, an avowed enemy of Petty, was the head, were not only a powerful but an unscrupulous body, and created many of the aforementioned financial woes of Petty (Fitzmaurice, 1895, p. 137). In this regard Petty notes "...the people thought to pay, any thing that was required [in taxes], rather than to pass the Fire of this Purgatory, even tho they need no burning" (Petty, 1690, p. 196).

In accordance with his lifelong interest in learning, Sir William continued to attend meetings of the Royal Society, when in London. Also, in 1683, he founded the Dublin Philosophical Society and became its first president. Sir William Petty died on December 16, 1687 at his house on Picadilly Street (Aubrey, 1983, p. 246).

Sir William Petty's life paints the portrait of a man who was deeply involved in the revolutionary socioeconomic milieu in which he found himself, both as a "thinker" and a "doer." This tapestry provides clues as to the motivation behind Petty's development of macroeconomic theories, as well as to the sources of his conceptualized reality and finally, reveals that reality itself.

Petty's Inducement to Theorize

What motivated Sir William Petty to craft his macroeconomic model and its concomitant economic theories? Did he harbor "wish-images" for a better society in the future (Mannheim, 1954, pp. 174, 184, 185)? If so, did Petty's normatively shaded wish-images drive him to undertake his economic theorizing in the hope of providing a paradigm under which such conditions, i.e., those that he hoped for, might exist? In other words, was he a social scientist in the sense of the great innovators in economics, such as Adam Smith, Alfred Marshall and John Maynard Keynes? Perhaps, on the other hand, he was motivated by the purely intellectual curiosity that was an inextricable part of Petty's entire life.

The motivational impetus for Petty's economic theorizing appears to spring from

a combination of the aforementioned sources. First, Sir William's economic writings indicate that he did indeed harbor a Mannheimian wish-image which consisted of a vision for a better society in the future. He explicitly professes this desire with the following:

Troth, I meane by Politiques not a quarter of all this, but ye way how to keep a people in Peace and Plenty, that is able to resist ye petulancy of ambitious conquerors and ye chagrin of discontented persons at home and to hinder ye land from bearing any unusefull herb to make ye best use of all it produces (Petty in Matsukawa, 1977, p. 37; as quoted in [Aspromorgous, 1988], p. 347n).

Similarly, Petty offers his reason for studying the economy of Ireland with the following:

"I believe [that the results of the undertaking] will tend to the Peace and Plenty of my Country; besides which I have no other end" (Petty, 1691b, pp. 129-130; emphasis deleted).

The intellectual debt that Petty owed to Sir Francis Bacon, as mentioned above, was duly noted by Sir William in his preface to Political Arithmetic: "I have taken the course...to express myself in Terms of Number, Weight, or Measure, to use only Arguments of Sense, and to consider only such causes, as have visible Foundations in Nature;..."(Petty, 1690, p. 244).²² However, the importance of this new method in inspiring Petty's intellectual curiosity was noted much earlier in his professional life in

²²According to Maurice Cornforth, "Bacon's new doctrine asserted: (1) That science is the highway to knowledge. (2) That scientific knowledge is based on observation. On the basis of observation, scientific theories are worked out, which must be tested by fresh observations, which in turn suggest further theoretical development -- and so on. (3) That knowledge is objectively true, and no other means of obtaining objective truth exists. (4) Bacon contrasted the method of science, not only to the unscientific amassing of 'undigested' facts, but to the method of 'dogmatism.' By this he meant the propounding of theories a-priori, that is, not based on observation, not tested by observation, but derived from principles which are supposed to be given in some way without reference to experience" (Cornforth, 1947, p. 23).

correspondence he had with Samuel Hartlib,²³ who was also an enthusiast of the new Baconian approach. In his introduction to The Advice for Advancement of some particular Parts of Learning, Petty offers the following:

To give an exact definition or nice division of learning, or of the advancement thereof, we shall undertake (it being already so accurately done by the great Lord Verulam [Bacon]) intending only to show . . . to point at some pieces of knowledge, the improvement whereof . . . would make much to the general good and comfort of all mankind, and withall to deliver our own opinion by what means they [mankind] may be raised some one degree neerer to perfection (Petty, 1648, p.1).

In the following conclusion to the same tract, Petty writes:

The next book which we recommend is the history of nature free, for indeed the history of trades is also an history of nature, but of nature vexed and disturbed. What we mean by this history, may be known by the Lord Verulam's most excellent specimen thereof, and as for the particulars it should treat on, we refer to his exact and judicious catalogue of them, at the end of his Advancement of Learning (Petty, 1648, p. 26).^{24 25}

²³Samuel Hartlib (c1600-1662), a fervent disciple of Bacon, immigrated to England from Poland in 1628. Characteristic of second generation Baconians, he was eager to apply and to spread the Baconian Method (Letwin, [1963] 1975, p. 124).

²⁴In The Advancement of Learning, Bacon provides a glimpse of his overall view with the following "History of Nature is three sorts; of nature in course, of nature erring or varying, and of nature altered or wrought; that is, history of creatures, history of marvels, and history of Arts" (Bacon, 1989, vol. 3, p. 330; emphasis added). It is the "history of arts" that Petty is referring to in the quotation.

²⁵It is evident that Sir William was following the urgings of Sir Francis Bacon when he (Bacon) wrote in The Great Instauration, the following: "Next, with regard to the mass and composition of it [natural history]: I mean it to be a history not only of nature free and at large (when she is left to her own course and does her work her own way), -such as that of the heavenly bodies, meteors, earth and sea, minerals, plants, animals, - but much more of nature under constraint and vexed; that is to say, when by art and the hand of man she is forced out of her natural state, and squeezed and moulded. Therefore I set down at length all experiments of the mechanical arts, of the operative part of the liberal arts, of the many crafts which have not yet grown into arts properly so called, so far as I have been able to examine them and as they conduce to the end in view . . . I do in

Petty did not receive his method directly from Sir Francis Bacon, but rather from Bacon through Sir Thomas Hobbes. The importance of the Bacon-Hobbes connection was noted by Karl Marx and Frederick Engels. They put it this way:

The real founder of English Materialism and all modern experimental science was Bacon. For him natural science was the true science and physics based on perception was the most excellent part of natural science.... According to his teaching the senses are infallible and are the source of all knowledge. Science is experimental and consists in applying a rational method to the data provided by the senses (Marx and Engels, [1845] 1956, p. 172).

Marx and Engels pointed out, however, that "Hobbes systematized Bacon" and in so doing, Hobbes cleansed Bacon's work of its theological "inconsistencies" (Marx and Engels, [1845] 1956, pp. 173, 172).²⁶

But Hobbes did more than cleanse Bacon's work of the theological inconsistencies noted by Marx and Engels. Whereas Bacon was only interested in using the information gained from the senses in an inductive fashion, Hobbes balanced his scientific method with a concomitant reliance on deduction. In this regard, he writes: "All ... science, ... is either perception by sense [induction], or the imagination [deduction], or both"

fact (low and vulgar as men may think it) count more this part both for helps and for safeguards than upon the other; seeing that the nature of things betrays itself more readily under the vexations of art than in its natural freedom" (Bacon, 1989, vol. 4, p. 29; emphasis added).

²⁶In Hobbes's own words: "Concerning the thoughts of man, I will consider them first singly, and afterwards in train, or dependence upon one another. Singly, they are every one a representation or appearance, of some quality, or other accident of a body without us, which is commonly called an object. Which object worketh on the eyes, ears, and other parts of a man's body; and by diversity of working, produceth diversity of appearances. The original of them all, is that which we call SENSE, for there is no conception in a man's mind, which hath not at first, totally, or by parts, been begotten upon by the organs of sense. The rest are derived from that original" (Hobbes, 1839, vol. 3, p. 1).

(Hobbes, 1839, vol. 1, p. 66).²⁷

Sir William Petty, while explicitly mentioning his debt to Bacon, was more influenced by Hobbes. As noted in his biography presented above, Petty was employed as a young man by Thomas Hobbes and remained a friend and admirer of his genius throughout his life. The Hobbesian influence on Petty manifested itself in two ways. First, Hobbes transmitted to Petty the cleansed work of Sir Francis Bacon. Secondly, he improved upon Bacon's scientific method by balancing his (Bacon's) highly inductive approach with the inclusion of deduction, which is part of the Hobbesian scientific method.

While noting the influence of Hobbes on Petty, Tony Aspromorgous observed that whereas "Hobbes had devoted himself to determining the theoretical conditions for peace in human society; Petty turned to the conditions required for prosperity." But Aspromorgous opined that "no explanation on the grounds of purely intellectual conviction can be given" for Petty's choice of political economy. The only explanation that Aspromorgous could think of was that an "element of temperament or tastes and historical accident" conditioned Petty's selection of political economy as a vocation

²⁷Later, he re-emphasized the importance of a balanced inductive-deductive approach to science with the following: "Analysis is continual reasoning from the definitions of the terms of a proposition we suppose true, and again from the definitions of the terms of those definitions and so on, till we come to some things known, the composition whereof is the demonstration of the truth or falsity of the first supposition, and this composition or demonstration is what we call Synthesis. Analytica is therefore that art, by which our reason proceeds from something supposed, to principles, that is to prime propositions, or to such as are known by these, till we have so many propositions as are sufficient for the demonstration of the truth or falsity of the thing supposed. Synthetica is the art itself of demonstration. Synthesis, therefore, and analysis, differ in nothing, but in proceeding forwards or backwards; and Logistica comprehends both" (Hobbes, 1839, vol., pp. 309-310).

(Aspromorgous, 1988, p. 347). It may very well be, however, that Petty's wish-images of the good society of the future stimulated him to inquire into the nature and character of those conditions that must prevail if prosperity is to become an actuality.

In summary, the explanation of the reason for Sir William Petty's desire to explore things economic is provided above in the presentation of his inducements to theorize. Specifically, his Mannheimian wish-image for a better society stimulated him to turn his attention to, as Matsukawa puts it, conditions required for human prosperity. Furthermore, an intellectual stimulus was provided by the revolutionary Baconian scientific method, which Hobbes transferred to Petty in an improved form.

Sources of Petty's Conceptualized Reality

As mentioned above, an innovating economist cannot know the socioeconomic actuality of his contemporary society. In its place is substituted a conceptualized reality, a surrogate for the unknowable, actual contemporary society. This image of actuality may be viewed as the output of an intellectual process of conceptualization in which Petty used a variety of inputs. In terms of their sources, however, these inputs may be divided into three main categories: philosophical-theoretical factors, empirical information obtained from the contemporaneous socioeconomic milieu, and historical elements. These factors then provided Petty with a unique pair of intellectual spectacles through which he viewed the world.

The philosophical-theoretical inputs that shaped Sir William Petty's conceptualized

reality came from four main sources; namely, the writings of Sir Francis Bacon, Petty's medical training both in the Lowlands and subsequently, with Hobbes in Paris, his educational experiences under the Jesuits at Caen in France and the political philosophy of Sir Thomas Hobbes. A discussion of these inputs and their respective influence follows.

Petty's overall approach, which tended to be macroeconomic in focus, had as its philosophical and theoretical foundation some Baconian influence, along with his medical training in the Lowlands, as well as his study of anatomy under Hobbes in Paris. This source is fittingly noted by Sir William in his preface to The Political Anatomy of Ireland when he renders the following:

Sir Francis Bacon, in his Advancement of Learning, hath made a judicious Parallel in many particulars, between the Body Natural, and Body Politick, and between the Arts of preserving both in Health and Strength: And it is as reasonable, that as Anatomy is the best foundation of one, so also of the other; and that to practice upon the Politick, without knowing the Symmetry, Fabrick, and Proportion of it, is as casual as the practice of Old-women and Empricks.

Now, because Anatomy is not only necessary in Physicians, but laudable in every Philosophical person whatsoever; I therefore, who profess no politics, have, or my curiosity, at large attempted the first essay of Political Anatomy (Petty, 1691b, p. 129; emphasis deleted).²⁸

Petty had another important philosophical input for his conceptualized reality. He perceived of a socioeconomic order which could only be understood by finding the

²⁸When Petty used the term "art" he meant it in the same sense that Bacon meant "mechanical arts;" i.e. the ability to produce things "artificially" as distinct from things found in nature. It is equivalent in meaning to what is now termed technique or technology. Keynes put it this way: "Everything is produced by labour, aided by what used to be called art and is now called technique" (Keynes [1936] 1964, p. 213). Petty himself put it this way: "And forasmuch as possibly there may be more Art and Hazzard in working about the Silver, then about the Corn . . ." (Petty, 1662, p. 43).

fundamental natural laws which governed society. Natural law had as its foundation the teachings of Aristotle. It was then passed on to the medieval scholastics, who still followed the metaphysical approach in attempting to uncover these laws. Hence, the source of Sir William's belief in natural law may have been the education that he received from the Jesuit fathers in Caen in France.

A more likely source, however, is Thomas Hobbes. Thus, Joseph Schumpeter notes: "Though separated from the scholastics by the religious split and by the change in the political scene, the [seventeenth-century philosophers of natural law] were of the same professional type as the scholastics and they went about the same tasks, by the same method, in much the same spirit -- so much so, in fact, that the best way to characterize them is to call them Protestant (or laical) scholastics" (Schumpeter, 1954, p. 116). Later, he identifies a "few representative seventeenth-century names: Grotius, Hobbes, Locke, Pufendorf" (Schumpeter, 1954, p. 116; emphasis added). Furthermore, while describing the contributions of early social scientists, Schumpeter writes that "some of the philosophers probed into that human nature from which their natural laws were to be derived. Again, Hobbes is the outstanding example" (Schumpeter, 1954, p. 120). Thus, the Hobbesian influence on Petty vis-a-vis natural law appears very tenable.

The final philosophical input came from Thomas Hobbes and regarded an important institution in Petty's reality, the nation-state. In his political philosophy, Hobbes provided a model in DeCive (1642)²⁹ and the more well-known Leviathan (1651) in which a strong central government is proposed, both in terms of its relationship

²⁹Petty, writing shortly before his death, includes DeCive in a short list of books as a publication he wished his sons to read (Fitzmaurice, p. 303, 1895).

with the local governments and its power vis-a-vis the citizenry.

The empirical inputs for Petty's conceptualized reality came from three separate sources. First, his boyhood experience in Romsey provided young William with his greatest childhood delight of observing the various artificers, as has already been noted in his brief biography above. This provided Petty with first-hand knowledge of this important group of people in the newly emerging capitalist system. This class in society and their activities were important parts of his conceptualized reality.

The other important empirical sources for Petty's conceptualized reality came from his adventures in Ireland, especially his undertaking of the Down Survey, and from his experience as a young student in Holland. In undertaking the Down Survey, Petty was able to examine the social and economic conditions of an entire country. The economy about which Petty was gathering information, seventeenth-century Ireland, was primitive when compared with England during that same time period. Petty hoped to be able to better understand the fundamental principles underlying the new capitalist system by examining the more simple market economy of Ireland. Petty had knowledge about another contemporaneous capitalist economy, Holland, which, as mentioned above, he gathered during his stay there as a medical student. This information provided him with data on a more developed market economy; i. e., one with more evolved commercial and financial institutions. It was an economy that he thought was well worth emulating.³⁰

³⁰The important role of Holland as an ideal to be followed, and as a source of stimulation to English economists of the middle and late seventeenth-century, is thoroughly described by Joyce Appleby in Economic Thought and Ideology in Seventeenth-Century England (Appleby, 1978, chapter 4).

Other important contemporary sources of information for Petty were the various documents on vital statistics that provided data on the population and wealth of Ireland, England and London. These records were the various bills of mortality. It was these instruments which were of utmost importance to Sir William in providing data for his various estimates of wealth. For example, in Chapter I of Verbum Sapienti, he uses the London Bills of mortality to help estimate the wealth of London and through extrapolation the entire Kingdom of England (Petty, 1691a, pp. 105-108).

Writings that incorporate these official papers as their empirical foundation include Natural and Political Observations upon the Bills of Mortality (Graunt, 1676),³¹ Observations upon the Dublin-Bills of Mortality, 1681, and the State of that City (Petty, 1686), Housing, Hospitals, etc. of London and Paris (Petty, 1687a), Observations upon the Cities of London and Rome (Petty, 1687b), and Five Essays in Political Arithmetic (Petty, 1687c). These contemporary documents on vital statistics that Petty drew from provided important elements for his conceptualized reality.

The historical input for Sir William Petty's conceptualized reality was the

³¹The authorship of this particular tract has been disputed. Hull, on the evidence available, concludes that Graunt indeed was the author of the pamphlet (Hull, 1899, pp. xxxix-liv). In chapter XXVII of The Petty Papers (Petty, 1927, vol. 2, pp. 323-283) and in the introduction to The Petty-Southwell Correspondence, 1676-1687 (Petty, 1928, vol. 1, pp. xi-xxxii), the Marquis of Landsdowne makes a counter argument. It appears to this writer that Graunt was indeed the author with some possible assistance from Petty. Sir William never disputed the authorship during his lifetime. In fact, Graunt was admitted as an original member of the Royal Society on the basis of this manuscript. Petty, who was also an original member of the Society, apparently agreed with the organization's decision.

Doomsday Book.³² For example, he used this historical document to estimate, by some rather rough extrapolation, the doubling time of the population of England to be 360 years (Petty, 1683a, pp. 463-464). Now, having examined the philosophical-theoretical, empirical and historical sources that provided the structure for Petty's conceptualized reality, it is now appropriate to present that reality.

Petty's Conceptualized Reality

As mentioned above, Sir William Petty's conceptualized reality was the result of philosophical-theoretical inputs, empirical inputs and historical inputs. This reality will be viewed by first examining the central economic dilemma in Petty's macroeconomic world. Then, the economic processes, the economic actors and the institutional setting in which they performed will be presented.

The central economic dilemma in Petty's world, which he derived principally from the empirical inputs, is the existence of involuntary unemployment. For example, in manuscript 58 of The Petty Papers, Sir William explains how his statistical method could be used to estimate the gap between actual employment and full-employment and thereby, provide a basis for increasing the level of employment. Thus, he writes that

³²William the Conqueror, in an attempt to ascertain the population and wealth of his kingdom and consequently, its taxing potential, ordered this survey of England. The survey is in two volumes; Great Doomsday covering most of England (north and northwest excluded), and Little Doomsday covering Essex, Suffolk and Norfolk. This is the only source that reflects the British society of that time, even if it is somewhat limited, in that it restricted itself to arrangements that were relevant financially to the King and Great Lords.

"[b]y knowing the number of working hands between 10 & 70, and the number of those already employed in trade & faculties of gaine, It may bee knowne how many spare hands there are, & consequently what new trades may be introduced without destroying what [trades there] are already" (Petty, 1927 vol. 1, p. 194).

Also, in Chapter II of A Treatise of Taxes and Contributions, he expresses his concern about the 100 involuntarily unemployed workers out of 1000. In this regard, Sir William writes: "... since there is food enough for this supernumerary 100 [involuntarily unemployed],... how should they come by it" Petty, 1662, p. 30)?

He first notes that they may starve, beg or steal; the penalty for the latter being hanging or exile. He opposes these remedies and gives his reasons with the following:

I think 'tis plain, they ought neither to be starved, nor hanged, nor given away; ... [nor allowed to beg because] if they beg, they may pine for hunger to day, and be gorged and glutted to morrow, ... which will for ever after Indispose them to labour, even upon the greatest occasion which may suddenly and unexpectedly happen. ... [moreover] it will be certainly the safer way to afford them the superfluity [unsold inventories] which would otherwise be lost and wasted (Petty, 1662, pp. 30-31).

Thus, Petty was concerned about involuntary unemployment for two reasons. First, it robbed the laborers of their faculty for work. In Sir William's world, "...Labour is the Father and active principle of Wealth ..." (Petty, 1662, p. 68). Secondly, involuntary unemployment resulted in the loss of output in the short run.

In Petty's view, the third problem associated with unemployment was the the welfare of the workers themselves. For by preserving the workers' faculty for laboring, not only was their productivity maintained over the long haul, but the output available to these same workers increased. In this regard, as mentioned above, he wrote at least

one economic tract which he believed would "tend to the Peace and Plenty of my Country; besides which I have no other end" (Petty, 1691b, p. 130; emphasis deleted). Hence, Petty did perhaps harbor a do-gooder streak in his ideology.

Not surprisingly, Sir William Petty cast the conceptualization of economic processes in medical terms. In this regard, he wrote in the preface to The Political Anatomy of Ireland:

Futhermore, as Students in Medicine, practice their inquiries upon cheap and common Animals, and such whose actions they are best acquainted with, and where there is the least confusion and perplexure of Parts; I have chosen Ireland as such a Political Animal, who is scarce Twenty years old, where the Intrigue of State is not very complicate[d], and with which I have been conversant from an Embrion; and in which, if I have done amiss, the fault may be easily mended by another.

'Tis true that curious Dissections cannot be made without [a] variety of proper Instruments; whereas I have had only a common Knife and a Clout, instead of the many more helps which a work requires. yet not knowing, that even what I have readily done, was much considered, or indeed thought useful by others, I have ventur'd to begin a new Work, which when Corrected and Enlarged by better Hands and Helps ... (Petty, 1691b, pp. 129-130; emphasis deleted).

From the above, it is apparent that Sir William hoped that the empirical information gathered from the Down Survey would allow him to formulate macroeconomic theories concerning the newly evolving capitalist economies.

The central process in Sir William Petty's macroeconomic world is trade. His emphasis on trade springs largely from his empirical and historical inputs. He defines trade thusly in An Explication of Trade and Its Increase: "Trade is the making [production], gathering [buying by wholesalers], dispensing [retailing] and exchanging of commodities [in markets]" (Petty, 1927, vol. 1, p. 210). Thus, Petty viewed trade as a continuous economic process from the point of production to the stage of sale to

final purchasers, with all of the activities taking place in markets.

Petty makes his most explicit reference as to the importance of trading activity in ultimately determining the level of national output with the following passage from The Political Anatomy of Ireland:

Though Trade, properly speaking, be the Commutation of Commodities, that generally speaking, 'tis the way whereby to Purchase Riches and Power, the Parents of Pleasure: Not only by getting Commodities out of the Earth and Sea; by ploughing, fishing, Mines, Vecture, etc. [but] by getting away those Commodities from them [the non-trading artificers and laborers], who first got them out of the Earth and Sea, as aforesaid (Petty, 1691b, p. 194).

The significance of trading to the economy in Petty's conception of the world is evidenced here and throughout his writings. For example, a whole chapter is devoted exclusively to trade in The Petty Papers (Petty, 1927, vol. 1, pp. 208-242).

Petty developed his view of economic role-playing on the basis of his empirical and historical inputs. However, the behavior of the economic actors was derived from Thomas Hobbes and other natural law philosophers. Before presenting the respective roles of the actors, I would like to discuss what motivated their behavior in Petty's reality. Edmund Burke in a letter to Adam Smith refers to "those natural movements of the mind which every Science relating to our Nature ought to begin" (Burke, 1987, p. 46). It was this concept, the idea that there were underlying natural laws that governed human behavior, that Petty meant by the natural laws in human society. More specifically, Petty offers the following: "But of the vanity and fruitlessness of making Civil Positive Laws against the Laws of Nature, I have spoken elsewhere, and instanced in several particulars" (Petty, 1662, p. 48). Thus, Sir William

viewed it as important that civil laws be passed that reflected natural law. Such laws, e.g. those guaranteeing the right to property or protecting citizens from people who stole or broke contracts, would make it possible for human natural propensity to play its part.

The importance of Petty's belief in natural law is evidenced by his referral to it in several other instances in his writings (Petty, 1662, p. 9; 1690, p. 243; 1695, p. 445; 1926, vol. 1, pp. 20, 144, 220, 245, vol. 2, p. 269). In an attempt to discover these laws of nature, he then wished to use the aforementioned Baconian approach, as altered and received from Hobbes. The actors and their roles will now be discussed.

The economic actors in Sir William's macroeconomic world are "merchants" (international merchants, domestic retailers, and manufacturing enterprisers), "artisans" (skilled workers), "laborers" (unskilled workers), the peerage and gentry (upper and lower nobility), and foreign consumers of domestic output. The merchant is the central actor in Petty's mercantile economy, for it is he who is engaged in the central process of trade. Moreover, he distinguished between three types of merchants.

The first two groups are involved in the gathering and dispensing aspects of trade, and Petty dichotomizes them on the basis of whether they are engaged in international or domestic trade. Sir William describes the role of the merchant involved in international trade as "manag[ing] the Exchange of our superflous Commodities [unsold inventories] with the same of other countries ... [while] Retailers are needed to make the subdistribution into every Village of this Nation, and to receive back their superfluities [unsold inventories]" (Petty, 1662, p. 28).

The third type of merchant is the shop-owning enterpriser in manufacturing. He

is the employer of both the artisans and the unskilled workers. It is then the gathering and dispensing activities of the merchants (traders of domestic and foreign wares) that help to determine the aggregate demand for domestically produced goods, by being intermediaries between the producers (manufacturing enterprisers) and final demanders.

The five purchasing groups of domestic output were then the merchants, specifically, their inventories of unsold merchandise, artisans and laborers themselves, as well as the peerage and gentry, and foreign consumers. Therefore, it was the activities of the merchants as traders that helped to influence what the non-trading manufacturing enterprisers could sell and ultimately, the number of laborers that they could employ. By trading superfluous commodities, both domestically and internationally, the merchants were better able than consumers left to their own devices to facilitate, and thereby increase, the aggregate demand for domestic output. Thus, the trading merchant is to Sir William's world what the "undertaker" is to the Smithian world and the "entrepreneur" is to the Keynesian world.

The artisans contribute to the country's output by engaging in various and sundry manufacturing processes.³³ Furthermore, their contribution is enhanced by division of labor. Petty notes this when he renders the following:

But the gain which is made by Manufacturers, will be greater, . . . [if] each Manufacture will be provided into as many parts as possible, whereby the Work of each Artisan will be simple and easie; As for example. In the making of a Watch, If one man shall make the Wheels, another the Spring, another shall Engrave the Dial-plate, and another shall make the cases, . . . (Petty, 1682, p. 473).

³³In manuscript 25 of The Petty Papers, while proposing statistics for a registry, Sir William provides a list of thirty-eight types of artisans. Included in this list are fishermen and mariners (Petty, 1927, vol. 1, pp. 94-95).

Moreover, in his conceptualized reality, Sir William Petty had a concept of technology, which he termed "art," and whose accumulation was important in determining the future wealth of the country. Thus, he notes:

. . . one Man by Art may do as much work, as many without it; viz. one Man with a Mill can grind as much Corn, as twenty can pound in a Mortar; one Printer can make as many Copies, as an Hundred Man can write by hand; one Horse can carry upon Wheels, as much as Five upon their Backs; and in a Boat, or upon Ice as Twenty: So that I say again, this first point of this general Position, needs little or no proof (Petty, 1690, pp. 249-250; emphasis added).

Similarly, he writes:

if by ... Simple Labour I could dig and prepare for Seed a Hundred Acres in a thousand days; suppose then, I spend a hundred days in studying a more compendious way, and in contriving Tools for the same purpose; but in all hundred days dig nothing, but in the remaining nine hundred days I dig two hundred Acres of Ground, then I say, that the said Art which cost but one hundred days Invention is worth one Man's labour for ever; because the new Art, and one man, perform'd as much as two men could have done without it (Petty, 1691b, p. 182).

The final actors in Petty's macroeconomic drama are the laborers or unskilled workers, a group which includes day laborers and propertyless farm hands. Thus, Sir William writes: "Labourers are such as have no trade, whereunto common Husbandmen may be added" (Petty, 1927, vol. 1, p. 183). There were capitalist landlords, from among the peerage and gentry who hired the common husbandmen, as well as propertied farmers who worked their own land and were called yeomen. It is evident that Petty differentiates the artisan from the laborer on the basis that the former has a skill or trade and the latter does not. For laborers to contribute to the national output, they first, had obviously to be employed and secondly, as mentioned above, had to be disciplined in order to be productive.

Labor, whether it be from the artisan or the unskilled worker, was the source of all value in Petty's reality. His clearest statement concerning this labor theory of value occurs in A Treatise of Taxes and Contributions, where he states: "If a man can bring to London an ounce of Silver out of the Earth in Peru, in the same time that he can produce a bushel of Corn, then one is the natural price of the other; [however, if] a man can get two ounces of Silver as formerly he did one, then corn will be as cheap at ten shillings the bushel, as it was before at five shillings *ceteris paribus*" (Petty, 1662, pp. 50-51).

The economic actors did not act in an institutional vacuum. The five primary institutions in Petty's conceptualized reality are the industries, households, the state, institutions of financial intermediation and money. In Petty's conceptualized reality, there were three distinct industries, merchandizing, manufacturing and agriculture, which he dichotomized on the basis of productivity. In this regard, he writes: "There is much more to be gained by Manufacture than Husbandry, and by Merchandize than Manufacture" (Petty, 1690, p. 256). In a similar fashion, he notes that "[a] seaman is in effect equivalent to three Husbandmen" (Petty, 1690, p. 259). Thus, Petty regarded the commercial sector of the economy more valuable than the manufacturing sector, and the manufacturing sector more important than agriculture.

Households are an important institution in Sir William's world because they are necessary to shelter and provide a place to work for people, whom Petty regarded as a

productive resource.³⁴ In this respect, he offers the following: "Fewness of People, is real poverty, and a Nation wherein [there] are Eight Millions of people, are more than twice as rich as the same scope of Land wherein [there] are but Four ..." (Petty, 1662, p. 34). In this same vein, he notes that " ... [it is] a mistake, [to think] that the greatness and glory of a Prince lyeth rather in the extent of his Territory, then in the number, art, and industry of his people, well united and well governed" (Petty, 1662, p. 22; emphasis added). Households performed a dual function in that they not only supplied the factors of production, but also were the demanders of final goods and services.

The third primary institution in Petty's macroeconomic drama is the government; more specifically, the central government, which he considered prominent in a truly Hobbesian manner. As mentioned above, Sir William Petty conceived of a political economy that was governed by natural laws. However, there is a role for government in his conceptualized reality. The government's role should be simply to promulgate positive laws that reflect the underlying natural laws. Petty expresses that belief with the following:

Lastly, this great Person takes the great Settlement in hand, when Ireland is as a white paper, when there sits a Parliament most affectionate to his Person, and capable of his Counsel, under a King curious as well as careful of Reformation; and when there is opportunity, to pass into Positive Laws whatsoever is right reason and the Law of Nature (Petty, 1662, p. 9).

³⁴Joyce Appleby in chapter VI of Economic Thought and Ideology in Seventeenth Century England (Appleby, 1978, pp. 129-157) notes that many seventeenth-century English economists shared this notion. She includes Petty and Barbon among this group.

In manuscript 65 of The Petty Papers, Sir William confirms this influence with the following passage: "The Words Sovereignty & Empire doe signify even as Large a Power as Mr. Hob[be]s attributes to his Leviathan; That is to say, a Power & Right of doing all things that are naturally possible"(Petty, 1927, vol. 1, p. 219). As we shall later see, what Hobbes laid down in theory, Petty, through some of his economic writings, tried to put in practice (Fitzmaurice, 1895, p. 188).

Financial establishments were also an intricate part of Petty's world. These financial intermediaries, which at the time were in their infancy, were necessary to facilitate interaction between borrowers (merchants) and lenders (peerage and gentry) for the purpose of furnishing credit for goods in transit.

This leads us to the central institution in Petty's conceptualized reality, money. Not surprisingly, he employs a medical metaphor to describe its importance to the economy:

For Money is but the Fat of the Body-politick, whereof too much doth as often hinder its Agility, as too little makes it sick. 'Tis true, that Fat lubricates the motion of the Muscles, feeds in want of Victuals, fills up uneven Cavities, and beautifies the Body, so doth Money in the State quicken its Action, feeds from aboard in the time of Dearth at Home; even accounts by reason of its disability, and beautifies the whole, altho more especially the particular persons that have it in plenty (Petty, 1691a, p. 113).

Having described the actors, economic processes and institutions of Sir William Petty's conceptualized reality, it is now appropriate that we analyze Nicholas Barbon's conceptualized reality in a similar manner.

CHAPTER III

NICHOLAS BARBON'S REALITY

In the following section of this Chapter, a sketch of Nicholas Barbon's life will be provided as background for a discussion of his incentive to theorize and of the sources and nature of his conceptualized reality.

The Life of Nicholas Barbon

Barbon (1640-1698)³⁵ was born in London, the son of a leather merchant, Praisegod Barbon, who was also an avid anabaptist preacher³⁶ as well as a politician of some note.³⁷ ³⁸Nicholas Barbon was, therefore, brought up in a family that was part of the newly emerging merchant class. Hence, it is not unreasonable to assume that he had a first-hand knowledge of the life, aspirations and activities of the members of this

³⁵The year of Nicholas Barbon's birth is uncertain. Some writers give it as 1637 and others as 1640.

³⁶See the microfilm series of Early English Books, 1641-1700 for reprints of several of Barbon's pamphlets written on religious topics.

³⁷The Barebones Parliament which met from July through December of 1653 was named for Praisegod Barbon. Christopher Hill comments on the origination of the term thusly: "It came to be known as the Barebone Parliament, a social sneer directed against Praisegod Barbon, one of its members, who was a leather-seller"(Hill, [1961] 1980, p. 97).

³⁸During the interregnum, Praisegod Barbon did all in his power to prevent the Restoration of Charles II. As a result of his political stance, he was jailed in the Tower after the Restoration from November 26, 1661 until July 27, 1662 when his wife successfully petitioned for his release (Grosart, 1950 [1922], p. 1073). Little is known concerning the activities of Praisegod Barbon from the time of his release until his death in 1679.

class.

As a young man, Barbon studied medicine at Leyden and Utrecht, as did Petty, and he graduated with an M.D. from Utrecht in October of 1661 (Harrison, 1950 [1922], p. 1070). In 1664, he was admitted as an Honorary Fellow to the College of Physicians in London. It seems that he did not practice medicine for long, however. Instead, he became active in other professional activities. More precisely, he became the prominent London builder of his time. He was already engaged in the profession when the "great fire" occurred in London in 1666. This well-documented catastrophe provided an obvious impetus to his, then, fledgling business. Another fire in 1678 gave Barbon the opportunity to obtain another commission to rebuild the Middle Temple section of London following that disaster.³⁹

Barbon was engaged in other entrepreneurial activities in London. For example, he established the first English fire insurance company in 1681. But his involvement in

³⁹It was during this commission that Barbon met Roger North, who provides the closest look at Nicholas Barbon in his (North's) autobiography. For example, North renders the following on Barbon as a builder: "There was one Nicholas Barbon ... bred a doctor of physic, but that failing he fell into that of building, and the fire of London gave him means of doing and knowing much of that kind. His talent lay more in economizing ground for advantage and the little contrivances of a family than the more noble aims of architecture, and all his aim was at profit. But he had like to have lost his trade by slight building in Mining Lane, where all the vaults for want of strength fell in, and houses came down most scandalously" (North, 1887, p. 53). Later, in the same vein, North notes: "He never failed to satisfy everyone in treaty and discourse, and if he had performed as well he [would have] been a truly great man. His fault was that he knowingly overtraded his stock, and that he would not go through with undertakings without great disappointments to the concerned, especially in point of time. This disposed him to great and clamorous debts, and consequently, to arrests and suits, wherein he would fence with much dexterity, with dilatories and injunctions" (North, 1887, p. 54). In modern parlance, Barbon certainly "talked the talk," but in North's opinion, could not or more probably would not "walk the walk." In essence, Roger North paints the picture of a somewhat disingenuous businessman.

the fledgling banking industry of his time was of greater importance from the point of view of the development of his thinking on matters economic. Barbon entered the world of finance in 1695 when he and John Asgill founded a land bank. Their bank was different from the existing land banks, however, in that it resembled a present-day savings and loan institution.⁴⁰ Thus Asgill and Barbon announced that they would grant loans secured by mortgages at 3 1/2 percent interest and that they would pay 2 percent interest on deposits (Horsefield, 1960, p. 198).

The Barbon-Asgill land bank met with some success originally, but dissolved shortly after Barbon's death. In 1695, consistent with his interest in banking, Barbon published a pamphlet entitled An Account of the Land Bank, showing the design and manner of the settlement, and prepared a prospectus for a "national land bank," an idea which was stillborn (Vickers, 1987, p. 189).

During his life, Barbon was also heavily involved in the political arena, a volatile theater of endeavor, as evidenced by the political turmoil that eventually led to the "glorious revolution" of 1688. Most noteworthy, Barbon was elected a member of Parliament in 1690 and again in 1691, a position that his father had previously held. In his entry of April 5, 1698, Narcissus Luttrell notes Barbon's passing with the following: "Dr. Barebone, a member of parliament, and the famous builder, is dead" (Luttrell, 1857, vol. 4, p. 364).

Nicholas Barbon's life paints the portrait of a man who was deeply involved in

⁴⁰Land banks were institutions whose assets consisted mainly of titles to land. Notes, which were intended to circulate as currency, were then issued on the basis of these titles. For a description of a typical land-bank scheme, namely that of Hugh Chamberlen and John Briscoe, see J. Keith Horsefield (1960, pp. 156-195).

the socioeconomic milieu in which he found himself. This involvement, along with the reasons he reveals in his writings, as we shall presently examine, provides some clues as to his inducement to theorize about macroeconomic issues, as well as to the sources and nature of his conceptualized reality.

Barbon's Inducement to Theorize

Was Nicholas Barbon motivated to craft his macroeconomic theories by the aforementioned Mannheimian wish-image of a better society? Was he driven by mere practical concerns, such as providing a model that would suggest policies that were friendly to his personal business concerns or political agenda? In other words, was he, as Letwin implies, merely a "projector?" Maybe, on the other hand, his motivation to speculate on things economic was merely an abstract intellectual interest to help him better understand the revolutionary society in which he found himself.

It is somewhat difficult to untangle the motivational forces that turned Barbon economist. His tracts on fire insurance are exercises in promotion and not really economic in nature, and therefore, can be dismissed for our purposes. However, his pamphlet on building, while promotional, can be regarded as his first attempt at economic theorizing. Barbon offers the following reason for writing An Apology for the Builder: "Therefore the design of this discourse is to answer these aspersions [that the increase in building is prejudicial to the nation], to remove these fears and false conceptions, by confuting these Popular Errors, and Showing that the Builder ought to

be encouraged in all Nations as the chief promoter of their welfare" (Barbon, 1990, p.3). While the tract represents a transition in which entrepreneurial interests are a driving force, his motivation to turn economist seems to be spurred also by a desire to improve the welfare of the nation.

A discourse of Trade represents Barbon's first full-scale effort in economics and he offers his clear purpose for writing the Discourse with the following passage:

Trade is now become as necessary to Preserve Governments, as it is useful to make them Rich.

And not withstanding the great Influence, that Trade hath in the Support and Welfare of States and Kingdoms, yet there is nothing more unknown, or that Men differ more in their Sentiments, than about the True Causes that raise and promote Trade (Barbon 1690, preface; emphasis deleted).

Barbon's reason for writing the tract is explicitly stated as a desire to explain how to "raise and promore trade."

What vision did Barbon wish to fulfill by increasing trade? Did he desire to improve the welfare of the temporarily unemployed, or did he merely wish to see the wealth of the nation increase? Barbon responds in favor of the latter with the following: "Trade Increaseth the Revenue of the Government, by providing an Employ for the People: For every Man that Works, pay[s] by those things which he Eats and Wears, something to the Government"(Barbon, 1690, p. 39). Thus, it is the welfare of the nation and not the worker which apparently concerns Barbon.

Barbon wrote A Discourse Concerning Coining the New Money Lighter in

response to the great recoinage debate of the 1690s.⁴¹ There were two schools of thought in the debate. One group, of whom the most prominent member was William Lowndes,⁴² favored devaluing the currency in order to ensure that a sufficient money supply existed for the English economy. The other school of thought was headed by John Locke⁴³ and favored restoring silver coins to the nominal weights that they had since the time of Elizabeth I (Horsefield, 1960, p. 23).

Barbon threw his weight on the side of the devaluationists in the controversy. Specifically, he wrote the Discourse in response to Locke's pamphlet, Further Considerations Raising the Value of Money, which was a criticism of the position that Lowndes took in A Report Containing an Essay for the Amendment of the Silver Coins. Furthermore, in the preface to the tract, he offers some insight into his reasons for

⁴¹The best sources for the arguments surrounding the recoinage debate are Chapters III through VI of British Monetary Experiments, 1650-1710, (Horsefield, 1960, pp. 23-70) and The Great Recoinage of 1696 to 1699 (Li, 1963).

⁴²William Lowndes (1652-1724) was Secretary of the Treasury during the "great recoinage debate," and as such, was asked to prepare a preliminary report. He proposed in A Report Containing an Essay for the Amendment of the Silver Coins (Lowndes, 1695), that the nominal value of the crown be raised by 25 per cent from 5s. to 6s. 3d., with the values of all other coins to be raised in proportion. This proposal was defeated chiefly through the efforts of John Locke. For a brief biography of Lowndes, see Cramb (Cramb, 1917, pp. 210-212).

⁴³John Locke (1632-1704) was a philosopher whose political philosophy formed the foundation of modern democratic republics and whose philosophy of knowledge provides the fullest exposition of the modern empirical method. Locke wrote several important tracts propounding his ideas on money. Among the most important pamphlets written on the subject are: Some Considerations of the Consequences of the Lowering of Interest, and Raising the Value of Money (1691), Some Observations on a Printed paper Entitled, For Encouraging the Coining Silver Money in England, and After for Keeping it Here (1695) and the above-mentioned Further Considerations Raising the Value of Money (1695). For a brief biography of Locke's life see Hamilton (Hamilton, 1917, pp. 27-36).

engaging in economic theorizing. Barbon, after disclaiming that he is a projector, offers the following reason for writing the discourse:

And therefore I hope [that] I shall be believed when I declare that I have no other design in writing this Discourse, than the service of my Country, and I have the same Candor to believe it of those who have wrote for the contrary Opinion; and that Mr. Lock[e] and I do in this agree, tho' in our Arguments we differ (Barbon, 1696, preface).

Later, Barbon seems to include the welfare of the citizenry as part of his purpose when he concludes the preface thusly: " . . . I shall not think my time ill spent, especially if anything that I have wrote, may tend to the service of the Public" (Barbon, 1696, preface).

To conclude, Barbon's inducement to theorize about things economic, seemed to have as its genesis some self-interest as exhibited in An Apology for the Builder. However, in his two most important works, A Discourse of Trade and A Discourse Concerning Coining the New Money Lighter, Barbon seems to be driven somewhat by a desire to provide civic service; the underlying force appears to be some sort of Mannheimian wish-image.

That vision had as its focus both the welfare of the citizenry and a more powerful nation-state, with the latter being the prominent aim. Barbon put it this way:

Trade Increaseth the Revenue of the Government, by providing an Employ for the People: For every Man that Works, pay[s] by those things which he Eats and Wears, som[e]thing to the Government. Thus the Excise and Custom's are Raised, and the more every Man Earns, the more he Consumes, and the King's Revenue is the more Increased (Barbon, 1690), p. 39).

Hence, his vision was that of a well off English populace living in a mighty country, who would extend her hegemony through trade. To Barbon, economics was then a tool to

achieve this goal.

Sources of Barbon's Conceptualized Reality

Barbon's conceptualized reality sprang from three sources, namely, historical elements, observation and data on the contemporary socioeconomic scene, and philosophical-theoretical inputs. The influence and relative importance of each of these sources will be discussed in the order listed above.

The historical inputs to Barbon's conceptualized reality came from two main sources. The first historical input to Barbon's conceptualized reality were the historical documents on vital statistics, namely, the doomsday book. He used this document to illustrate increases in population over time. For example, he writes:

. . . the most undeniable Proof of the Increase of Mankind in England, is the Dooms-Day-Book, which was a Survey taken of all the Inhabitants of England, in the Reign of William the conqueror; by which it appears that the People of England are increased more than double since that time . . . (Barbon, 1690, p.45)

Thus, he used the doomsday book to estimate the population growth of England (also see Barbon, 1685, pp. 9, 10, 25).

The second historical input involves the various histories with which Nicholas Barbon was apparently familiar. While trying to explain the population growth of Europe, he notes that one reason for the growth may be the increased fertility of the land which he implies is the result of human farming methods. Then, as proof of this population growth, he notes "that no great Famines, has been taken Notice of by

Historians, in these Last Three Hundred Years' (Barbon, 1690, p.42). Further, in a similar vein, he writes "That the Matter of Fact is so [that Europe has grown more populous], which does appear by comparing the ancient Histories of Countries with the Modern" (Barbon, 1690, p. 44).

These historical inputs allowed Barbon to dichotomize the world into the ancient and the modern. He viewed society as evolving over time. More precisely, Barbon perceived of population and the arts of the people both growing chronologically. Thus, the contemporaneous societies of late seventeenth-century Europe were more heavily populated than ancient civilizations, a fact which Barbon drew from the aforementioned historical sources.

The arts of the people had also become more pronounced in Barbon's opinion, as the ancient world evolved into the modern one. By art, Nicholas Barbon was referring to the trades of artificers who transformed natural resources into artificial wares, that is, consumer products. He offers the following on this point: "Artificial Wares are those which by Art are Changed into another Form than Nature gave them; As Cloth, Calicoes, and wrought Silks, etc. which are made of Wool, Flax, Cotten, and Raw Silks" (Barbon, 1690, p. 3; emphasis added). His historical knowledge then led Barbon to conclude:

In the Ancient Descriptions, the countries are full of Vast Woods, wild Beasts; the Inhabitants barbarous, and . . . without Arts, . . . But in the modern, the Woods are cut down, and the Lyons, Bears and wild Beasts destroyed; . . . the People are Cloathed, and have all Arts among them; and those Colonies and Familes, are increased into Great States and Kingdoms . . . (Barbon, 1690, pp. 44-45; emphasis added).

The empirical inputs for Nicholas Barbon's conceptualized reality seem to come

from four sources, three of which involve his personal observations, and one of which is from data on his contemporary scene. First, his boyhood experiences in London, especially being the son of a leather merchant, no doubt provided valuable information to the young Barbon about the newly emerging merchant class. His knowledge of the various trades that were becoming increasingly important, was originally obtained from personal observation during his young life. Secondly, this awareness was then reinforced by his own professional experience, first, and most importantly, as a builder, and later in the fledgling insurance and banking industries. The third important empirical influence on Barbon came from the experiences he had in Holland as a young medical student. Holland is referred to in all of his economic tracts, and usually cited as a model worth emulating. Finally, the socioeconomic data that Barbon relied on came from the London bills of mortality which he used to estimate the population growth of London (Barbon, 1685, pp. 9, 10, 19, 27, 30).⁴⁴

As noted above, this time period was one of both political and economic upheaval; in other words, a revolutionary era during which new existential factors were arising in society. In the political arena, two revolutions took place, the Restoration in 1690 and the "Glorious Revolution" of 1688. At the same time, England, as well as

⁴⁴Barbon's only reference to Sir William Petty is in regards to the London Bills of Mortality, in which he credits both Graunt and Petty as being co-authors. Barbon writes the following: "And we cannot make a better discovery of it [population growth of London] than by the Bills of Mortality, for it is reasonable among such a number of Mankind, such a number should die; and whether it be in such a proportion as one in three and thirty, as Mr. Gra[u]nt and Sir William Petit [Petty] have observed, is not so material to this purpose, but it is a certain demonstration, That if the Burials have increased, the number of Citizens hath increased, though the proportion may be uncertain" (Barbon, 1685, p. 27).

other countries in Europe, were undergoing economic revolution, as they tended toward economic systems of capitalism. These revolutionary developments were also important sources for Barbon's conceptualized reality.

There are hardly any traces of philosophical inputs in Barbon's writings, but there is a good deal of evidence of a scientific input, namely from the science of medicine. Hence, Barbon's medical training in the Lowlands led him to follow a largely macroeconomic focus when formulating his economic theories. The importance of this influence on Barbon is made quite evident when he renders the following about the appropriate focus for understanding the true nature of trade:

The Reasons why many men have not a true Idea of Trade, is, Because they Apply their Thoughts to particular Parts of Trade, wherein they are chiefly concerned in Interest, and having found out the best Rules and Laws for forming that particular Part [trade], they govern their Thoughts by the same NOTIONS in forming the Great BODY of Trade, and not reflecting on the Different Rules of Proportions betwixt the Body and Parts, have a very disagreeable Conception, and like those, who having learnt to Draw well an Eye, Ear, Hand, and other Parts of the Body, (being Unskilful in the Laws of Symmetry) when they join them together, make a very Deformed Body.

Therefore, whoever will make a true Representation of Trade, must Draw a rough Sketch of the Body and Parts together, which though it will not entertain with so much Pleasure as a well-finish't Piece, yet the Agreeableness of the Parts may be as well discern'd, and thereby such Measures taken, as may best suit the Shape of the Body (Barbon, 1690, preface).

Barbon's medical metaphor highlights the influence of his training in medicine on his approach to economics, when he notes that the proper focus for studying the body economic is the same as that for studying the body human. Hence, when Barbon contemplated his earlier personal experiences retrospectively, and viewed contemporary and historical data, he did so from the point of view of medicine. This important

scientific input provided the means by which Barbon translated data into the facts of his reality. Furthermore, he viewed his conceptualized reality as the latest link in a long historical process that began in the ancient world and had evolved into his contemporary "modern" one. Having explored the empirical, historical and scientific inputs of Nicholas Barbon's conceptualized reality, his conception of the contemporary society will now be presented.

Barbon's Conceptualized Reality

Barbon deduced the assumptions for his macroeconomic theories from his conceptualized reality. That reality, as was the case with Sir William Petty, will first be viewed by examining the central economic dilemma in his world. Then, the economic actors, the economic processes that they engaged in and the institutional milieu in which they performed will be presented.

The central problem in Nicholas Barbon's conceptualized reality is a lack of trade, a process which he describes with the following: "Trade is the Making and Selling of one sort of Goods for another ..." (Barbon, 1690, p. 1). Barbon describes the effects of trade, and more to the point, the effects of its decay with the following:

... [s]o that by Trade, the Inhabitants are not only well Fed, Clothed and Lodged; but the Richer sort are Furnished with all the things to promote the Ease, Pleasure, & Pomp of Life: Whereas, in the same country where there's no Trade, the Land-Lords would have but Coarse Diet, Coarser Clothes, and worse Lodgings; and nothing for the Rent of their Lands, but the Homage and Attendance of their Poor Bare-footed Tenants, For they have nothing else to give (Barbon, 1690, pp. 36-37).

The major economic actors in Nicholas Barbon's macroeconomic world are artificers, merchants, the peerage and gentry, and foreign consumers of domestic output. A discussion of their respective roles follows. The artisans and the merchants together produced the national output through the process of trade. Barbon uses the word trade in such a way as to include production, as well as buying and selling. He defines the respective roles of the actors in this process thusly:

... The making is called Handy-Craft Trade, and the maker an Artificer; The selling is called Merchandizing and the Seller a Merchant: The Artificer is called by several Names from the sort of Goods he makes. As a Clothier, Silk-weaver, Shoo-maker or Hatter, etc. from [the] Making of Cloth, Silk, Shooes, or Hats; And the Merchant is distinguished by the Names of the Countrey he deals to, and is called, Dutch, French, Spanish or Turk[ish] Merchant (Barbon, 1690, pp. 1-2; emphasis added).

Hence, Barbon separated the role of the artificer from that of the merchant. The artificer produced the national output, while the merchant was responsible for selling the goods.

The merchant is also a skilled worker in the Barbonian world, and therefore, must acquire proficiency in that art. Barbon puts it this way:

Because the Difference in the Qualities of Wares, are so difficulty understood, it is [necessary] that the Trader [merchant] serves an Apprenticeship to learn them; and the knowledge of them is called the Mystery of Trade; and in common Dealing, the Buyer is forced to rely on the Skill and Honesty of the Seller, to deliver Wares with such Qualities as he affirms them to have . . . (Barbon, 1690, p. 12; emphasis added).

The artificer's wage is then, to a large extent, determined by the art required of a particular trade, e.g., clothier, shoemaker or hatmaker, etc., and the skill that the artisan possesses in that trade. Thus, Barbon writes that "[t]he Price of the Artificer, is [determined] by reckoning the Cost of the Materials, with the time of working them; The Price of Time is according to the Value of the Art, and the Skill of the Artist"

(Barbon, 1690, p. 19; emphasis added). It may be inferred from the above statement, that Barbon's definition of art included both physical capital and human capital.

Artificers and merchants perform a dual role in Barbon's macroeconomic world. For besides producing the national output, they consume the national output along with the other two groups of economic actors, the gentry and foreign consumers. Consequently, the aggregate demand of these four groups ultimately determines the level of short run output and employment in the economy.

Barbon conceived of man as having two types of demand which are respectively derived from the "wants of the body" and the "wants of the mind."⁴⁵ He defines goods that satisfy the wants of the body as "all things necessary to support Life . . . [and includes] those Goods which are useful to supply the Three General necessities of Man, Food, Clothes and Lodging . . ." (Barbon, 1690, p. 14). Barbon later changed his ideas about necessities when he observed that "nothing is absolutely necessary to support Life, but Food; for a Great Part of Mankind go Naked, and lye in the Huts and Caves; so that there are but few things that are absolutely necessary to supply the Wants of the Body" (Barbon , 1690, p. 14).

Barbon identifies commodities that satisfy wants of the mind as "all such things that can satisfy Desire; Desire implys Wants: It is the Appetite of the Soul, and is as natural to the Soul, as Hunger to the Body" (Barbon, 1690, pp. 14-15). Wants of the mind are especially significant to aggregate demand because as Barbon notes:

⁴⁵Barbon's distinction between those things that satisfy the "wants of the body" and the "wants of the mind" are similar to Adam Smith's distinction between the "necessaries and conveniences of life" (Smith, [1776] 1981, vol. 1, pp. 10, 47, 51, 176; vol. 2, p. 927).

The Wants of the Mind are infinite, Man naturally Aspires, and as his Mind is elevated, his Senses grow more refined, and more capable of Delight; his Desires are enlarged, and his Wants increase with his Wishes, which is for every thing that is rare, [and] can gratifie his Senses, adorn his Body, and promote the Ease, Pleasure, and Pomp of Life (Barbon, 1690, pp. 14-15).

Hence, in the Barbonian world, wants of the mind have increased with the knowledge of mankind. Moreover, Barbon conceives of these wants as being socially conditioned. In this regard, he writes: " ... amongst the Civilized of the World ... Ornaments of the Body have been Worn ... differing in Shapes and Fashions according to the Custom of the Country" (Barbon, 1690, p. 17).⁴⁶

Now, it was the gentry who played the important role of nonproductive spenders on final goods and services, because it was they who were most able to fulfill the wants of the mind and thereby, increase effective demand. Thus Barbon writes that one of the factors that promote trade is ". . . Liberality in the rich [the gentry]: Liberality is the free usage of all those things that are made by the Industry of the Poor, for the Use of the Body and Mind" (Barbon, 1690, p. 62). Then, Barbon notes the importance of "conspicuous consumption" (Veblen, 1899, pp. 40-60) when he writes in a truly Veblenesque fashion the following:

Beside[s], There is another great Advantage to Trade, [that is gained by the] Enlarging of Cities; the Two Beneficial Expences of

⁴⁶Barbon's statement that 'wants of the mind are infinite' anticipates Marshall's observation that [t]here are an endless variety of wants" (Marshall, [1890] 1920, p. 78). Furthermore, in a manner similar to Barbon, Marshall noted the impact of changing social circumstances upon people's wants with the following: " ... each new step upward is to be regarded as the development of new activities giving rise to new wants." Thus, Marshall in a Barbonian fashion was convinced that the "whole history of man shows that his wants expand with the growth of his wealth and knowledge" (Marshall, [1890] 1920, pp. 76, 186).

Cloathing and Lodging, are Increased; Man being Naturally Ambitious, The Living together occasions Emulation, which is seen by Out-Vying one another in Apparel, Equipage, and Furniture of the House; whereas, if a man lived Solitary alone, his chiefest Expence, would be Food. It is from this very Custom [of conspicuous consumption]; [that] the Gentry of France Living in Cities, with the Invention of Fashion; That France, tho' a Country no way fitted for Trade has so great a share of it . . . (Barbon, 1690, pp. 69-70).

Thus, an important consequence of the gentry's role as spenders was that it enticed emulation to consume, both amongst themselves, and especially from the lower classes. Hence, it was the spending of the gentry that was necessary to alleviate the central economic dilemma of the Barbonian macroeconomic world, the existence of involuntary unemployment, a problem that arose when the rich did not purchase enough of the goods that were made by the "industry of the poor." Thus, Barbon concludes that "[p]rodigality is a vice that is prejudicial to the Man, but not to Trade ... Covetousness is a Vice, prejudicial both to Man & Trade" (Barbon, 1690, pp. 62-63).

Having described the economic actors and their essential processes of producing and consuming, it is now appropriate to examine the institutional framework which comprised the Barbonian World. The four prominent institutions in Nicholas Barbon's macroeconomic world were households (both rich and poor), the state, the embryonic financial institutions and money.

Households are important in the Barbonian macroeconomic world for three reasons. First, they are necessary to shelter the people which Barbon notes when he writes that "[h]ouses are Hives for the People to breed and swarm in, without which they cannot increase" (Barbon, 1685, p. 26). This was significant because Barbon regarded people as being a component of national wealth which he notes in the following passage:

"[T]he People are the Riches and the Strength of the Country, And it is not much more [of an] Advantage to a Prince, to have a Title to Lands, in Terra Incognita, As to Countries without People" (Barbon, 1690, p. 55).

Most of the work of the artificers was done in households, which Barbon cites as the second aspect of this institution. In this regard, he writes that "[h]ouses are the Places where the Artificers make their Goods, and Merchants Sell them" (Barbon, 1690, p. 69).⁴⁷ The third important attribute of households is that they provided yet another opportunity for conspicuous consumption, especially in the case of rich households. Barbon explicitly suggests this when he writes: " ... Expences of ... Lodging are Increased; [because] Man ... [by] Living together, occasions Emulation, which is seen by [the] Out-Vying [of] one another in ... Equipage and, Furniture of the House" (Barbon, 1690, p. 69).

The second important institution in the Barbonian reality was government, which he separated into two types and termed Turkish and Gothic, respectively. Accordingly, he writes:

There seems to be but two settled Forms of Government, The Turkish, and Gothic, or English Monarchy: They are both founded upon Property of Land; in the First, the Property and Legislative Power is solely in the Prince; In the Latter, they are in both the Prince and People: The one is best fitted to raise Dominion by Armies; for the Prince must be Absolute to give Command, according to the Various Fortunes of Warr: The other [Gothic or English] is Best for Trade; for men are most industrious, when they are most free, and secure to enjoy the Effects of their Labours (Barbon, 1690, p. 51).

⁴⁷By arguing that production is household production, Barbon anticipated Hans Brems's concept of "do-it-yourself households" (Brems, 1986, pp. 134-135, 137-139, 182), which he (Brems) describes in a discussion of the economics of W. S. Jevons and Carl Menger.

The best form of government in terms of trade was, in his view, the Gothic or English model, because it made the people free and thereby, encouraged effort because the inhabitants were able to enjoy the fruits of their labor.

In Barbon's view, England would become more prosperous if it acquired an empire, because then the "[s]ubjects of England ... would increase" (Barbon, 1690, p. 61). Furthermore, he felt that the best way for a nation to maintain and increase her hegemony was by sea. Furthermore, this type of dominion was consistent with the Gothic form of government. He puts it this way: ". . . The Arts of navigating discover'd, hath added an unlimited compass to the Naval Power. There needs no Change of the Gothic Government; for that best Agrees with such an Empire" (Barbon, 1690, p.57).

Later, he explains why the Gothic form of government is consistent with an empire acquired by sea:

The Ways of preserving Conquests gain'd by Sea, are different from Those at Land. By the one, the cities, Towns and Villages are burnt, to thin the People, that they may be the easier Governed, and kept into Subjection; by the other, the cities must be enlarged, and New ones built: Instead of Bannishing the People, they must be continued, in their Possession, or invited to the Seat of Empire; by the one the Inhabitants are enslaved, by the other, they are made Free: The seat of such an Empire, must be an Island, that this Defence may be solely in Shipping; the same way to defend their Dominion, as to enlarge it (Barbon, 1690, p. 58)

The Gothic form of government with its inherent freedom for the individual is, therefore, consistent with dominion by sea. Furthermore, that dominion requires naval power. Later, Barbon, not surprisingly, concludes that "England seems the Properer Seat for such an Empire" (Barbon, 1690, pp. 59-60).

A second role of government is to ensure honest and fair trading by preventing and punishing fraud. Barbon writes that "It is the Care of the Government, to prevent and punish the Fraud of False Weights and Measures, and in most Trading-Cities, there are Publick weight-Houses, and Measurers . . ." (Barbon, 1690, p. 10).

The third type of important institutions in the Barbonian world were the embryonic institutions of financial intermediation. These financial intermediaries were important to the process of facilitating the transfers of funds from lenders (the gentry) to Borrowers (merchants) whereby the latter were enabled to acquire goods for resale. These nascent banks took various forms, from the various land bank schemes of Chamberlen, Briscoe, Asgill and Barbon to the lumbard banks, which were glorified pawnshops that accepted all kinds of goods and which supplied credit in the form of circulating notes that were backed by the goods in question.⁴⁸ Regardless of their form, these institutions were important elements in Barbon's reality because they were necessary to ensure liquidity to the merchants.

This brings us to the foremost institution in Nicholas Barbon's conceptualized reality, money. This is evidenced throughout his writings, but is put most succinctly by him in the following passage:

For Money is the measure of Commerce; And for a Nation to be without Money, is the same thing as if it were without measures, and had neither Yards, Scales, nor Bushels in the Country; without some of which, no Bargain can be made (Barbon, 1696, p. 92).

Money is prominent in Barbon's mercantile economy, as we shall later see in his

⁴⁸For a thorough discussion of the early development of financial institutions in England, see part IV of British Monetary Experiments 1650-1710 (Horsefield, 1960, pp. 93-211).

macroeconomic analyses.

Having presented the respective conceptualized realities of Sir William Petty and Nicholas Barbon, it is now apropos that we compare and contrast these realities in an attempt to ascertain whether sufficient conditions exist to test the new inevitability theory.

CHAPTER IV

DID PETTY AND BARBON CONCEPTUALIZE EXISTENTIAL FACTORS IN SIMILAR TERMS?

In his work on The Origins of Scientific Economics, William Letwin made an observation with regard to the intellectual backgrounds of Sir William Petty and Nicholas Barbon that affected me "as if scales had fallen from my eyes," to quote Jeremy Bentham (Bentham, 1962, vol. 1, p. 268). Letwin put it this way:

His education [Barbon's] would seem of little relevance to his career were it not that two other of the principal economic writers of the period, Petty and Locke, also studied medicine, as did still other contemporaries prominently involved in economic policy, such as Benjamin Worsley and Hugh Chamberlen. Perhaps, medicine, as it was then taught in the Lowlands, was one of the few academic disciplines that could appeal to energetic young men interested in the modern learning rather than the ancient, and ambitious ones, who wanted an education that could be put to work (Letwin, 1963, p. 49; emphasis added).

Their parallel academic training may have preconditioned Petty and Barbon to conceptualize reality in like terms.⁴⁹ In other words, their similar educational experiences caused them to construct congeneric concepts out of observed data.

Robert Merton has gone to the extreme of arguing that not only are facts constructed by individuals, but so are data themselves. He expressed it as follows.

⁴⁹Georgescu-Roegen (1983, p. xi) cites the father of modern genetics, the Austrian monk, Gregor Mendel, as a scientist who wrote before his time. Interestingly, Jacob Bronowski wrote the following about Mendel "where did Mendel get the model of all or nothing heredity? . . . there does exist one model . . . which is so obvious that no scientist would think of it; but a child or a monk might. That model is sex . . . males, and females of the same species do not produce . . . hermaphrodites: they produce either a male or a female: (Bronowski, 1974, p. 387). Bronowski seems to be implicitly crediting Mendel's breakthrough to his singular "conceptualized reality" which was formulated as a result of his unique training and life.

"Despite the etymology of the term, data are not "given" but are "contrived" with the inevitable help of concepts'" (Merton in Stark, 1958, p. 106). The idea of contrived data is important because it makes the conceptualized reality of the scientist even more significant in that it is not only critical in determining notions of cause-and-effect, but is also consequential in concocting data.

This is especially relevant in the present context, because during the time period under consideration (late seventeenth-century England) economics was in a pre-paradigm situation. Consequently, data gathering was a random and somewhat inaccurate process and, therefore, more highly subject to the normative aspects of data gathering referred to by Merton. With that in mind, a brief summary and subsequent comparison of Petty and Barbon's conceptualized realities follow in order to ascertain whether the two realities are so similar that they constitute the kind of sufficient conditions that form one of the criteria for the acceptability of the inevitability doctrine.

A Comparison of Petty and Barbon's Conceptualized Realities

Both Sir William Petty and Nicholas Barbon viewed trade, by which they meant all productive activities from the point of production to final purchase, as the central economic process in their respective conceptualized realities. Then, the fundamental economic dilemma in each of their realities was a lack of this activity, as evidenced by low output and high unemployment. Moreover, their regard about a lack of trade seemed directed primarily to the welfare of the state, but was also concerned with the

welfare of the people.

Sir William Petty conceived of a world that was largely inhabited by five groups of people; artificers, laborers, merchants, the peerage and gentry, and foreign consumers of domestic output. The first two groups were responsible for producing the national output. The artificers produced goods through embryonic manufacturing processes, which were enhanced by the division of labor. Laborers were in Petty's economic milieu, unskilled workers. Furthermore, they had to be disciplined by continual employment in order to be productive, which was the primary reason that Sir William viewed unemployment as bad.

The three types of merchants, international merchants, domestic retailers and manufacturing enterprisers, are the central actors on Petty's macroeconomic stage, for it is they who are most responsible for the central process of trade. The extent of their activities is a major factor in determining the level of employment. Artificers, laborers and merchants perform a dual role in Petty's macroeconomic drama, for they, along with the peerage and gentry, and foreign consumers of domestic output, are the purchasers of national output. Their aggregate demand ultimately determines whether there will be a level of output consistent with full employment.

The four prominent institutions in Petty's economic world were the households, the state, financial institutions, and most importantly, money. The households were necessary to shelter the people, an important component of the nation's wealth. Also, the households provided a workplace for the artisans.

The state, in Petty's view, should wield considerable if not absolute power, as

described by Thomas Hobbes in Leviathan. The third institutional element in Sir William's conceptualized reality were the nascent financial intermediaries, which were responsible for furnishing credit for goods in transit. The final and central institution in Petty's world is money, for his conception was of a monetary reality.

Sir William Petty conceived of a political economy that was governed by natural laws. That is, the characters in his macroeconomic drama were driven by natural propensities, which are reflected in man-made laws. Thus, in referring to laws limiting usury, he writes that "of the vanity and fruitlessness of making Civil Positive Laws against the Laws of Nature, I have spoken elsewhere, and instanced the several particulars" (Petty, 1662, p. 48). Similarly, in explaining why laws prohibiting the exportation of bullion may impoverish a nation, he writes that "[p]erhaps they are against the Laws of Nature" (Petty, 1695, p. 445).

In Nicholas Barbon's macroeconomic world, artificers and merchants are the major economic actors, for it is they who produce and distribute the national output. In contrast to Petty, Barbon does not dichotomize between skilled and unskilled workers, for he views all labor as possessing some degree of skill, including trading. Therefore, the class that Sir William separates as laborers are part of the artisan class in Barbon's perception, an inconsequential difference. The merchant class engages in the process of trading, which is essential in the Barbonian world. Whereas, Petty subdivided merchants into three types, Barbon lumped them together in one group.

These two groups, along with the peerage, gentry and foreigners, are the consumers of the national output. Barbon places special emphasis on the peerage and

gentry's important role in consumption, for it is they who have the means to purchase "wants of the mind," and consequently he suggests that conspicuous consumption by this group is an important aspect of aggregate demand. Thus, for the most part, it is this group that determines whether there will be sufficient effective demand to ensure full employment.

Not surprisingly, the institutions that dominate Sir William Petty's economic world are also very important in the Barbonian macroeconomic reality. In Nicholas Barbon's world, the households, the state, financial intermediaries and money are the dominant institutions. Domiciles are necessary to provide shelter and a place to work for the artificers.

The state is an important institution and its prominent functions should be aimed at protecting and increasing the nation's most important economic process, namely trade. In this regard, Barbon writes that "[t]he seat of such an Empire [one whose dominion is gained by sea], must be an Island, that this Defence may be solely in Shipping; the same way to defend their Dominion as to enlarge it" (Barbon, 1690, p. 58). Barbon, although in favor of a strong central government, does view individual freedom as being important to the process of trade and therefore advocates the Gothic form of government because it ". . . is Best for Trade; for men are most industrious, when they are most free" (Barbon, 1690, p. 51). The aspect of self-interest is implicit in Barbon's conceptualized reality because individual freedom is an important component for a prospering economy.

The third type of important institution in Nicholas Barbon's conceptualized reality were the fledgling institutions of financial intermediation. As with Petty, these

intermediaries were essential to provide the liquidity necessary for merchants to finance goods in transit. Finally, as was the case with Petty, the Barbonian world was a monetary reality.

The difference between these two economists' conceptualized realities appear insignificant. The same actors and institutions inhabit their respective worlds. Moreover, the central economic dilemma in both of their realities is involuntary unemployment caused by a lack of effective demand.

Ostensibly, there is one minor distinction between Petty and Barbon's perception of the political economy. Sir William Petty believed strongly that natural laws governed the workings of the economy, much as they governed the workings of nature. That is, the economic actors were imbued with certain innate desires which governed their behavior. The writings of Nicholas Barbon do not exhibit any explicit belief in natural law. However, the motivations of the Barbonian economic actors can be implicitly interpreted as emanating from some type of natural propensity. Hence, Barbon favors the Gothic form of government because it permits individual freedom, where apparently these natural propensities can best be acted upon to the benefit of the economy.

The preceding discussion has established sufficient conditions for the new inevitability theory. Therefore, an analysis of the separate macroeconomic theories that Sir William Petty and Nicholas Barbon used to manipulate the independent variables in their respective macroeconomic models is now in order.

PART III

MACROECONOMIC ANALYSES

CHAPTER V

THE MACROECONOMICS OF SIR WILLIAM PETTY

Sir William Petty's conceptualized reality was too complicated to be analyzed in a relatively rigorous fashion. Hence, he simplified that reality in the following manner. First, he abstracted a number of judgementally selected constants and variables from that reality. Secondly, he used these elements as inputs in a construction of a model of his reality. Thirdly, from the very same reality he deduced a number of ingredients that served as assumptions for his theories. Fourthly, on the basis of these assumptions, Petty formulated a number of economic theories which he used to manipulate the independent variables of his model for the purpose of explaining and predicting the behavior of the model's dependent variables. In other words, these theories, in the parlance of Alfred Marshall, served as a set of "economic laws" for the model (Marshall [1890] 1920, p. 27). Fifthly, Petty drew a number of conclusions on the basis of a theoretical analysis of the behavior of his model. Finally, on the basis of the conclusions arrived at by manipulating the variables in the model, Petty then reached some policy recommendations. With that in mind, a formal analysis of Sir William Petty's macroeconomics will be offered, followed by his policy recommendations.

The major constants in Petty's macroeconomic model are the economic actors and the institutional elements that are part of his conceptualized reality. The most important actor in Sir William's model is the merchant because of his prominent role in ultimately determining aggregate demand. It is he who helps to meet and augment the consumption

demands of the other three economic groups; the artisans, the laborers and foreign consumers of domestic output, by engaging in the process of trade. An important institutional element that Petty abstracted from his reality and embodied in his model is money, for his economy is monetary. Because of the monetary nature of Petty's reality, the fledgling financial institutions, which were necessary to provide sufficient liquidity for his mercantile economy, are also important institutional elements for his macroeconomic model.

The independent variables in Petty's model are the determinants of aggregate demand. In his open model of the economy, they are, respectively, domestic consumption, investment and foreign consumption of domestically produced output. They collectively then determine Petty's dependent variables, the level of employment and therefore, output in the short run.

To understand his formal macroeconomic analysis, it is necessary that the economic theories that he used to manipulate the independent variables in his model first be presented. The central aspect of his macroeconomic model is its monetary features. Therefore, it is appropriate to begin the analysis with Sir William's monetary economics.

Petty's Monetary Economics

Sir William Petty deduced an important assumption for his monetary theory from his conceptualized reality. Specifically, from his labor theory of value, he assumed that money derived its value from the labor that has been embodied in the metal. This placed

him squarely in the "metallist"⁵⁰ camp concerning the value of money. In Quantulumcunque Concerning Money,⁵¹ Petty makes this explicit in answering queries eight and nine in the following manner:

Qu. 8. But if the new shilling were $\frac{3}{4}$ ths of the weight as formerly, then the Merchant would not meddle with them at all, and so secure this fear of Impoverishment?

Answ. The Merchant would Export then, just as before; Only he will give but $\frac{3}{4}$ so much Pepper, or other Indian Goods, for the new retrenched Shilling as he did for the old: And would Accept in India $\frac{3}{4}$ as much Pepper as he formerly had for the old: And consequently there would be no difference, but among a few such Fools as take Money by its name [face value], and not by its weight and fineness [intrinsic value].

Qu. 9. If a Shilling was by new coinage reduced to $\frac{3}{4}$ of its present weight, should we not thereby have $\frac{1}{3}$ more of Money than now we have, and consequently be so much the richer?

Answ. You would indeed have $\frac{1}{3}$ part more of the new christened Shillings; but not as Ounce more of Silver, nor Money; nor could you get an Ounce more of Foreign Commodities for all your new multiplied Money than before; Nor even for any Domestic Commodities; but perhaps a little at first from the few Fools mentioned above (Petty, 1695, p. 441; emphasis deleted).

Thus, metallic money had an intrinsic value, and therefore, could command other commodities at a certain rate, because human labor had been embodied in the metal.

Having documented Petty's metallist view of money, it is now appropriate to analyze his monetary theory. Sir William Petty theorized that money had an important

⁵⁰Metallists believed that money had an intrinsic value which was based on its metallic content. Furthermore, this value could not be altered by the face value of the coin. Cartelists, on the other hand, defined money by its functions with the metallic content being unimportant. See Joseph Schumpeter (1954, p. 288-300) for a thorough discussion of cartelism and metallism.

⁵¹Petty wrote the Quantulumcunque Concerning Money in 1682 when the problem of recoinage was in its preliminary discussion. The debate reached its height in the 1690s and in 1695, when recoinage was imminent, the tract was published posthumously. The tract consists of thirty two questions concerning money, to which Petty's answers then reveal his views concerning the subject.

impact on the real economy. In other words, "money matters" (Davidson, 1978, p. 48).⁵² That is to say, the supply of money in the economy affects real variables like output and employment.

In line with his belief that money matters, Sir William's discussion in Chapter V of Verbum Sapienti is largely a presentation of "how much money is necessary to drive the Trade of the Nation" (Petty, 1691a, p. 112). Similarly, in Chapters IX and X of Political Arithmetic, Petty's inquiry is concerned with first having sufficient money to move the trade of the nation and, secondly, to have a sufficient medium of exchange to expedite the trade of the "whole commercial world" (Petty, 1690, pp. 310-313). From Sir William's perspective, money matters for international trade as well as for domestic trade.

In accordance with his belief that money affects the level of trade, Petty attempts to calculate the money necessary to drive the trade of England in query 25 of Quantulumcunque Concerning Money. He writes the following:

. . . I think that so much money as will pay half a Years Rent for all the lands of England, and a Quarters Rent of the Housing, and a Weeks Expense of all the People, and about a Quarter of the Value of all the exported Commodities, is sufficient for that purpose [driving the nation's trade]. Now when the States will cause these things to be computed, and the Quantity of their Coins to be known, . . . then it may also be known whether we have too much or too little money (Petty, 1695, p. 446).

⁵²Paul Davidson uses this term to stress the important interrelationships between the monetary and real sectors that exist in a monetary, i.e., non-barter economy. According to Davidson, the absence of the monetary sector of the economy would result in an incomplete macroeconomic perspective, and therefore, a flawed macroeconomic view. The relationship between the monetary and real sectors, he (Davidson) cites as being central to the Keynesian system. That conception also appears to be evident, at least in rudimentary form, in the monetary theory of Sir William Petty.

In query 26, Sir William even goes so far as to recommend "erect[ing] a bank" if there is not sufficient money for commerce (Petty, 1695, p. 446).

Petty's monetary analysis is very sophisticated in that a determination of the proper size of the money stock for a nation at any point in time requires a knowledge of the velocity of money at that place and time.⁵³ In Verbum Sapienti he offers the following:

It may be asked, If there were occasion to raise 4 Millions per Annum, whether the same 6 Millions (which we hope we have) would suffice for such revolutions and circulations thereof as Trade requires? I answer yes, for the Expense being 40 Millions, if the revolutions were in such short circles, viz. weekly, as happens among poorer artizans and labourers, who receive and pay every Saturday, then $40/52$ parts of 1 Million of Money would answer those ends: But if Circles be quarterly, according to our custom of paying rent, and gathering Taxes, then 10 Millions were requisite. Wherefore supposing payments in general to be of mixed Circle between One week and 13. then add 10 Millions to $40/52$, the half of which will be $5-1/2$, so as if we have $5-1/2$ Millions we have enough (Petty, 1691a, pp. 112-113).

In the above, Petty is very explicit in his analysis that the longer the time period between payments, the larger will be the stock of money necessary to drive the nation's trade, because longer payment periods result in a lower velocity of money.⁵⁴

⁵³Alfred Marshall, while noting the influences that determine the amount of money that people want to hold as an asset, refers to Petty and the concept of the velocity of money with the following: "... the rule for one man may not serve well for another in similar conditions: but as Petty said, 'The most thriving men keep little ... money by them, but turn and wind it into the various commodities to their good profit'" (Marshall, 1923, p. 47).

⁵⁴Roncaglia makes the interesting observation that "Petty estimated the velocity of circulation on the basis of the institutional characteristics of the economic system such as the payments periods for wages, rents, and taxes." (Roncaglia, 1985, p. 32). Then, he contrasts this theory with Keynes' theory of velocity which is based on liquidity preference. Roncaglia concludes that Petty's institutional analysis is sound, given that institutions of financial intermediation (which were so important in Petty's

Specifically, Petty implies that if payments are weekly, the velocity of money will be 40 and therefore, the necessary money stock will be 1 million pounds. However, if payments are quarterly, velocity will be 4 and therefore, the necessary size of the money stock will be 10 million pounds. Consequently, Sir William's examination reveals that the requisite amount of money necessary to drive the nation's trade is equal to the volume of trade divided by the velocity of money.

The last aspect of Petty's monetary economics is his theory of the rate of interest. Sir William devotes Chapter V of A Treatise of Taxes and Contributions to the subject. He defines interest thusly:

Wherefore when a man giveth out his money upon condition that he may not demand it back until a certain time to come, whatsoever his own necessities shall be in the mean time, he certainly may take a compensation for this inconvenience which he admits against himself: And this allowance is that we commonly call Usury [interest] (Petty, 1662, p. 47; emphasis added).⁵⁵

Thus, by describing interest as a payment for inconvenience, Petty apparently held some type of Keynesian notion that interest "is the reward for parting with liquidity for a specified period" (Keynes, [1936] 1964, p. 167).

Later, he provides justification for a premium above the "simple" rate of interest, a payment for risk, when he renders the following: "[B]ut when the security is casual, then a kinde of ensurance must be enterwoven with the simple natural Interest..." (Petty, 1662, p. 48). Thus, where risk is involved, the payment of interest is a compensation

macroeconomic analysis) were not yet fully developed in seventeenth-century England.

⁵⁵Petty gives a similar definition in query 28 of Quantulumcunque Concerning Money (Petty, 1695, p. 446).

for both inconvenience and risk.

Petty then suggests a minimum that this payment could be by comparing the interest rate to an equivalent investment in land. He offers the following: "As for Usury, the least that can be, is the Rent of so much Land as the money will buy, where the security is undoubted . . ." (Petty, 1662, p. 48). However, the rate of interest may be above the minimum when the element of risk is involved. According to Petty, the payment for risk "may advance the Usury very conscionably unto any height below the Principle it self" (Petty, 1662, p. 48). The interest payment, as Sir William notes, could not exceed the principle, and hence, the maximum rate of interest must be one hundred per cent. Then, not surprisingly, Sir William opines that the rate of interest is governed by natural laws when he notes:

. . . I see no reason for endeavoring to limit Usury upon time any more then that upon place, which the practice of the world doth not, unless it be that those how make such Laws were rather Borrowers then Lenders: But of the vanity and fruitlessness of making Civil Positive Laws against the Laws of Nature, I have spoken elsewhere, and instanced in several particulars (Petty, 1662, p. 48).

What did Petty mean by this passage? First, he believed that man had a natural propensity to labor and in mixing this faculty for laboring with nature was able to produce both consumer goods and a surplus.⁵⁶ Secondly, it is also a law of nature that

⁵⁶Petty described his theory of rent with the following: "Suppose a man could with his own hands plant a certain scope of Land with Corn, that is, could Digg, or Plough, Harrow, Weed, Reap, Carry Home, Thresh, and Winnow so much as the Husbandry of this Land requires; and had withal Seed wherewith to sow the same. I say, that when this man hath subducted his seed out of the proceed of his Harvest, and also, what himself hath both eaten and given to others in exchange for Clothes, and other Natural necessities; that the remainder of Corn is the natural and true Rent of the Land for that year..." (Petty, 1662, p. 43).

people want to consume, and therefore, they must be given interest to forgo the convenience of liquidity. Thus, the mixing of these natural propensities ultimately determined the rate of interest.

Petty's insistence in A Treatise of Taxes and Contributions that natural law governed at least the simple rate of interest is the basis for his embryonic monetary theory of the rate of interest. In this regard, he introduced the size of the money stock in Political Arithmetic as a determinant of the interest rate when he wrote: "But the natural fall of Interest, is the effect of the increase of mon[e]y" (Petty, 1690, p. 304).

Natural laws were universal in Sir William Petty's world, but interest rates varied from country to country. This discrepancy occurred because of different institutional arrangements among countries. Hence, Petty writes: "Their (Holland's) third Policy (for increasing trade) is their Bank, the use whereof is to encrease Mon[e]y ..." Petty, 1690, p.261). Ostensibly, the supply of money from non-banking persons (who are guided by the laws of nature), can be supplemented by bank money which may force non-banking people to accept a lower rate of interest, otherwise borrowers could go to banks.

The significance of Sir William's nascent theory of the rate of interest will become apparent in the following sections. It is now appropriate that we turn our attention to Petty's overall macroeconomic system. It is a synthesized system in that the monetary and real sectors are combined in his macroeconomic analyses.

Petty's Synthesized System of Macroeconomics

Consumption was an important component of aggregate demand in Sir William's macroeconomic model. Accordingly, he writes that "[i]ncrease of Trade depends upon encrease of People and luxury in their consumption ..." (Petty, 1927, vol. 1, p. 247). In the same vein, Petty writes the following: "Thus may Trade encrease without encrease of people, when men desiring to have [a] greater variety of commodities are contented to take paynes for it, rather than to feed simply and live lazily" (Petty, 1927, vol. 1, p. 214). Hence, the stimulative effects on consumption caused by rising expectations could increase output and employment without increases in population.

Petty, also, harbored a theory of underconsumption,⁵⁷ even if somewhat fragmented and incomplete. Ironically, in his theory of underconsumption, a general glut would be the result of a distribution of income that was too equal. In this regard, he writes:

... equal spreading of Wealth would destroy all Splendor and Ornament ... [for example, in] Ireland, [there] being perhaps 11 Millions, being divided among 1,100 M. people, then no one man having above 10£. he could Probably build no House worth above 3£. which would be to leave the face of Beggery upon the whole Nation: And withal such Parity would beget Anarchy and Confusion (Petty, 1691b, pp. 193-194).

⁵⁷Theories of underconsumption were relegated to the underground from the time of the establishment of the classical paradigm to the emergence of the Keynesian paradigm. Hobson and Mummery present a concise statement of the underconsumptionist argument with the following: "... we may summarise our theory thus: the community considered as the recipient of money incomes produces consumable articles; the community considered as the spender of money incomes buys and consumes these articles. If, owing to the desire to save, it refrains from spending the whole of its money income, the whole of the consumable articles produced cannot be sold. Over-supply is, in consequence, caused ..." (Mummery, Albert Frederick and Hobson, John Atkinson, 1889, pp. 98-99).

Further on, Sir William offers an embryonic Keynesian income-expenditure theory with the following:

On the other side, if the largeness of a publick Exhibition should leave less money then is necessary to drive the Nations Trade, then the mischief thereof would be the doing of less work, which is the same as lessening the people, or their Art and Industry; for a hundred pound[s] passing a hundred hands for Wages, causes . . . 10000£. worth of commodities to be produced, which hands would have been idle and useless, had their not been this continuous motive [demand for] . . . their employment (Petty, 1662, p.36).

In this passage, Petty also renders his own nascent theory of the multiplier when he refers to income "passing a hundred hands for wages." Consequently, Sir William's embryonic income-expenditure theory is one in which increases in disposable income have multiplicative effects on aggregate demand and therefore, output and employment. Petty's incipient income-expenditure theory is one in which, first, an increase in disposable income resulting from a fiscal surplus augments domestic consumption, an important independent variable in his theory. Then, this increase in demand has a multiplicative effect on output and employment. In Petty's conceptualized reality, as described in Chapter III, it was the role of the merchant to trade the superfluous commodities of one nation for those of another, as well as to trade the superfluous commodities produced within the various regions of the same country (Petty, 1662, p. 28). The amount that the merchant was willing to invest in such goods depended on the relationship between the rate of interest and the rate of profit that the merchant could, then, expect to earn on his stock of commodities. In his rudimentary interest-profit analysis of investment, Sir William distinguished between payments of rent and interest payments. He put it in this way: "But before we talk too much of Rent, we should

endeavor to explain the mysterious nature of them, with reference as well to Money, the rent of which we call usury; as to that of Lands and Houses, afore-mentioned"(Petty, 1662, p. 42). Hence, the surplus earned from land was considered rent and the payment received for money lent was interest income. The owners of both of these assets (land and money) were the peerage (upper nobility) and gentry (lower nobility).

As mentioned in the section on Petty's conceptualized reality, the merchants depended on the nobility, along with the embryonic depository institutions, to finance their stock of goods in transit. The income earned from the merchant's stock was considered profit by Petty. Concerning this, he writes: " ... we must enquire, how much all of the People could earn [from labor] ... and compare that summ, with the Total expense above mentioned; deducting the Rents, and Profits of their Land, and Stock ... (Petty, 1690, p. 307; emphasis added). Thus, in Sir William's concept of the distribution of income, he made the distinction between the rent receivers, peerage and gentry and the profit receivers (merchants).

The merchant's profit was then determined by the difference between the price at which he could sell his stock and the cost of purchasing it, which included the rate of interest. Thus, while commenting on the lack of trade in Ireland, Petty offers this:

Note, that Interest in Ireland is 10 per Cent, which is a great hindrance to Trade; since the Interest must enflame [increase] the price of Irish Commodities, and consequently give to other Nation's the means of underselling (Petty, 1691b, p. 187).

To Petty, a high rate of interest meant a higher cost to the merchant and therefore, required him to increase the price of his goods in order to maintain his profit margin. Thus, in a Keynesque fashion, the rate of interest and the rate of profit are in conflict.

Moreover, the rate of interest in Sir William's mercantile economy anticipated the Keynesian notion in an entrepreneurial economy that "the rate of interest on money plays a peculiar part in setting a limit to the level of employment, since it sets a standard to which the marginal efficiency of a capital-asset must attain if it is to be newly produced" (Keynes, [1936] 1964, p. 167). In Petty's economy, the interest rate set a similar limit on employment, in that it determined whether or not a merchant would invest in new goods for trade.

Petty had an underdeveloped theory of international trade that depended on the concept of absolute advantage. Thus, countries gained control of international markets by enjoying better natural resources or by having artisans that were more highly skilled. In this regard, Sir William notes that one country which "can undersel[l] others ... [has] natural and intrinsick advantages ... [by which it] may easily have the Trade of the World ..." (Petty, 1690, p. 258). Similarly, while presenting his reasons why England has to import certain commodities, he writes that it is "[b]ecause our Soyl will not bear so good or in so great a quantity ... [and] [b]ecause our people are not so well practi[s]ed or encourag[e]d or disciplin[e]d in the making or producing of them" (Petty, 1927, vol. 1, pp. 209-210).

There was a monetary aspect to international trade that was also important in Petty's macroeconomic analysis. Namely, the actual process of international trade could generate an inflow of specie which would increase the money supply. Hence, Sir William notes: "But the Labour of Seamen, and Freight of Ships, is always of the nature of an Exported Commodity, the overplus whereof, above what is imported, brings home

mon[e]y, etc." (Petty, 1690, p. 260).

The theories described above were the tools used by Sir William Petty to manipulate the independent variables in his model, domestic consumption and foreign consumption of domestically produced output, in such a way as to predict changes in the dependent variables, employment and ultimately, output in the short run.

In Chapter VIII of Political Arithmetic, Petty reveals employment as his dependent variable, while illustrating his concept of full-employment income. He first estimates the total expense of the nation to be 70 million £.. He then attributes "three parts of seven [of national income] ... to the Rent of Land, and the Profits of all Personal Estate[s], Interest of mon[e]y, etc...." Petty, 1690, p.307). The remaining four parts in seven, or forty million £., Sir William estimates to be the income of labor. He then deduces the potential income of workers to be "two Millions per annum more than they now [earn] ... and [moreover] that there are also Employments, ready, proper and sufficient for that purpose" (Petty, 1690, p. 307).

Sir William's formal analysis may be interpreted as proof of his central proposition that the economy is incapable of generating full employment left to its own devices. Having described Petty's demand-driven macroeconomic model for the determination of short run output and employment, it is now appropriate to present his policy recommendations which flow from the analysis and conclusions stemming from his macroeconomic model.

Petty's Policy Recommendations

Sir William Petty's vision for the future was one of increasing wealth for the nation state, as described above, which would exist within the framework of a strong central government as proposed by Hobbes in Leviathan. To achieve this "ultimate social goal" (Jensen, 1984, p. 77), the potential level of short run output and employment as described in his model must be maintained. Thus, Petty's policy recommendations, which emanated from his macroeconomic analysis, were aimed at increasing output and employment. As mentioned above, money matters in Sir William Petty's macroeconomic world. With that in mind, it is appropriate to present his recommendations for monetary policy, which will include his policy recommendations for the interest rate. That will be followed by a discussion of Petty's recommendations for fiscal policy including Keynesian type proposals of make-work programs, and finally, his recommendations for trade policy.

Petty was concerned that the merchants have sufficient liquidity to carry on their trade. Consequently, he makes various proposals for the establishment of a bank. Thus, in Chapter I of Political Arithmetic, he cites the Dutch bank as one reason for Holland's commercial success. In this regard, he notes that "[t]heir [the Dutch] third policy is their Bank, the use whereof is to encrease Mon[e]y, or rather to make a small summ equivalent in Trade to a greater . . . "(Petty, 1690, p. 265). Later, in the same passage, Petty enthusiastically recommends the establishment of an English bank, one based on the Dutch model, because such a bank would allow for a sufficient money supply to drive

the nation's trade. In this regard, he writes the following:

As for example, suppose a Hund. thous. Pounds will drive the Trade of the Nation, and suppose there be but Sixty-thousand Pounds of ready Money in the same; suppose also that twenty thous. Pounds will drive on and answer all Payments made of under 50£. In this case Forty of the Sixty being put into the Bank, will be equivalent to Eighty, which eighty and twenty kept out of the Bank do make up an Hundred, [that is to say] enough to drive the Trade as was proposed . . . (Petty, 1690, p 265).

Here, Petty appears fully aware of the money creation potential of a fractional reserve banking system. He notes that placing forty thousand pounds in a financial institution would double the money supply to eighty thousand pounds, apparently assuming a money multiplier of two. This money creating potential may have provided Sir William with another reason for favoring the establishment of a bank.⁵⁸

In Quantulumcunque Concerning Money, Sir William is again explicit in his desire to see a bank established in England to ensure a sufficient money supply. In this regard, he renders the following:

Qu. 26. What remedy is there if we have too little money?

Answ. We must erect a Bank, which well computed, doth almost double the Effort of our coined Money: And we have in England Materials for a Bank which will furnish stock enough to drive the Trade of the whole Commercial World (Petty, 1695, p. 446).

Petty, although less concerned about the possibility of England having too large a supply of money, offers a simple solution if that situation should arise with the

⁵⁸Consistent with Petty's desire to see a bank established in England and/or Ireland were his proposals for a land registry which would, among other things, reduce the risk involved in a land bank by more precisely controlling the collateral. For example, he writes: "... [then] the said lands shall not only become as money, but as a Bank of money, which is far more safe and commodious than coynes" (Petty, 1662, p.78). In a similar vein, he proffers the following recommendation to King James II: "... erect a Registry of Lands, which may [in] effect coyne lands into mon[e]y" (Petty, 1927, vol. 1, p. 257).

following:

Qu. 27. What if we have too much Coine?

Answ. We (the government) may melt down the heaviest, and turn it into the Splendor of Plate, in Vessels or Utensils of Gold and Silver, or send it out, as a Commodity, where the same is wanting or desired; or let it out at Int[e]rest, where Int[e]rest is high (Petty, 1695, p. 446).

Petty felt that a low rate of interest was the cause of prosperity. Therefore, when referring to the low rate of interest in Holland, he writes: "As for lowness of interest [in Holland], it is also the necessary effect and not the fruit of their contrivance" (Petty, 1690, p. 261). Hence, he favors policies that affect the causal factors that determine the rate of interest, most specifically, the size of the money stock. In this regard, Sir William notes that "[t]he natural fall of Interest is the effect of the increase of money" (Petty, 1690, p. 304). Consequently, his policy recommendations vis-a-vis the interest rate were aimed at its major causal factor, the size of the money supply. For example, his proposals for a bank, described above, were aimed, at least partially, at lowering the rate of interest by increasing the money supply through the money multiplier.

For much the same reason, Petty's foreign trade policies, as we shall presently see, were aimed at encouraging a favorable balance of trade. Such a balance would result in an increase in the money supply through the inflow of specie, which would have the beneficial effect of lowering the rate of interest.

Sir William's policy recommendations concerning foreign trade were ultimately designed to stimulate domestic output and employment at the expense of foreign output and employment; a sort of "beggar-thy-neighbor" scheme. To Petty, an inflow of precious metals from abroad, which would bring about a surplus in the balance of

payments, was a goal of foreign trade, as it was for most of his contemporaries. However, the purpose of his recommendations was not to secure a treasure of precious metals, but rather to obtain a high level of output and employment.⁵⁹ Therefore, as mentioned above, Petty's design in acquiring an inflow of precious metals from a favorable balance of trade was to ensure a lower rate of interest.

Consistent with his belief that employment ought to be the goal of trade policy, Petty proposes higher customs on manufactured imports than on unwrought imports. In Chapter VI of A Treatise of Taxes and Contributions, Sir William offers the following:

The Measure of Customs upon imported Commodities are; I. That all things ready and ripe for Consumption may be made somewhat dearer then the same things grown or made at home, if the same be feasible ceteris parabus

On the contrary, all things not fully wrought and Manufactured, as Raw Hides, Wool, Beaver, Raw-silk, Cotton; as also all Tools and Materials for Manufacture, as also Dying-stuff, etc. ought to be gently dealt with [in terms of customs duties] (Petty, 1662, p. 56).

As for excise taxes on exports, Petty, is again concerned about the potential impact on aggregate demand and ultimately, output and employment. In this regard, he notes that "[t]he Measures of Customs outwards may be such, as after reasonable profit to the Exports will leave such if our Commodities as are necessary to Foreigners somewhat cheaper unto them then they can be had from elsewhere" (Petty, 1662, p. 55). Sir William is obviously aware of the importance of having English products be

⁵⁹E. A. J. Johnson coined the term "foreign-paid- income" theory of trade to describe the proponents of this goal during the mercantilist period. He describes its development, as well as its significance during this period in Chapter XV of Predecessors of Adam Smith (Johnson, ,1937, pp. 301-384). Sir James Steuart expresses this concept most lucidly with the following: "It is therefore a general maxim, to discourage the importation of work and to encourage the exportation of it" (Steuart, [1805] 1967, vol. 2, p. 2).

competitive in international markets because of its ultimate effect on aggregate demand.

Among Petty's proposals for trade policy was one for import substitution. Thus, he noted that "the value ... of all the Commodities Imported into, and spent in England, ... might by diligence be produced and Manufactured here" (Petty, 1690, p. 309).

However importantly Petty may have viewed a favorable balance of trade, he still recognized the significance of foreigners being able to purchase English goods; and thus, advocates a free trade policy with a qualification. Sir William offers the qualification with the following:

As for the Prohibition of Importations, I say that it need not be, until they much exceed our Exportations. For if we should think it hard to give good necessary Cloth for debauching Wines, yet if we cannot dispose of our Cloth to others, 'twere better to give it for Wine or worse, then to cease making it, may, better to burn a thousands mens laborers for a time, then to let those thousand men by non-employment lose their faculty of labouring (Petty, 1662, p. 60).

Here, Petty is advocating a policy of free trade, except when England faces a very unfavorable balance of trade, because such a policy will create foreign markets for English-made goods.⁶⁰

Sir William was also clearly concerned about the effect that the fiscal system could have on the level of economic activity in the newly emerging economies of

⁶⁰Petty's position within the Kingdom (England, Ireland, and Scotland) was that tariffs were to be strictly prohibited. Thus, he writes: "It is inconvenient that the same King's Subjects should pay Customs as Aliens, passing from one part of...their own King's Territories to, another" (Petty, 1691b, p. 160). Similarly, he writes: "...England sometimes by Prohibiting the Commodities of Ireland, and Scotland, as of late it did the Cattle, Flesh, of Ireland, did not only make Food, and consequently Labour, dearer in England, but also hath forced the People of Ireland, to fetch those Commodities from France, Holland, and other places, which before was sold them from England, to the great prejudice of both Nations" (Petty, 1690, p. 299).

England and Ireland.⁶¹ In A Treatise of Taxes and Contributions, his policy recommendations illustrate this concern. Here, Petty states "[t]hat if the Sovereign were sure to have what he wanted in due time, it were [to] his own great damage to draw away the money [in taxes] out of his Subjects hands, who by trade increase it, and to hoard it up in his own coffers, where 'tis no use even to himself . . ." (Petty, 1662, p. 32). This rather remarkable passage from Petty reveals the importance of fiscal policy in determining employment and output in the short run. In this excerpt, Petty makes it apparent that if the King ran a budget surplus, it would reduce aggregate demand because of its detrimental impact on domestic consumption. Implicit in this statement is the notion that such a surplus would reduce disposable income⁶² and that this was the factor that reduced consumption.

Petty makes his advocacy of employment for the involuntarily unemployed quite

⁶¹Petty believed that the sole purpose of taxation should be the financing of government expenditures and should not, therefore, entail any redistributive aspects. Consequently, for a tax to be equitable according to him, it had to be proportional. In this regard, he offers the following: "Let the tax be never so great, if it be proportional unto all, then no man suffers the loss of any riches by it. For men...if the Estates of them all were halved or doubled, would in both case be equally rich" (Petty, 1662, p. 32). Consistent with his concept of fairness, Petty writes that "...there are two sorts of riches, one actual and the other potential. A man is actually or truly rich according to what he eateth, drinketh, weareth, or in any other way really and actually enjoyeth; others are but potentially or imaginatively rich" (Petty, 1662, p. 91). On this basis, Sir William concludes that taxes should be excise, that is, they should be based on consumption. Moreover, this type of taxation ensures equity because "...No man payes double or twice for the same thing, forasmuch as nothing can be spent but once; ...otherwise men pay both by the Rent of their Lands, by the Smoaks, by their Titles, and by customs,... they also pay by Benevolence and by Tythes" (Petty, 1662, p. 95).

⁶²Petty's concept of disposable income is clearly stated in the following passage: "The gross Produce of the whole Revenue in the year 1683 was 300085£.: So as the [net] disposable Revenue might be about 270000£." (Petty, 1687d, p. 586).

clear in his writings. In Chapter II of A Treatise of Taxes and Contributions, he observes "that we finde out certain constant Employments for all other indigent people, who labouring according to the Rule upon them, may require a sufficiency of food and raiment" (Petty, 1662, p. 29). As to what these employments should be, Petty continues:

I answer, such as were reckoned as the sixth Branch of the Publick Expençe, viz. making all High-wayes so broad, firm, and eaven, as whereby the charge and tedium of travelling and Carriages may be greatly lessened. The cutting and scrowing of Rivers into Navigable, the planting of usefull Trees for timber, delight, and fruit in convenient places. The making of Bridges and Cawseys. The working in Mines, Quarries, and Collieries, The manufactures of Iron, etc. (Petty, 1662, p. 29-30).

As to who should pay these workers, Petty responds: "I answer every body" (Petty, 1662, p. 30). These workers would then be paid, as was the case with other public charges, with tax revenue.

The employment of the involuntarily unemployed was so important to Sir William Petty that he recommends "make-work" jobs for these workers, as evidenced in this previously cited quotation:

Now as to the work of the supernumeraries, let it be without expence of Foreign Commodities, and then 'tis no matter if it be employed to build a useless Pyramid upon Salisbury Plain, bring the Stones at Stonehenge to Tower-Hill, or the like; for at worst this would keep their mindes to discipline, and obedience, and their bodies to a patience of more profitable labours when need shall require it (Petty, 1662, p. 31).⁶³

⁶³This is identical to the policy advocated by John Maynard Keynes for a depressed economy nearly three hundred years later. Keynes writes: "If the Treasury were to fill old bottles with banknotes, bury them at suitable depths in disused coal mines which are then filled up to the surface with lawn rubbish, and leave it to private enterprise on well-tried principles of laissez-faire to dig the notes up again (the right to do so being obtained, of course, by tendering for leases of the note-bearing territory), there need be no more unemployment and, with the help of the repercussions, the real income of the community, and its capital wealth also, would probably become a good deal greater than

Petty's proposal for public works expenditures stems from his macroeconomic model, one in which underconsumption was indeed a real possibility.⁶⁴ These suggested programs were designed to increase domestic consumption during recessionary periods. This is stressed in the beginning of the excerpt, when Sir William admonishes that " . . . the work of the supernumeraries . . . be without [the] expence of Foreign Commodities." For then, the stimulative effects of these make-work programs would be lessened.

Having presented Sir William Petty's macroeconomic theories, as well as his overall macroeconomic model, and the policy recommendations that emanated from those theories and that model, we will now interpret the macroeconomics of Nicholas Barbon.

it actually is. It would, indeed, be more sensitive to build houses and the like; but if there are political and practical difficulties in the way of this, the above would be better than nothing" (Keynes, [1936] 1964, p. 129).

⁶⁴Petty's purpose in advocating this policy was two-fold. First, the workers should not lose their skills which would be one result of their unemployment. He makes this quite explicit when he notes that it would be "better to burn a thousand mens labours for a time, then to let those thousand men by non-employment lose their faculty of labouring" (Petty, 1662, p. 60). Secondly, he hoped to promote the welfare of the population, which he expressed in the Preface of The Political Anatomy of Ireland (Petty, 1691b, p. 130). Keynes, on the other hand developed his model for the purpose of solving the economic problem by which he meant the poverty of the working class. Keynes puts it this way: "...the author of these essays [Keynes],...believes that the day is not far off when the economic problem will take a back seat, where it belongs, and that the arena of the heart and head will be occupied, or reoccupied by our real problems-the problems of life and of human relations, of creation and behaviour and religion" (Keynes, 1972, p. xviii). He later estimates that "the economic problem may be solved, or be at least within sight of solution, within a hundred years" (Keynes, 1972, p. 326).

CHAPTER VI

THE MACROECONOMICS OF NICHOLAS BARBON

In an analytical process similar to the one followed by Sir William Petty, Nicholas Barbon constructed a model along with a series of theories that he employed in order to explain and predict the behavior of the model. As with Petty, Barbon's macroeconomic analysis led him to a number of conclusions, on the basis of which he formulated a number of policy recommendations.

The constants in Nicholas Barbon's macroeconomic model are the economic actors and the institutional elements that undergird his conceptualized reality. The two most important groups of actors in Barbon's macroeconomic model are the merchants, and the peerage and gentry, because of their important roles in determining aggregate demand, his ultimate independent variable. It is the merchant's role, by engaging in the process of trade, to meet and perhaps stimulate the consumption demands of the other three economic classes; namely, the artificers, the foreign consumers of domestic output and most importantly, the peerage and gentry. This last socioeconomic class (peerage and gentry) is especially significant because they alone have the means to satisfy the wants of the mind. The spending of the peerage and gentry on goods that satisfy those desires is a significant component of aggregate demand.

The most important institutional element that Nicholas Barbon abstracted from his conceptualized reality and included in his macroeconomic model is money. As was the case with Petty, Barbon's economy is monetary. In conjunction with the monetary nature

of his reality, Barbon included the embryonic banking enterprises which were necessary to provide sufficient liquidity for trade in the possible absence of an adequate money supply.

The independent variables in Barbon's macroeconomic model are then the determinants of aggregate demand. In his open model of the macroeconomy, they are domestic consumption, investment and foreign consumption of domestic output. These components of spending comprise the ultimate independent variable that is the driving force in his economic system, aggregate demand.⁶⁵ Aggregate demand, in turn, determines the level of output and employment in the short run, Barbon's dependent variables.

To understand Nicholas Barbon's overall macroeconomic model, it is now necessary that the economic theories he used to manipulate the independent variables in his model be discussed. An important attribute of his macroeconomic model, as mentioned above, is its monetary features. A discussion of Barbon's monetary economics follows.

⁶⁵As previously mentioned the dependent variable and the ultimate independent variable are similar in the Keynesian System and the Barbonian system. This is apparent in the following by Keynes "...whilst the volume of employment...depends on the aggregate demand function given by his [the entrepreneurs] expectations of the sum of the proceeds resulting from consumption and investment respectively" (Keynes [1936], 1964, p. 77; emphasis added). A primary difference between the two systems is that the Keynesian model is a closed model and Barbon's system is an open system. That is, foreign trade is very important in the Barbonian world.

Barbon's Monetary Economics

Barbon had a cartelists view of money; that is, the physical characteristics of money, specifically its metallic content, did not ultimately determine its value. His cartelists conception stems from his theory of value.⁶⁶ Barbon first notes that "Gold and Silver are [but] commodities as well as Lead or Iron; and according to their Plenty or Scarcity will make those things that are made of them Dearer and Cheaper" (Barbon, 1696, p. 7). Later he concludes:

Now if the Value of all things arise from their use: If Plenty or Scarcity makes things Dear or Cheap: If Silver be a Commodity for several uses, and more plentiful in some places than in others; then it must necessarily follow that Silver can have no Certain or Intrinsic Value, and if Silver be of an uncertain Value, then it can never be the instrument of Commerce and Traffick: For, that which is uncertain in its own Value, can never be a certain Measure of another Value (Barbon, 1696, p. 8, emphasis added).

Thus, Barbon categorizes precious metals as being merely another commodity. Therefore, they have their value determined within the context of his subjective theory of value. Moreover, the value of the precious metals is volatile, as is the case with other commodities. Hence, Barbon is led to his cartelists position.

He first states this view in A Discourse of Trade with the following: "Mon[e]y

⁶⁶Barbon's cartelists position is consistent with his subjective theory of value. This theory of value is hinted at throughout his economic writings. Barbon's most explicit definition of the principle is given in the following: "The Price of Wares is the present Value; and ariseth by computing the occasions or use for them [demand for goods], with the Quantity to serve that Occasion [supply of goods], for the value of things depending on the use of them, the over-pluss of those Wares, which are more than can be used, become worth nothing; so that Plenty, in respect of the occasion, makes things cheap; and Scarcity dear" (Barbon, 1690, p. 18). The differing theories of value between Petty and Barbon, with Petty having an embodied labor theory of value, can be at least partially explained by the important role of natural law in Petty's reality, and the lack of that philosophical input in Barbon's conceptualized reality.

is a Value made by a Law; and the Difference of its Value is known by the Stamp and the Size of the Piece" (Barbon, 1690, p. 20). Not surprisingly, in A Discourse Concerning Coining the New Money Lighter in Answer to Mr. Lockes Considerations about Raising the Value of Money, Barbon reemphasizes his cartelists views on money because those views (Barbon's) are at the heart of his disagreement with John Locke concerning the recoinage debate.⁶⁷ These opinions are most fully expressed in the following observation:

. . . there is no Intrinsic Value in Silver, or any fixt or certain Estimate that common consent has placed on it; but that it is a Commodity, and riseth and falleth as other Commodities do.

. . . Money is the instrument and measure of commerce, and not Silver.

. . . it is the Instrument of Commerce from the Authority of that Government where it is Coined; and that by the Stamp and Size of each piece the value is known.

. . . Money differs from Uncoined Silver in this, that the Authority of the Government gives a fixt and certain value to each piece of Money, which is generally beyond the value of Silver in it.

. . . it is the Money that men give, take and contract with all other Commodities, and which they estimate the value of all other things, having regard more to the stamp and curr[e]ncy of the Money, than to the quantity of Silver in each piece (Barbon, 1696, preface; emphasis added).

Barbon then expands his cartelists conceptions by suggesting that all money need merely be "fiat" money. In this regard, he offers the following:

It is not absolutely necessary, [that] Mon[e]y should be made of Gold or Silver; for having its sole Value from the Law, it is not Material upon what Metal the Stamp be set. Mon[e]y hath the same Value and performs the same Uses; if it be made of Brass, Copper, Tin or anything else (Barbon, 1690, p. 21).

From the above, it is apparent that Barbon had an advanced definition of money

⁶⁷See footnote 41 for sources that provide a more complete presentation of that controversy.

that emanated from his cartelism views. Specifically, he attempted to define money by its functions, particularly as a standard of account and a medium of exchange, rather than by the intrinsic value of its metallic content.

Having determined that the "[v]alue of Money aris[es] from the Authority of Government" (Barbon, 1696, p. 15), Nicholas Barbon concludes that the exchange rate of coins between countries is also determined by the stamp of the coins and not by the intrinsic value of their metallic content. He puts it this way:

. . . it will be found to be a vulgar Error [that the exchange rate of coins is determined by the metallic content of the respective pieces]; and that the Par of money [exchange rate] is made by computing the Valuation that the several Governments set on their Coins; which is not from the equal Quantity of Silver in each piece of money. For there is scarce two Mints that agree in the Standards of their coin (Barbon, 1696, p. 19; emphasis deleted).

Barbon buttresses his cartelism position on international exchange rates among coins by noting that "[t]he Pound Troy is divided into a number of pieces differing in their weight, and that no two mints divide their money alike" (Barbon, 1696, p. 20). Thus, he concludes that "[t]his difference in the Standards of the several Mints and in the unequal division of their money, shows plainly that there is no common agreement about the quantity of Silver in their Coins . . ." (Barbon, 1696, p. 21). Therefore, the stamp of the coins determines their comparative value and not any intrinsic metallic content.

With the Barbonian concept of "what money is" in mind, it is now appropriate to analyze his monetary theory. Nicholas Barbon theorized that money had an important impact on the real economy. In other words, his macroeconomic world is one in which

money matters in the Keynesian-Davidsonian sense. Therefore, if the supply of money falls below a certain level, it will have a depressing effect on aggregate demand which Barbon notes in the following passage: ". . . When money is wanting, men consume less: They are better Husbands, and make everything last longer; which lessens the consumption of the Native Commodities [and thereby lessens aggregate demand]" (Barbon, 1696, p. 93). Hence, an adequate money supply is needed in the Barbonian world to maintain a high level of short run output and employment.

Barbon was also concerned about specie movements between countries possibly causing an inadequate domestic money supply. Thus, in A Discourse of Trade, the scholar, while discussing the disadvantage of making money out of gold or silver, opines the following: ". . . though this may be a Conveniency to the Merchant, it [the ability to move "specie" from one country to another in response to changes in the price of bullion] often proves a Prejudice to the State by making Mon[e]y Scarce" (Barbon, 1690, p. 24). In A Discourse Concerning Coining the New Money Lighter in Answer to Mr. Lock's Consideration about Raising the Value of Money, the overriding message is that the newly recoined money should be made lighter to ensure an adequate supply of money to stimulate and maintain trade. Making the new coins lighter was a form of devaluation which would work in the following fashion. If silver coins were devalued by 25%, new silver coins would contain 75% of the standard Mint weights of the old coins. Thus, in this particular example, the quantity of silver coins corresponding to a given weight of silver could be increased by 33%.

Barbon expresses the impact such a devaluation of coins could have on the money

supply with the following: "The Effects of raising the Value of Money [coining the new money lighter], are: That it increases the Species of the Money [the size of the money supply], and preserves it in the Country where 'tis coin'd" (Barbon, 1696, p. 85; emphasis deleted). The concluding phrase of the above quote expresses Barbon's opinion that the incentive to melt coins down, clip them, or transfer them to countries where the price of bullion is above the face value of the coins would be eliminated or greatly lessened if the new money had a smaller metallic content. Further, he notes that "...if the Money be Rais'd above the price of Bullion, it will not be in the Interest of Goldsmiths and Merchants to melt it down" (Barbon, 1696, p. 85). Thus, it is Barbon's notion that devaluation would help ensure an adequate money supply to drive the nation's trade.

The relationship between the size of the money supply and the level of trade, employment and the general welfare of society is, then, explicitly stated in various places in the concluding chapter of the above tract. For example, he renders the following:

. . . if the Money be not rais'd, the Mischiefs will be real, and Consequences very fatal to the Nation.

For, if the money be new-coin'd according to the old Standard [one with a higher metallic content], it will be certainly melted down, and carried away as fast as 'tis coin'd, ... and the Nation will be left without money: The Consequence whereof will be; that Trade will be at a stand[still]; the prices of all Commodities will fall; And a general Poverty and Clamour over the whole Nation will ensue (Barbon, 1696, p. 92).

Moreover, in the same vein Barbon notes in his conclusion:

Besides [there will be] the preventing [of] those fatal Consequences that follow Coining the Money too weighty; [such] as the Loss of the Money; Decay of Trade; the Fall of Rents; And a general Poverty and Clamour all over the Nation (Barbon, 1696, p. 96).

Nicholas Barbon has a view of the macroeconomy in which money definitely does matter in the Davidsonian sense. That is, money is a major force in determining aggregate demand and therefore, the volume of final output and employment.

Barbon's theory of the rate of interest is not a monetary theory in the sense of a liquidity preference theory and therefore, it will be included in the discussion of his theory of investment in the following section. As with Petty, Barbon's monetary and real sectors of the economy are combined in his macroeconomic analyses. A discussion of that synthesized macroeconomic system follows.

Barbon's Synthesized System of Macroeconomics

As mentioned above, consumption is an important component of aggregate demand in Nicholas Barbon's macroeconomic world. His theory regarding this component of spending is underconsumptionist in nature. In Chapter V of A Discourse of Trade, Nicholas Barbon presents his underconsumptionist argument with the following observation:

The Chief Causes that Promote Trade, ... are Industry in the Poor, and Liberality in the Rich: Liberality is the free usage of all those things that are made by the Industry of the Poor, for the use of the Body and Mind. It relates chiefly to Man's self, but doth not hinder him from being Liberal to others.

The Two Extrems to this Vertue are Prodigality and Covetousness: Prodigality is a Vice that is prejudicial to the Man, but not to Trade; . . . Covetousness is a Vice prejudicial both to Man & Trade; It starves the Man, and breaks the Trader; and by the same way the Covetous Man thinks he grows rich, he grows poor; for by not consuming the Goods that are provided for Man's Use, there ariseth a dead Stock, called Plenty [a general glut], . . . And a Conspiracy of the Rich Men to

be Covetous, and not spend, would be as dangerous to a Trading State, as a Foreign War; for though they themselves get nothing by their Covetousness, nor grow the Richer, yet they would make the Nation poor ... (Barbon, 1690, pp. 62-63).

Thus, prodigality is described as being beneficial to the nation, whereas covetousness is deemed biased for the nation as a whole. Hence, a high propensity to consume is obviously a driving force in the Barbonian system.

Moreover, domestic spending not only affects output, but also affects employment. In this regard, Barbon notes:

Building is the chiefest Promoter of Trade; [because] it Imloys a greater Number of Trades and People, than Feeding or Cloathing: The Artificers that belong to Building, such as Bricklayers, Carpenters, Plasterers, etc. [employ many hands]; Those that make the Materials for Building, such as Bricks, Lyme, Tyle, etc. [employ more]; and with thos that Furnish the Houses, such as Upholsters, Pewterers, etc. they are almost Innumerable (Barbon, 1690, p. 68; emphasis deleted).

Barbon has isolated three different types of spending; they are, specifically, expenditures on food, clothing and furnishing, and building. These three types of outlays then represent the domestic spending component of aggregate demand in Barbon's model. Furthermore, the expenditures which most increase output and therefore employment, are those that are to be most desired by the nation. Therefore, in the above passage, he identifies building as the chiefest promoter of trade.

Later, while further describing the importance and impact of domestic spending on output and employment, Barbon describes the benefits that spending on clothing and furnishing will have on trade. First, he writes:

. . . Fashion or the alternation of Dress, is a great promoter of Trade, because it occasions the Expense of cloaths, before the Old ones are worn out: It is the Spirit and Life of Trade; . . . The Promoting of New

Fashions, ought to be Encouraged, because it provides a Livelihood for a great Part of Mankind (Barbon, 1690, pp. 65, 67; emphasis deleted).

Subsequently, in a Veblenesque manner, Barbon renders the following:

. . . by Enlarging of Cities; the Two Beneficial Expenses of Cloathing and Lodging, are Increased; Man being Naturally Ambitious, the Living together, occasion[s] Emulation, which is seen by Out-Vying one another in Apparel, Equipage, and Furniture of the House; whereas, if a Man lived Solitary alone, his chiefest Expense would be Food (Barbon, 1690, p. 69).

Thus, because of the emulative effects of expenditures on clothing and furnishings, such spending is a great promoter of trade, especially when compared to expenditures on food.

Nicholas Barbon perceives of domestic spending as being a major component of aggregate demand. He encourages it as a stimulative factor in the economy to the point of promoting conspicuous consumption. Having examined Nicholas Barbon's theory of domestic spending, his theory of investment will now be presented. The discussion will begin with his theory of the rate of interest.

In Chapter III of A Discourse of Trade, Barbon presents his theory of the rate of interest. His concept of the interest rate is clearly rendered in the following passage:

Interest is the Rent of Stock and is the same as the Rent of Land: The First is the Rent of Wrought or Artificial Stock [real capital]; the Latter of the Unwrought or Natural Stock [land and sea and the natural resources they contain].

Interest is commonly reckoned for Mon[e]y, because the mon[e]y Borrowed at Interest, is to be repayed in Mon[e]y; but this is a mistake: For the Interest is paid for Stock: for the Mon[e]y borrowed, is laid out to buy Goods, or pay for them before bought: No Man takes up Mon[e]y at Interest, to lay it by him, and lose the Interest of it (Barbon, 1690, pp. 31-32).

Having defined interest as a payment for wrought or artificial stock, Barbon then describes the relationship between interest and profit. In this regard, he offers the

following:

. . . It [the rate of interest] is the Rule by which the Trader makes up the Account of Profit and Loss; the Merchant expects by Dealing, to get more than Interest by his Goods; because of bad Debts, and other Hazards which he runs; and therefore, reckons all he gets above Interest, is Gain; all under, Loss, if no more than Interest, neither Profit nor Loss (Barbon, 1690, p. 32).

It is apparent from the above musings of Nicholas Barbon that the interest rate is an important variable in his theory of investment. The merchant measures his profit or loss by comparing the return on his merchandise with the rate of interest, and will engage in trade as long as the former is above the latter. Not surprisingly, this passage indicates that Barbon has a similar view of the relationship between the return on "circulating capital" (Smith, [1776] 1976, p. 279) and the rate of interest in a mercantile economy, that Keynes had on the relationship between the "marginal efficiency of capital" (Keynes, [1936] 1964, p. 135-136) and the rate of interest in an entrepreneurial economy. In other words, Barbon had an interest-profit theory of investment for his mercantile economy. Having described Nicholas Barbon's theories of consumption and investment, a discussion of his theory of foreign trade will be presented.

Barbon's theory of international trade was based on absolute advantage. Countries gain an advantage in international markets by benefitting from natural endowments or acquired advantages in the form of more advanced skills (art), which allows them to sell their goods at lower prices than other countries. For example, as a result of its natural resources and climate, a country could produce natural wares more cheaply, and similarly, by acquiring and enhancing its art, it could produce artificial wares more cheaply.

Hence, various economies have advantages in the production of different "[s]taple [c]ommodities" (Barbon, 1690, p. 3). Subsequently, Barbon lists the staple commodities of several countries:

Thus, Herrings, and other Fish are the Staples of Holland; the Dutch living amongst the Water, are most naturally inclined to Fishing: English Wool being the best in the World, is the staple of England, ... Spices are the Staple of Holland; and the making of Glass and Paper were the Staple of Venice (Barbon, 1690, pp. 4-5; emphasis deleted).

Interest payments were also a relevant cost of production and therefore, were included in Barbon's theory of international trade. In this regard, he writes:

The next Cause of the Decay of TRADE in England,... is, That Interest is higher in England, than in Holland, and other places of great Trade: It is at Six per cent in England, and at Three [percent] in Holland; . . .

Interest is the Rule of Buying and Selling: And being higher in England, than in Holland; the English Merchant Trades with a Disadvantage, because he cannot Sell the same sort of Goods in the same Port, for the same Value as the Dutch merchant. The Dutch merchant can sell 100£. worth of Goods for 103£. and the English Merchant must sell the same sort, for 106£. to make the same Account of Principal and Interest (Barbon, 1690, pp. 79-80; emphasis deleted).

There are two other aspects of international trade that are important to consider in Barbon's macroeconomic model of short run output and employment. They are highlighted in the following passage:

. . . It is not Necessity that causeth the Consumption [of foreign goods], Nature may be Satisfied with little; but it is the wants of the mind, Fashion and Desire of Novelties, and Things scarce, that causeth [foreign] Trade. A Person may have English-Lace, Gloves, or Silk, as much as he wants, and will buy no more such, and yet, lay out his Mon[e]y on a Point of Venice, Jessimine-Gloves, or French-Silks; he may desire to Eat Westphalia Bacon, when he will not [eat] English; so that, the Prohibition of Foreign Wares, does not necessarily cause a greater Consumption of the like sort of English.

Besides, There is the same wants of the Mind in Foreigners, as in

the English; they desire Novelties, they Value English-Cloth, Hats, and Gloves, and Foreign Goods, more than their Native make; so that, tho' the Wearing or Consuming of Foreign Things, might lessen the Consuming of the same sort in England; yet there may not be a lesser Quantity made, and if the same quantity be made, it will a greater Advantage to the Nation, if they are Consumed in Foreign Countries, than at Home; because the Charge, and Imploy of the Freight, is gained by it, which in bulky Goods, may be a Fourth Part of the whole Value (Barbon, 1690, pp. 72-74).

First, he notes that the demand for foreign products is primarily derived from wants of the mind and not from wants of the body. Therefore, the consumption of foreign commodities should not, to any extent, hinder the consumption of domestic commodities. Moreover, foreigners also have wants of the mind, which would be a boon to the aggregate demand for English products. Secondly, the process of foreign trade would itself generate additional output and employment that could, from Barbon's perspective, be as much as a fourth part of the whole value in the case of bulky goods.

Nicholas Barbon's final macroeconomic theory is a theory of secular growth. To achieve secular growth, England must first have a sufficient population base, "for the People are the Riches and the Strength of the Country, And it is not much more Advantage to a Prince, to have a Title to Lands, in Terra Incognita, As to Countries without People" (Barbon, 1690, p. 55). But population itself is not sufficient to ensure growth, the people must have arts, that is, technique (technology) and the skills necessary to produce wrought goods from unwrought goods. The arts of the people in Barbon's mercantile world are analogous to additions to capital equipment in a modern economy, both of which are necessary for economic growth in their respective historical periods.

The theories described above were the tools used by Nicholas Barbon to manipulate the independent variables in his model, domestic consumption, investment and foreign consumption of domestic output. He manipulated them in such a fashion as to predict changes in the dependent variables, short run output and employment.

There is an explicit and direct relationship between output and employment in Nicholas Barbon's macroeconomic model. Indeed, they are interchangeable and consequently, both can stand as the dependent variable. The following passage rendered by Barbon makes this quite clear:

Those Expenses that most Promote Trade, are in Cloaths and Lodging: In Adorning the Body and the House, There are a Thousand Traders Employ'd in Cloathing and Decking the Body, and Building, and Furnishing of Houses, for one that is Employ'd in providing Food (Barbon, 1690, p. 64).

In A Discourse of Trade, Barbon succinctly identifies employment as a dependent variable with the following: "It is true, that if our Serge, Stuffs, or Cloth, are Exchanged for unmanufactured Goods, it would be a greater Advantage to the Nation, because of the difference in [the] Number of Hands [employed] in the making of the First, and the Lat[t]er" (Barbon, 1690, p. 77). Barbon is unequivocal here that the trading of manufactured goods for unmanufactured goods is desirable because of the positive impact that it would have on employment.

Having presented Nicholas Barbon's macroeconomic theories, as well as his formal macroeconomic analysis, a discussion of the the policy recommendations, which emanated from the analysis and conclusions based on his model, will now be presented.

Barbon's Policy Recommendations

Nicholas Barbon's ultimate social goal is the welfare of the nation state and the preservation of the national government. His demand-driven model, described above, furnished the apparatus that explained how a high level of output and employment could be maintained in order to ensure Barbon's ultimate social goal. Barbon's policy prescriptions then flow from his macroeconomic model with the welfare of the nation state and the preservation of the national government as ultimate aims. Consequently, he advocates policies that affect the independent variables in his model in such a way as to raise the overall level of demand in the economy.

Barbon's main policy proposal is the establishment of free trade in the international arena.⁶⁸ He makes his desire for free trade explicit with the following:

The Prohibition of Trade, is the Cause of its Decay; for all Foreign Wares are brought in by the Exchange of the Native: So that the Prohibiting of any Foreign Commodity doth hinder the Makeing and Exportation of so much of the Native, as used to be Made and Exchanged for it. The Artificers and Merchants, that Dealt in such Goods, lose their Trades; and the Profit that was gained by such Trades, and laid out amongst other Traders, is Lost (Barbon, 1690, p. 71).

Nicholas Barbon's advocacy for free trade is based on its stimulative effect on the domestic economy. In Barbon's opinion, free trade will improve both foreign demand for domestic goods and home demand for domestic goods. The latter increase in demand will arise indirectly from the spending of the increased profits, i.e., the income of those

⁶⁸W. J. Ashley (1897) cites Nicholas Barbon, Sir Dudley North, Sir Josiah Child and William Davenant as being the originators of the free trade policy of the Tory Party in England during the last years of the seventeenth century.

who directly profit from foreign trade, on domestic goods.

Here is the point at which Barbon hesitates in the total advocacy of free trade. As mentioned above, he makes a distinction between wrought and unwrought goods; the former being manufactured goods and the latter being raw materials and unfinished goods. Barbon is somewhat concerned about the importation of too many wrought goods because the labor used in their production, i.e., the increase in employment, has been realized by foreigners. This would have had too negative an influence on domestic employment and therefore, domestic demand. Barbon makes this opinion explicit when he renders the following:

To Conclude, If the bringing in of Foreign Goods, should hinder the making and consuming of the Native, which will very seldom happen [only in the above cited circumstance]; this disadvantage is not to be Remedied by a Prohibition of those Goods; but by Laying so great Duties upon them, that they may be always Dearer than those of our Country make. (Barbon, 1690, p. 78).

Nicholas Barbon appears equivocal in his advocacy of free trade in that he is proposing a tariff rather than outright prohibition, when special circumstances arise, as described in the above passage. However, his trade policy is consistent in the context of his macroeconomic analysis. Free trade is to be desired because it stimulates and maintains a high level of aggregate demand. This policy is to be abrogated only in special circumstances, those rare situations are instances in which free trade may lessen aggregate demand.

Nicholas Barbon's monetary policy and its concomitant impact on the economy are the overriding themes in A Discourse Concerning Coining the New Money Lighter, which contains the author's response to John Locke concerning the recoinage controversy

in the 1690s in England. As mentioned above, Barbon favored lowering the silver content in the new coined money because it would increase the money supply and thereby, stimulate the level of demand which would increase the level of output and employment in the nation. He feels that an adequate money supply is necessary to drive the nation's economy and makes it explicit with the following:

For Money is the measure of Commerce; And for a Nation to be without money, is the same thing as if it were without measures, and had neither Yards, Scales, nor Bushels in the Country; without some of which, no Bargain can be made.

In those Countries where the Inhabitants do not live upon Trade, but a Country-life, every man having always Provisions sufficient to sustain life, they may shift without money, and barter one Commodity for another. But in England, where the great Body of the People depend upon Trade, and that by selling of such Goods, the greatest part of which People are under no great necessity of having, but may shift without; and have no way of feeding themselves but by the profits of such Bargains, they cannot live without money; and if there were no money, would starve, because no persons will barter for those Goods that they have no absolute occasion for, if they want money (Barbon, 1696, pp. 92-93; emphasis deleted).

Barbon's monetary position during the recoinage debate then flowed from the implications of the above excerpt.

Barbon noted that "[i]nterest in all Countrys is set[t]led by a Law" (Barbon, 1690, p. 33). Thus, his final policy proposal was that England lower the rate of interest to a percentage at least as low as its major competitor, namely Holland. The importance that this economist attaches to a low rate of interest is evidenced in the following passage: "The Two chief causes of the decay of trade, are the many prohibitions [which has already been discussed] and high interest" (Barbon, 1690, p. 71). Later, Barbon amplified his position vis-a-vis Holland:

The next Cause of the Decay of TRADE in England,...is, That Interest is higher in England, than in Holland, and other places of great Trade: It is at Six per Cent. in England, and at Three in Holland; for all Merchants that Trade in the same sort of Goods, to the same Ports, should Trade . . . [at] the same Interest (Barbon, 1690, pp. 79-80; emphasis deleted).

Barbon's conception of the interest rate and its relationship to profit, as described in the previous section, had led him to determine that a low rate of interest was necessary for England to compete with foreign rivals. That is, a low interest rate would increase foreign consumption of domestic goods, as well as help maintain domestic consumption of England's own commodities. In other words, a low rate of interest would ensure a better balance of trade which would increase aggregate demand, and in turn, augment domestic output and employment.

Having presented the macroeconomics of Sir William Petty and Nicholas Barbon, their respective corpora of macroeconomic thought will now be compared and contrasted. A comparison of their conceptualized realities revealed that sufficient conditions existed for an analysis of my more evolved inevitability theorem. If these would-be innovating economists also shared similar macroeconomic theories, some credence will have been provided for my new hypothesis.

PART IV
CONCLUSION

CHAPTER VII

ARE THERE "MINI-MULTIPLES" IN THE MACROECONOMICS OF PETTY AND BARBON?

Jurg Niehans, while noting that "[t]he existing literature on multiple discoveries in economics used the 'case study' approach.... uses the 'overview' approach pioneered ... by Ogburn and Thomas and continued by Merton ..." (Niehans, 1995, p. 2). Limiting himself to what he calls "'pure theory,' at the exclusion of ideas, empirical findings and policy doctrine" (Niehans, 1995, p. 2), Niehans cites forty examples of multiple discovery in economics, from Torrens and Ricardo's theory of comparative cost to the present (Niehans, 1995, pp. 19-21).

In the following discussion, I will use an overview approach vis-a-vis the macroeconomic theories of Sir William Petty and Nicholas Barbon. In other words, I will be examining whether or not their respective individual theories constitute what I term "mini-multiples." I am defining mini-multiples as simultaneous independent discoveries found within the respective corpora of economic thought of two or more economists.

The first element to be compared will be Petty and Barbon's respective hypotheses regarding the impact of money on real variables. Here, the two early economists have identical theories in that they both maintained that money mattered. Sir William in his famous medical metaphor described money as the "Fat of the Body-politic . . . [of which] too little makes it sick" (Petty, 1691a, p. 113). Then, in query 25 of Quantulumcunque Concerning Money, as mentioned above, Petty estimates the money

necessary to drive the nation's trade (Petty, 1695, p. 446).⁶⁹ Barbon's conception of the non-neutrality of money is stated explicitly in various places in A Discourse Concerning Coining the New Money Lighter (Barbon, 1696, preface, pp. 25, 91-94). Barbon's own business affairs probably led him to the conclusion that an elastic money supply was necessary to efficiently drive a nation's trade, and subsequently, that fiduciary money would be required to ensure that supply.

There are similarities and dissimilarities between Petty and Barbon's theories of the rate of interest. For example, they both compare interest to the rent of land. Petty observes: "As for Usury, . . . [it] is the Rent of so much Land as the money will buy . . ." (Petty, 1662 p. 48). Barbon, in a similar vein, offers the following: "Interest is the Rent of Stock and is the same as the Rent of Land: The First is the Rent of Wrought or Artificial Stock; the Latter of the Unwrought . . ." (Barbon, 1690, p. 31). Both economists seemed to think of interest as a type of factor payment similar to rent.

It is at this point that their analyses diverge. Petty, not surprisingly, considers the rate of interest to be governed by natural law. However, he slips into an incipient monetary theory of the rate of interest with the following: "But the natural fall of Interest, is the effect of the increase of mon[e]y" (Petty, 1690, p. 304). Whereas Petty is lurching toward a monetary theory of the rate of interest, Barbon offers a real theory

⁶⁹Sir William Petty, as did Nicholas Barbon, on the basis of their respective opinions that money mattered, put forth policy recommendations that advocated fiduciary money as mentioned in Chapters V and VI, respectively. See Karl Pribram (1983, pp. 73-76) for a full discussion of the problems concerning fiduciary money. He cites Petty and Barbon as being strong proponents of the idea.

of the rate of interest.⁷⁰ Barbon's real analysis indicates that he considers money interest to be some part of return on a merchant's stock. It is equivalent to Keynes' marginal efficiency of capital. In fact, Nicholas Barbon seems to have confused the concepts of the marginal efficiency of capital and the rate of interest and thus was not able to develop a purely monetary macroeconomic analysis, a development that indeed did not reach full fruition until the arrival of Keynes.

Sir William Petty and Nicholas Barbon both harbored underconsumptionist theories. Petty explicitly stresses the importance of consumption on output in manuscripts 62 and 64 of The Petty Papers (Petty, 1927, vol. 1, pp. 214, 217). Then, he expresses his concerns about underconsumption that would result, ironically, from the "equal spreading of Wealth [which] would destroy all Splendor and Ornament" (Petty, 1691b, pp. 193-194).

Barbon propounds his underconsumptionist theory even more forcefully. In the following well known passage from A Discourse of Trade, he writes that "Covetousness is a Vice, prejudicial both to Man & Trade; It starves the Man, and breaks the Trader; and by the same way the Covetous Man thinks he grows rich, he grows poor; for by not consuming the Goods that are provided for Man's Use, there ariseth a dead Stock, called Plenty ..." (Barbon, 1690, pp. 62-63). Then, in an unabashedly Veblenesque fashion, Barbon promotes conspicuous consumption as an important stimulus to consumption demand and ultimately, output and employment (Barbon, 1690, pp. 65, 67, 69).

⁷⁰Joseph Schumpeter provides a thorough discussion of the nascent theories of the rate of interest during this time period, separating them as much as possible on the basis of whether the analysis was largely real or monetary (Schumpeter, 1954, pp. 276-287).

Petty and Barbon's theories of investment can both be termed interest-profit theories. To Petty, profit was the return to a merchant's stock (Petty, 1690, p. 307). That return on investment was calculated by subtracting the costs of the goods to the merchant, including interest costs, from the price that the merchandise could be sold at. A higher rate of interest meant higher costs to the merchant. Thus, high rates of interest curtailed investment because the merchant would be less competitive, e.g., in international markets, which Petty notes while discussing the problem of high interest in Ireland (Petty, 1691b, p. 187).

Barbon's theory of investment is very similar to Petty's described above. He, also, views the interest rate as the rate of return on a merchant's stock, which is similar to Petty's perception. To Barbon, the merchant will engage in trade as long as the return on merchandise (profit) is greater than the rate of interest (Barbon, 1690, p. 32), which is similar to Sir William's view. Hence, investment to both economists depended on the relationship between the rate of profit and the rate of interest.

Sir William Petty and Nicholas Barbon have essentially identical theories of international trade which can best be described as theories based on absolute advantage. In this regard, Petty notes that one country can undersell others if it has natural and intrinsic advantages, by which he meant natural endowments and skilled workers (Petty, 1690, p. 258; 1927, vol. 1, pp. 209-210). These natural and intrinsic advantages then translate into lower costs and increased market share.

Barbon's theory of international trade stresses these same absolute advantages as being the determinants of the amount and type of commodities that a nation could expect

to trade in international markets. He illustrates his proposition by indicating the staples in the production of which various European countries have an absolute advantage (Barbon, 1690, pp. 4-5). Having compared Petty and Barbon's various macroeconomic theories, their respective discoveries will now be categorized as to whether or not they can be considered examples of mini-multiples.

In summary, Sir William Petty had six theories which he used to manipulate his macroeconomic model. They are respectively; his theory of non-neutral money, a theory of the velocity of money, a theory of the rate of interest, and theories of consumption, investment and international trade. Nicholas Barbon had economic laws regarding all of the above, except for a theory of the velocity of money.

Four of the macroeconomic discoveries they formulated can be rightly classified as mini-multiples. These cases include their corresponding discoveries regarding the effect of money on the economy (non-neutral), consumption (underconsumptionist), investment (interest-profit theories), and international trade (absolute costs based on absolute advantage). Their particular discoveries in respect to the interest rate, while similar in some respects, are different in that Petty's analysis tended to be monetary in nature, while Barbon's theory can be regarded as a real analysis of the interest rate. To conclude, the fact that Petty and Barbon formulated four similar macroeconomic laws in their respective bodies of thought, discoveries which can accurately be described as mini-multiples, lends some credence to my new inevitability hypothesis.

Having compared and contrasted the individual economic laws of Sir William Petty and Nicholas Barbon, I would like to offer another analysis of their economic

writings in an effort to determine whether these writings do indeed represent multiples in the Mertonian sense. This attempt will involve a comparison of the main focus of both economists' writings.

CHAPTER VIII

DO THE OVERALL MACROECONOMIC ANALYSES OF SIR WILLIAM PETTY AND NICHOLAS BARBON REPRESENT MULTIPLES?

Don Patinkin, while considering the notion of multiple discoveries, states that ". . . a scientist should not be regarded as having made a discovery unless it is part of his central message" (Patinkin, 1983, p. 306). Patinkin illustrates his concept of a central message in the following passage:

. . . in studying a man's writings we must distinguish between that which was fully integrated into his conceptual framework and that which was not; between the systematic component of his thinking and the random component; between, if you wish, the "signal"-or what I have called the "central message"-the writer wished to convey and the "noise" (Patinkin, 1982, p. 16; emphasis added).⁷¹

⁷¹Patinkin used the notion of the central message in an attempt to refute those economists who claimed that the theories put forth by the Stockholm school, which included such luminaries as Erik Lindahl, Gunnar Myrdal and Bertil Ohlin, as well as the ideas of the Polish economist Michal Kalecki, represented multiples of the theories expressed in The General Theory of Employment, Interest and Money. In Patinkin's opinion, the central message of Keynes, the Stockholm School and Kalecki are different and therefore, their discoveries are not examples of multiples in the Mertonian sense. He describes Keynes' central message ". . . to be the theory of effective demand as an explanation of a state of 'unemployment equilibrium' in a capitalist economy" (Patinkin, 1983, p. 308). Patinkin writes that the central message of the Stockholm school ". . . had to do, not with the equilibrating role of changes in output, but with the related movements of the rate of interest and the various price levels and their subsequent effect on investment" (Patinkin, 1983, pp. 310-311). Finally, in Patinkin's opinion, Kalecki's central message ". . . has to do, not with unemployment equilibrium, but with the generation of cycles of investment (and hence of output and employment) in a capitalist economy on the implicit assumption that, at every instant of time in the cycle, planned savings and investment have-in some unspecified manner-been equilibrated" (Patinkin, 1983, p. 311).

Having described the central message, Patinkin later addresses the problem of identifying such a message. In this regard, he offers the following:

In general, however, the literature that we have been examining [the writings of Keynes, the Stockholm school and Kalecki] does not provide a precise and unambiguous statement of its central message: of the major problem to which it addresses itself and the conclusions it reaches. And in the absence of such a statement I suggest identifying the central message in much the same way that we identify the theme of a movement in a classical symphony: by its being announced early in the the movement and by repetition afterward-either exactly or by different combinations of instruments or in different tonal areas. So is the central message of a scientific work announced by its presentation early in the work (and frequently in its title) and by repetition, either verbatim or modified in accordance with the circumstances. Let me also emphasize that this announcement must be read in ... the context of the events in the real world then impinging on the writer (Patinkin, 1982, pp. 82-83; emphasis added).

Having written before the time of more formal treatises on the political economy, and therefore, a time of somewhat unsystematic theorizing, the identification of the respective central messages of Sir William Petty and Nicholas Barbon may appear somewhat difficult. However, the schema used in this study to evaluate the macroeconomic writings of both economists makes it possible to discern their central messages. Then, a conclusion can be drawn as to whether or not these major discoveries represent multiples.

The Central Messages of Petty and Barbon

As indicated above, the real world events of seventeenth-century Europe led Sir William Petty to conceive of unemployment as the main dilemma in his conceptualized

reality. With this in mind, the central message of the economic writings of Sir William Petty can best be described as a theory of aggregate demand as an explanation for short run employment and output in the newly emerging capitalist economies. This analysis is fully described in Chapter V of this study.

Petty, of course, made other contributions to the field of macroeconomics. These findings represent the less systematic component of his thinking and therefore, cannot be described as part of his central message, but rather should be considered "noise." Petty's major contribution in this regard would be in the area of policy, where he suggests that the government serve as the employer of last resort. In this regard, Sir William writes:

. . . it follows now, that we finde out certain constant Employments for all other indigent people, who laboring according to the Rules upon them, may acquire a sufficiency of food and raiment

But what shall these employments be? I answer, such as were reckoned as the sixth Branch of the Publick Expence, viz. making all High-wayes so broad, firm, and eaven, as whereby the change and tedium of travelling and Carriages may be greatly lessened. The cutting and scouring of Rivers into Navigable; the planting of usefull Trees for timber, delight, and fruit in convenient places.

The making of Bridges and Causeys. The working in Mines, Quarries, and Collieries, The Manufactures of Iron, etc.

38. I pitch upon all these particulars, first, as works wanting in this Nation; secondly, as works of much laborers, and little art; and thirdly, as introductive of new Trades into England, to supply that of cloth, which we have almost totally lost (Petty, 1662, pp. 29-30; emphasis added).

In Petty's open model of the macroeconomy, it is an appropriate role for the government to find employment for the involuntarily unemployed, the main dilemma in his reality. Later, he follows this passage with a recommendation that the unemployed be put to work on make-work projects if necessary with his famous quotation that "supernumeraries . . . be employed to build a useless pyramid upon Salisbury Plain,

bring the stones at Stonhenge to Tower-Hill, or the like . . ." (Petty, 1662, p. 31). The government, being part of effective demand, could respond in the absence of sufficient private sector demand to ensure full employment, an idea that was resurrected by Keynes in The General Theory of Employment, Interest and Money.

As described in Chapter III, Nicholas Barbon considered a lack of trade to be the fundamental problem in his economic reality. Accordingly, in a manner similar to Petty, he developed a macroeconomic analysis of aggregate demand as an explanation for output and employment in the short run as his central message. This analysis is presented above in Chapter VI (see pp. 112-126).

However, the policy recommendations of Nicholas Barbon, the more random component of his macroeconomic thought, that is, the "noise," is different from the recommendations that flow from Petty's analysis. Barbon proposes a policy of laissez faire in the following famous passage:

The Chief causes that Promote Trade [and employment], . . . are Industry in the Poor, and Liberality in the Rich: Liberality, is the free Usage of all those things that are made by the Industry of the Poor, for the use of the Body and Mind; It Relates chiefly to Man's self, but doth not hinder him from being Liberal to others (Barbon, 1690, p. 62).

In summary, Sir William Petty and Nicholas Barbon have identical central messages, as defined by Patinkin. Both economists developed theories of aggregate demand as explanations for short run output and employment in the new capitalist economies of Europe, which qualifies their findings as multiple discoveries in the Patinkin-Mertonian sense.

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